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Profile of APSRTC-With Reference to Visakhapatnam City

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Abstract

Transportation plays an important role in the modern society particularly RTC buses. For the continuous development of India there should be a synchronized transport system. Competitiveness and increasing productivity are based on the efficient transport system that exists in the country. Efficient transport is indispensable to the economic development of nation. There are various modes of transport that include road transport, rail transport etc. The present study is an endeavor to depict the empirical profile of APSRTC – Visakhapatnam City.

Keywords: APSRTC, Evolution, Profile, Visakhapatnam City.

Introduction

Andhra State and Nizam dominion were separate before the reorganization of states by Government of India. After the reorganization of states and consequent formation of Andhra Pradesh on 1st November, 1956, the Road Transport Department of erstwhile Nizam's dominion continued to work as a Government Department with its services operating only in nine districts of Telangana region of previous Nizam's dominion. The private operators of Andhra State, before the formation of Andhra Pradesh, were operating their buses in the coastal Andhra and Rayalaseema regions. The Andhra Pradesh Government was therefore, and then faced with an alternative of either denationalizing the bus services in Telangana or extending the nationalization of bus services to the remaining 11 districts of earlier Andhra State. The decision was naturally in favour of nationalization, so that there would be uniformity throughout the state of Andhra Pradesh.

In pursuance of this decision and the recommendations of the Planning Commission that wherever road services are run by a State, a Corporation should be formed so that it could provide the necessary economy and lead to a more efficient administration, the Andhra Pradesh State Road Transport Corporation (APSRTC), was established with effect from 11th January 1958, as per G.O.M.S. No. 38. Home (Transport) Department, dated 6th January, 1958. Rules under the R.T.C. Act, 1950, were also framed and issued by the Government. Thus, this turned out to become the oldest State Road Transport undertaking in India.

When the APSRTC was formed, it took over the assets and liabilities of its predecessor, the Road Transport Department (RTD). The assets were valued at Rs. 2.25 crores as on 31st March, 1958. Prior to the formation of the APSRTC the road transport services in the twin cities of Hyderabad-Secunderabad, Warangal and Kothagudem and the mofussil services in the nine districts of Telangana were under operation by the RTD. After the formation of A.P.S.R.T.C, nationalization of road transport was extended to the contiguous districts, namely, Krishna, Guntur and

west Godavari in the Coastal region in a phased manner from 1st April, 1958. The bus routes in these districts were nationalized between 1958 and 1961.

Upto November, 1958, the services in Hyderabad city area were operated from only one depot located at Gowliguda. In December, 1958, however another depot was opened at Ranigunj in Secunderabad to relieve the increasing congestion at Gowlignda and reduce the working costs. In addition to ordinary and express services for long distance travellers on mofussil routes, deluxe services were introduced in January, 1960.

Within three years of the formation of the APSRTC the nationalized transport services in the State witnessed enormous growth. During 1961-62, the APSRTC operated 1, 666 buses from 34 operating depots, on 323 routes with a total route length of 9,835 kml. A total of 8.09 crore vehicle kilometers were operated and 15-16 crore passengers were carried. While the capital-at-charge increased to Rs.7.90 crores, the gross revenues of APSRTC rose to 6.60 crores. The working expenses including the provision for depreciation, worked out to Rs. 6.32 crores, yielding a profit of Rs. 28 lakhs. By this time, the APSRTC achieved a significant progress with considerable improvement in the fleet, standard of operation and services. Considerable progress was also recorded in the provision of facilities to the traveling public and the employees of APSRTC.

The night express services were started in 1963-64. The first service was introduced on Hyderabad-Vijayawada route from 1st May, 1963. The system of issuing tickets in advance and reservation of seats at nominal charges Rs. 0.25 was extended to all the express and deluxe services in 1963-64 to facilitate the traveling public in ensuring their seats without having to wait for the same, at the time of departure of the services. Articulated double-decker buses designed by APSRTC and Hyderabad Allwyn were introduced in the city in April, 1963. A departmental training school was opened at Vijayawada during this year for providing training facilities to mechanical and operating staff. The Regional workshop at Vijayawada also commenced its operations in 1963-64.

An industrial engineering cell was created in 1964-65 to constantly review the working and help APSRTC in increasing the productivity. To have an effective control and proper and timely recruitment, a Recruitment and Training cell was established in the Personnel Department in January 1965. As an experimental measure, the system of one-man operation of service on long distance express and deluxe services operating between Hyderabad and Vijayawada was introduced in November, 1964. These services were operated without conductors but with experienced and selected drivers to look after the passengers. A new depot was opened at Barakatpura to operate the city services more efficiently. A printing press was started to undertake the printing work of APSRTC in 1964-65.

Prior to 1965, the depots in APSRTC were managed by supervisory rank persons. The supervisor in charge of the depot was reporting to Assistant Mechanical Engineer on engineering matters, Assistant Traffic Manager on operational matters, Assistant Personnel Officer on establishment matters, Divisional Accounts Officer on accounts matters and Divisional Manager who was overall in-charge of all depots. These officers were located at district head quarters which were far away from many depots. It was found that this system was not yielding the designed results since the supervisor was not given necessary authority to deal with issues that arise at depot level day-to-day. There was the feeling that the depot should be treated as a profit and loss centre so that there would be an all-round awareness as to which depots were loosing and which depots were making profit. With this background it was decided in October, 1965, to post officers to each depot as Depot Manager so that they would function as in-charge of depots, looking after all functions relating to stores, personnel, mechanical engineering, operations and security. Thus, unit of command at the depot level was sought to be achieved. This officer was delegated with necessary powers also so that it would be possible for him to look after the day to day functions of the depot. Seen in retrospect this administrative change which continues to be even now in vogue has brought considerable effectiveness to the organization. The presence of an officer at the depot resulted in better discipline and better operational control. The depot manager was also able to attend to the most important functions, namely public relations. It is said that other organizations in India also have adopted this system.

Another important development in 1965-66 was the creation of vigilance and implementation cells under the direct control of the chairman. The vigilance cell was established to determine key performance indicators, set realistic targets and forecast the trends in operations. The implementation cell was formed to ensure the implementation of the administrative decisions in connection with the working methods and procedures of the APSRTC. There is significant increase in the operation of schedules all over the state. To overcome the shortage of qualified personnel one more training school at Hyderabad was started to impart instructions to drivers, mechanics, assistant depot clerks, electricians and conductors.

A retreading unit was set up at Vijayawada in April, 1965. Kukatpalli and Charminar depots were started in November, 1965 and April, 1966, respectively to operate city services more efficiently. Around this time, trailer buses were introduced in city services. Special school buses were also started to cater to the needs of student community. Ladies specials were also run for school going girls and working women. Standard buses were introduced to cope up with the peak hour traffic in Hyderabad-Secunderabad. Limited stop services were introduced

in the city. Dilshuknagar depot was opened in September, 1966. Mehadipatnam depot was started in 1968-69. Body Building unit was established in June, 1966. Within a short time, this unit achieved full fabrication and assembly of the new bodies from raw materials to its design as against the assembly of bodies from the kits of the basic structure procured from outside builders in the previous years. The tire retreading unit at Hyderabad also started functioning from January, 1970 to meet the growing requirements of tire retreading and repairing works of the APSRTC.

Purpose of Study

The objective of the study is to portray the evolution of APSRTC and the profile of APSRTC (Visakhapatnam City).

Origin of APSRTC in Visakhapatnam City

Visakhapatnam is the city of destiny on the East Coast of India and is situated at 17^0 42^1 latitude North and 28^0 2^1 longitude East at a distance of 866 Kms from Calcutta and 760 Kms. from Madras. It is bound by Bay of Bengal on the East and a group of hills on the west, Simhachalam range of hills which is a continuation of Eastern Ghats on the North and Dolphin's Nose above 1500, high projecting into Bay of Bengal, on the South. The city is spread over an area of 78.33 sq. Kms and the population of Visakhapatnam city is 17.30 lakhs and that of Visakhapatnam district is 42.88 lakhs. The city is now called the Steel City with the emergence of gigantic steel plant.

The bus transport in Visakhapatnam city was managed by private operators up to November 1978. There were frequent ghastly accidents due to unhealthy competitions in running buses among various private operators resulting in fatal accidents every month. Therefore, the people of Visakhapatnam city demanded and also launched an agitation for immediate nationalization of bus routes. As a consequence of this, nationalization of bus routes in Visakhapatnam took place on December 12, 1978. The APSRTC made a beginning of its operations with a fleet strength, of 139 buses replacing private buses. At the time of nationalization there was only one bus depot, that is. Visakhapatnam Rural Depot from which the city services were also operated. The city division-Visakhapatnam Urban Division of APSRTC was formed in the year1988.Later on consequent to the introduction of regional set up in a phased manner in the state from 16th January 1978, Visakhapatnam Region was formed in November 1994. There are now 5 urban depots and 4 rural depots functioning under the region catering to the needs of the public. The present studies are confined to the urban transport in Visakhapatnam.

Urban Transport in Visakhapatnam

At the time of formation of Visakhapatnam Region the strength of the city buses then was 407 and it is now 667 (Dec 2010) in the region carrying about 6.5 lakhs of passengers daily. There are now 5 urban depots functioning under Visakha region, catering to the needs of various categories of local people residing in Visakhapatnam and also people coming to Visakhapatnam from neighboring areas/ villages on different purposes.

Table – 1: Establishment of city depots in Visakhapatnam city

Sl. No	Category	Name of the Depot	Commencement of the Depot
1	Urban	Simhachalam Depot	03-12-1978
2	Urban	Gajuwaka Depot	03-01-1979
3	Urban	Waltair Depot	26-01-1979
4	Urban	Maddilapalem Depot	15-12-1987
5	Urban	Steel city Depot	24-01-1992

Source: Regional Office, APSRTC, Visakhapatnam

Table 1 describes the different depots functioning under Visakhapatnam region and their respective dates of commencement. Simhachalam depot was commenced on 3-12-1978, Gajuwaka Depot on 3-01-1979, Waltair depot on 26-01-1979, Maddilapalem depot on 15-12-1987 and Steel City depot on 24-01-1992.

Simhachalam depot facilitates the transport needs of commercial and pilgrim passengers connecting various business centres, villages and Lord Sri Varaha Narasimha Swamy Temple, etc. Gajuwaka depot caters the transport needs of industrial workers belonging to various central, state, quasi-government, organizations/ industries i.e. Port, HPCL, Shipyard, Colleges etc. Waltair Depot is started mostly to meet the transport needs of student community connecting various educational institutions, picnic spots, etc. Maddilapalem depot is functioning to meet the transport needs of all public connecting various places in the city Steel city depot has come up at Kurmannapalem catering to the needs of steel plant employees taking them to important villages around steel plant, their rehabilitation colonies and to all sectors of steel plant township and to the city bus complex. Depot wise schedules, buses held and passengers transported (in lakhs) are given in Table 2.

Table – 2: Urban depot wise schedules and buses held and passengers transported

Depot	Schedule			Buses held			Passengers traveled (lakhs)
	RTC	Hire	Total	RTC	Hire	Total	
Gajuwaka	114+24=138			123+24=147			0.77
Simhachalam)	95+34=129			103+34=137			0.90
Waltair	132+40=172			139+40=179			1.51
Maddilapalem	120+33=153			128+33=161			0.77
Steel City	90+15=105			95+15=110			0.92
Total	**551+146=697**			**588+146=734**			**4.87**

Among the urban depots the highest number of schedules that is 172 schedules are operated by Waltair depot and this is followed by Maddilapalem depot 153 schedules, Gajuwaka depot 138 schedules, Simhachalam depot 129 schedules and Visakha Steel city depot 105 schedules. The highest number of passengers transported was 1.51 lakhs, recorded by Waltair depot and this was followed by Simhachalam depot 0.90 lakhs, Visakha steel city depot 0.92 lakhs and Waltair and Maddilapalem depot each transported 0.77 lakhs of passengers.

Operations in APSRTC Visakhapatnam

APSRTC Visakhapatnam region has varied range of services with good transport net work between the villages, towns and cities within the state and also has operations in the neighbouring states. It is supported by infra structure like Bus Stops, Bus Stands and Bus Complexes based on the requirements in villages, towns and cities. Different types of buses providing different passenger comforts services, with variation in fare, are in operation for the convenience of its passengers. Different types of buses held are given in Table 3.

Operation of Buses under Different Categories

- Palle Velugu: It was previously called as "Red Bus". It connects the villages and also the villages to nearby towns.
- City Service: Ordinary service operated within the city and the fare is cheaper than other services.
- Metro Express: Comfortable with 2+2 seats with limited halts operated on longer routes within the city.
- JNNURM: These buses are purchased with central Government assistance under a special scheme. These buses have the electronic display of its number and route and are comfortable with 2+2 opposite seats. They have limited stops and are operated on longer routes within the city. Fare is comparatively more than ordinary city services.
- Express: Operated as a service between the towns and also in between towns and cities.
- Deluxe: Usually operated on longer routes. Fare is more than express service Fare.
- Super Luxury: Most popular non air conditional service between towns and cities and vice versa.
- Garuda: Air Conditioned Volvo bus services with lower floor introduced, are named as "Garuda" and are operated between the cities covering long distances. These buses are very fast, comfortable and safe.

Table – 3: Different types of buses held under Visakhapatnam region

Sl. No	Type of Bus	Total number
1	Palle Velugu	199
2	City Service	481
3	Metro Express	100
4	JN NURM	162
5	Express	68
6	Deluxe	55
7	Super Luxury	47
8	Garuda	15
	Total	**1127**

City Operations

There are nearly 200 city operations under urban transportation of Visakhapatnam region carrying passengers from important centers in the city to different places in the city and also from adjoining remote places to educational institutions, business establishments, information technology centers, central and state government offices, hospitals, railway station, port, Bharat Heavy Plants & Vessels, Steel plant, naval establishments, places of worship and many

other important worth seeing places in the city. The details of the bus number and the route covered are given in Table 4:

Table – 4: City operations

Bus No	From	To
25V	Old Bus Stand	Vellankipalem
25B/H	Old Bus Stand	Navodaya
28	Simhachalam	RK Beach
28A	RK Beach	Pendurthi
28J	Sujathanagar	RK Beach
28K	Kothavalasa	RK Beach
28R	RK Beach	Pendurthi
28P	ZP (Zilla Parishad)	Sabbavaram
28S	Simhapuri Colony	ZP
28V	VUDA Park	Simhachalam
28Z	Zilla Parishad	Simhachalam
30A	Old Head Post Office	Indian Express Office
30M	Old Head Post Office	Muralinagar
30N	Old Head Post Office	NGGO's Office
30V	Old Head Post Office	Madhurawada
31	Old Head Post Office	Kailasapuram
31A	Old Head Post Office	Srinivasa Nagar
31G	Old Head Post Office	Boddapalem
33	Old Head Post Office	Srinivasanagar
35	Old Bus Stand	Chintala Agraharam
35A	Old Bus Stand	Porlapalem
2K	HB Colony	MN Club
1	Yadava Jaggarajupeta	Vuda Park
1T	Kapula Tunglam	Vuda Park
2	Natayyapalem	Vuda Park
2	Venkojipalem	BHPV
2A	Autonagar	Vuda Park MVP Bus Station
2G	Gantyada	CBS
2M	Mindi	Maddilapalem
3	Sheelanagar	Pendurthi
4A	Balacheruvu	Autonagar
4M	Nadupuru Colony	Duvvapalem
5	Old Head Post Office	Pulagalapalem
5B	Port Area	Ramavaram
5D	Old Head Post Office	Venkateswara Temple
5R	Old Head Post Office	City Bus Station
5S	Sramasakthinagar	Simhachalam
6B	Old Head Post Office	Chinthagantla
6A/S	Simhachalam	Sujathanagar
6KV	CBS (Krishnapuram)	Venkatapuram
6/29	Simhachalam-Old Head Post Office	NAD Colony-CBS
7	S.R.Puram	Ravindranagar
8	Old Head Post Office	Meghadrigedda
9G	Old Head Post Office	Chandrayyapeta & Gullipalli
9P	Purna Market	Amruthapuram
9T	Old Head Post Office	Thavvavanipalem
10	Maddelapalem Bus Station	Old Head Post Office
11C	VS Krishna College	Old Head Post Office

12A	Old Bus Stand	Kothavalasa
13A	VS Krishna College	Old Head Post Office
14	Muvvalavanipalem Bus Station	Old Head Post Office
16	Yarada	RK Beach
17A	Venkojipalem	Kotha Road
17B	Rushikonda	Old Head Post Office
20	Seetammadhara NE	Old Head Post Office
20A	HB Colony	Old Head Post Office
20A/M	Muvvalavanipalem Bus Station	Old Head Post Office via HGC
20V	Muvvalavanipalem	Venkateswara Temple
21	Simhapuri Colony	Simhachalam/Old Head Post Office
23	VUDA Park	Kapu Jaggarao Peta
25	Old Head Post Office	Madhuravada
25A	Old Bus Stand	Madhuravada
25B	Old Bus Stand	Ananadapuram
25C	Kommadi	Old Bus Stand
25A/D	Ayodhya Nagar	Old Bus Stand
38N	Autonagar	CBS
38P	Sivarampuram	CBS
38S	SV Palem	CBS
38T	Sector X1	CBS
38V	V.Colony	CBS
40	Simhachalam	CBS via NH5
41	Central Bus Station	Kothavalasa
42	GWK (Gajuwaka)	Collectorate
44A	Nunaparthi	Collectorate
48	Ravada	Collectorate
48R	MN Club	Madhusudhana Nagar
48M	Old Head Post Office	Madhurawada/VUDA Colony
48N/B	Old Head Post Office via Allipuram	Madhurawada/VUDA Colony
48V	Old Head Post Office	MS Nagar
51	Venkateswara Temple	Simhachalam
51R	Sagarnagar	Kailasapuram
52A	Simhachalam	Bus complex
52E/D	Old Head Post Office	Rushikonda
52D	Old Head Post Office	Jodugullapalem
52E	Old Head Post Office	Ravindranagar
52K	Old Head Post Office	Ravindranagar
52S	MN Club	Rushikonda
52V	Old Head Post Office	Ravindranagar
53	Old Head Post Office	Sagarnargar
55A	NAD/Pendurthi	Visalakshinagar
55C	Simhachalam /SP Colony	Sontyam
55E	Ch.Agraharam	Scindia
55K	Simhachalam	Scindia Gate
55S	Scindia Gate	Sujathanagar
55P	Kothavalasa	Steel Plant MG
56	Pendhurthi-Simhachalam	Old Head Post Office
57	Simhachalam	Balacheruvu
57B	Pendhurthi	Balacheruvu Megadri Gedda
57D	Maddelapalem Colony	Megadrigedda
58Z	Zilla Parishad	Sagar Nagar

60	Simhachalam via M. Lova	Old Head Post Office
60B	ARC	RK Beach
60C	Arilova Colony	Old Head Post Office
60M	Mudasarlova	Old Head Post Office
63	Devada	Waltair
63A/N	Old Gajuwaka	Appikonda
63C	Appikonda	Collectorate
64A	Old GWK	SW Varam
64	Talapaka	Collectorate
65	D.Palem	VUDA Park
65F	Duvvapalem	Fishing Harbour
66A	S.Varam	Collectorate
66G/N	Old Gajuwaka	PYPalem
66V	Vondali	Collectorate
66S	Scindia	Ayyannapalem
67	Gajuwaka	Sabbavaram
69	Arilova Colony	Rly Stn
70	Sramasakthinagar	MVP
77	Manthripalem	CBS
77	Tadi	VUDA Park
77b	Bharanikam	Collectorate
300	Sabbavaram	CBS
315	Old Head Post Office	Santhapalem
336	Steel Plant	Sector X1-CBS
338	Steel Plant	CBS
338	Central Bus Station	Steel Plant Gate
400M	Yedumetla Marripalem	Maddilapalem
400	Rajivnagar	MVP
400G/K	School Bus	Anakapalli
400B	Maddilapalem	Kurmannapalem
400Z	HB Colony	FDB Stores
401	Maddilapalem	Kurmannapalem
401D	HB Colony	DP School
401G	Rajiv Nagar	Maddilapalem
401	Maddelapalem	Kurmannapalem
401D	HB Colony	DP School
401G	Rajivnagar	Maddilapalem
400	Kurmannapalem	Maddilapalem
400A	S. Colony	Maddilapalem
400S	Narava	Maddilapalem
400V	V.Colony	Maddilapalem
411	HB Colony	Steel Plant
409	Maddelapalem	Steel Plant
404	Steel Plant Gate	PMP Colony
405	Steel Plant Gate	Midilapuri Colony
411A	Steel Plant Gate	HB Colony
444	Paravada	CBS
448	Dr. Colony	Kailasapuram
505	S. Colony	Maddilapalem
535	Maddelapalem	NAD
540	Maddelapalem	Simhachalam
556	Kotha RD	Chintagantla

541	Maddelapalem	Kothavalasa
555	Appugarh	Simhachalam
632	Kaniti	VUDA Park
638	Siddhartha Nagar	CBS
644	Paravada	Collectorate
666	Kurmannapalem	Madhuravada
777	Gantyada / HB Colony	Madhuravada
900	Venkojipalem	Maddilapalem Station
900A	Rly Station	Eenadu
900K	Old Bus Stand	INS Kalinaga
900K/R	Old Bus Stand	INS Kalinaga
904	Steel Plant	Muvvalavanipalem Bus Station
914	Muvvalavanipalem Bus Station	Steel Plant Main Gate
924	Muvvalavanipalem Bus Station	Old Head Post Office

Depot Wise Staff Position and their Duties

Depot is the basic unit as it is the actual point of action and the revenue generating unit. The depot manager head the level of operation of the depot looking after all functions relating to operations, mechanical engineering, personnel, stores and security. Depot manager is assisted by different categories of employees of the concerned departments and the composition of staff of departments vary from depot to depot depending on the performance and requirement of the depot namely its bus schedules, fleet held, number of kilometers operated etc. The depot wise staff position, obtained from the Regional Office as on Dec 2010, of different departments performing important functions are given in Table No. 5.

Table – 5: Depot-wise staff position and their duties

Name of Post	GWK	SML	WTR	MDP	VSC
Operational Department					
Asst. Manager (Traffic)	1	1	1	1	1
Super-in-tendent	1	1	1	1	0
Dy. Super-in-tendent	1	2	2	2	0
Traffic Inspector (Grade III)	3	1	5	1	2
Depot Clerks	2	2	1	2	1
Asst. Depot Clerks	15	21	18	27	16
Controllers	-	-	-	1	-
Drivers (Grade I)	22	34	39	13	12
Drivers (Grade II)	182	174	200	252	147
Drivers (Casual)	1	-	-	-	-
Drivers (Contingent)	120	53	162	93	90
Light Vehicle Drivers	0	1	0	0	0
Conductors (Grade I)	10	8	17	-	3
Conductors (Grade II)	256	238	255	356	187
Conductors (Contingent)	126	95	183	77	76
Total	**740**	**631**	**884**	**826**	**535**
Name of Post	**GWK**	**SML**	**WTR**	**MDP**	**VSC**
Mechanical Department					
Asst. Manager (Mechanical)	1	1	1	1	1
Super-in-tendent	1	1	1	2	1
Dy. Super-in-tendent	1	2	2	1	1
Leading Hand / Vehicle Inspector	2	1	2	1	0
Mechanic (Grade I)	6	6	4	12	6
Mechanic (Grade II)	20	19	25	18	14
Electrical (A.C)	2	0	0	1	0

Electrical (D.C)	0	3	4	3	3
Tyre Mechanic	2	3	3	1	3
Coach Builder	3	4	3	5	2
Pannel Beater	1	-	-	-	1
Painter	1	-	1	2	1
Welder	1	1	1	1	-
Trimmer	1	2	1	2	2
Black Smith	1	1	2	1	-
Hammer Man	2	1	1	2	1
Mill Wright Mechanic	0	0	0	1	1
Helper	12	16	14	13	10
Shramik	11	12	25	32	16
Total	**68**	**73**	**90**	**99**	**63**
Name of Post	**GWK**	**SML**	**WTR**	**MDP**	**VSC**
Personnel Department					
Asst. Manager (Personnel)	0	0	1	0	0
Super-in-tendent	1	1	0	1	0
Dy. Super-in-tendent	0	0	0	0	1
Senior Assistant	1	1	1	1	1
Junior Assistant	2	2	2	2	1
Typist	1	1	1	1	1
Record Tracer	0	1	0	0	0
Care Taker	0	0	1	0	0
Total	**5**	**6**	**6**	**5**	**4**
Name of Post	**GWK**	**SML**	**WTR**	**MDP**	**VSC**
Finance Department					
Super-in-tendent	0	0	0	1	0
Dy. Super-in-tendent	0	0	1	0	1
Senior Assistant	1	1	1	0	1
Junior Assistant	1	1	1	0	1
Total	**2**	**2**	**3**	**1**	**3**
Name of Post	**GWK**	**SML**	**WTR**	**MDP**	**VSC**
Stores Department					
Assistant Manager (Materials)	0	1	0	0	0
Super-in-tendent (Materials)	1	0	0	1	0
Total	**1**	**1**	**0**	**1**	**0**
Name of Post	**GWK**	**SML**	**WTR**	**MDP**	**VSC**
Security Department					
Assistant Sub-Inspector	0	0	1	1	0
Security Head Guard	0	1	1	2	1
Security Guards	6	5	7	5	5
Total	**6**	**6**	**9**	**8**	**6**

Source: APSRTC Records

Organization Structure

Regional Manager is the administrative head of APSRTC Visakhapatnam region and Urban and Rural bus depots operations in the region will be functioning under his guidance and supervision. He will be assisted by the Deputy Chief Traffic Manager – Urban, Deputy Chief Manager-Rural and Deputy Chief Mechanical Engineer (in-charge for all depots in the Region) in their respective subjects. There is one Senior Medical Officer in-charge for over all control of health and hygiene of the entire region. There is one personnel officer (P.O.) for the entire region and he will be the Regional Manager in the administrative matters of his office. The duties and responsibilities of APSRTC personnel working in different departments of Visakhapatnam Region

Administration

The Regional Manager is the head of the APSRTC Visakhapatnam Region and is assisted by different categories of the following officers of different departments on administrative, technical and other matters.

Regional Manger (RM)

Regional Manger is in-charge of the entire region and the depots that come under the region. He is delegated with the powers to take decisions on all routine administrative matters of the region except on matters of corporate interest. Regional Manager is given the powers to recruit all categories of staff from the lowest level in class IV to one level below the first line of supervisors. He is responsible for the entire maintenance, planning and development of the public transport system in the region. He is given the powers necessary for maintaining operations at peak level of performance.

Deputy Chief Manager (Traffic & Mechanical)

Deputy Chief Managers assist the Regional Manger in their respective subjects. They perform the duties of inspection and supervision of the depots and extend necessary help and guidance to the Depot mangers.

Depot Manger (DM)

Depot Manger is the key person of administration to operate the services as per the schedules allotted by the Regional Manger, i.e., to exercise control over the staff working in the depot. Viz., from assistant manger to shramick in the depot, to maintain good industrial relations, to achieve targets, takes disciplinary action up to Deputy Superintendent Category and for other categories i.e., Superintendent and Assistant Managers. He can initiate action and submit the case to the Regional Manager, inspection of control points ensuring traffic clearance, maintains co-ordination among all wings of depot in general.

Personnel Department (P)

The personnel department in APSRTC plays an important role in administrating the organization with effective measures to satisfy the Government as well as the commuters in day-to-day performance. The following key posts in the personnel department are important in the organization to run the administration in a smooth way.

Assistant Manager (Personnel)

Assistant Manager (P) reports to Regional Manager. He exercises control and supervision on the staff in the regional office, ensures maintenance of registers and records as prescribed in the office manual, pays special attention on important matters of Personnel Department like settlements of ex-employees and disabled employees, attends to audit objections, legal cases, etc., leave sanctioning authority upto 7 days to subordinating staff, obtains personnel records and reports of employees from depots and maintains seniority lists of regional seniority posts.

Superintendent (P)

Reports to Depot Manger, takes functional guidance from Assistant Manager (P), exercises control and supervision on the staff working in depot managers office, pay special attention on important parameters as mentioned above for Assistant Manager (P).

Deputy Superintendent (P)

Deputy Superintendent (P) exists in the depot where the schedules are less than 60. His Duties are the same as above noted for superintendent (P), and he has to report to Depot Manager.

Senior Assistant (P)

Attends to duties as per the subjects allotted in the work list prepared in the regional office, like maintenance of files, registers, transfer registers and seniority lists. He also attends to duties allotted by Assistant Manager (P) from time to time.

Junior Assistant (P)

Attends to subjects other than recruitment, transfers, preparation of seniority lists and promotions. Attends to routine work like payment of bills (telephone, current etc.,) preparation of pay orders, audit objections, etc.

Personal Assistant (P)

He reports to Assistant Manger (P). Works as personal assistant to Regional Manger. Takes dictation, attends to confidential files, maintenance of merit rating reports, appeal cases, etc.

Finance Department

Assistant Manger

He reports to Regional Manger and is responsible for the maintenance of accounts, preparation of salary bills, drawal of amounts. He has to inspect and check the accounts of bus cash dealt by the depot clerk, responsible for the recovery of house building advances, festival advance, motor cycle loans, etc.

Senior Assistant

Senior Assistant (F) attends to the preparation and compilation of salary bills, maintenance of ledgers and allotted account head registers and maintenance of records for non- departmental recoveries.

Junior Assistant

Junior Assistant (F) attends to similar duties as that of senior Assistant (F) and to the items of work allotted.

Mechanical Engineering Department

This department is playing an important role in operational performance of APSRTC buses which carry the passengers to a long distance throughout the state as well as interstate services. The following personnel are playing key role in this department.

Assistant Engineer (Mechanical)

Assistant Engineer is the responsible for the maintenance and upkeep of the vehicles and give update reports to Depot Manager. Ensures chart I, chart II, chart III, chart IV and chart-V maintenance of vehicles.

Chart I : Daily things to be attended on the vehicle
Chart II : Weekly things to be attend on the vehicle
Chart III : Monthly things to be attend on the vehicle
Chart IV: quarterly things to be attend on the vehicle
Chart V : Fitness certificate

Assistant Engineer (Mechanical) exercises control and supervision on all the employees of the garage. Sanctions leave up to 7 days to subordinate staff. He maintains various registers pertaining to maintenance parameters and submits periodical returns to Depot Manger and Deputy Chief Mechanical Engineer, Exercises control on stores section. He also ensures accounts of materials received in and sent out of the garage of the depot. Supply of buses by scheduled time from the garage for operation of service, sends mechanics out of the depot when break down takes place. Maintains various registers prescribed under Factories Act.

Superintendent (Mechanical)

Reports to Assistant Engineer (Mechanical) and attends to the same duties of Assistant Engineer (Mechanical) under his direction and supervision. Assistant Engineer (Mechanical) and Superintendent (Mechanical) will arrange their duties on shifts as per their convenience.

Deputy Superintendent (Mechanical)

Attends to duties assigned by Assistant Engineer (Mechanical).

Leading Hand

Leading hand is the lowest level supervisor closer to the workers and attends to all types of works assigned by Assistant Engineer, Deputy Superintendent Engineer.

Mechanics

They attend to their duties chart-wise as per the programme given to them. Make available the vehicles for the scheduled operations in time. Attends minor repairs as and when required

Artisans: As per their trade, they attend to their respective duties.

Helper: Helper will assist the mechanic.

Cleaning and washing of buses and also assist Mechanics.

Stores Department

This department is an important one, which maintain the stock of the requirement parts and goods for the vehicles of the APSRTC. The following personnel are the key posts in the department.

Assistant Manager (Material)

Reports to Deputy Chief Mechanical Engineer His duty is to put indent, collect and maintain the spare parts required for the maintenance and light repairs of vehicles in the depot. Attends to local purchase of materials as per the sanction received from the authorities.

Assistant Depot clerk

Maintains various stocks registers in the stores department. Assists Assistant Manager (stores) in the procurement, issue and maintenance of the spare parts required for the repairs of the vehicles in the depot

Traffic Department

The control of bus routes and traffic is maintained by this department. The important personnel administrators of the department have been discussed here under.

Assistant Manager (Traffic)

Reports to Deputy Chief Traffic Manager. Supervises and exercises control over his subordinate staff. Visits accident spots and submits report with sketch etc., to Deputy Chief Traffic Manager (urban) if it is a matter concerned with urban depots and to the Deputy Chief Traffic Manager (Rural) if it is concerned with rural depots, Ensures crew for the services to be operated, prepares programme for the operation of schedules for the next day, ensuring leave sanction and sick reporting of crew to be within the cushion of 30% allotted. He can sanction leave up to 7 days to the categories up to superintendent. Checking of control points and ensures clearance of traffic, operation of special hire buses as ordered by the Depot Manager. Responsible for proper accounts like tickets and

cash. Proposes changes in bus timings from time to time to suit traffic behaviour and ensures punctual operation of buses.

Superintendent & Deputy Superintendent (Traffic)

The Superintendent duties are similar as mentioned above for Assistant Manger (Traffic) and reports to Assistant Manager (Traffic), whereas, the deputy superintendent, attends to the duties assigned by the Asst. Manager (T) and Superintendent (T).

Depot Clerks

There are different categories of Depot clerks attending to different types of works assigned to them. Receives and maintains account of the tickets received from the regional stores and issues the tickets to the tray for each service. Receives the cash from the Assistant Depot Clerks who in turn receives the cash from the conductors and remits this cash in the bank the next day with escort.

Assistant Depot Clerk

Assistant Depot Clerks' duty is to issue tickets to the tray as and when required, to receive the bus cash as per way bills and statistical return from the conductors and to hand over the same to Depot Clerk, to maintain various registers in the Operation Department (traffic), to prepare daily earnings particulars like kilometers per liter (KMPL), earnings per kilometer (EPK) etc, and submit the same to Assistant Manager (traffic), to attend to clerical duties in the office of Assistant Manager (traffic).

Drivers

The duty of a driver is to receive the vehicle service bus-from the garage with anticipation, carefulness, to stop the bus at all stages, to maintain bus speed standards prescribed by the authorities, to obtain kilometers per litre target (KMPL), to hand over the bus at the depot without any damage or accident, to maintain in the log sheet about the repairs, the bus needs for the next day operation.

Conductor

The duty of a conductor is to conduct the service bus, issue of tickets and collection of fares from the passengers, to maintain statistical record and to ensure stoppage of bus at all stages and for proper, prompt and punctuality in operation, to assist weak and disabled passengers in alighting and boarding the bus, to maintain and extend courtesy to the passengers, to report by the quickest possible means in case of accidents to the nearest depot, to hand over the bus cash on return in the depot to the Assistant Depot Clerk on duty in the counter.

Security Department

This department looks after the security of the properties of APSRTC and the protect the corporation with the guards working under this control. The following are the key personnel under this department.

Security Head Constable

Safeguards the movable properties of the depot, maintains records pertaining to incoming and outgoing materials including vehicles, reports thefts, loss, damages and accidents to the Depot Manger. Keeps watch and reports, whenever necessary, on the activities of the unions and also any improper and illegal activities if any, of the employees and unions to the higher officials. Keeps a special watch on the employees working inside garages and workshops and provides security to all lawful activities that are entrusted by the concerned Depot Manager.

Conclusion

Transport routes are the basic economic arteries of the country. Transport system is regarded as the controller of the national economy and provides a very important link between production and consumption. The amount of traffic moving in a country is a measure of its progress.

In a country like India, the importance of transport is more because of its vastness as well as varied nature of geographical conditions. In India, it is also a source of national integration. The present Indian transport system comprises several modes including rail, road, coastal shipping, air transport, etc. Transport has recorded a substantial growth over the years both in terms of length and output of the system.

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18-19

Socio-Economic Profile of the Union Members in APSRTC:A Case Study of Visakhapatnam City

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Abstract

Trade unions help in accelerated pace of economic development in many ways. They are helping in the recruitment and selection of workers, inculcating discipline among the workforce, enabling settlement of industrial disputes in a rational manner and helping social adjustments with their activities. Workers have to adjust themselves to the new working conditions, the new rules and policies. Workers coming from different backgrounds may become disorganized, unsatisfied and frustrated. Unions will help them in such adjustment. The present study is an attempt to portray the socio-economic-profile of the sample respondents (union members) with reference to Visakhapatnam City.

Keywords: APSRTC, Age wise distribution, Caste, Gender wise distribution, Income wise distribution, Religion, Union Members, Visakhapatnam City.

1. Introduction

The existence of a strong and recognized trade union is a pre-requisite to industrial peace. Decisions taken through the process of collective bargaining and negotiations between employer and unions are more influential. Trade unions play an important role and are helpful in effective communication between the workers and the management. They provide the advice and support to ensure that the differences of opinion do not turn into major conflicts. The central function of a trade union is to represent people at work. But they also have a wider role in protecting their interests. They also play an important educational role, organizing courses for their members on a wide range of matters. Seeking a healthy and safe working environment is also prominent feature of union activity.

Trade unions are a part of society and as such, have to take into consideration the national integration as well. Some important social responsibilities of trade unions include promoting and maintaining national integration by reducing the number of industrial disputes, incorporating a sense of corporate social responsibility in workers and achieving industrial peace. Hence, the trade unionism in India developed quite slowly as compared to the western nations. Indian trade union movement can be divided into three phases.

2. Purpose of the Study

The primary objective of the study is to portray the socio-economic profile of the sample union members with reference to Visakhapatnam city.

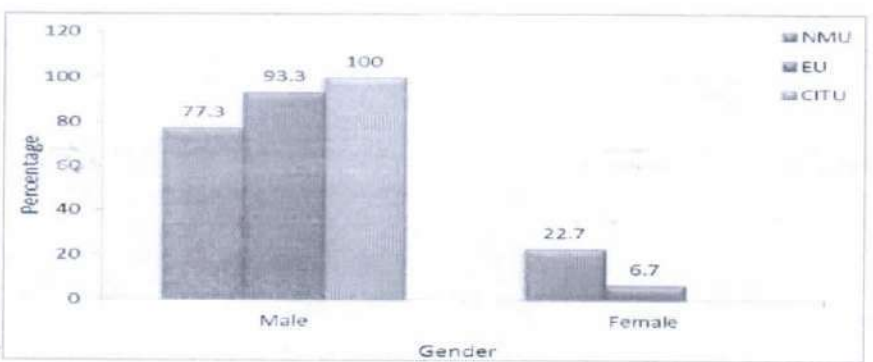
Research Design	
Sampling Area	Visakhapatnam City
Sample Size	200
Sampling Unit	APSRTC
Sampling Method	Convenience sampling

3. Results and Discussion

Table – 1: Gender wise distribution of the sample union members in APSRTC

Gender	Unions			Total
	NMU	EU	CITU	
Male	116 (77.3)	28 (93.3)	20 (100.0)	**164 (82.0)**
Female	34 (22.7)	2 (6.7)	-	**36 (18.0)**
Total	**150 (100.0)**	**30 (100.0)**	**20 (100.0)**	**200 (100.0)**

Figure – 1:Gender-wise distribution of the sample union members in APSRTC



The table 1: shows the distribution of male and female employees in APSRTC working under three different unions. The above table depicts out of total employees 4/5th employees are male as male are more preferred to this trade compared to females and in that most of the employees are working under NMU union compared to EU and CITU.

Table – 2: Age wise distribution of the sample union members in APSRTC

Age	Unions			Total
	NMU	EU	CITU	
20-29 years	26 (17.3)	3 (10.0)	-	**29 (14.5)**
30-39 years	69 (46.0)	5 (16.7)	13 (65.0)	**87 (43.5)**
40-49 years	38 (25.3)	14 (46.7)	3 (15.0)	**55 (27.5)**
50-59 years	17 (11.3)	8 (26.7)	4 (20.0)	**29 (14.5)**
Total	**150 (100.0)**	**30 (100.0)**	**20 (100.0)**	**200 (100.0)**

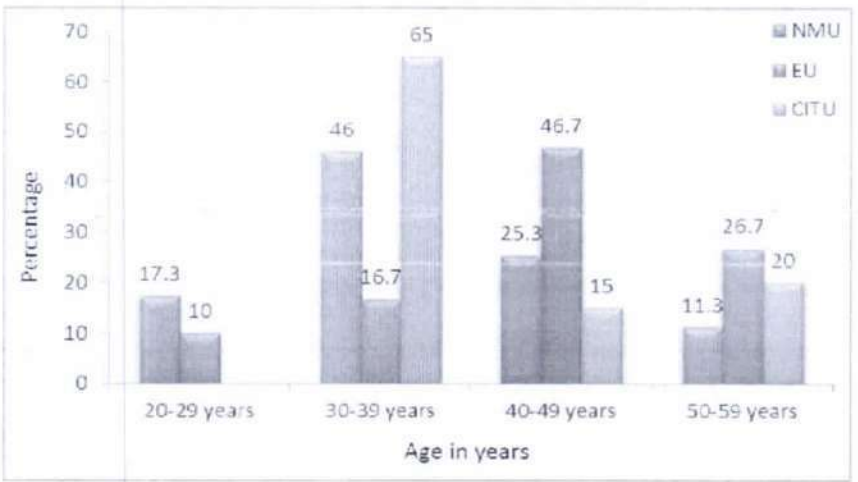


Figure – 2: Age wise distribution of the sample union members in APSRTC

The above table 2: shows the age wise distribution of the employees working under three unions. Most of the employees are working under NMU union and When the total employees are distributed age wise most of them (43.5%) are of age group 30-39 years which indicates earning age group(30-39yrs) are preferring as a union members when compare with other age groups.

Table – 3: Distribution of the sample union members by their religion

Religion	Unions			Total
	NMU	EU	CITU	
Hindu	114 (76.0)	19 (63.3)	14 (70.0)	**147 (73.5)**
Muslim	7 (4.7)	1 (3.3)	-	**8 (4.0)**
Christian	29 (19.3)	10 (33.3)	6 (30.0)	**45 (22.5)**
Total	**150 (100.0)**	**30 (100.0)**	**20 (100.0)**	**200 (100.0)**

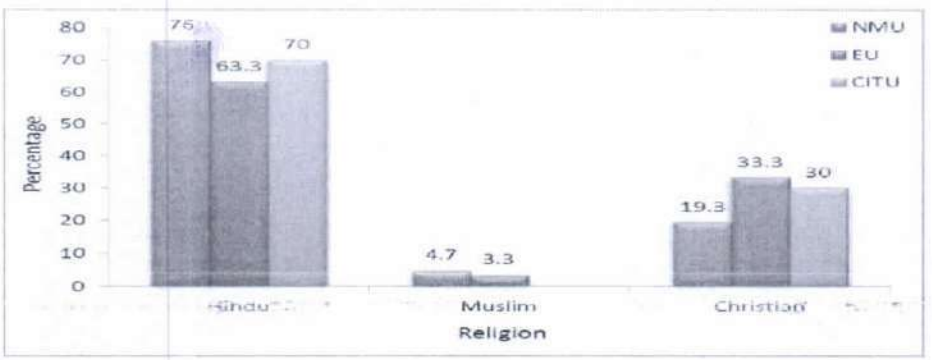


Figure – 3: Distribution of the sample union members by their religion

The above table 3: shows the distribution of employees according to their religion working under three different unions. Out of total employees most of them (75%) are working under NMU union and in all three unions most of them are Hindus (73.5%) and very less members are Muslims (4.0%).

Table- 4: Distribution of the sample union members by their Caste

Caste	Unions			Total
	NMU	EU	CITU	
O.C	43 (28.7)	12 (40.0)	4 (20.0)	**59 (29.5)**
B.C	76 (50.7)	8 (26.7)	9 (45.0)	**93 (46.5)**
S.C	31 (20.7)	10 (33.3)	7 (35.0)	**48 (24.0)**
Total	**150 (100.0)**	**30 (100.0)**	**20 (100.0)**	**200 (100.0)**

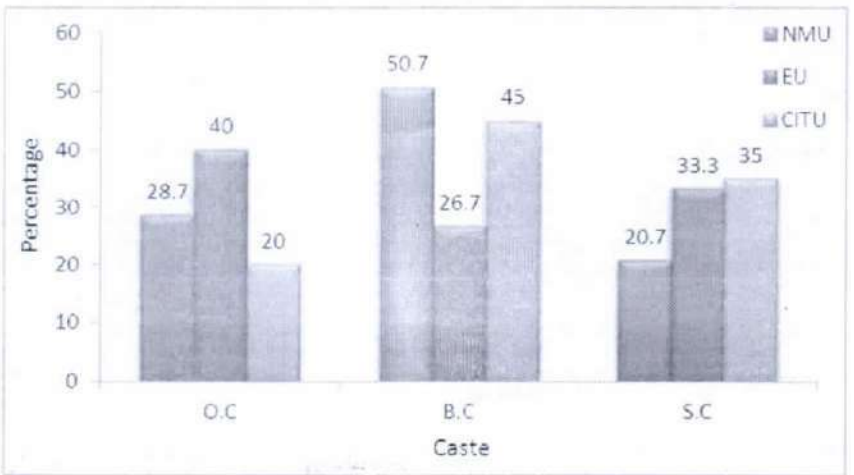


Figure – 4: Distribution of the sample union members by their caste

The above table 4: explains about the **Caste** of employees working under three different unions. Out of the total employees, 3/4th are working in NMU union in which half of them belong to backward caste and in remaining half, open category employees are more compared to schedule caste. In EU union open category are more than Scheduled class and the least are Backward class of employees whereas in CITU Backward class are more compared to Schedule class and the least are open category.

Table – 5: Distribution of the sample union members of their marital status

Marital status	Unions			Total
	NMU	EU	CITU	
Unmarried	22 (14.7)	4 (13.3)	5 (25.0)	**31 (15.5)**
Married	128 (85.3)	26 (86.7)	15 (75.0)	**169 (84.5)**
Divorce	-	-	-	-
Widower	-	-	-	-
Total	**150 (100.0)**	**30 (100.0)**	**20 (100.0)**	**200 (100.0)**

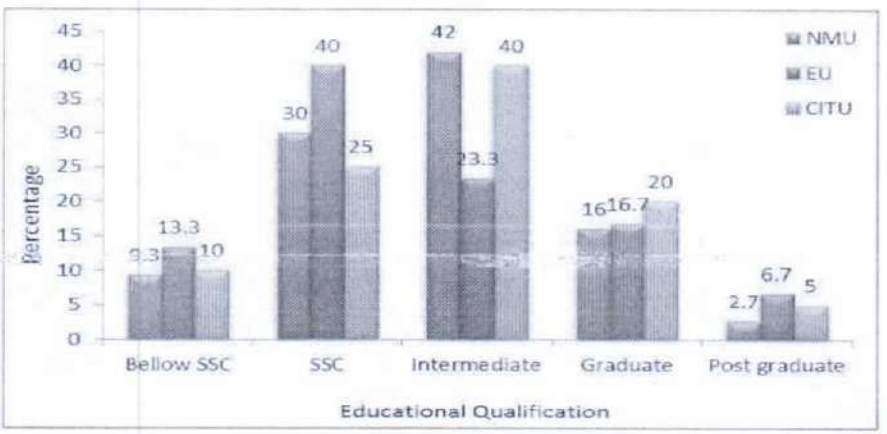
Figure – 5: Distribution of the sample union members of their marital status

The above table 5: shows the distribution of Unmarried and Married employees working under three different unions. Out of three unions employees working in NMU are more compared to EU and CITU and in overall $3/4^{th}$ are married and $1/4^{th}$ are unmarried which indicates married are more preferred to work in this Department compared to unmarried.

Table – 6: Distribution of the sample union members by their level of education

Level of education	Unions			Total
	NMU	EU	CITU	
Bellow SSC	14 (9.3)	4 (13.3)	2 (10.0)	**20 (10.0)**
SSC	45 (30.0)	12 (40.0)	5 (25.0)	**62 (31.0)**
Intermediate	63 (42.0)	7 (23.3)	8 (40.0)	**78 (39.0)**
Graduate	24 (16.0)	5 (16.7)	4 (20.0)	**33 (16.5)**
Post graduate	4 (2.7)	2 (6.7)	1 (5.0)	**7 (3.5)**
Total	**150 (100.0)**	**30 (100.0)**	**20 (100.0)**	**200 (100.0)**

Figure – 6: Distribution of the sample union members by their level of education

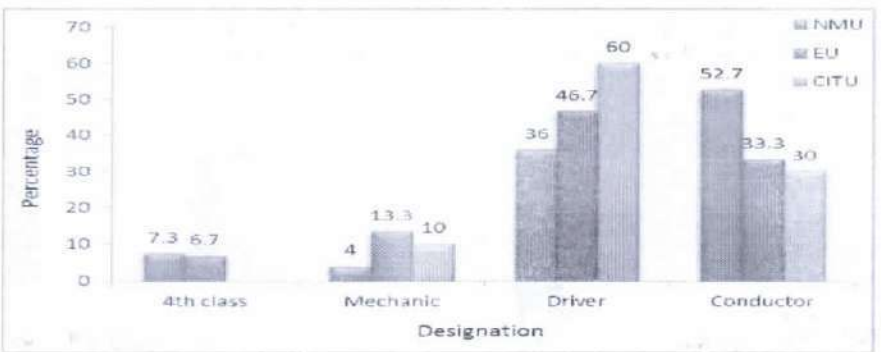


The above table 6: shows the level of education of the employees working under three unions. The above table

depicts that out of total employees, employee with SSC and Intermediate qualification are more compared to other educational background which indicates higher qualification people (graduates & post graduates) do not prefer to work in this particular trade.

Table – 7: Distribution of the sample union members by their designation

Designation	Unions			Total
	NMU	EU	CITU	
4th class	11 (7.3)	2 (6.7)	-	**13 (6.5)**
Mechanic	6 (4.0)	4 (13.3)	2 (10.0)	**12 (6.0)**
Driver	54 (36.0)	14 (46.7)	12 (60.0)	**80 (40.0)**
Conductor	79 (52.7)	10 (33.3)	6 (30.0)	**95 (47.5)**
Total	**150 (100.0)**	**30 (100.0)**	**20 (100.0)**	**200 (100.0)**



Figure–7: Distribution of the sample union members by their designation

The above table 7: shows the distribution of sample respondents in terms of their designation under three unions of employees. A significant amount of members are in NMU union working as conductors (52.7%) followed by drivers (36%). Among the EU, 46.7 percent of the employees are drivers, followed by 33.3 percent conductors, 13.3 percent mechanics and the least 6.7 percent are 4th class employees. Whereas, under CITU 60.0 percent are drivers, followed by 30.0 percent conductors. Hence, overall conductors (47.5%) dominate, followed by drivers (40.0%).

Table – 8: Distribution of the sample union members by their traditional occupation of the family

Family occupation	Unions			Total
	NMU	EU	CITU	
Agriculture	14 (9.3)	2 (6.7)	2 (10.0)	**18 (9.0)**
Business	9 (6.0)	2 (6.7)	2 (10.0)	**13 (6.5)**
Caste Based Profession	15 (10.0)	2 (6.7)	2 (10.0)	**19 (9.5)**
Employment	112 (74.7)	24 (80.0)	14 (70.0)	**150 (75.0)**
Total	**150 (100.0)**	**30 (100.0)**	**20 (100.0)**	**200 (100.0)**

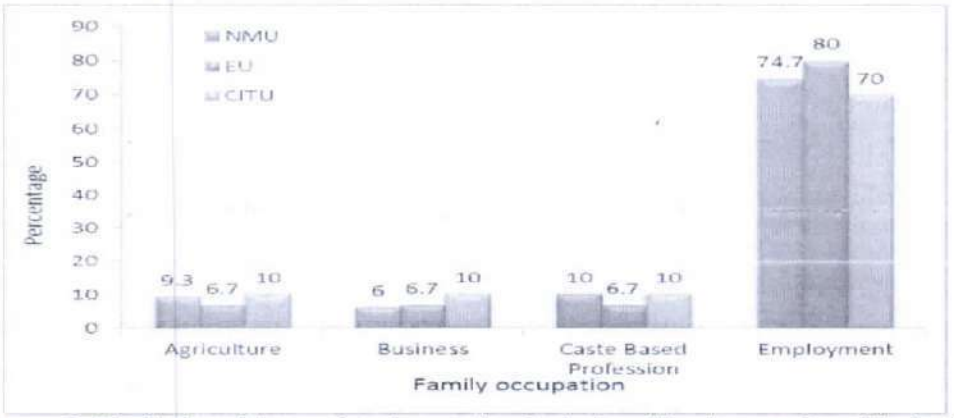
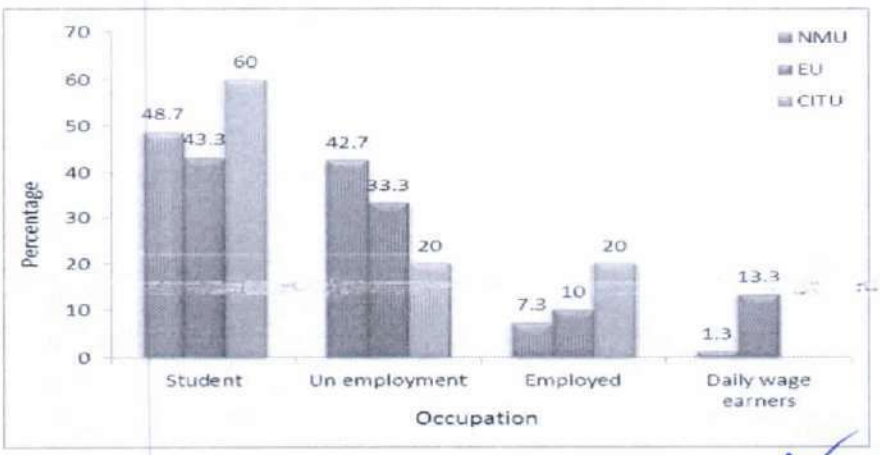


Figure – 8: Distribution of the sample union members by their traditional occupation of the family

The above table specifies about traditional occupation of the family among three unions in APSRTC. Out of the total respondents from all the union employees, majority of their traditional occupation of the family (75.0%) are employees and from the remaining 9.5 percent are caste based profession, 9.0 percent are of their family occupation are agriculture and the remaining very few (6.5%) are business people.

Table – 9: Distribution of the sample union employees of their previous occupation

Occupation	Unions			Total
	NMU	EU	CITU	
Student	73 (48.7)	13 (43.3)	12 (60.0)	**98** **(49.0)**
Un employment	64 (42.7)	10 (33.3)	4 (20.0)	**78** **(39.0)**
Employed	11 (7.3)	3 (10.0)	4 (20.0)	**18** **(9.0)**
Daily wage earners	2 (1.3)	4 (13.3)	-	**6** **(3.0)**
Total	**150** **(100.0)**	**30** **(100.0)**	**20** **(100.0)**	**200** **(100.0)**



Figure–9: Distribution of the sample union employees of their previous occupation

The above table-9 explains about the distribution of the above three types of union employees in APSRTC by their previous occupation. Out of the total respondents from all the union employees of their previous occupation, most of them (49.0%) are students and from the remaining 39.0 percent are un employed, 9.0 percent are employed and the remaining very few (3.0%) are daily wage earners.

Table – 10: Distribution of the sample union employees of their annual income of the family

Annual Income (Rs.)	Unions			Total
	NMU	EU	CITU	
Less than 50,000	2 (1.3)	-	-	**2** **(1.0)**
50,000 - 1 lakh	92 (61.3)	10 (33.3)	14 (70.0)	**116** **(58.0)**
1 - 2 lakhs	54 (36.0)	20 (66.7)	5 (25.0)	**79** **(39.5)**
2 - 4 lakhs	2 (1.3)	-	1 (5.0)	**3** **(1.5)**
Total	**150** **(100.0)**	**30** **(100.0)**	**20** **(100.0)**	**200** **(100.0)**

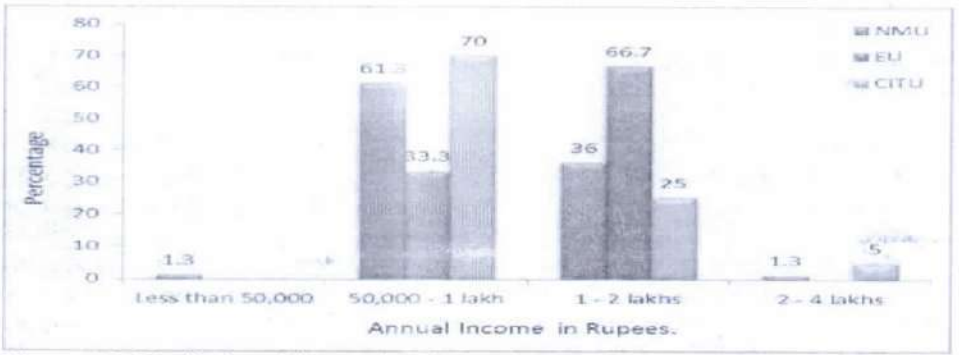


Figure – 10: Distribution of the sample union employees of their annual income of the family

The above table infers about the annual income of the family among the three unions. Out of the total respondents from all the union employees, more than half percent of employees family annual income is between Rs 50,000 to 1 Lakh then about 39.5% of employees annual income is between 1 to 2 lakhs and near or about 1% employees income is either low i.e less than 50,000 or more i.e. between 2 to 4 lakhs.

Table – 11: Experience of the sample union employees working in this profession

Experience	Unions			Total
	NMU	EU	CITU	
Below 5 years	20 (13.3)	3 (10.0)	3 (15.0)	**26** **(13.0)**
6-10 years	68 (45.3)	7 (23.3)	9 (45.0)	**84** **(42.0)**
11-15 years	29 (19.3)	9 (30.0)	2 (10.0)	**40** **(20.0)**
16-20 years	33 (22.0)	11 (36.7)	6 (30.0)	**50** **(25.0)**
Total	**150** **(100.0)**	**30** **(100.0)**	**20** **(100.0)**	**200** **(100.0)**

Figure – 11: Period of the sample union employees working in this profession

Table-11 designates the distribution professional experience among the three types of union in APSRTC. Majority of the employees (42.0%) are having 6-10 years of experience, 13.0 percent are having below 5 years of experience as union employees. Among the total employees of NMU, most of them (45.3%) are having 6-10 years of experience as a union employee, whereas EU employees, majority of their experience as a union employee (36.7%) are having 16-20 years of experience and 30.0 percent are having 11-15 years of experience,. From the total CITU employees of their experience as union employees in APSRTC, most of them (45.0%) are having 6-10 years of experience.

4. Findings

- The data reveals that male employees in APSRTC are dominating the female employees in number, and among which majority group of employees are from backward caste followed by forward caste and schedule caste. While most of the employees are married, a significant number of employees are unmarried.
- The education levels of the employees indicate that a dominated group are with intermediate qualification (39.0%) followed by SSC (31.0%), graduates (16.5%) and post graduates
- Out of the total employees selected for data, conductors (47.5%) are dominating with their number followed by drivers (40.0%) and very few are 4th class employees.
- According to the data, in NMU and CITU majority group of employees are with 6-10 years of experience, but in the case of EU, majority group of employees are having more than 11 years experience in the organization, and it shows that in three unions most of respondents are joined during 1999 to 2005 as union employees.

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Non Performing Assets in Public Sector Banks: A Cause Analysis

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Abstract

Lending Funds is considered as the primary function of primary function which provides financial support to various sectors such as agriculture, industry, personal loans etc., but in recent times the banks as taken a cautious stand in lending. The main reason for such an initiative is the mounting issues of non-performing assets (NPAs).A loan asset is considered as non-performing asset when it ceases to generate income for the bank. From 31st March, 2004 NPA was defined as a credit facility in respect of which the interest or installation of principal has remained past due for a specified period of time which was four quarters. NPA in public sector banks is increasing year after year and thus this is becoming a debatable topic. So considering this anglete paper is undertaken to analyze the reasons for advances becoming NPA in Public sector banks and intends to give suitable suggestions to overcome NPA.

Keywords: NPAs, NPA Classification, Types of NPA, Causes of NPA.

1. Introduction

NPA is defined as an advance where payment of interest or repayment of instalment of principal (in case of term loans) or both remains unpaid for a certain period. In India, the definition of NPAs has changed over time. According to the Narasimham Committee Report (1991), those assets (advances, bills discounted, overdrafts, cash credit etc.) for which the interest remains due for a period of four quarters (180 days) should be considered as NPAs. Subsequently, this period was reduced, and from March 1995 onwards the assets for which the interest has remained unpaid for 90 days were considered as NPAs. An NPA is defined as a loan asset, which has ceased to generate any income for a bank whether in the form of interest or principal repayment

Classification of NPA

NPA have been classified into following four types:

Standard Assets: A standard asset is a performing asset. Standard assets generate continuous income and repayments as and when they fall due.

Sub-Standard Assets: All those assets (loans and advances) which are considered as non-performing for a period of 12 months.

Doubtful Assets: All those assets which are considered as non-performing for period of more as 12 months.

Loss Assets: All those assets which cannot be recovered.

Causes for Non-Performing Assets

External causes: Natural calamities and climatic conditions, Recession, changes in Government policies changes in economic conditions, Industry related problems, Impact of liberalization on industries, Technical problems.

Internal causes: Internal defaulters, Faculty projects, Most of the project reports are ground realities, proper linkages, product pricing etc. Some approach for the "heck" of starting adventure, with poor knowledge of product risks, over depended on poorly paid killed workers and technicians, Building up pressure for sanctions, Inept handling by banker's lack of professionalism and appraisal standards, Non-observance of system, procedures and non-insistence of collaterals etc, Lack of post sanction monitoring, unchecked diversions.

2. Review of Literature

This section provides an overview of some of the existing literature with regard to the NPA. This literature review helps me to better understanding of both research topics and of the existing gap:

Meeker Larry G. and Gray Laura (1987) evaluate that information. A regression analysis comparing the non-performing asset statistics with examiner classifications of assets suggests that the non-performing asset information can be a useful aid in analyzing the asset quality of banks, particularly when the information is timely.

Toor N.S. (1994) stated that recovery of non-performing as-sets through the process of compromise by direct talks rather than by the lengthy and costly procedure of litigation. He suggested that by constant monitoring, it is possible to detect, the sticky accounts, the incipient sickness of the early stages itself and an attempt could be made to review the unit and put it backon the road to recovery

S.N. Bidani (2002) argued that non-performing Assets are the smoking gun threatening the very stability of Indian banks. NPAs wreck a banks' profitability both through a loss of interest income and write-off of the principal loan amount itself. This is definitive book which tackles the subject of managing bank NPAs in it"s entirely, starling right from the stage of their identification till the recovery of dues in such ac-counts.

Paul Purnendu, Bose,Swapan and Dhalla, Rizwan S.(2011) attempted to measure the relative efficiency of Indian PSU banks on overall financial performances. Since, the financial industry in a developing country like India is undergoing through a very dynamic paceof restructuring, it is imperative for a bank to continuously monitor their efficiency on Non-Performing Assets, Capital Risk-Weighted Asset Ratio, Business per Employee, Return on Assetsand Profit per Employee. Here, Non-Performing Assets is a negative financial indicator. To prove empirically, we propose a framework to measure efficiency of Indian public sector banks.

Khedekar Pooja S. (2012) recommends that a strong banking sector is essential for a flourishing economy. Indian banking sector emerged stronger during 2010-11 in the aftermath of global financial meltdown of 2008-10 under the watchful eye of its regulator. The level of NPAs acts as an indicator showing the credit risks & efficiency of allocation of resource. NPA involves the necessity of provisions, any increase in which bring down the overall profitability of banks. An excessive rise in interest rates over the past 18 months has led to a sharp increase in non-performing assets. This not only affects the banks but also the economy as a whole. Pooja also deals with understanding the concept of NPA, the causes and overview of different sectors in India.

Selvarajan B. and Vadivalagan, G. (2012) state that non-Performing Assets is not a dilemma facing exclusively the bankers; itis in fact an all pervasive national scourge swaying the entire Indian economy. Non-Performing Asset is a sore throat of the Indian economy as a whole. Non-Performing Assets have affected the profitability, liquidity and competitive functioning of banks and developmental of financial institutions and finally the psychology of the bankers in respect of their disposition towards credit delivery and credit expansion. NPAs do not generate any income for the banks, but at the same time banks are required to make provisions for such NPAs from their current profits. Apart from internal and external complexities, increases in NPAs directly affects banks' profitability sometimes even their existence.

Veerakumar, K. (2012) mentions that the Indian banking sector has been facing serious problems of raising Non-Performing Assets (NPAs). Like a canker worm, NPAs have been eating the banking industries from within, since nationalization of banks in 1969. NPAs have choked off quantum of credit, restriction the recycling of funds and leads to asset-liability mismatches. It also affected profitability, liquidity and solvency position of the Indian banking sector. One of the major reasons for NPAs in the banking sector is the 'Direct Lending System' by the RBI under social banking motto of the Government, under which scheduled commercial banks are required to lend40% of their total credit to priority sector. The banks who have advanced to the priority sector and reached the target suffocated on account of raising NPAs, since long. The priority sector NPAs have registered higher growth both in percentage and in absolute terms year after year. The present paper is an attempt to study the priority sector advances by the public, private and foreign bank group-wise, target achieved by them and a comparative study on priority and non-priority sector NPAs over the period of 10 years between 2001-02 and 2010-11.the author also aims to find out the categories of priority sector advances which contribute to the growth of total priority sector NPAs during the period under study.

Murthy, K. V. Bhanu Gupta, Lovleen. (2012) studied the impact of liberalization on the non-performing assets of the four banking segments, namely, public sector, old private sector, new private sector and foreign banks by

studying the overall trends in NPAs. We have used the Structure- Conduct- Performance (S-C-P) approach that shows the relationship between competition and conduct, concentration and growth in NPAS. Our results show that on an average across the banking industry segments, average non-performing assets in the past 11 years have been declining at the rate of 13% p.a. compounded growth rate. The old private sector banks' nonperforming assets have reduced at the rate of 11.98% and that of public sector banks have declined at the rate of 18% and foreign bank sat 11.4%. Though new private sector banks and the foreign banks seem to be more efficient but their conduct does not show consistency and stability.

Joseph, Mabvure Tendai Edson, Gwangwava (2012) attempted to find out the causes of non-performing loans in Zimbabwe. Loans form a greater portion of the total assets in banks. These assets generate huge interest income for banks which to a large extent determines the financial performance of banks. However, some of these loans usually fall in ton on-performing status and adversely affect the performance of banks. In view of the critical role banks play in an economy, it is essential to identify problems that affect the performance of these institutions. This is because non-performing loans can affect the ability of banks to play their role in the development of the economy. A case study research design of CBZ Bank Limited was employed. Interviews and questionnaires were used to collect data for the study. Their study revealed that external factors are more prevalent in causing non-performing loans in CBZ Bank Limited. The major factors causing nonperforming loans were natural disasters, government policy and the integrity of the borrower.

Debarsh and Sukanya Goyal (2012) emphasized on management of non-performing assets in the perspective of the public sector banks in India under strict asset classification norms, use of latest technological platform based on Core Banking Solution, recovery procedures and other bank specific indicators in the context of stringent regulatory framework of the RBI. Non-performing Asset is an important parameter in the analysis of financial performance of a bank asit results in decreasing margin and higher provisioning requirements for doubtful debts. The reduction of non-per-forming asset is necessary to improve profitability of banks and comply with the capital adequacy norms as per the Basel Accord.3

Kavitha. N (2012), tried to have an assessment of non-performing assets on profitability its magnitude and impact. Credit of total advances was in the form of doubtful assets in the past and has an adverse impact on profitability of all Public Sector Banks affected at very large extent when non-performing assets work with other banking and also affect productivity and efficiency of the banking groups. The study observed that there is increase in advances over the period of the study.

3. Objectives of the Study

- To study the concept on Non- Performing Assets and its relevance in the banking sector
- To identify the loan/bank based components that contribute to NPA.

4. Formulation of Hypothesis

Hypothesis I:

"There is a significant difference between the importances of bank based internal components that contribute to NPA.

Hypothesis II:

"There is a significant difference between the importances of bank based external components that contribute to NPA".

5. Methodology

In order to achieve the objective of the study an appropriate methodology has been adopted. Research done is descriptive in nature.

Source of Data

The present study is mainly based on Secondary data. The data is taken from the Ph.D Thesis titled "A Study on Handling Non-Performing Assets with special reference to Public Sector Banks in Kanyakumari District".

Statistical Tools Used

Friedman Test: The Friedman Test is a non-parametric test. It is used to test for differences between groups when the dependent variable being measured is ordinal.

6. Data Analysis & Interpretation

Mean and SD of Bank based internal components that contribute to NPA

Table 1. Mean and SD of Bank based internal components that Contribute to NPA

Sl. No.	Importance to the Bank based internal components that contribute to NPA	Mean	Std. Deviation
1	Improper selection of borrowers	2.18	0.872
2	Deficiency in processing	2.00	0.886
3	Improper appraisal of assets	2.10	0.834
4	Lack of monitoring pre and post sanction of loan	2.57	0.680
5	Terms and conditions of credit	1.59	0.494
6	Unsecured loans	2.42	0.665

Source: Primary Data

Inference:

From the above table, Lack of monitoring pre and post sanction of loan has the highest mean followed by Unsecured loans, Improper selection of borrowers, Improper appraisal of assets, Deficiency in processing and Terms and conditions of credit. Highest standard deviation of Deficiency in processing shows low focus on the particular internal components that contribute to NPA.

Mean and SD of bank based external components that contribute to NPA

Table 2. Mean and SD of bank based external components that contribute to NPA

Sl. No.	Importance to the bank based external components that contribute to NPA	Mean	Std. Deviation
1	Selection of unsuitable and Unviable scheme	2.12	0.832
2	Mis-utilization of fund	2.59	0.678
3	Insolvency or death of borrower	1.32	0.645
4	Low income from project	2.01	0.649
5	Lack of infrastructure, Modern Technology and marketing facilities	1.33	0.493
6	Political interference and labor unrest	2.40	0.662
7	Willful default due to liberal government policy and	2.42	0.799
8	Sluggish legal system	1.62	0.673
9	Price escalation of inputs	1.81	0.755
10	Power failures	1.99	0.891

Source: Questionnaire

Inference:

From the above table, mis-utilization of fund has the highest mean followed by Willful default due to liberal government policy,Political interference and labor unrest,Selection of unsuitable and Unviable scheme,Low income from project,Power failures,Price escalation of inputs,Sluggish legal system,Lack of infrastructure, Modern Technology and marketing facilities,Insolvency or death of borrower . Highest standard deviation of Power failures shows low focus on the particular external components that contribute to NPA.

HYPOTHESIS I

Null Hypothesis: There is no significant difference between mean ranks towards Importance to the Bank based internal components that contribute to NPA.

Table 3. Friedman test for significant difference between mean ranks towards Importance to the Bank based internal

components that contribute to NPA

Sl. No.	Importance to the Bank based internal components that contribute to NPA	Mean Rank	Chi-Square	P value
1	Improper selection of borrowers	3.62	280.580	0.000**
2	Deficiency in processing	3.10		
3	Improper appraisal of assets	3.36		
4	Lack of monitoring pre and post sanction of loan	4.71		
5	Terms and conditions of credit	1.89		
6	Unsecured loans	4.32		

Source: Primary Data

** Denotes significance at 1% level

Inference:

Since P value is less than 0.01, the null hypothesis is rejected at 1 per cent level of significance. Hence it is concluded that there is significant difference between mean ranks towards Importance to the Bank based internal components that contribute to NPA. From the table, based on mean rank, Lack of monitoring pre and post sanction of loan (4.71) is the best internal component that contribute to NPA, followed by Unsecured loans (4.32), Improper selection of borrowers (3.62), Improper appraisal of assets (3.36), Deficiency in processing (3.10) and Terms and conditions of credit (1.89).

HYPOTHESIS II

Null Hypothesis: There is no significant difference between mean ranks towards Importance to the Bank based External components that contribute to NPA.

Table 4. Friedman test for significant difference between mean ranks towards Importance to the Bank based External components that contribute to NPA

Sl.No.	Importance to the External components that contribute to NPA	Mean Rank	Chi-Square	P value
1	Selection of unsuitable and Unviable scheme	6.15	547.007	0.000**
2	Mis-utilization of fund	8.04		
3	Insolvency or death of borrower	3.04		
4	Low income from project	5.75		
5	Lack of infrastructure, Modern Technology and marketing	2.85		
6	Political interference and labour unrest	7.47		
7	Willful default due to liberal government policy and expectation of debt relief	7.39		
8	Sluggish legal system	3.95		
9	Price escalation of inputs	4.78		
10	Power failures	5.59		

Source: Primary Data

** Denotes significance at 1% level

Inference:

Since P value is less than 0.01, the null hypothesis is rejected at 1 per cent level of significance. Hence it is concluded that there is a significant difference between mean ranks towards Importance to the Bank based External components that contribute to NPA

From the table, based on mean rank, Mis-utilization of fund (8.04), Political interference and labour unrest(7.47),Willful default due to liberal government policy and expectation of debt relief(7.39),Selection of unsuitable and Unviable scheme(6.15),Power failures(5.59),Low income from project(5.75),Price escalation of inputs(4.78),Sluggish legal system(3.95),Insolvency or death of borrower(3.04),Lack of infrastructure, Modern Technology and marketing facilities(2.85).

7. Findings of the Study

- From Table 7.1 Bank based internal components that Contribute to NPA are ranked on the basis of the response and mean score calculated. Lack of monitoring pre and post sanction of loan has the highest mean followed by Unsecured loans, Improper selection of borrowers, Improper appraisal of assets, Deficiency in processing and Terms and conditions of credit.
- From Table 7.2, Bank based external components that contribute to NPAare ranked on the basis of the response and mean score calculated.Mis-utilization of fund has the highest mean followed by Willful default due to liberal government policy, Political interference and labor unrest, Selection of unsuitable and Unviable scheme, Low income from project, Power failures, Price escalation of inputs, Sluggish legal system, Lack of infrastructure, Modern Technology and marketing facilities, Insolvency or death of borrower .
- From Table 7.3, By Friedman Test it is concluded that there is significant difference between mean ranks towards Importance to the Bank based internal components that contribute to NPA.This shows the validity of ranking based on mean.
- From Table 7.4, By Friedman Test it is concluded that there is significant difference between mean ranks towards Importance to the Bank based external components that contribute to NPA. This shows the validity of ranking based on mean.

8. Conclusion

This paper reveals the NPA and its scenario in all the scheduled commercial banks during the decade. It even depicts the various reasons for the growth of NPA. NPAs reflect the overall performance of the banks. A high level of NPA is a poor indicator of bank performance. The NPA growth involves the necessity of provisions, which reduces the overall profits and shareholders' value. Careful steps by the bankers like selection of right borrowers, viable economic activity correct end use of funds and timely recovery of loans are absolutely necessary pre conditions for preventing or reducing the incidence of new NPAs which will enhance the credibility of the banks and attain the objective of the sound financial system.

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Leveraging Technologies to Redefine Business: Technology Perspective

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Abstract

The disruptors in the financial services industry are rewriting the rules, banks used to perform operations traditionally. The financial services industry known for conservative and resistant to change has been challenged by financial technology (fintech) companies that compete by combining digital technology, social media, and big data analytics to replace traditional models with financial products and services enabled by new technology. The present study is an attempt to portray the Role of Fin Techs, Challenges etc.

Keywords: Challenges, Opportunities, Role of Fin Techs, Trends.

1. Introduction

Digital disruption is occurring at every level of the financial services industry. New competitors, new channels, new processes and new consumer expectations are shifting the industry paradigm. Banks today are facing rapid and irreversible changes across technology, customer behavior and regulation. The net effect is that the industry's current shape and operating models are no longer sustainable into the future.

The only way to survive in this world of disruption is to stay in sync with these movements and accelerate execution to gain a critical competitive advantage. Subsequently, it is imperative for companies to embrace cutting-edge technology if they are to succeed in this fast-paced, agile environment in which every business needs to operate.

By 2025, the banking landscape is most likely to include some of today's popular banking brands in addition to other prominent names. The use of modern day technologies will differentiate successful companies from laggards.

Fin techs have changed how financial services are structured, provisioned and consumed, but have not successfully established themselves as dominant players. Although Fin techs have limited success in their approach with in the competitive landscape, they have laid the foundation for future disruption.

2. Challenges - Confronting Digital Pace

There's been plenty of discussion over digital transformation in the last few years, the challenges of this sort of organizational change have become increasingly evident. Digital transformation remains a slippery eel that financial service providers just can't seem to grab on to.

2.1 Legacy Technology and Infrastructure

Legacy systems and complex process architectures are limiting banks' ability to enhance customer experience, impacting their advanced analytics capabilities. In financial services, this often happens because established players are rapidly bringing in new technologies through acquisitions or mergers, creating an architecture that's a Frankenstein project of smaller pieces. It's not sustainable, and it doesn't scale well. This is a problem particularly poignant in well-established financial services companies that may have been architecting piecemeal on the back-

end for years. Building a new, ideal solution from scratch is not a practical option from a fiscal or timeline standpoint.

People want to create something new, not pay for problems that are already there. However, it is very necessary for building a robust digital business that will survive long-term.

2.2 Supports for Change

Digital transformation is not just about technology, it's also about business process and organizational changes. Organizations that want to be successful with their digital transformations need to start by aligning stakeholders from across all facets of the organization behind the company's innovation efforts. Having the team working off of the same playbook and finding ways to build on technologies being deployed throughout the organization is vital.

There are many other challenges currently faced by financial institutions however the in-depth coverage is not the prime focus of this paper.

3. Opportunities - Strategic Choices in Digital Age

The digital transformation process of the financial sector involves adapting to the new digital client, reinventing the value proposition (even beyond what is strictly financial) and being able to create new business models based on technologies such as Cloud, mobility, Big Data and Analytics. The first major challenge is to keep moving to adopt a true customer centricity strategy that focuses on the customer as the center of all business decisions. There is no alternative since in the digital age the customer has plenty of information at his fingertips and a greater power. This reality requires bank institutions to respond to interaction and service models that the digital customer already has. In this sense, understanding, learning how to interact and meeting the needs of new customers are still key aspects to maintain and ensure competitiveness within the sector.

There are four fundamental ways in which digital capabilities can be used by banks to create value.

First, digital technologies increase a bank's connectivity—not just with customers but also with employees and suppliers. This extends from online interactivity and payment solutions to mobile functionality and opportunities to boost bank brands in social media.

Second, digital draws on big data and advanced analytics to extend and refine decision making. Such analytics are being deployed by the most innovative banks in many areas, including sales, product design, pricing and underwriting, and the design of truly amazing customer experiences.

A third way that digital creates value is by enabling straight-through processing—that is, automating and digitizing a number of repetitive,

Finally, digitization is a means of fostering innovation across products and business models. Examples of this include social marketing and crowd sourced support, as well as "digitally centered" business models.

4. Role of Fin Techs

Following years of dominance by large institutions, the industry is undergoing incredible disruption in the form of nimble, tech-savvy startups. Well-established financial services companies are increasingly finding themselves confronted with fast-moving fintech disruption. Fintech companies are currently very active at trying to disrupt the financial services market. There is a huge funding boom happening in financial services, similar to the one that happened in the 2000s, when the Internet was starting to take off and there was a lot of money chasing a lot of different ideas.

The digital shift underway in the Fintech sector has pushed innovation to a whole new level, across the globe.

Levering the potential of AI, particularly in the Fintech arena, will revolutionize the relationship between humans and machines. And one of the key aspects will be to use cognitive systems to amplify human intelligence. To stay competitive, banks must remain cognizant of numerous implications from within and from outside the financial services industry. In these times of uncertainty, only one thing is

certain – change. Below are some of the fintech trends that expected to drive future dynamics of the banking ecosystem.

5. Trends

Trend #1: Significant Investment in Digital Transformation

Digital disruption has impacted the financial services industry, and banks are investing heavily in digital transformation. Rapid growth in online and mobile banking, as well as empowered customers embracing digital touch points, is further fueling the need for investments in digital transformation

5.1 Trend #2: Cloud Computing

Banks have been leveraging the cloud to streamline processes, and with a growing confidence in its security, there has been an increase in its uptake. The banking industry has witnessed a huge push toward the cloud, with most banks initiating migration of infrastructure and applications to the cloud. Banks generally have been a bit cautious with cloud implementations and tend to stick to implementations in peripheral functions such as ERP, HR, and service desks versus core functions (consumer loans, payments, enterprise data) that link to the general ledger, mainly due to risk concerns There is a requirement for banks to have the ability to scale their processing capacity up or down, as per the prevailing market demands

Trend #3: Next-gen chatbots

2017 saw several major banks in India such as HDFC, ICICI, and YES Bank, amongst others, adopting chatbots for supporting customer interactions. Currently, these chatbots are said to possess the intelligence of a 2-3-year old. However, as machines do not suffer from physical or learning fatigue, the evolution of a chatbot could be best described as more exponential than linear. So, in 2018, we could expect more chatbots to be deployed with improved quality of interactions, speed of responses, and accuracy in decision-making.

Trend #4: Machine Learning

Banks in 2018 will start adopting new regression models powered by machine learning to deliver better offerings. The brightest data scientists will be involved in this delivery and they will be aided by insights into customer behavior, expectations and responses. These insights will be gained by adopting big data tools and will enable banks to predict customer needs and meet them in a customized manner.

Trend #5: Blockchain

Several major players have already begun pilot projects to measure the feasibility of adopting blockchain into their ecosystems. NITI Aayog officials are working on the project named 'IndiaChain', India's largest blockchain network. It's aimed to reduce fraud, speed up contract enforcement and increase transparency in banking operations. As blockchain is virtually unhackable due to time stamps that mark a data entry in a distributed ledger, banks will explore options to leverage the power of blockchain to transform backend operations.

Trend #6: Smart workflows

With the help of embedded AI aiding the backend operations of banks, they will be able to quickly identify bottlenecks in their operation workflows and bring in significant improvements in process efficiencies.

Trend #7: Automated personalization

Banks will leverage the power of fintech to personalize the offerings that users see on all their devices. Banks will change the appearance of apps based on actual usage. This will make users feel more connected with banks and it will also set the stage for efficient self-service. There will also be advancements in providing pre-filled data to users based on their previous interaction history, preferences and banking habits.

Trend #8: Open banking

With initiatives such as Unified Payments Interface (UPI) and Aadhaar Enabled Payment System (AEPS), banking will become more 'open' in 2018. With more APIs exposed by banks, the process of carrying out payments and other banking transactions would be greatly quickened as well as simplified.

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An Energy-Efficient New Approach for Cluster Head Selection Algorithm in Wireless Sensor Network

P. Thiruvannamalai Sivasankar, B. Maheswara Rao

Abstract— Wireless Sensor Networks (WSNs) forced in its exclusive typesets such seeing that it can be accomplished to endure the callous natural situation, improved scalability, etc. Wireless Sensor Network (WSNs) consists of sensors and a Sink. The sensor nodes received energy resources from the battery only. So, network lifetime is most important while overworking for information transmission. Clustering is one of the great efficient of energy method. The principal node in a Cluster group (Cluster-Head) is a significant role and duty to the transformation of information in between Cluster-members and the Sinks. For this proposed method, the nodes are participating individually at the time of Cluster-head (CH) election process. In this proposed method, the sensor node among its distance as well as energy score analysis of the sensor node to motivate the sensor nodes to involved honestly on the process of election its Cluster groups. The energy score analysis and distance are calculated on every round of the process and is updated. In this proposed method, each and every sensor node can participate directly without individuality and also the proposed scheme to calculate for the distance in between nodes in a cluster group and Sinks(BS) at time of election processes, So, it requires performing tasks like data control, data-aggregation exposure to the Sinks. The proposed method is gauged by using Quality of Service metrics through simulation results.

Keywords: WSN, Cluster, Sinks, energy

I. INTRODUCTION

A group of tiny sensor nodes to form the Wireless sensor networks (WSNs) and the nodes connected with the Sink node (Base-station). The size of the sensor is tiny and it has a minimum quantity of battery power for its operation The deploying sensor nodes in their sensing field is difficult for the user to change the source of energy because of the sensor nodes very small battery-powered device and the sensor node with limited energy in the WSN. The energy efficiency of WSN is an important [1][2] WSN is used widely in different types of applications. The energy conservation of sensor node in WSN should be optimized. The survey of the literature shows the Various necessity and application of WSN like monitoring of health and advanced power systems and environmental monitoring and military applications [3][4][5]. provided

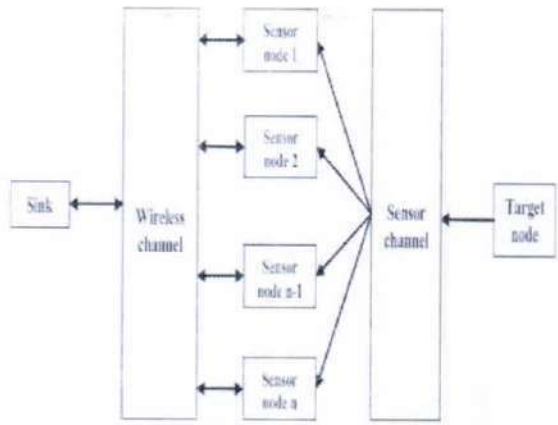

Figure 1 Wireless Sensor Network

The lifetime of energy is a highly defined parameter in a WSN because of all sensor nodes are located far away from Sinks(BS), its energy of the node is not restricted. The sensor nodes are spatially distributed in WSN and nodes collect the information within the range. The collected information transmits to Sinks (BS) in Figure 1.

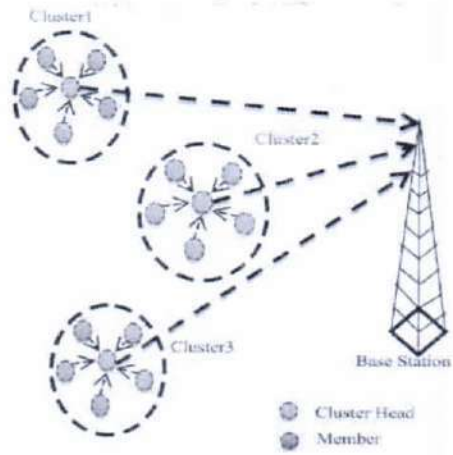

Figure 2 Cluster Group Formation

The Sinks receives the information either locally or through the Network gateway [6].

The storage capacity and capability of the computational, ability of communication of the sensor nodes are very less amount. So, a clustering method to improve the entire network lifetime. Every cluster member its data forwards to its Head of Cluster. The Head of Cluster (CH) is taking responsibility at a time of sensed information transmit to the Sinks. Hence, the selection of Head of Cluster (CH) should be careful.

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The selected cluster head based on the proposed scheme collects information from a member in a Cluster and convey to the Sinks. At the time of transmission, energy is directly proportional to distance and network. So, improved the lives of the Sensor nodes.

II. RELATED WORKS

The method was proposed the clustering fuzzy C-means to decide cluster based on its an optimal number. The fuzzy C clustering technique is effective for reducing energy consumption because of it selected the cluster based it's an optimal number [7].

The method has proposed an algorithm for selection Cluster-Heads(CHs) based on a process of Analytical hierarchy process in Wireless sensor networks [8].

The Head in Cluster (CH) selected on Fuzzy logic is existing is reducing the level of energy at the time of the transmission to the Sinks. So, Network lifetime is improved. Fuzzy logic descriptors in [7] include energy level, centrality, and concentration. The Head of Clusters(CH) is selected on its location.

The rest of the article follows as section I introduces the overall concept of proposed works. In the second section we discuss the methodology and implement the works. In section III describes implemented works. In Section IV produces result and feature of proposed

Private Head of Clusters election is proposed in Head of Clusters (CH) to protect from different types of attacks [9]. Private Head of Clusters (CH) election method skins the individuality of Head of Clusters (CH) from attackers can check the implementation of Head of Cluster (CH) model of an election.

An Efficient Head of Clusters (CH) selection method has proposed in [8] then the main focus is an eliminating the re-clustering and reducing energy consumption for the program purpose by involving and ignoring overload in Head of Clusters (CH)

In [10] the lifetime of the network is improved because of Head of Clusters (CH) is selected using a method of hit sets.

In this clustering mechanism used based on location is proposed [11]. In this method, the sensor-node which is very close to Sinks is elected as the Head of Clusters (CH)[11][13][14].

In [12] the election of Cluster-head model in this proposed novel to eliminate individually to involve in the election method. In this proposed election method, the sensor node involved individually based an energy score analysis value. The energy score analysis value is calculated on the level of energy in a node.

III. PROPOSED WORK

A. To avoid acting as a cluster head selfishly

- The WSN is the limited resource-network. The sensor nodes many times act individually in this network. In this proposed clustering method, the Cluster-head play is an important role.
- A sensor node may not be involved at the time of election process because of that node selfishness. The node acts sometimes individually elected as a Head of Clusters (CH). To solving this situation a proposed method Head of Cluster election is introduced.
- In this proposed method, the sensor node among its distance cum energy score analysis of sensor node is motivating to sensor nodes as per honestly involving in process of election its Cluster groups. The distance and the energy score analysis value are calculated for all and each round, the distance and the energy score analysis value of the sensor nodes are calculated.
- The Esteem value (ESVi) estimated through a number of expected slots of time that a sensor node wants to stay alive (nTi) in a Cluster group and Energy level (E) of each sensor node.
- The Esteem-value(ESV) is estimated given eqn 1..

$$ES_{Vi} = E_i / {}_n T_i \quad (1)$$

$$PC(Si) = \frac{ES_{Vi}}{\sum_{i=1}^{N} ES_{Vi}} \quad (2)$$

$$R_i = \begin{cases} \infty & if\ (E_i < E_{dgi}) \\ PC(Si)_i / Em; & otherwise \end{cases} \quad (3)$$

The notations of the above equations are given below:

- nTi → Number of Time slots Node to alive
- E_i → Sensor Node Energy Level i
- $Pc_i\ (S_i)$ → Sampling Value
- Em_{ch} → Minimal energy in Cluster-Heads(CHs)
- R_i → Value of Energy score analysis N→ Number of Packets
- ES_{Vi}→ EsteemValue

When the node value of energy score analysis is infinity (∞) at the time node energy level is lowerthan the required energy to gathering data activity. This represents that the node level of energy is too low to become a Head of Clusters(CHs)

Algorithm:

Notations

- nT_i → Number of Time slots Node to alive
- E_i → Energy Level- i
- $PC_i(S_i)$ → Sampling Value of Per- Centum
- Em_{ch} → Minimal energy in Cluster-Heads(CHs)
- R_i → Value of Energy score -analysis
- N → Number of Packets
- ES_{Vi} → EsteemValue

Data Input

- N→ Number of Packets
- E_i → energy level of the node i

Result:

Energy score analysis (R_i)

Step 1:
Begin

$$ES_{Ti} \leftarrow \frac{E_i}{nT_i}$$

$E_i \leftarrow \sum_{i=1}^{n} Em_i$;

Step 2:

$$PC_i(S_i) = \frac{Em_i}{E_i}$$

Step 3:

If $(E_i < Em_{ch})$ // *cluster head selection*

Begin

$R_i R_i R_i \leftarrow \infty$ // energy score analysis
// not selected

Else

Begin

$R_i \leftarrow PC_i(S_i)$ /Emi ;

End if

End

End.

B. *Area of yhe Cluster Group:*

The number of Cluster group to be formed with a group of nodes with look upon to its Base station (BS). The distributed sensor node in a circular region is equally splited by given formula

$$Degree_{partition} = \frac{360}{N_{cluster}}$$

Area of Circle $= \pi r^2$

Let the Cluster Areas are A1, A2, A3, A4 // divided in to four portions

$\frac{\pi r^2}{4}$ is the Cluster Area of CA1,CA2,CA3,CA4

Cluster Area 1 having some of the sensor nodes

CA1 = $\int_{S_{11}}^{S_{1n}} \frac{\pi}{4} ds$ where S is the sensor node

S11 - is the cluster Area1 starting node

S1n - is the cluster Area1 ending node

$$CA_1 + CA_2 + CA_3 + CA_4 =$$

$$\int_{S_{11}}^{S_{1n}} \frac{\pi r^2}{4} ds + \int_{S_{21}}^{S_{2n}} \frac{\pi r^2}{4} ds + \int_{S_{31}}^{S_{3n}} \frac{\pi r^2}{4} ds + \int_{S_{41}}^{S_{4n}} \frac{\pi r^2}{4} ds$$

C. *Distance Estimation of the Cluster Group:*

$for(i = 1; i <= n; i++)$

$for(j = 2; j <= n; j++)$

$$D_{i,j+1} = \sqrt{S_{i,j} - S_j}$$

$$DS_{i,j} = \sqrt{(x_{i,j+1} - x_i) + (y_{i,j+1} - y_i)}$$

$$DS_{i,j+1} = \sqrt{(x_{i,j+2} - x_i) + (y_{i,j+2} - y_i)}$$

$$X = \min(DS_{i,j}, DS_{i,j+1}) \; // \; Nearest - selection$$

if $(X == Ds_{i,j})$

Node $S_{i,j}$ *is linked to* $S_{i,j+1}$ *link to node distance* $Ds_{i,j}$

Else

Node $S_{i,j}$ *is linked to* $S_{i,j-1}$ *link to node distance* $Ds_{i,j}$

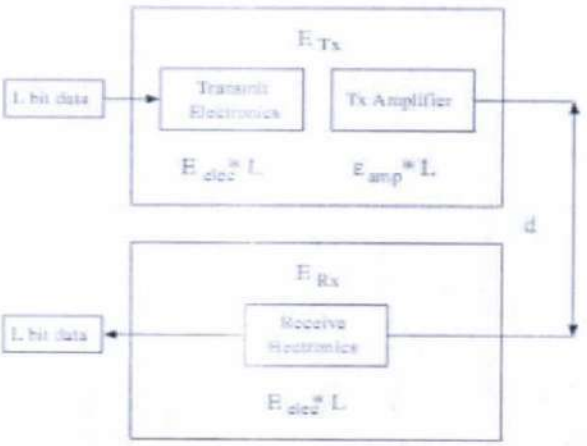

Figure 3.Model of Energy Consumption [15, 16]

The following parts are in Model of Energy consumption [15][16] in WSN.:

1. The energy requires for the message size l-bit at d distance.

$$E_{Tx}(l,d) = \begin{cases} l * E_{ele} + l * \varepsilon_{fs} * d^2, d \le d_0 \\ l * E_{ele} + l * \varepsilon_{mp} * d^4, d \le d_0 \end{cases}$$

Where

E_{ele} - Circuit fatigue of sender cum receiver

d_0 - Critical Distance multipath-free space and fading form.

ε_{fs} - Free Space form.

ε_{mp} - Fading form of multipath.

2. Required Energy of Receiving message size l-bit at d distance is

$$E_{RX}(l) = l * E_{ele}$$

3. The Energy of Data Aggregation is

$$E_{DA}(l) = l * E_{da}$$

IV. Performance Evaluation

The Network Performance is evaluated by NS2 simulator. In NS2 using the object-oriented language C++ and Object Oriented Tool Command Language (OTCL). The C++ and OTCL are acted as both backend and front end.

The EECHS method to evaluate the list of parameters such as

i) Ratio of Packet delivery

ii) Ratio of Packet loss.

iii) Energy consumption.

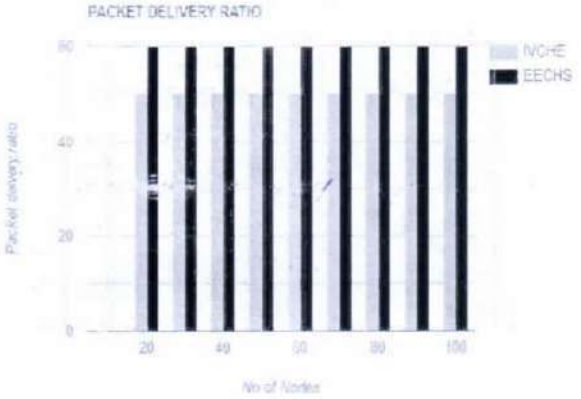

Figure 4 Proportion of Frame delivery

Figure 4 Shows Proportion of Frame Delivery methods of Energy Efficient Head of Cluster Selection (EECHS) and In-vulnerable Cluster-Head Election (IVCHE)

a. The Proportion of Frame Delivery (PFD)

Frame delivered effectively at one end is Proportion of Frame Delivery

Network quality is evaluated by the limitation of Frame delivery Proportion. A Proportion of Frame delivery is calculated as follow

DNF = Delivered number of Frames.

PDR = DNF / Timeslots (4)

The new EECHS Scheme has high performance compared to existing IVCHE Scheme.

b. The Proportion of Frame Loss(PFL)

A Proportion of Frame Loss (PFL) is

PFL = NFD / Timeslots (5)

Where NFD is Number of Frames Dropped

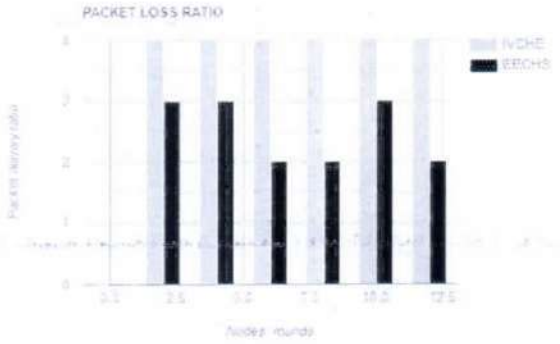

Figure 5 Proportion of Frame Loss

Figure 5 Shows Proportion of Frame loss methods of new a scheme of EECHS and existing scheme of IVCHE

The network quality provided by the routing scheme is used to evaluate the proportion of frame loss. The graph of the Packet loss ratio (PLR) of the new proposed scheme (EECHS) as shown in Figure 5.The high performance of the network based on the Lower the Packet loss ratio.

Energy Consumption

The node energy produces its lifetime

Balanced energy of a node is defined by

Balanced Energy = TE - (n*PT) (6)

Where,

TE → Total Energy

n → Number of Transmission

PT → Transmission Power

Figure 6 shows the consumption of energy in the sensor node while using the proposed EECHA scheme compared with the In Vulnerable Cluster Head Election (IVCHE) method.

Figure 6 show that the new proposed scheme (EECHS) consumes energy is less because of its efficient. The proposed EECHS scheme provides a higher battery lifetime.

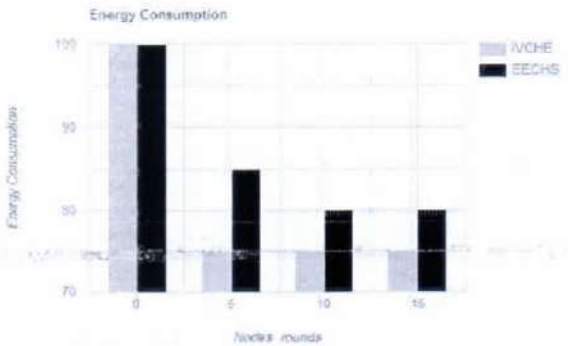

Figure 6 Energy Consumption

V. Conclusion

In Wireless sensor nodes have the minimum amount of power from a small battery and the battery power utilize to sense critical data like a different level of environmental and medical, military etc.. So, the nodes of sensors are not ready to freely accept heavy transmission with data to the base station. So, we have to select the energy efficient Cluster-head using the clustering technique. At the time of Head of Cluster election, the sensor nodes may act individually and some of the sensor nodes do not involve because of its individuality. In this new present article Head of cluster election scheme (EECHS) to avoid individuality involve in Head of Cluster (CH) election and also consider the distance of its sensor nodes in the Cluster head (CH) selection. In this proposed scheme is calculated the value of energy score analysis and also calculated the distance between for each sensor node. The proposed method is evaluated on the node energy through energy score analysis. The proposed method utilized chooses whether the node having the potential to broadcast the required quantity of information. This novel provides a key to reserve consumption of Head of Cluster (CH) among its member of Cluster to avoid participate individually. This method can be utilized for communication very easily.

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Empirical Analysis on Financial Performance through Cash Flow Statements

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Abstract

The present case study is an attempt to anlyze the financial performance of the company by using cash flow statements. The study findings can be helpful for the management of Zuari Cement Ltd., Dondapadu to improve their financial performance and formulate policies that will improve their performance.

Keywords::Analysis, Cash Flow Statements, Performance, Zuari Cement Ltd.

1. Introduction

A Cash Flow Statement is a statement of changes in the financial position of a firm on cash basis.The working capital concept of fund comprises not only cash/bank but also other current assets and current liabilities. Thus, a change in working capital (Funds) does not necessarily means a change in cash/bank. Such a change may be because of change in non-cash current assets and/or in current liabilities. This leads to the inability of the concern in paying tax and dividends in time.

2. Utility and Significance of Cash Flow Statement

A Cash Flow Statement is of primary importance to financial management. At the same time it serves as a

valuable tool of financial analysis. The main advantages of cash flow statement may be summarized are as follows.

- Cash Flow Statement reveals the causes of changes in cash balances between two balance sheet dates.
- This statement helps the management to evaluate its ability to meet its obligations i.e., payment to creditors, the payment of bank loan, payment of interest, taxed, dividend etc.,
- It throws light on caused for poor liquidity in spite of good profits and excessive liquidity in spite of heavy losses.
- Cash Flow Statement helps the management in planning repayment of loans, replacement of assets etc.
- This statement is helpful in short-term financial decisions relating to liquidity.

3. Objectives of the Research

- To study the effectiveness of cash flows of different activities in Zuari Cement Limited and to suggest measures to control cash flows.
- To study the operating activities in Zuari Cement Limited through profit & Loss Account.
- To study the financing activities through schedules of Balance sheet.
- To study the investment decision that was made by company and to identify the cash/profit incurred through its decision.
- To study about the cash flows those have an impact on the liquidity position.
- To identify the firm's ability to meet its obligation cash flows.
- To analyzes all data collected in the light of determining financial position of firm in handing cash.
- To make necessary recommendation to company an improving cash management.

4. Data Collection Methods

4.1 Primary Data

Collection of primary data is collected through from the top management in the company. The financial auditor helps me a lot in collecting the information about the cash flow statements.

4.2 Secondary Data

The data relating to the financial statement of ZCL have been collected from the published annual reports for the years 2013-2014 to 2017-2018.

5. Data Analysis & Interpretation

Cash flows statement for the year ended 31st December 2012(rupees in lakhs)

Particulars		For the year ended 31st December 2014 (Amalgamated)	For the year ended December 2013
Cash flows from operating activities			
Profit before tax		28,360.18	13,444.82
Adjustments:			
Depreciation		5,204.23	2,200.41
Amortization of goodwill		1,799.20	-
Interest and other finance cost		950.93	871.49
Loss on sale of fixed assets/ assets discarded		265.76	450.41
Amortization of miscellaneous expenses		-	67.10
Interest income		(1,118.67)	(60.18)
Dividend income		(0.39)	(1.65)
Profit on sale of current investment		(194.82)	(76.00)
Operating cash flows before working capital changes		35,266.42	16,896.40
(Increase)/decrease in sundry debtors		707.52	(922.32)
(Increase)/decrease in loans and advances		(1,579.34)	(291.88)
Decrease in inventories		750.52	255.06
Increase in current liabilities and provisions		984.50	2,765.83
Cash generated from operations		36,130.05	18,673.09
Taxes(paid)		(5,827.03)	(1,074.02)
Net cash provided by operating activities	**(a)**	30,303.02	17,599.07
Cash flows from investing activities			
Purchase of fixed assets		(17,314.80)	(3,917.45)
Proceeds from sale fixed assets		453.53	3.71
Purchase of shares in SVCL		(16.95)	(951.82)
Purchase of current investment		(4,950.96)	(17,756.65)
Dividend received		4,003.02	14,024.45
Inter corporate deposit taken		0.39	1.65
Interest received			

	-	1,598.00
Net cash used in investing activities	826.64	61.93
(b)	(16,999.13)	(6,936.18)
Cash flows from financing activities		
Proceeds from borrowings	2,551.31	-
Repayment of borrowings	(5,071.07)	(9,494.48)
Interest and other finance cost paid	(952.86)	(975.28)
Net cash used in financing activities	(3,472.62)	(10,469.76)
(c)		
Net increase in cash and cash equivalents	9,831.27	193.13
(a)+(b)+(c)		

Interpretation

- The operating activities shows positive result i.e., 17,599 to 30,303 which shows the miscellaneous expenses almost zero, the dividend income is decreasing and increasing in sundry debtors.
- The net cash in investing activities shows positive result, because of decrease in purchase of fixed assets and also increased in interest received.
- The net cash in financing activities shows positive result, because of decrease in repayment of borrowings.
- The net increase in cash and cash equivalents at the end of the year 2009 shows the positive result.

Cash Flows Statement for the Year Ended 31st December 2013(Rupees in lakhs)

	For the year ended 31st December 2015	For the year ended 31st December 2014
Cash flows from operating activities		
Profit before tax	32,195.97	28,360.18
Adjustments:		
Depreciation	5,377.68	5,204.23
Amortization of goodwill	1,799.20	1,799.20
Interest and other finance cost	534.19	950.93
Loss on sale of fixed assets/ assets discarded	535.38	265.76

Provision for obsolescence of stores and spares	(230.93)	-
Loans and advances written off	8.11	-
Stores and spares written off	347.57	-
Provision for bad debts no longer required written back		
Liabilities no longer required written back	(11.51)	-
Interest income	(249.13)	-
Dividend income	(745.19)	(1,118.67)
Profit on sale of current investment	(8.39)	(0.39)
Operating cash flows before working capital changes	(475.92)	(194.82)
Increase in sundry debtors	39,077.03	35,266.42
(Increase)/decrease in loans and advances	(109.09)	707.52
(Increase)/Decrease in inventories	(2,942.11)	(1,579.34)
(Increase)/Decrease in current liabilities and provisions	(2,216.97)	750.52
Cash generated from operations		-
Taxes(paid)	10,079.44	984.50
Net cash provided by operating activities (a)	43,888.30	36,130.05
	(11,364.05)	(5,827.03)
	32,524.25	30,303.02
Cash flows from investing activities		
Purchase of fixed assets and capital work in progress		
Proceeds from sale fixed assets		
Purchase of shares in SVCL	(54,181.05)	(17,314.80)
Purchase of long term investment	13.91	453.53
Purchase of current investment	-	16.95
Proceeds from sale of current investment	(37,933.67)	-
Dividend received	43,360.55	(4,950.96)
Interest received	8.39	4,003.02
Net cash used in investing activities (b)	1,009.81	0.39
		826.64
	(47,722.06)	(16,999.13)
Cash flows from financing activities		
Proceeds from borrowings		
Repayment of borrowings		
Interest and other finance cost		
Repayment of nonconvertible borrowings	10,915.03	2,551.31
Net cash used in financing activities (c)	(1,575.00)	(5,071.07)
	(534.19)	(952.86)
	(846.72)	-
Net increase / Decrease in cash and cash equivalents (a)+(b)+(c)	7,959.12	(3,472.62)

	7,238.69	9,831.27

Interpretation

- The net cash flow from operating activities shows positive result. i.e., 30,303 to 32,524 cash flows in operating activities are the principal revenue producing activities.
- The net cash flow from operating activities in the year 2011-2012 is shows the positive performance. This means the profit increased and other finance cost was decreased.
- The net cash flows from investing activities showed positive result. Because of increased in the interest received and also long term investments comes to zero.
- The net cash flows from financing activities shows positive performance by repayment of borrowings are drastically decreased.
- Hence, the net cash and cash equivalents are little bit decreased and overall cash flows showing negative result when compared with previous year.

Cash Flows Statement for the Year Ended 31st December, 2014(Rupees in lakhs)

Particulars	For the year ended 31st December, 2016	For the year ended 31st December,2015
Cash flows from operating activities		
Profit before tax	27,719.24	32,195.97
Adjustments:		
Depreciation	5,488.32	5,377.68
Amortization of goodwill	1,799.20	1,799.20
Interest and other finance cost	424.13	534.19
Loss on sale of fixed assets/ assets discarded	18.59	535.38
Provision for doubtful advances	50.38	-
Provision for obsolescence of stores and spares	-	(230.93)
Loans and advances written off	12.95	8.11
Stores and spares written off	86.89	347.57
Provision for bad debts no longer required written back		
Liabilities no longer required written back	-	(11.51)
Interest income	(261.67)	(249.13)
Dividend income	(141.42)	(745.19)
Profit on sale of current investment	(116.50)	(8.39)
Operating cash flows before working capital changes	-	(475.92)
Increase in sundry debtors	35,080.11	39,077.03
(Increase)/decrease in loans and advances	(1,244.40)	(109.09)
(Increase)/Decrease in inventories	3,610.70	(2,942.11)
(Increase)/Decrease in current liabilities and provisions	1,606.03	(2,216.97)
Cash generated from operations		
Taxes(paid)	(2,283.25)	10,079.44

		36,769.19	43,886.33
Net cash provided by operating activities	(a)	(9,922.23)	(11,362.08)
		26,846.96	32,524.25
Cash flows from investing activities			
Purchase of fixed assets and capital work in progress			
Proceeds from sale fixed assets			
Purchase of current investment		(29,552.81)	(54,181.05)
Dividend received		20.02	13.91
Interest received		(1,03,807.41)	(37,933.67)
		92,143.32	43,360.55
Net cash used in investing activities (b)		182.94	8.39
		1,128.28	1,009.81
		(39,885.66)	(47,722.06)
Cash flows from financing activities			
Proceeds from borrowings			
Repayment of borrowings		36,645.37	10,915.03
Interest and other finance cost		(2,151.36)	(1,575.00)
Repayment of nonconvertible borrowings		(5,146.89)	(534.19)
Net cash used in financing activities (c)		-	(846.72)
		29,347.12	7,959.12
Net increase / Decrease in cash and cash equivalents (a)+(b)+(c)			
		16,308.42	(7,238.69)

Interpretation

- In the year 2012-2013 the operating activities show the decreasing trend i.e., from 32,524 to 24,846. The operating activities are the key indicators to which the operation of an enterprise has generated cash flows to maintain operating capability of the enterprise.
- The net cash flow fromoperating an activity in the 2012-2013 is not showed the positive performance. Because of decrease in profit, increase in depreciation, increase in loans & advances and also increase in the sundry debtors.
- The net cash flows from investing activities are the acquisition & disposal of long term assets.

- The investing activities are shows positive performance. Because of sales fo fixed assets increased, purchase of fixed assets decreased and also increased in the dividend & interest income.
- The net cash flows from financing activities show the positive trend. This means of increase in borrowings.

Cash Flow Statement for the year ended 31st December, 2015(Rupees in lakhs)

	For the year ended 31st December, 2017	For the year ended 31st December, 2016
Cash flows from operating activities		
Profit before tax	5,062.88	27,719.24
Adjustments:		
Depreciation	8,160.36	5,488.32
Amortization of goodwill	1,799.20	1,799.20
Interest and other finance cost	3,439.37	424.13
Loss on sale of fixed assets/ assets discarded	65.84	18.59
Provision for doubtful advances	-	50.38
Provision for obsolescence of stores and spares	21.14	-
Loans and advances written off	22.14	12.95
Stores and spares written off	59.40	86.89
Provision for site restoration	91.40	-
Provision for doubtful advances no longer required written back	(9.77)	-
Provision for doubtful debts	-	(261.67)
Liabilities no longer required written back	(937.40)	-
Interest income	(277.34)	(141.42)
Dividend income	(157.49)	(116.50)
Profit on sale of current investment	(29.98)	-
Operating cash flows before working capital changes	17,759.75	35,080.11
Increase in sundry debtors	(191.19)	(1,244.40)
(Increase)/decrease in loans and advances	(2,244.75)	3,610.70
(Increase)/Decrease in inventories	(4,763.72)	1,606.03
(Increase)/Decrease in current liabilities and provisions	10,293.34	(2,283.25)
Cash generated from operations	20,873.43	36,769.19
Taxes(paid)	(3,882.66)	(9,922.23)
Net cash provided by operating activities (a)	16,990.77	26,846.96
Cash flows from investing activities		
Purchase of fixed assets and capital work in progress	(40,628.70)	(29,552.81)
Proceeds from sale fixed assets	28.48	20.02
Purchase of current investment		

Proceeds from sale of current investment	(52,169.03)	(1,03,807.41)
Investment in subsidiary	62,117.59	92,143.32
Dividend received	-	-
Interest received	322.18	182.94
Net cash used in investing activities (b)	929.94	1,128.28
	(29,399.54)	(39,885.66)
Cash flows from financing activities		
Proceeds from borrowings	44,344.59	36,645.37
Repayment of borrowings	(42,750.00)	(2,151.36)
Interest and other finance cost	(5,717.25)	(5,146.89)
Net cash used in financing activities (c)	(4,122.66)	29,347.12
Net increase / Decrease in cash and cash equivalents (a)+(b)+(c)	(16,531.43)	16,308.42

Interpretation

- The net cash flow from operating activities in the year 2013-2014 is falls drastically from 26,846 to 16,990.
- The net cash flow from operating activities is shows negative performance. Because of Increased in depreciation, increased in other finance cost and increased in the sundry debtors.
- The net cash flow from investing activities is shows the positive performance. By decreased in the current investment and increased in the dividend received.
- The net cash flows from financing activities are shows negative result.

Cash Flow Statement for the Year Ended 31st December, 2016(Rupees in lakhs)

	For the year ended 31st December, 2018	For the year ended 31st December, 2017
Cash flows from operating activities		
Profit before tax	15,390.09	5,062.88
Adjustments:		
Depreciation	11,339.49	8,160.36
Amortization of goodwill	1,799.20	1,799.20
Interest and other finance cost	5,607.36	3,439.37
Loss on sale of fixed assets/ assets discarded	6.60	65.84
Provision for doubtful advances	16.91	-

Provision for obsolescence of stores and spares		171.49	21.14
Loans and advances written off		-	22.14
Stores and spares written off		-	59.40
Provision for site restoration		104.70	91.40
Provision for doubtful advances no longer required written back		(5848)	(9.77)
Provision for doubtful debts		2.82	-
Liabilities no longer required written back		(141.86)	(937.40)
Interest income		(1,055.15)	(277.34)
Dividend income		-	(157.49)
Profit on sale of current investment		(429.19)	(29.98)
Operating cash flows before working capital changes		32,753.98	17,759.75
Increase in sundry debtors		(892.59)	(191.19)
(Increase)/decrease in loans and advances		(7,693.75)	(2,244.75)
(Increase)/Decrease in inventories		(3,311.92)	(4,763.72)
(Increase)/Decrease in current liabilities and provisions		7,623.32	10,293.34
Cash generated from operations		28,479.04	20,873.43
Taxes(paid)		(3,391.25)	(3,882.66)
Net cash provided by operating activities	**(a)**	25,087.79	16,990.77
Cash flows from investing activities			
Purchase of fixed assets and capital work in progress		(24,395.97)	(40,628.70)
Proceeds from sale fixed assets		37.44	28.48
Purchase of current investment		(34,650.00)	(52,169.03)
Proceeds from sale of current investment		31,029.46	62,117.59
Investment in subsidiary		(5,782.49)	-
Dividend received		-	322.18
Interest received		1,025.18	929.94
Net cash used in investing activities	**(b)**	(32,736.38)	(29,399.54)
Cash flows from financing activities			
Proceeds from borrowings		21,763.16	44,344.59
Repayment of borrowings		(501.93)	(42,750.00)
Interest and other finance cost		(5,729.55)	(5,717.25)
Net cash used in financing activities	**(c)**	15,531.68	(4,122.66)
Net increase / Decrease in cash and cash equivalents(a)+(b)+(c)		7,883.10	(16,531.43)

Interpretation

- The net cash from operating activities shows the positive performance. i.e., from 16,990 to 25,087
- The net cash flows from operating activities are increased. Due to, Loans and advances written off comes to zero.
- The net cash flows from investing activities are shows positive performance. Why because of purchase of fixed assets is decreased, current investment is also decreased.
- The net cash flows from financing activities showed positive result. Because, decrease in borrowings and repayment of borrowings.

6. Findings

- The study reveals investing, operating and financing activities shows the positive result, where the firm maintaining most of liquidity cash to run day to day activities.
- It may conclude from the analysis, the net cash flows from investing activities are highly increased. Due to purchase of fixed assets affects on the net cash and cash equivalents.
- The net cash flows from operating activities, profit is slightly decreased and the fixed assets are sold hugely and sale of current investment is increased these leads to generated cash flows and cash equivalents.
- As it is clear stated the impact on profit before tax and these leads to decrease in net operating activities and also these shows the impact on the net cash and cash equivalents.
- It can be finalized, the profits was slightly increased that leads to the net operating profit also increased. And, investing activities shows also positive indicators. Repayment of borrowings is also decreased and these lead to net cash and cash equivalents.

7. Suggestions

- It is suggested to the company authorities to increase the operating, financing and investing activities to improve for the future prospects of business concern.
- By observing the above statement the company tries to reduce some investment on long term investment for meet the present expenses of a firm. If the company continue the same the company unable to meet the day to day expenses.
- While examining into the contents, the profit before tax is slight decreased and try to recollect the sundry debtors.
- As reported by the study, try to maintain the minimum profits and reduce interest, other finance cost.
- It is suggested to company authorities' focus on the proceeds from borrowings and operating activities to generate the optimum profit.

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COMMON COUPLED FIXED POINT THEOREMS FOR FOUR MAPPINGS IN DISLOCATED QUASI b-METRIC SPACES

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ABSTRACT

In this paper, we prove two common coupled fixed point theorems for four mappings in dislocated quasi b-metric spaces and provide two examples to support our theorems. Our results generalize some existing results in the literature.

Mathematics Subject Classification: *47 H 10, 54 H 25.*

Keywords: *Dislocated quasi b-metric, coupled fixed points, w-compatible pair of maps, Cauchy sequence.*

1. INTRODUCTION

Hitzler [7] and Hitzler and Seda [6] introduced the notion of dislocated metric spaces and generalized the celebrated Banach contraction principle in such spaces.

Zeyada *et.al* [15] initiated the concept of dislocated quasi metric spaces and generalized the results of Hitzler and Seda [6] in dislocated quasi metric spaces.

The notion of b-metric space was introduced by Czerwic [3] in connection with some problems concerning with the convergence of non measurable functions with respect to measure.

Recently Klin-eam and Suanoom [8] introduced the concept of dislocated quasi b-metric spaces and which generalize b-metric spaces [3] and quasi b-metric spaces [13] and proved some fixed point theorems in it by using cyclic contractions.

The authors [1,5,8,10,11,12,14] etc. obtained fixed, common fixed points and common coupled fixed point theorems in dislocated quasi b-metric spaces using various contraction conditions for single and two maps.

In this note, we prove two common coupled fixed point theorems for four maps in dislocated quasi b-metric spaces and we also give examples to support our theorems.

Bhaskar and Lakshmi kantham [4] developed some coupled fixed point theorems in partially ordered metric spaces. Lakshmi kantham and Ciric [9] defined common coupled fixed points for a pair of mappings. Abbas *et al.* [2] introduced w-compatible mappings and proved some common coupled fixed point theorems in cone metric spaces.

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First we recall some known definitions and lemmas.

Definition 1.1: let X be a non-empty set, $s \geq 1$ (a fixed real number) and $d: X \times X \to [0, \infty)$ be a function. Consider the following condition on d.

(1.1.1) $d(x,x) = 0, \forall x \epsilon X$
(1.1.2) $d(x,y) = d(y,x) = 0 \Rightarrow x = y, \forall x, y \epsilon X$
(1.1.3) $d(x,y) = d(y,x), \forall x, y \epsilon X$
(1.1.4) $d(x,y) \leq d(x,z) + d(z,y), \forall x, y, z \epsilon X$
(1.1.5) $d(x,y) \leq s[d(x,z) + d(z,y)], \forall x, y, z \epsilon X$

(i) If d satisfies (1.1.2), (1.1.3) and (1.1.4) then d is called a dislocated metric and (X, d) is called a dislocated metric space.
(ii) If d satisfies (1.1.1), (1.1.2) and (1.1.4) then d is called a quasi metric and (X, d) is called a quasi metric space.
(iii) If d satisfies (1.1.2) and (1.1.4) then d is called a dislocated quasi metric or dq-metric and (X, d) is called a dislocated quasi metric space.
(iv) If d satisfies (1.1.1), (1.1.2), (1.1.3) and (1.1.4) then d is called a metric and (X, d) is called a metric space.
(v) If d satisfies (1.1.1), (1.1.2), (1.1.3) and (1.1.5) then d is called a b-metric and (X, d) is called a b-metric space.
(vi) If d satisfies (1.1.2) and (1.1.5) then d is called a dislocated quasi b-metric and (X, d) is called a dislocated quasi b-metric space or dq b-metric space.

Definition 1.2: Let (X, d) be a dq b-metric space. A sequence $\{x_n\}$ in (X, d) is said to be

(i) dq b-convergent if there exists some point $x \epsilon X$ such that $\lim_{n\to\infty} d(x_n, x) = 0 = \lim_{n\to\infty} d(x, x_n)$. In this case x is called a dq b-limit of $\{x_n\}$ and we write $x_n \to x \text{ as } n \to \infty$.
(ii) Cauchy sequence if $\lim_{n,m\to\infty} d(x_n, x_m) = 0 = \lim_{n,m\to\infty} d(x_m, x_n)$.

The space (X, d) is called complete if every Cauchy sequence in X is dq b-convergent.

One can prove easily the following Lemma.

Lemma 1.3: Let (X, d) be a dq b-metric space and $\{x_n\}$ be dq b-convergent to x in X and $y \epsilon X$ be arbitrary. Then

$\frac{1}{s} d(x,y) \leq \lim_{n\to\infty} inf\, d(x_n, y) \leq \lim_{n\to\infty} \sup d(x_n, y) \leq s d(x,y)$
$\frac{1}{s} d(y,x) \leq \lim_{n\to\infty} \inf d(y, x_n) \leq lim_{n\to\infty} \sup d(y, x_n) \leq s d(y,x)$.

Definition 1.4([4]): Let X be a non-empty set .An element $(x,y) \epsilon X \times X$ is called a coupled fixed point of a mapping $F : X \times X \to X$ *if* $x = F(x,y)$ *and* $y = F(y,x)$.

Definition 1.5: Let X be anon-empty set and $F : X \times X \to X$, $f: X \to X$ be mappings .

(i) ([9]). An element $(x,y) \epsilon X \times X$ is called a coupled coincidence point of F and f if fx = F(x, y) and fy = F(y,x).
(ii) ([9]). An element $(x,y) \epsilon X \times X$ is called a common coupled fixed point of F and f if x = fx = F(x, y) and y = fy = F(y,x).
(iii) ([2]). The pair (F, f) is called w-compatible if $f(F(x,y)) = F(fx, fy)$ *and* $f(F(y,x)) = F(fy, fx)$ whenever there exist $x, y \epsilon X$ *with* $fx = F(x,y)$ *and* $fy = F(y,x)$.

2. MAIN RESULT

Before proving our main theorems, we state the following

Definition 2.1: For the integer $s \geq 1$, let Φ_s denote the set of all functions $\varphi: [0, \infty) \to [0, \infty)$ satisfying the following

(i) φ is monotonically non-decreasing,
(ii) $\sum_{n=1}^{\infty} s^n \varphi^n(t) < \infty$ for all $t > 0$, (iii) $\varphi(t) < t$ for $t > 0$.

From (i) and (iii), it is clear that $\varphi(0) = 0$.

Theorem 2.2: Let (X, d) be a complete dislocated quasi b- metric space with fixed integer $s \geq 1$ and F, G : $X \times X \to X$ and $S, T: X \to X$ be continuous mappings satisfying

(2.2.1) $d(F(x,y), G(u,v)) \leq \varphi(max\{ d(Sx, Tu), d(Sy, Tv)\})$ for all $x, y, u, v \in X$, *where* $\varphi \in \Phi_s$,
(2.2.2) $d(G(x,y), F(u,v)) \leq \varphi(max\{d(Tx, Su), d(Ty, Sv)\})$ for all $x, y, u, v \in X$, *where* $\varphi \in \Phi_s$,
(2.2.3) $F(X \times X) \subseteq T(X), G(X \times X) \subseteq S(X)$,
(2.2.4) $FS = SF$ *and* $GT = TG$.

Then F, G, S and T have a unique common coupled fixed point in $X \times X$.

Proof: Let $(x_0, y_0) \in X \times X$.

From (2.2.3), there exist sequences $\{x_n\}, \{y_n\}, \{z_n\}$ and $\{w_n\}$ in X such that

$F(x_{2n}, y_{2n}) = Tx_{2n+1} = z_{2n}$,
$F(y_{2n}, x_{2n}) = Ty_{2n+1} = w_{2n}$,
$G(x_{2n+1}, y_{2n+1}) = Sx_{2n+2} = z_{2n+1}$,
$G(y_{2n+1}, x_{2n+1}) = Sy_{2n+2} = w_{2n+1}$,$n = 0,1,2, \ldots$

Case-(i): Suppose max $\{d(z_{2n}, z_{2n-1}), d(z_{2n-1}, z_{2n}), d(w_{2n}, w_{2n-1}), d(w_{2n-1}, w_{2n})\} = 0$ for some n.
Then $z_{2n-1} = z_{2n}$ and $w_{2n-1} = w_{2n}$ from (1.1.2). Now from (2.2.1),

$$d(z_{2n}, z_{2n+1}) = d\big(F(x_{2n}, y_{2n}), G(x_{2n+1}, y_{2n+1})\big) \leq \varphi(max\{d(z_{2n-1}, z_{2n}), d(w_{2n-1}, w_{2n})\}). \quad (1)$$

From (2.2.2) we have

$$d(z_{2n+1}, z_{2n}) = d\big(G(x_{2n+1}, y_{2n+1}), F(x_{2n}, y_{2n})\big) \leq \varphi(max\{d(z_{2n}, z_{2n-1}), d(w_{2n}, w_{2n-1})\}). \quad (2)$$

From (2.2.1) and (2.2.2), we have

$$d(w_{2n}, w_{2n+1}) = d\big(F(y_{2n}, x_{2n}), G(y_{2n+1}, x_{2n+1})\big) \leq \varphi(max\{d(w_{2n-1}, w_{2n}), d(z_{2n-1}, z_{2n})\}). \quad (3)$$

and

$$d(w_{2n+1}, w_{2n}) = d\big(G(y_{2n+1}, x_{2n+1}), F(y_{2n}, x_{2n})\big) \leq \varphi(max\{d(w_{2n}, w_{2n-1}), d(z_{2n}, z_{2n-1})\}). \quad (4)$$

Since φ is monotonically non-decreasing, we have

$$max\begin{Bmatrix} d(z_{2n}, z_{2n+1}), d(z_{2n+1}, z_{2n}), \\ d(w_{2n}, w_{2n+1}), d(w_{2n+1}, w_{2n}) \end{Bmatrix} \leq \varphi\left(max\begin{Bmatrix} d(z_{2n-1}, z_{2n}), d(z_{2n}, z_{2n-1}), \\ d(w_{2n-1}, w_{2n}), d(w_{2n}, w_{2n-1}) \end{Bmatrix}\right) = \varphi(0) = 0. \quad (5)$$

Thus $z_{2n} = z_{2n+1}$ and $w_{2n} = w_{2n+1}$ from (1.1.2).

Continuing in this way, we have $z_{2n-1} = z_{2n} = z_{2n+1} = \cdots$ and $w_{2n-1} = w_{2n} = w_{2n+1} = \cdots$

Hence $\{z_n\}$ and $\{w_n\}$ are constant Cauchy sequences in X.

Case-(ii): Suppose max $\{d(z_{n-1}, z_n), d(z_n, z_{n-1}) d(w_{n-1}, w_n), d(w_n, w_{n-1})\} \neq 0$ for n=1, 2, 3,.....As in

Case(i), we have from (5) that

$$max\begin{Bmatrix} d(z_{2n}, z_{2n+1}), d(z_{2n+1}, z_{2n}), \\ d(w_{2n}, w_{2n+1}), d(w_{2n+1}, w_{2n}) \end{Bmatrix} \leq \varphi\left(max\begin{Bmatrix} d(z_{2n-1}, z_{2n}), d(z_{2n}, z_{2n-1}), \\ d(w_{2n-1}, w_{2n}), d(w_{2n}, w_{2n-1}) \end{Bmatrix}\right)$$

This is true for n=1, 2, 3,...

Hence using the monotonically non-decreasing property of φ, we get

$$\begin{aligned} max\begin{Bmatrix} d(z_n, z_{n+1}), d(z_{n+1}, z_n), \\ d(w_n, w_{n+1}), d(w_{n+1}, w_n) \end{Bmatrix} &\leq \varphi\left(max\begin{Bmatrix} d(z_{n-1}, z_n), d(z_n, z_{n-1}), \\ d(w_{n-1}, w_n), d(w_n, w_{n-1}) \end{Bmatrix}\right) \\ &\leq \varphi^2\left(max\begin{Bmatrix} d(z_{n-2}, z_{n-1}), d(z_{n-1}, z_{n-2}), \\ d(w_{n-2}, w_{n-1}), d(w_{n-1}, w_{n-2}) \end{Bmatrix}\right) \\ &\ldots\ldots\ldots \\ &\leq \varphi^n\left(max\begin{Bmatrix} d(z_0, z_1), d(z_1, z_0), \\ d(w_0, w_1), d(w_1, w_0) \end{Bmatrix}\right) \end{aligned} \quad (6)$$

Now for all positive integers n and p, consider, using (6),

$$\begin{aligned} d(z_n, z_{n+p}) &\leq s\, d(z_n, z_{n+1}) + s^2 d(z_{n+1}, z_{n+2}) + \cdots + s^p d(z_{n+p-1}, z_{n+p}) \\ &\leq s\, \varphi^n(t) + s^2 \varphi^{n+1}(t) + \cdots + s^p \varphi^{n+p-1}(t), \text{ where } t = max\begin{Bmatrix} d(z_0, z_1), d(z_1, z_0), \\ d(w_0, w_1), d(w_1, w_0) \end{Bmatrix} \\ &\leq s^n\, \varphi^n(t) + s^{n+1} \varphi^{n+1}(t) + \cdots + s^{n+p-1} \varphi^{n+p-1}(t), \text{ since } s \geq 1 \\ &= \sum_{i=n}^{n+p-1} s^i\, \varphi^i(t) \leq \sum_{i=n}^{\infty} s^i\, \varphi^i(t). \end{aligned}$$

Since $\sum_{i=1}^{\infty} s^i\, \varphi^i(t)$ converges for all $t > 0$, its remainder after n terms tends to zero as $n \to \infty$.

Hence, we have $\lim_{n\to\infty} d(z_n, z_{n+p}) = 0$. Also using (6), we have

$$\begin{aligned} d(z_{n+p}, z_n) &\le s\, d(z_{n+p}, z_{n+1}) + s\, d(z_{n+1}, z_n) \\ &\le s^2\, d(z_{n+p}, z_{n+2}) + s^2\, d(z_{n+2}, z_{n+1}) + s\, d(z_{n+1}, z_n) \\ &\le s^3\, d(z_{n+p}, z_{n+3}) + s^3\, d(z_{n+3}, z_{n+2}) + s^2\, d(z_{n+2}, z_{n+1}) + s\, d(z_{n+1}, z_n) \\ &\cdots\cdots\cdots \\ &\le s^{p-1}\, d(z_{n+p}, z_{n+p-1}) + s^{p-1}\, d(z_{n+p-1}, z_{n+p-2}) + \cdots + s^2\, d(z_{n+2}, z_{n+1}) + s\, d(z_{n+1}, z_n) \\ &\le s^{p-1}\, \varphi^{n+p-1}(t) + s^{p-1}\varphi^{n+p-2}(t) + \cdots + s^2\, \varphi^{n+1}(t) + s\, \varphi^n(t), \text{ where t is as in above} \\ &\le s^{n+p-1}\, \varphi^{n+p-1}(t) + s^{n+p-2}\varphi^{n+p-2}(t) + \cdots + s^{n+1}\, \varphi^{n+1}(t) + s^n\, \varphi^n(t), \text{ since } s \ge 1 \\ &= \sum_{i=n}^{n+p-1} s^i\, \varphi^i(t) \le \sum_{i=n}^{\infty} s^i\, \varphi^i(t). \end{aligned}$$

As in above, we have $\lim_{n\to\infty} d(z_{n+p}, z_n) = 0$.

Similarly we can show that $\lim_{n\to\infty} d(w_n, w_{n+p}) = 0$ and $\lim_{n\to\infty} d(w_{n+p}, w_n) = 0$.

Thus $\{z_n\}$ *and* $\{w_n\}$ are Cauchy sequences in X.

Since X is a complete dislocated quasi b- metric space, there exist $z, w \in X$ such that $\{z_n\}$ converges to z and $\{w_n\}$ converges to w.

Since SF = FS and S and F are continuous, we have

$$\begin{aligned} Sz &= \lim_{n\to\infty} S(z_{2n}) = \lim_{n\to\infty} S\big(F(x_{2n}, y_{2n})\big) = \lim_{n\to\infty} F(Sx_{2n}, Sy_{2n}) = \lim_{n\to\infty} F(z_{2n-1}, w_{2n-1}) \\ &= F(\lim_{n\to\infty} z_{2n-1}, \lim_{n\to\infty} w_{2n-1}) = F(z, w). \end{aligned}$$

Similarly we have $Sw = F(w, z)$.

Since TG= GT and T and G are continuous, we have

$$\begin{aligned} Tz &= \lim_{n\to\infty} T(G(x_{2n+1}, y_{2n+1}) = \lim_{n\to\infty} G(Tx_{2n+1}, Ty_{2n+1})) = \lim_{n\to\infty} G(z_{2n}, w_{2n}) \\ &= G(\lim_{n\to\infty} z_{2n}, \lim_{n\to\infty} w_{2n}) = G(z, w). \end{aligned}$$

Similarly we have $Tw = G(w, z)$.

$d(Sz, Tz) = d\big(F(z, w), G(z, w)\big) \le \varphi(max\{d(Sz, Tz), d(Sw, Tw)\})$ from (2.2.1)

$d(Sw, Tw) = d\big(F(w, z), G(w, z)\big) \le \varphi(max\{d(Sz, Tz), d(Sw, Tw)\})$ from (2.2.1)

Thus we have $max\{d(Sz, Tz), d(Sw, Tw)\} \le \varphi(max\{d(Sz, Tz), d(Sw, Tw)\})$,

which in turn yields that $d(Sz, Tz) = 0 = d(Sw, Tw)$, since $\varphi(t) < t \text{ for all } t > 0$.

Similarly using (2.2.2), we can show that

$d(Tz, Sz) = 0 = d(Tw, Sw)$.

Hence by (1.1.2), we have $Sz = Tz$ *and* $Sw = Tw$.

Let $\alpha = Sz = Tz$ *and* $\beta = Sw = Tw$.

Then $S\alpha = S^2z = S\big(F(z, w)\big) = F(Sz, Sw) = F(\alpha, \beta)$,

$S\beta = S^2w = S\big(F(w, z)\big) = F(Sw, Sz) = F(\beta, \alpha)$,

$T\alpha = T^2z = T\big(G(z, w)\big) = G(Tz, Tw) = G(\alpha, \beta)$,

$T\beta = T^2w = T\big(G(w, z)\big) = G(Tw, Tz) = G(\beta, \alpha)$.

Now using (2.2.1) and (2.2.2), we have

$d(S\alpha, \alpha) = d(F(\alpha, \beta), Tz) = d\big(F(\alpha, \beta), G(z, w)\big) \le \varphi(max\{d(S\alpha, \alpha), d(S\beta, \beta)\})$,

$d(\alpha, S\alpha) = d\big(Tz, F(\alpha, \beta)\big) = d\big(G(z, w), F(\alpha, \beta)\big) \le \varphi(max\{d(\alpha, S\alpha), d(\beta, S\beta)\})$,

$d(S\beta, \beta) = d(F(\beta, \alpha), Tw) = d\big(F(\beta, \alpha), G(w, z)\big) \le \varphi(max\{d(S\beta, \beta), d(S\alpha, \alpha)\})$,

$d(\beta, S\beta) = d\big(Tw, F(\beta, \alpha)\big) = d\big(G(w, z), F(\beta, \alpha)\big) \le \varphi(max\{d(\alpha, S\alpha), d(\beta, S\beta)\})$.

Since φ is monotonically non-decreasing, we have

$max\{d(S\alpha, \alpha), d(\alpha, S\alpha), d(S\beta, \beta), d(\beta, S\beta)\} \le \varphi(max\{d(S\alpha, \alpha), d(\alpha, S\alpha), d(S\beta, \beta), d(\beta, S\beta)\})$

which in turn yields that $S\alpha = \alpha$ *and* $S\beta = \beta$, since $\varphi(t) < t \text{ for } t > 0$ and from (1.1.2).

Similarly we can show that $T\alpha = \alpha$ and $T\beta = \beta$.

Thus $F(\alpha,\beta) = S\alpha = \alpha = T\alpha = G(\alpha,\beta)$ and $F(\beta,\alpha) = S\beta = \beta = T\beta = G(\beta,\alpha)$.

Hence (α,β) is a common coupled fixed point of F, G, S and T.

UNIQUENESS:

Let (p, q) be another common coupled fixed point of F, G, S and T. Then $F(p,q) = Sp = p = Tp = G(p,q)$ and $F(q,p) = Sq = q = Tq = G(q,p)$.

Consider $d(\alpha,p) = d\big(F(\alpha,\beta),G(p,q)\big) \le \varphi(max\{d(\alpha,p),d(\beta,q)\})$ from (2.2.1),
$d(p,\alpha) = d\big(G(p,q),F(\alpha,\beta)\big) \le \varphi(max\{d(p,\alpha),d(q,\beta)\})$ from (2.2.2),
$d(\beta,q) = d\big(F(\beta,\alpha),G(q,p)\big) \le \varphi(max\{d(\alpha,p),d(\beta,q)\})$ from (2.2.1),
$d(q,\beta) = d\big(G(q,p),F(\beta,\alpha)\big) \le \varphi(max\{d(p,\alpha),d(q,\beta)\})$ from (2.2.2).

Since φ is monotonically non-decreasing, we have
$max\{d(\alpha,p),d(p,\alpha),d(\beta,q),d(q,\beta)\} \le \varphi\ (max\{d(\alpha,p),d(p,\alpha),d(\beta,q),d(q,\beta)\})$

which in turn yields that $\alpha = p\ and\ \beta = q$, since $\varphi(t) < t\ for\ t > 0$ and from (1.1.2).

Thus (α,β) is the unique common coupled fixed point of F, G, S and T.

Example 2.3: Let X = [0,1] *and* $d(x,y) = |x-y|^2 + |x|$. Let F, G : $X \times X \to X$ and $S,T: X \to X$ be defined by $F(x,y) = \frac{x+y}{64}, Sx = \frac{x}{2}, G(x,y) = \frac{x+y}{96}, Tx = \frac{x}{3}$. Let $\varphi: [0,\infty) \to [0,\infty)$ be defined by $\varphi(t) = \frac{t}{4}$.

(i) Clearly $d(x,y) = d(y,x) = 0 \Rightarrow x = y$

(ii) $d(x,y) = |x-y|^2 + |x| = |x-z+z-y|^2 + |x|$
$\le 2[|x-z|^2 + |z-y|^2] + |x|$
$\le 2[|x-z|^2 + |x| + |z-y|^2 + |z|]$
$= s[d(x,z) + d(z,y)]$, where s = 2.

$$d\big(F(x,y),G(u,v)\big) = d\left(\frac{x+y}{64},\frac{u+v}{96}\right) = \left|\frac{x+y}{64} - \frac{u+v}{96}\right|^2 + \left|\frac{x+y}{64}\right|$$
$$= \left|\frac{3x-2u+3y-2v}{6\times 32}\right|^2 + \frac{x}{64} + \frac{y}{64}$$
$$\le \frac{1}{36\times 32\times 32}\,2[|3x-2u|^2 + |3y-2v|^2] + \frac{x}{64} + \frac{y}{64}$$
$$= \frac{1}{16\times 32}\left[\left|\frac{x}{2} - \frac{u}{3}\right|^2 + \left|\frac{y}{2} - \frac{v}{3}\right|^2\right] + \frac{x}{64} + \frac{y}{64}$$
$$= \frac{1}{32}\left[\frac{1}{16}\left|\frac{x}{2} - \frac{u}{3}\right|^2 + \frac{1}{16}\left|\frac{y}{2} - \frac{v}{3}\right|^2 + \frac{x}{2} + \frac{y}{2}\right]$$
$$\le \frac{1}{32}\left[\left|\frac{x}{2} - \frac{u}{3}\right|^2 + \left|\frac{y}{2} - \frac{v}{3}\right|^2 + \frac{x}{2} + \frac{y}{2}\right]$$
$$= \frac{1}{32}[d(Sx,Tu) + d(Sy,Tv)]$$
$$\le \frac{1}{16}\max\{d(Sx,Tu),d(Sy,Tv)\}$$
$$\le \frac{1}{4}\max\{d(Sx,Tu),d(Sy,Tv)\}$$
$$= \varphi(max\{d(Sx,Tu),d(Sy,Tv)\}),\ since\ \varphi(t) = \frac{t}{4}.$$

Similarly we can show that $d\big(G(x,y),F(u,v)\big) \le \varphi(max\{d(Tx,Su),d(Ty,Sv)\})$.

Also it is clear that F, G, S and T are continuous, FS = SF, GT = TG and $F(X\times X) \subseteq T(X), G(X\times X) \subseteq S(X)$. Thus all conditions of Theorem 2.2 are satisfied. Clearly (0, 0) is the unique common coupled fixed point of F, G, S and T in $X \times X$.

Now replacing the completeness of X, continuities of F, G, S and T and commutatively of pairs (F, S) and (G, T) by w-compatible pairs (F, S) and (G, T) and completeness of one of S(X) and T(X), we prove a unique common coupled fixed point theorem. In fact, we prove the following theorem.

Theorem 2.4: Let (X, d) be a dislocated quasi b- metric space with fixed integer $s \geq 1$ and $F, G: X \times X \to X$ and $S, T: X \to X$ be mappings satisfying

(2.4.1) $d\big(F(x,y), G(u,v)\big) \leq \varphi\left(\frac{1}{2s^2} max\{\, d(Sx, Tu), d(Sy, Tv)\ \}\right)$ for all $x, y, u, v \in X$, where $\varphi \in \Phi_s$ and φ is continuous,

(2.4.2) $d\big(G(x,y), F(u,v)\big) \leq \varphi\left(\frac{1}{2s^2} max\{d(Tx, Su), d(Ty, Sv)\}\right)$ for all $x, y, u, v \in X$, where $\varphi \in \Phi_s$ and φ is continuous ,

(2.4.3) $F(X \times X) \subseteq T(X), G(X \times X) \subseteq S(X)$,

(2.4.4) one of $S(X)$ and $T(X)$ is a complete sub space of X,

(2.4.5) the pairs (F, S) and (G, T) are w-compatible.

Then F, G, S and T have a unique common coupled fixed point in $X \times X$.

Proof: As in proof of Theorem (2.2), for $x_0, y_0 \in X$, the sequences $\{z_n\}$ and $\{w_n\}$ are Cauchy in X.

Suppose S(X) is a complete sub space of X.

Since $z_{2n+1} = Sx_{2n+2} \subseteq S(X)$, there exist z, u $\in X$ such that $z_{2n+1} \to z = Su$ and since $w_{2n+1} = Sy_{2n+2} \subseteq S(X)$, there exist $w, v \in X$ such that $w_{2n+1} \to w = Sv$. Hence clearly $z_{2n} \to z$ and $w_{2n} \to w$.

By Lemma 1.3, we have

$$\begin{aligned}
\tfrac{1}{s} d(F(u,v), z) &\leq \lim_{n\to\infty} \inf d\big(F(u,v), G(x_{2n+1}, y_{2n+1})\big) \\
&\leq \lim_{n\to\infty} \inf \varphi\left(\tfrac{1}{2s^2} max\{d(Su, Tx_{2n+1}), d(Sv, Ty_{2n+1})\}\right), \text{ from (2.4.1)} \\
&= \lim_{n\to\infty} \inf \varphi\left(\tfrac{1}{2s^2} max\{d(z, z_{2n}), d(w, w_{2n})\}\right) \\
&= \varphi(0), \text{ since } \varphi \text{ is continuous, } z_{2n} \to z \text{ and } w_{2n} \to w. \\
&= 0
\end{aligned}$$

Thus $d(F(u,v), z) = 0$.

Also by Lemma 1.3 and (2.4.2), we can prove that $d\big(z, F(u,v)\big) = 0$.

Hence Su = z = $F(u, v)$.Similarly we can show that Sv = w = F(v, u).

Thus (u, v) is a coupled coincidence point of S and F.

Since the pair (F, S) is w-compatible, we have

$Sz = S(Su) = S\big(F(u,v)\big) = F(Su, Sv) = F(z, w)$ and

$Sw = S(Sv) = S\big(F(v,u)\big) = F(Sv, Su) = F(w, z)$.

Now using Lemma 1.3, (2.4.1) and monotonically non-decreasing property of φ, we have

$$\begin{aligned}
\tfrac{1}{s} d(Sz, z) = \tfrac{1}{s} d(F(z,w), z) &\leq \lim_{n\to\infty} \inf d\big(F(z,w), G(x_{2n+1}, y_{2n+1})\big) \\
&\leq \lim_{n\to\infty} \inf \varphi\left(\tfrac{1}{2s^2} max\{d(Sz, z_{2n}), d(Sw, w_{2n})\}\right) \\
&\leq \varphi\left(\tfrac{1}{2s^2} max\{s\, d(Sz, z), s\, d(Sw, w)\}\right) \\
&\leq \varphi\left(\tfrac{1}{s} max\{d(Sz, z), d(Sw, w)\}\right).
\end{aligned}$$

Similarly, we have

$$\begin{aligned}
\tfrac{1}{s} d(z, Sz) = \tfrac{1}{s} d\big(z, F(z,w)\big) &\leq \lim_{n\to\infty} \inf d\big(G(x_{2n+1}, y_{2n+1}), F(z,w)\big) \\
&\leq \lim_{n\to\infty} \inf \varphi\left(\tfrac{1}{2s^2} max\{d(z_{2n}, Sz), d(w_{2n}, Sw)\}\right) \\
&\leq \varphi\left(\tfrac{1}{2s^2} max\{s\, d(z, Sz), s\, d(w, Sw)\}\right) \\
&\leq \varphi\left(\tfrac{1}{s} max\{d(z, Sz), d(w, Sw)\}\right).
\end{aligned}$$

$$\begin{aligned}
\tfrac{1}{s} d(w, Sw) = \tfrac{1}{s} d\big(w, F(w,z)\big) &\leq \lim_{n\to\infty} \inf d\big(G(y_{2n+1}, x_{2n+1}), F(w,z)\big) \\
&\leq \lim_{n\to\infty} \inf \varphi\left(\tfrac{1}{2s^2} max\{d(w_{2n}, Sw), d(z_{2n}, Sz)\}\right) \\
&\leq \varphi\left(\tfrac{1}{2s^2} max\{s\, d(w, Sw), s\, d(z, Sz)\}\right) \\
&\leq \varphi\left(\tfrac{1}{s} max\{d(z, Sz), d(w, Sw)\}\right),
\end{aligned}$$

$$\frac{1}{s}d(Sw,w)=\frac{1}{s}d(F(w,z),w)\le \lim_{n\to\infty}\inf d\big(F(w,z),G(y_{2n+1},x_{2n+1})\big)$$
$$\le \lim_{n\to\infty}\inf \varphi\left(\frac{1}{2s^2}max\{d(Sw,w_{2n}),d(Sz,z_{2n})\}\right)$$
$$\le \varphi\left(\frac{1}{2s^2}max\{s\,d(Sw,w),s\,d(Sz,z)\}\right)$$
$$\le \varphi\left(\frac{1}{s}max\{d(Sw,w),d(Sz,z)\}\right).$$

Since φ is monotonically non decreasing, we have
$\frac{1}{s}max\{d(Sz,z),d(z,Sz),d(Sw,w),d(w,Sw)\}\le \varphi\left(\frac{1}{s}max\{d(Sz,z),d(z,Sz),d(Sw,w),d(w,Sw)\}\right)$

Since $\varphi(t)<t\ for\ all\ t>0$, we have
$max\{d(Sz,z),d(z,Sz),d(Sw,w),d(w,Sw)\}=0$ which in turn yields that $Sz=z, Sw=w$.
Thus $z=Sz=F(z,w)\ and\ w=Sw=F(w,z)$. (1)

Since $F(X\times X)\subseteq T(X)$, there exist $\propto,\beta\ in\ X$ such that
$T\propto=F(z,w)=Sz=z\ and\ T\beta=F(w,z)=Sw=w$.

Since φ is monotonically non decreasing and $s\ge 1$, we have
$$d\big(T\propto,G(\propto,\beta)\big)=d\big(F(z,w),G(\propto,\beta)\big)$$
$$\le \varphi\left(\frac{1}{2s^2}max\{d(Sz,T\propto),d(Sw,T\beta)\}\right)$$
$$\le \varphi\left(\frac{1}{2s^2}max\begin{Bmatrix}s\,d\big(T\propto,G(\propto,\beta)\big)+s\,d(G(\propto,\beta),T\propto),\\ s\,d\big(T\beta,G(\beta,\alpha)\big)+s\,d(G(\beta,\alpha),T\beta)\end{Bmatrix}\right)$$
$$\le \varphi\big(max\{d\big(T\propto,G(\propto,\beta)\big),d(G(\propto,\beta),T\propto),d\big(T\beta,G(\beta,\alpha)\big),d(G(\beta,\alpha),T\beta)\}\big),$$

$$d(G(\propto,\beta),T\propto)=d\big(G(\propto,\beta),F(z,w)\big)$$
$$\le \varphi\left(\frac{1}{2s^2}max\{d(T\propto,Sz),d(T\beta,Sw)\}\right)$$
$$\le \varphi\left(\frac{1}{2s^2}max\begin{Bmatrix}s\,d\big(T\propto,G(\propto,\beta)\big)+s\,d(G(\propto,\beta),T\propto),\\ s\,d\big(T\beta,G(\beta,\alpha)\big)+s\,d(G(\beta,\alpha),T\beta)\end{Bmatrix}\right)$$
$$\le \varphi\big(max\{d\big(T\propto,G(\propto,\beta)\big),d(G(\propto,\beta),T\propto),d\big(T\beta,G(\beta,\alpha)\big),d(G(\beta,\alpha),T\beta)\}\big),$$

$$d\big(T\beta,G(\beta,\alpha)\big)=d\big(F(w,z),G(\beta,\alpha)\big)$$
$$\le \varphi\left(\frac{1}{2s^2}max\{d(Sw,T\beta),d(Sx,T\alpha)\}\right)$$
$$\le \varphi\left(\frac{1}{2s^2}max\begin{Bmatrix}s\,d\big(T\beta,G(\beta,\alpha)\big)+s\,d(G(\beta,\alpha),T\beta),\\ s\,d\big(T\alpha,G(\alpha,\beta)\big)+s\,d(G(\alpha,\beta),T\alpha)\end{Bmatrix}\right)$$
$$\le \varphi\big(max\{d\big(T\beta,G(\beta,\alpha)\big),d(G(\beta,\alpha),T\beta),d\big(T\alpha,G(\alpha,\beta)\big),d(G(\alpha,\beta),T\alpha)\}\big),$$

$$d(G(\beta,\propto),T\beta)=d\big(G(\beta,\alpha),F(w,z)\big)$$
$$\le \varphi\left(\frac{1}{2s^2}max\{d(T\beta,Sw),d(T\alpha,Sz)\}\right)$$
$$\le \varphi\left(\frac{1}{2s^2}max\begin{Bmatrix}s\,d\big(T\beta,G(\beta,\alpha)\big)+s\,d(G(\beta,\alpha),T\beta),\\ s\,d\big(T\alpha,G(\alpha,\beta)\big)+s\,d(G(\alpha,\beta),T\alpha)\end{Bmatrix}\right)$$
$$\le \varphi\big(max\{d\big(T\propto,G(\propto,\beta)\big),d(G(\propto,\beta),T\propto),d\big(T\beta,G(\beta,\alpha)\big),d(G(\beta,\alpha),T\beta)\}\big).$$

Thus we have
$$max\begin{Bmatrix}d\big(T\propto,G(\propto,\beta)\big),d(G(\propto,\beta),T\propto),\\ d\big(T\beta,G(\beta,\alpha)\big),d(G(\beta,\alpha),T\beta)\end{Bmatrix}\le \varphi\left(max\begin{Bmatrix}d\big(T\propto,G(\propto,\beta)\big),d(G(\propto,\beta),T\propto),\\ d\big(T\beta,G(\beta,\alpha)\big),d(G(\beta,\alpha),T\beta)\end{Bmatrix}\right)$$

which in turn yields that $T\propto=G(\propto,\beta)$ and $T\beta=G(\beta,\alpha)$. Since the pair (G, T) is w-compatible, we have
$Tz=T(T\propto)=T\big(G(\propto,\beta)\big)=G(T\propto,T\beta)=G(z,w)$ and
$Tw=T(T\beta)=T\big(G(\beta,\alpha)\big)=G(T\beta,T\alpha)=G(w,z)$.

Now we have
$$d\big(z,G(z,w)\big)=d\big(F(z,w),G(z,w)\big)$$
$$\le \varphi\left(\frac{1}{2s^2}max\{d(Sz,Tz),d(Sw,Tw)\}\right)$$
$$=\varphi\left(\frac{1}{2s^2}max\{d\big(z,G(z,w)\big),d\big(w,G(w,z)\big)\}\right)$$
$$\le \varphi\big(max\{d\big(z,G(z,w)\big),d\big(w,G(w,z)\big)\}\big),$$

$$\begin{aligned} d(G(z,w),z) &= d\big(G(z,w),F(z,w)\big) \\ &\le \varphi\left(\tfrac{1}{2s^2}\max\{d(Tz,Sz),d(Tw,Sw)\}\right) \\ &= \varphi\left(\tfrac{1}{2s^2}\max\{d(G(z,w),z),d(G(w,z),w)\}\right) \\ &\le \varphi\left(\max\{d(G(z,w),z),d(G(w,z),w)\}\right), \end{aligned}$$

$$\begin{aligned} d\big(w,G(w,z)\big) &= d\big(F(w,z),G(w,z)\big) \\ &\le \varphi\left(\tfrac{1}{2s^2}\max\{d(Sw,Tw),d(Sz,Tz)\}\right) \\ &= \varphi\left(\tfrac{1}{2s^2}\max\{d\big(w,G(w,z)\big),d\big(z,G(z,w)\big)\}\right) \\ &\le \varphi\left(\max\{d\big(w,G(w,z)\big),d\big(z,G(z,w)\big)\}\right), \end{aligned}$$

$$\begin{aligned} d(G(w,z),w) &= d\big(G(w,z),F(w,z)\big) \\ &\le \varphi\left(\tfrac{1}{2s^2}\max\{d(Tw,Sw),d(Tz,Sz)\}\right) \\ &= \varphi\left(\tfrac{1}{2s^2}\max\{d(G(w,z),w),d(G(z,w),z)\}\right) \\ &\le \varphi\left(\max\{d(G(w,z),w),d(G(z,w),z)\}\right). \end{aligned}$$

Thus we have

$$\max\begin{Bmatrix} d\big(z,G(z,w)\big),d(G(z,w),z), \\ d\big(w,G(w,z)\big),d(G(w,z),w) \end{Bmatrix} \le \varphi\left(\max\begin{Bmatrix} d\big(z,G(z,w)\big),d(G(z,w),z), \\ d\big(w,G(w,z)\big),d(G(w,z),w) \end{Bmatrix}\right)$$

which in turn yields that $z = G(z,w)$ and $w = G(w,z)$.

Thus $z = G(z,w) = Tz$, and $w = G(w,z) = Tw$. (2)

From (1) and (2), (z, w) is a common coupled fixed point of F,G,S and T. Uniqueness of common coupled fixed point of F, G, S and T follows as in Theorem 2.2.

Now we give an example to illustrate Theorem 2.4.

Example 2.6: Let $X = [0,1]$ and define $d(x,y) = |x-y|^2 + |x|$. Let F, G : $X \times X \to X$ and $S, T: X \to X$ be defined by $F(x,y) = \frac{x^2+y^2}{128}, G(x,y) = \frac{x^2+y^2}{256}, Sx = \frac{x^2}{2}, Tx = \frac{x^2}{4}$. Let $\varphi: [0,\infty) \to [0,\infty)$ be defined by $\varphi(t) = \frac{t}{4}$. As in Example 2.3, d is a dislocated quasi b-metric with s = 2.

Consider

$$\begin{aligned} d\big(F(x,y),G(u,v)\big) &= d\left(\frac{x^2+y^2}{128},\frac{u^2+v^2}{256}\right) = \left|\frac{x^2+y^2}{128}-\frac{u^2+v^2}{256}\right|^2 + \frac{x^2+y^2}{128} \\ &= \frac{|2x^2+2y^2-u^2-v^2|^2}{256\times 256} + \frac{x^2}{128} + \frac{y^2}{128} \\ &\le \frac{2\left[|2x^2-u^2|^2+|2y^2-v^2|^2\right]}{256\times 256} + \frac{x^2}{128} + \frac{y^2}{128} \\ &= \left\{\frac{16}{128\times 256}\left[\left|\frac{x^2}{2}-\frac{u^2}{4}\right|^2 + \left|\frac{y^2}{2}-\frac{v^2}{4}\right|^2\right]\right\} + \frac{x^2}{128} + \frac{y^2}{128} \\ &= \left\{\frac{1}{128\times 16}\left[\left|\frac{x^2}{2}-\frac{u^2}{4}\right|^2 + \left|\frac{y^2}{2}-\frac{v^2}{4}\right|^2\right]\right\} + \frac{x^2}{128} + \frac{y^2}{128} \\ &= \frac{1}{64}\left[\frac{1}{32}\left|\frac{x^2}{2}-\frac{u^2}{4}\right|^2 + \frac{1}{32}\left|\frac{y^2}{2}-\frac{v^2}{4}\right|^2 + \frac{x^2}{2}+\frac{y^2}{2}\right] \\ &\le \frac{1}{64}\left[\left|\frac{x^2}{2}-\frac{u^2}{4}\right|^2 + \frac{x^2}{2} + \left|\frac{y^2}{2}-\frac{v^2}{4}\right|^2 + \frac{y^2}{2}\right] \\ &= \frac{1}{64}\left[d(Sx,Tu)+d(Sy,Tv)\right] \\ &\le \frac{1}{32}\max\{d(Sx,Tu),d(Sy,Tv)\} \\ &\le \frac{1}{4}\cdot\frac{1}{2s^2}\max\{d(Sx,Tu),d(Sy,Tv)\}, \text{ since } s=2 \\ &= \varphi\left(\tfrac{1}{2s^2}\max\{d(Sx,Tu),d(Sy,Tv)\}\right), \text{ since } \varphi(t) = \tfrac{t}{4}. \end{aligned}$$

Similarly we can show that $d\big(G(x,y),F(u,v)\big) \le \varphi\left(\frac{1}{2s^2}\max\{d(Tx,Su),d(Ty,Sv)\}\right)$.

Also it is clear that S(X) and T (X) are complete subspaces of X, the pairs (F,S) and (G,T) are w-compatible and $F(X\times X) \subseteq T(X), G(X\times X) \subseteq S(X)$. Thus all conditions of Theorem 2.4 are satisfied.

Clearly (0, 0) is the unique common coupled fixed point of F, G, S and T in $X \times X$.

Remark: Theorem 2.4 is a generalization of Theorem 4.1 of [14], Theorem 3.2 of [11] and Theorem 2.1 of [1].

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EFFECT OF GGBS AND FINE AGGREGATE AS SELF CEMENTINOUS MATERIAL ON FRACTURE PROPERTIES OF SELF COMPACTING CONCRETE

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Abstract - *In the last few decades there is rapid increase in the amount of concrete used in the construction industry and there is great demand for high strength concrete. The high strength concrete should meet the requirements of workability, strength and durability. The flowing properties of concrete are generally improved by using self Compacting concrete (SCC) as the SCC will eliminate the damage induced by vibration. Concrete of higher strength leads to higher shrinkage and heat of hydration. A partial replacement of cement with silica fume, slag, fly ash and other chemical admixtures will reduce the above problems. The effect of mineral admixtures as supplementary cementations material on mechanical properties of Self compacting concrete was studied and compared with conventional concrete. The study focuses on comparison of fresh /hardened properties of self compacting Concrete with varying amount of the fines using ground granulated blast furnace slag (GGBS) and fly ash (FA). This thesis reports the results of an investigation Carried out on 20 and 35 MPa concrete with partial replacement of cement by GGBS and FA. Conventional concrete and SCC mixes with varying percentages of fly ash (20% and 25%) and GGBS (40% and 50%) and combination of fly ash and slag as supplementary cementations materials were investigated.*

***Key Words*: Self Compacting concrete (SCC) , ground granulated blast furnace slag , silica fume, slag, fly ash.**

1. INTRODUCTION

Fracture mechanics is based on the implicit assumption that there exists a crack in the structural component. The crack may be manmade such as a hole, a notch, a slot, reentrant corner etc. The crack may appear due to manufacturing defects like slag inclusion, cracks in a well-meant or heat affected zones due to uneven cooling, presence of foreign particles. Fracture mechanics deals with the question whether a known crack is likely to grow under a certain given loading conditions or not? It is applied even to cracks grown under fatigue loading. Study of Fracture Mechanics enables a designer to use much lower factor of safety, thus reducing cost of structural components. Fracture Mechanics was not studied as a separate discipline for a long time. If we look back, we would find that many bridges, boilers, buildings, ships failed due to fracture in nineteenth century.

During World war II Liberty ships failed in cold temperature of North Atlantic Ocean. With the development of large welded ships and high capacity jet airplanes, new questions arose about their safety. Engineers were forced to find out the causes of failure. And then a new discipline of engineering, "Fracture Mechanics" was developed. In fact, Griffith developed the right ideas for growth of a crack in 1920s. Griffith was not able to invent a convenient parameter that could be used by a practicing Engineer or Designer in predicting the failure load of a component through the growth of a crack under a given Loading condition. For all practical purposes, the modern Fracture Mechanics was born in 1948, when George Irwin formulated the Fracture Mechanics and devised workableParameters like Stress Intensity Factor and Energy release rate. Irwin's development was mainly for brittle or less ductile materials. The analysis was conservative for commonly used engineering materials such as steel, aluminum, which Are generally ductile. Other parameters like Crack Tip Opening Displacement by Wells and J-integral by Rice in 1968 were developed to account for large plastic zone at thecrack tip. Fracture mechanics is also applied in the fields like nuclear engineering, piping, spaceships, rockets, offshore structures etc.

2. BACKGROUND

A segment of the crack front can be divided into three basic modes as shown in fig.1.

Mode I is the opening mode and the dominant displacement is normal to the crack surface.

Mode II is a sliding mode and the displacement is in the plane of plate, the separation is antisymmetric through relative tangential displacement normal to the crack front.

Mode III also causes sliding motion but the displacement is parallel to the crack front, causing tearing.

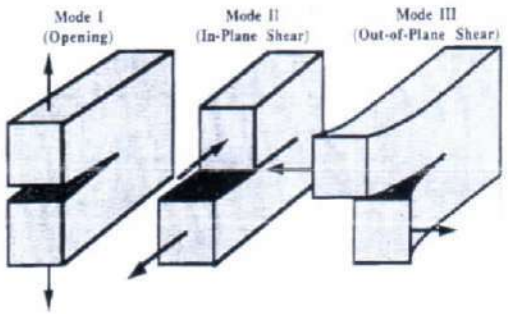


Fig 1. Modes of Fracture

Fracture Mode I can be studied adequately with well-developed experimental methods to find toughness. Codes of practice have been prepared for the experimental methods and they are internationally accepted. However, experimental methods to determine toughness of Mode II and Mode III are still under development and refinement stages.

Though only a single parameter is required to solve a fracture problem, researchers have proposed four parameters to measure the potency of a crack. They are energy release rate(G) which is energy based and is applied to brittle or less ductile materials. Stress Intensity Factor (K) is stress based also developed for brittle or less ductile materials. J integral(J) has been developed to deal with ductile material. Its formulation is quite general and can be applied to brittle materials also. Crack Tip Opening Displacement(CTOD) parameters were also developed for ductile materials and it is displacement based.

Fracture mechanics problems can be studied by two different approaches:

a) Material science.

b) Applied mechanics.

Problems of Fracture Mechanics are solved with two different approaches. In the first approach, a component geometry including the length, location and orientation of the crack is given along with boundary conditions. The objective is to find the upper limit of applied loads that would not cause catastrophic failure of the component. In the second approach, known as damage tolerance, the maximum loads on a component are known and the objective is to find the longest length of crack that remains dormant.

In current codes of practice, many provisions lack a sound physical basis. Hawkins (1985) identified twenty-nine provisions in the ACI code alone which could be put on a firm physical footing using the theory of Fracture Mechanics. Various ductility limitations and limits on minimum flexural and shear reinforcement are some of the provisions. ACI committee report (ACI 446.1R-91) advanced five strong arguments in support for the inclusion of the theory of fracture mechanics into the codes of practice. They are as follows: -

Generally crack formation is observed when the stress exceeds the limiting stress. For crack propagation, certain amount of energy is required. The propagation of crack under load can only be explained through an energy based propagation criteria.

In the limit or plastic analysis of a structure, the failure of its various parts occurs simultaneously in proportion to a single load parameter; that is when sufficient plastic hinges have formed. Such failures are characterized by a plateau in the load response diagram. When the Yield plateau is absent the failure is not plastic. It usually implies that material is softening due to fracture or other damage. The failure process in the absence of Yield plateau does not result in the formation of plastic hinges at isolated locations, but it takes place due to the propagation of a fracture zone throughout the structure.

If we load a structure in tension or flexure and record its response right up to the failure, the area under the load-deflection diagram represent the energy absorbed by the structure during the loading up to failure. If we ignore the energy lost in the loading grips and the supports only the elastic part of the energy is recoverable. The bulk of the energy is absorbed by the post peak tension softening range and it determines the ductility of the structure, the greater the energy absorbed, the more ductile will be its response. Limit analysis does not take into account the phenomenon of tension softening. It cannot give us an indication of the energy absorbing capacity of a concrete structure.

The most compelling argument in favour of the theory of Fracture Mechanics is the Size effect. The strength of specimens or structures made of quasi-brittle material such as concrete depends upon their size. Many investigations have shown experimentally that the strength decreases with increase in specimen size and then remain constant. This Size effect is associated with energy being released into the front of any large crack resulting in the redistribution of stress in this frontal zone. It is prevalent in many design situations such as flexural capacity of beams, diagonal tensile failure of beams, punching shear failure of slabs, tension failure of beams and pull out failure of reinforcing bars among others. But it is generally, ignored by the current design practice.

3. NEEDS AND ADVANTAGES

The concept self compacting, "the most revolutionary development in concrete construction for several decades" was introduced to overcome the problem of durability of concrete structures. The major problem posed to engineers

for several years to make durable concrete structures using sufficient compaction.

Compaction for conventional concrete is done by vibrating can easily cause segregation. In conventional concrete, it is difficult to ensure uniform quality and good density in heavily reinforced locations. If steel is not properly surrounded by concrete leads to durability problems. The answer to the problem may be type of concrete which can get compacted into every corner of form work and gap between steel, purely by means of its own weight and without the need for compaction.

Self compacting concrete is characterized by

Extreme fluidity as measured by flow, typically between 550-750mm on a flow table, rather than slump (height).

- No need for vibrators to compact the concrete.
- Placement being easier.
- No bleed water, or aggregate segregation.
- To be beneficial to safety and workmanship.
- Objective of the present study.

To develop mix designs for low fines, mid range self compacting concrete by adopting the smart dynamic concrete method of designing mixes.

The study focuses on comparison of fresh/hardened properties of SDC with varying amount of SCM trying out various options amongst the SCM available like slag and fly ash.

Rheological properties and workability of SDC

The Trial mixes for M20 and M35 grade will be carried out with various combinations of OPC+Fly ash and OPC + GGBFS using SDC Concept and the same will compared with TVC. (Traditional Vibrated Concrete)/Normal Concrete.

The slump flow will be measured at every 30 min Interval till 90 to 120 min.

Hardened/Grey properties of Concrete.

The compressive strength of the concrete will be studied at various age of concrete. (1, 3, 7, 14, 28, 56 and 90 days).

Fracture properties of concrete.

Split Tensile Strength of concrete.

Advantages of Smart Dynamic Concrete.

SDC is a system of low fines self consolidating concrete suitable for everyday use.

SDC matches the flowability of conventional self compacting concrete (slump flow of 550mm-650mm).

SDC is especially applicable for grades 20-40mpa. Since the ranging between 20-40mpa are more than 90% in regular application.

SDC is low cementitious based high flow concrete with a distinct cost advantage over self compacting concrete.

4. LITERATURE REVIEW:

Davis et.al. (1937) conducted an experimental work on FA concrete as early as in 1937 and concluded the following:

(i) The FA concrete mix sets more slowly than corresponding cement mix.

Experimental verification of Lane and Best with modern FA has confirmed this view.

Mehta and Dimond (1995), performed experiments on HPC and investigated that the effect of using FA (high calcium FA) containing soluble sulphates on high alkali Portland cement and they have pointed out that its soluble alkali plays an important role in increasing the alkali-silica reactivity and not the total alkali present in the FA.

Bharat Kumar et.al. (2000) presents the modified mix design procedure based on the experimental study, which utilizes optimum water content and the efficiency factor of mineral admixture. Investigation was carried out using 53 grade cement, crushed granite aggregate, river sand, sulphonated naphthalene formaldehyde type super plasticizer, type F, FA with 15% and 25% of cement replacement by mass of FA and GGBS with 15%, 30% and 50% of cement replacement by mass of slag. The ACI method was adopted for obtaining reference concrete mix. Mix proportions for two extreme Water – binder ratio (W/b) of 0.5 and 0.35 with and without FA or GGBS as cement replacement material were obtained and test specimens were cast. The highlights of their study were as follows:

(i) The early age strength of cement replacement material mixes show lower value for the same w/b because of slower pozzolanic reaction. However, the same early strength can be achieved by increasing the binder content.

(ii) The efficiency factor for cement replacement material, evaluated from the results of two extreme w/b shows increasing trend with the curing period. Therefore, it is essential that the concrete containing cement replacement material may require prolonged curing.

(iii) The efficiency factor for FA mixes showed decreasing trend as the replacement level is increased, whereas slag mixes showed increasing trend (except for high replacement level)

(iv) There is an increase in total binder content as the effective w/b decreases. However, as the cement

replacement material content increases, the cement required per unit strength reduces.

(v) The limited durability properties investigated (after 28 days curing) are found to improve by reduction of w/b and further improved by addition of cement replacement material.

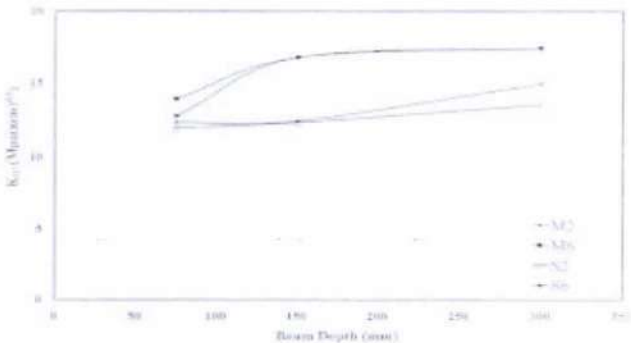
(vi) GGBS mixes up to 50% replacement level showed better performance in terms of mechanical properties and durability characteristics when compared with FA mixes.

Jianxin Ma and Jorg Dietz, (2002) have reported the development of ultra high performance concrete and have found good flowability in concrete with low water powder ratio. Because of the high viscosity of the cement paste, compaction was necessary. To improve the compaction characteristics of the concrete the idea of adding coarse aggregate was developed. The first tests showed a good workability of the fresh concrete and a good self compacting ability. They have attempted to reduce costs while improving workability, shrinkage tendency and the modulus of elasticity.Al-Tammi and M.Sonebi. (2003) Etringite and thaumasite can be found among the deterioration products of cementecious materials exposed to sulfate and hydrochloric acid attack. The results of a test program to investigate the acid resistance of self-compacting concrete(SCC) and conventional concrete(CC),immersed up to 18 weeks at 20°C in sulfuric and hydrochloric acid solutions, are described.

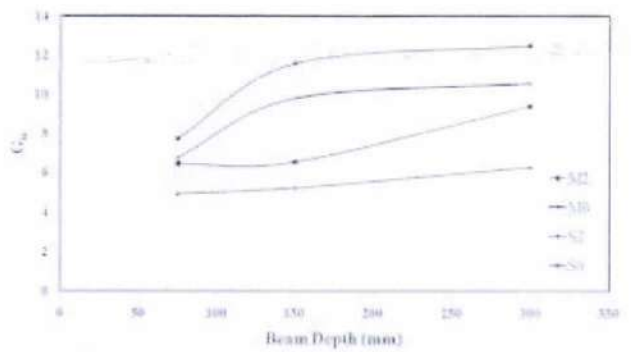
Janie Peter et. al,(2004) have reported self compacting concrete(SCC) made from almost the same ingredients as that of conventionally vibrated concrete(CVC) expect that relative proportions of these ingredients are to be carefully selected to impart self leveling and self compacting property to fresh concrete without a need for any external compacting and vibrating equipment. SCC have generally higher content of fines (cement and fine aggregate) and chemical admixtures so that enhanced cohesiveness with no tendency for segregation is achieved. Thus, CVCs and SCCs are designed to have different characteristics when the concrete is fresh. In order to understand the structural behavior of these two concretes in hardened stage, reinforced concrete(RC) beams of size 150mm*400mm*3000mm with similar concrete strength and identical reinforcement were cast and tested in flexure. The paper compares the structural behavior such as number of cracks, crack pattern, ultimate load carrying capacity, moment curvature relationship, longitudinal strain in both concrete and steel for SCC and CVC.

Praveen Kumar et. al. (2004) has shown that self-compacting concrete generally possesses a high powder content which keeps the concrete cohesive with high flowability. For achieving economy, a substantial part of this powder could contain fly ash. In such cases, early age strength development may prove to be a decisive factor, particularly when the formwork has to be reused. Test results of an experimental study are presented in this paper, which involved fly ash contents of more than 50 percent of the total powdered material. Compressive strength and split tensile strength test results are reported at the ages of 3, 7,28 and 56 days. Compressive strength of the order of 20 and 30 Mpa are obtained with SCC at the ages of 3 and 7 days, respectively.

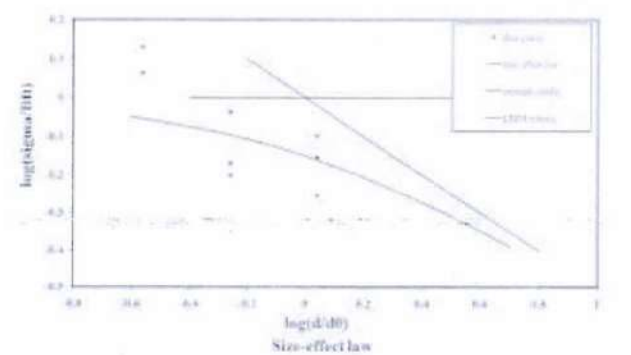
5. RESULTS & DISCUSSIONS:



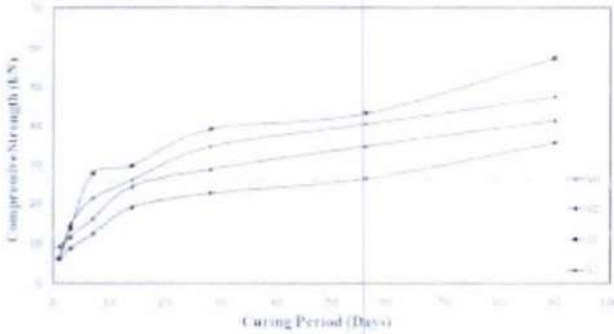
Variation of critical stress intensity factor with beam depth for $a_0/d=0.5$.



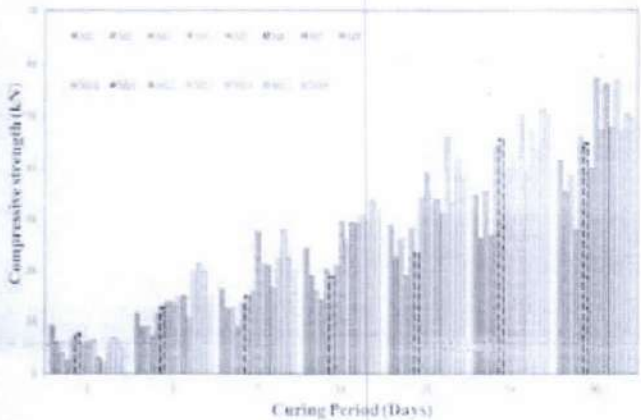
Variation of energy release rate Vs beam depth for $a_0/d=0.5$ at 28 days



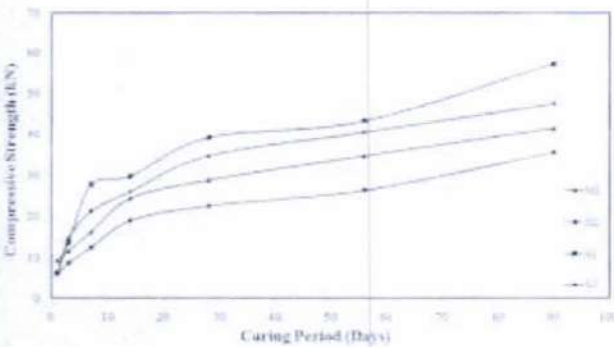
Size effect plot for TVC ($a_0/d=0.5$, Mix M2, 28 days)



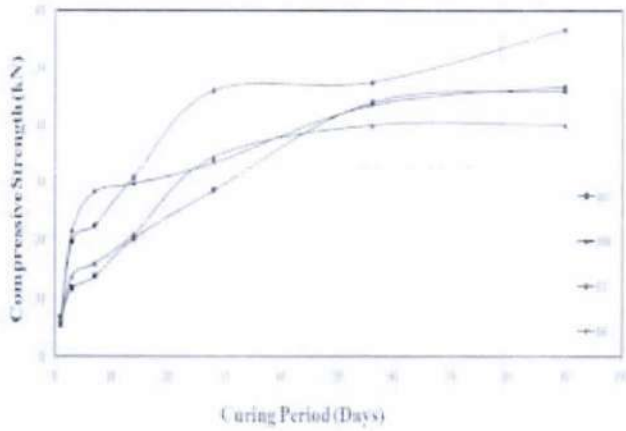
Plot of compressive strength v/s different percentage of fly ash replacement at different ages for M20



Plot of compressive strength at different ages for the different concrete mixtures.



Plot of compressive strength v/s different percentage of GGBS replacement at different ages for M20



Plot of compressive strength at different ages for different percentage of GGBS replacement for M35

6. CONCLUSIONS:

This experimental study fly ash and ground granulated slag furnace has been used as a replacement material in varying percentages from 20 to 50% (20%, 25%, 40% and 50%) for water cement ratio 0.48 and 0.52. In each of these grades, compressive strength and split tensile strength tests have been carried out as per IS standards. Two series of fracture tests have been carried out as per RILEM recommendations. The experimental results have captured all the features of the fracture behavior of concrete beam specimens. From the present study, following concluding remarks have been drawn:

1) Fly ash and Ground granulated blast furnace slag can be made use in the concrete as cement replacement material, which in turn helps in the reduction of environmental hazards.

2) Experimental results show that as the there is an increase in compressive strength of smart dynamic concrete compare to traditional vibrating concrete.

3) The relation between compressive strength and split tensile strength for GGBS and Fly ash replaced concrete is given by $f_t = 0.45\sqrt{f_{ck}}$

4) The results have shown that by measuring the peak loads it is possible to obtain the fracture parameters without resorting to sophisticated measurements.

5) Both TVC and SDC mixes show a strong size effect law. The experimental data is close to Bezant's size effect law.

6) The results show that as the beam depth increases critical stress intensity factor and energy release rate also increases.

Relation between Tensile & Compressive strengths

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COMPARISION OF SEISMIC RESPONSE FOR SHEAR WALL BUILDING WITH CONVENTIONAL FRAMED BUILDING BY USING ETAB'S

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Abstract: ***The evolution of tall building structural systems based on new structural concepts with newly adopted high strength materials and construction methods have been towards "stiffness" and "lightness". Structural systems are become "lighter" and "stiffer". It is common knowledge that rather than directly standing the forces, it is better to reduce them and dissipate the magnitude of vibrations. Structure design of high rise buildings is governed by lateral loads due to wind or earthquake. Lateral load resistance of structure is provided by interior structural system or exterior structural system. The rapid growth of urban population and limitation of available land, the taller structures are preferable now a day. So when the height of structure increases then the consideration of lateral load is very much important. For that the lateral load resisting system becomes more important than the structural system that resists the gravitational loads. Recently the shear wall structural system has been widely used for tall buildings due to the structural efficiency and aesthetic potential provided by the unique geometric configuration of the system. The present work aims to demonstrate the response of symmetrical building considered with; RCC framed structure, shear wall system with different storey module the building studied in this work is a reinforced concrete moment resisting frame (G plus 12) designed for gravity and seismic using 1893:2002. And is studied using Non-linear time history analysis. Using ETAB'S structural analysis software. In the study the story displacement, Storey drifts, base shear of the structure and over turning moment were studied and the results obtained were compared with those obtained from others.***

Keywords: ***Time history analysis, inter storey drift, yielded stiffness, Design basis earthquake***

I. INTRODUCTION

1.1 High Rise Building

High-rise buildings are generally defined as buildings 35 meters or greater in height, which are divided at regular intervals into occupiable levels. Undeniably the high-rise buildings are also seen as a Define > Frame sections > Add Rectangular > OKwealth-generating mechanism working in an urban economy. High-rise buildings are constructed largely because they can create a lot of real estate out of a fairly small piece of land. Because of the availability of global technology and the growing demand for real estate, high rise buildings are seen as the most fitting solution to any city that is spatially challenged and can't comfortably house its inhabitants.

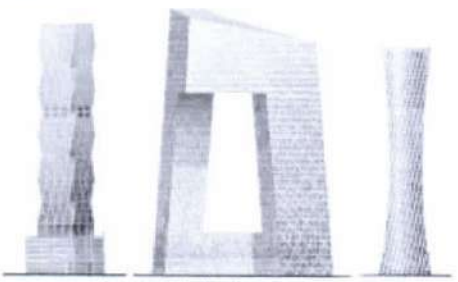

Fig. 1. High Rise Building

II. LITERATURE REVIEW

A lot of researches are being carried out in this field and we are discussing a few here as analysed the effect of various configurations of shear walls on high-rise structure[1]. studied on drift analysis due to earthquake load on tall structures. In this study regular shaped structures have been considered. [2] conducted the study and comparison of the difference between the wind behaviour of buildings with and without shear wall using Staad pro. [3] Comparative Study of Strength of RC Shear Wall at Different Location on Multi-Storied Residential Building, focus is to determine the solution for shear wall location in multi-storey building. [4]) studied on drift analysis due to earthquake load on tall structures. In this study regular shaped structures have been considered. Estimation of drift was carried out for rigid frame structure, coupled shear wall structure and wall frame structure[5].

III. METHODOLOGY

In this study comparison of shear wall building to the conventional building under seismic forces is done. Here G+12storey is taken, and same live load applied in both the buildings for its behaviour and comparison. The framed buildings are subjected to vibrations because of earthquake and therefore seismic analysis essential for these building frames. And analyze these structures using the nonlinear time history analysis

The detailed description of various steps being involved in modeling and simulation is shown below

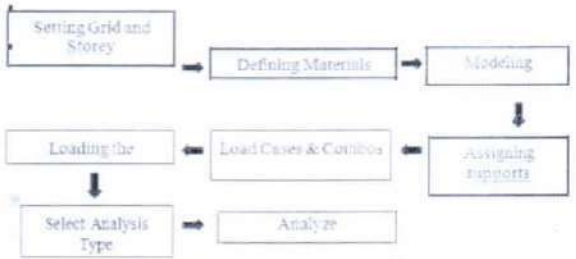

Fig. 2.Flowchart of welding process

Grid Setup

The first step in ETABS is to set the grid dimensions. This includes setting number of lines in X direction, Y direction and the spacing between grid lines. Then the storey data is defined which includes setting the number of stories, height of typical and bottom storey. The type of slab is also mentioned in the grid data

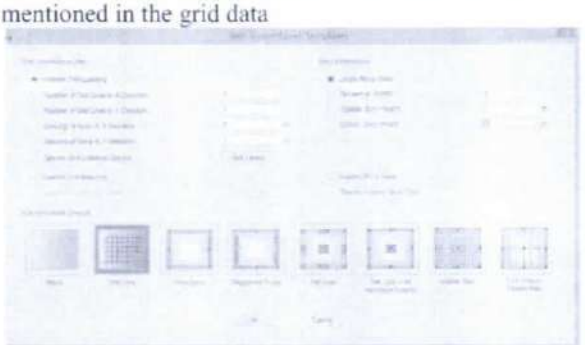

Fig. 3. Grid Setup

Defining Materials and Sections

The next step is to define material properties. This includes defining Modulus of Elasticity, Poisson's ratio, Coefficient of Thermal expansion, weight per unit volume, mass per unit volume, Bending reinforcement yield stress fy, Shear reinforcement yield stress fsy, type of design, Compressive strength etc

Fig. 6. Material Property Data

4.2.4 Definition of Sectional Properties of Beams and Columns After defining the material properties various sections are defined. Defining of sections involves defining depth, width, setting modifiers if any, defining the reinforcement of the section as column or beam etc.

Define > Frame sections > Add Rectangular > OK

Fig. 4. Sectional property of beam & column

4.2.5 Definition of Sectional Properties of slab section

Define > Wall/Slab/Deck Sections > ADD NEW SLAB> OK

Fig. 5. Sectional property of slab section

4.2.6 Modelling

After defining the sections and materials a three-dimensional modal of the structure is created using various modelling tools and techniques available in the ETABS. ETABS offers some of most advanced modelling tools such as snaps, replicate, mirror insert storey, delete storey etc.

4.2.7 Assigning Supports

The next step after modelling a three-dimensional structure is assigning the supports. Various supports such as simply, fixed, pinned can be assigned to the structure. By default, pinned support is assumed by ETABS

Assign > Joint/Point > Restraints(Supports) > FIXED > OK

4.2.7 Assigning Supports

The next step after modelling a three-dimensional structure is assigning the supports. Various supports such as simply, fixed, pinned can be assigned to the structure. By default, pinned support is assumed by ETABS.

Assign > Joint/Point > Restraints(Supports) > FIXED > OK

4.2.8 Defining Diaphragms

In order to account for the in-plane rigidity of the structure, slab sections are modeled as rigid diaphragms by using the 'rigid diaphragm' option in the assign menu. By modeling the slabs as rigid diaphragms, the masses of the floors are automatically lumped at their center of gravity (i.e. mass center). However, for the buildings of irregular configuration (i.e. L-type, C-type, Y-type, narrow buildings etc.) slabs sections are modeled as 'semi rigid diaphragms'.

4.2.9 Defining Load Cases and Combinations
The various loads such as Dead, Live, Earth quake and Wind are defined. Various combinations such as service, ultimate etc. are defined. ETABS generates automated load combination depending upon code.
Define > Static Load Cases > New Loads > OK

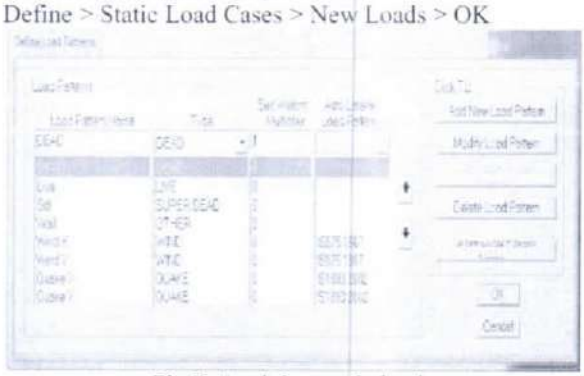

Fig.7. Applying static load cases

4.2.12 Time history functions

For this purpose, earth-quake ground acceleration records components of the Zone-II Earthquake record have been selected. Which is a low intensity earthquake zone of zone factor 0.10 which comes under the Zone-II according to the classification of seismic zones by IS 1893-2002 part-1. The records are defined for the acceleration points with respect to a time-interval of 0.005 second. The acceleration record has units of m/sec2 and has a total number of 26,706 acceleration data coordinates out of which the most critical data points which are of the highest intensity are the first 10,000 acceleration data coordinates have been considered.

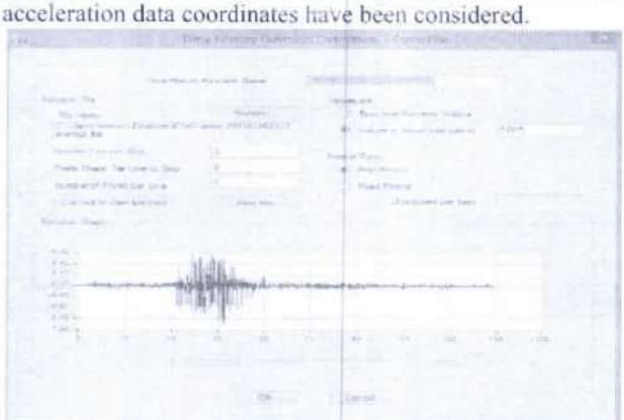

Fig.9. Time History Functions

4.2.13 Analyze
After the above steps are done, the structure is analyzed against various types of loads and combinations. After the analysis has been carried out deformed shape of the structure is shown. The various forces can be viewed.
Analyze > Check Model > Run Analysis > OK

4.3 STUDY OF BUILDINGS

4.3.1 BUILDING DESCRIPTIOSTRUCTURAL SYSTEM OF THE ALL THE MODELS

4.3.3 Model 1: In the first model, a storied reinforced concrete frame building situated in zone II, is taken for the purpose of study. The plan area of building is 15 x 15m with 3m as height of each typical story. It consists of 5 bays in X-direction and 5 bays in Y-direction. The total heights of the buildings were 37.5m.

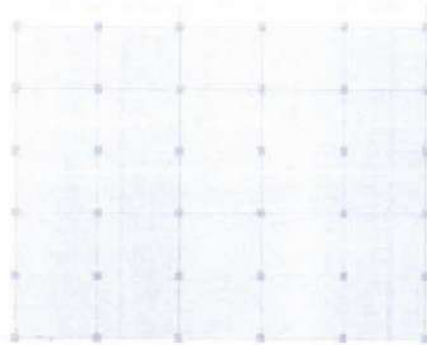

Fig.8. Model Plan of conventional framed building

Fig.10. Isometric Views of conventional framed building

4.3.4 Model 2: In the Second model, shear wall building situated in zone II, is taken for the purpose of study. The plan area of building is 15 x 15m with 3m as height of each typical storey. It consists of 5 bays in X-direction and 5 bays in Y-direction. The total heights of the buildings were 37.5m.

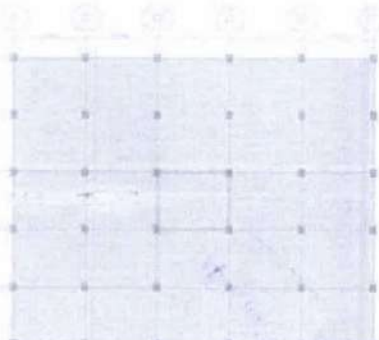

Fig.11. Model Plan View of shear wall core building

Fig.12. Isometric Views of shear wall Model

4.3.5 Model 3: In the third model, shear wall building situated in zone II, is taken for the purpose of study. The plan area of building is 15 x 15m with 3m as height of each typical storey. It consists of 5 bays in X-direction and 5 bays in Y-direction. The total heights of the buildings were 37.5m.

Fig.13 Model Plan View of shear wall coupled Buildings

Fig.14. Isometric Views of shear wall coupled Model

TABLE I. CALCULATIONS OF SEISMIC LOADS

Mass no	WI(KN)	hi(m)	$WIxhI^2$	$WIxhi^2/\sum^b h=1WIxhi^2$	Qi(KN)
1	1524.3	37.5	2143546.8	0.113	128.5
2	3741.9	34.5	4453796.4	0.235	267.2
3	3741.9	31.5	3712900.2	0.196	222.3
4	3741.9	28.5	3039358.2	0.160	181.98
5	3741.9	25.5	2433170.4	0.128	145.5
6	3741.9	22.5	1894336.8	0.100	113.7
7	3741.9	19.5	1422857.4	0.075	85.3
8	3741.9	16.5	1018732.2	0.053	60.2
9	3741.9	13.5	681961.2	0.036	40.9
10	3741.9	10.5	412544.4	0.021	23.8
11	3741.9	7.5	210481.8	0.011	12.5
12	3741.9	4.5	75773.4	0.004	4.5
13	3741.9	1.5	8419.2	0.0004	0.45
		$\sum^b h=1WIxhi^2$	18896725.2		

6.1.1 DISPLACEMENT RESULTS (X-DIRECTION)

TABLE II. DISPLACEMENT RESULTS OF ALL THE MODELS

	FRAME	SHEAR CORE	SHEAR CORNERS	SHEAR COUPLED
Base	0	0	0	0
Story1	0.2	0.1	0.1	0.1
Story2	1.6	0.6	0.5	0.7
Story3	3	1.4	1.2	1.6
Story4	4.5	2.3	2	2.7
Story5	6	3.4	3	3.8
Story6	7.5	4.5	4.1	5.1
Story7	8.9	5.7	5.2	6.3
Story8	10.2	6.9	6.3	7.5
Story9	11.5	8	7.4	8.7
Story10	12.6	9.1	8.5	9.7
Story11	13.5	10.1	9.6	10.7
Story12	14.3	11.1	10.5	11.5
Story13	14.7	12	11.5	12.3

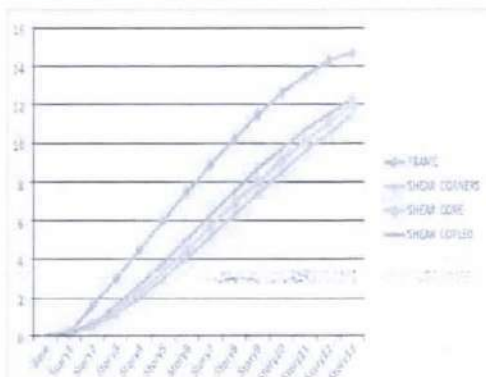

Fig.15.Displacement Results in X direction

6.1.2 DISPLACEMENT RESULTS (Y-DIRECTION)

TABLE III. DISPLACEMENT RESULTS (Y-DIRECTION)

	FRAME	SHEAR CORE	SHEAR CORNERS	SHEAR COUPLED
Base	0	0	0	0
Story1	0.3	0.1	0.1	0.2
Story2	2	0.8	0.7	0.9
Story3	4	1.9	1.6	2.1
Story4	6	3.1	2.7	3.5
Story5	8	4.5	4	5.1
Story6	10	6	5.4	6.7
Story7	11.9	7.5	6.8	8.2
Story8	13.7	9	8.2	9.8
Story9	15.4	10.5	9.6	11.2
Story10	16.9	11.8	10.9	12.5
Story11	16.9	11.8	10.9	12.5
Story12	19.1	14.2	13.3	14.6
Story13	19.7	15.2	14.4	15.5

6.1.3 DRIFTS RESULTS(X-DIRECTION)

TABLE.IV. DISPLACEMENT RESULTS OF ALL THE MODELS

	FRAME	SHEAR CORE	SHEAR CORNERS	SHEAR COUPLED
Base	0	0	0	0
Story1	0.000142	0.000068	0.000058	0.000074
Story2	0.000451	0.000164	0.000137	0.000193
Story3	0.000488	0.000252	0.000221	0.000295
Story4	0.000495	0.000315	0.000282	0.000359
Story5	0.000495	0.000357	0.000326	0.000397
Story6	0.000488	0.000383	0.000356	0.000414
Story7	0.000474	0.000394	0.000372	0.000415
Story8	0.00045	0.000393	0.000378	0.000404
Story9	0.000416	0.000383	0.000374	0.000382
Story10	0.000371	0.000365	0.000363	0.000352
Story11	0.000312	0.000272	0.000276	0.000262
Story12	0.000241	0.000215	0.000221	0.000212
Story13	0.000157	0.000112	0.000107	0.000122

Table: 9 Drifts results of all the models

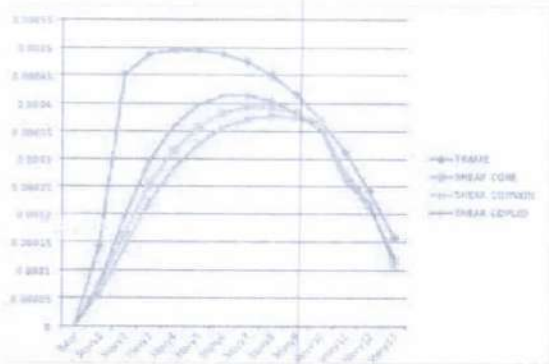

Fig.16.Drift of Models

6.1.4 TIME PERIOD RESULTS

TABLE: .V . TIME PERIOD RESULTS OF THE ALL MODELS

MODES	FRAME	SHEAR CORE	SHEAR CORNERS	SHEAR COUPLED
1	1.341	0.941	0.876	1.007
2	1.095	0.848	0.795	0.896
3	1.05	0.771	0.562	0.692
4	0.442	0.257	0.226	0.292
5	0.357	0.257	0.213	0.264
6	0.347	0.237	0.137	0.199
7	0.258	0.153	0.102	0.143
8	0.205	0.121	0.098	0.132
9	0.205	0.114	0.061	0.097
10	0.183	0.109	0.061	0.087
11	0.145	0.085	0.06	0.082
12	0.143	0.074	0.043	0.006

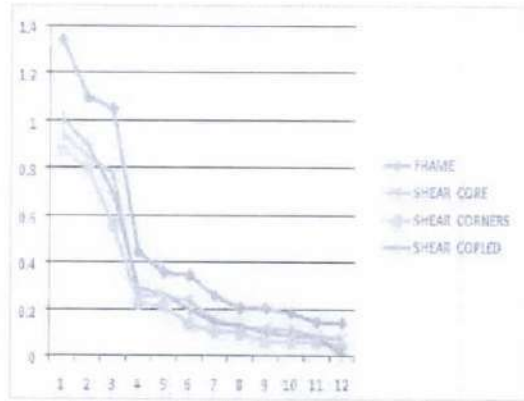

Fig.17.Time Period of buildings in x direction

CONCLUSIONS

As the lateral loads are resisted by diagonal columns, the top storey displacement is very much less in shear wall at corner structure as compared to the simple frame building.

For high-rise buildings, in order to control the seismic response shear wall at corner were modelled and the results showed that there is a drastic decrease in storey displacements storey drift, time period and material consumptions.

As time period is less, lesser is mass of structure and more is the stiffness, the time period is observed less in structure which reflects more stiffness of the structure and lesser mass of structure.

The storey drift is very much less for shear wall at corner structural system as compared to the simple frame building.

Shear wall at corner provide more resistance in the building which makes system more effective.

The design of both structures is done by using same member size but that member sizes are not satisfied to design criteria in case of simple frame structure and failure occurs with excessive top storey displacement. So, the higher sizes of members are selected to prevent the failure criteria.

Shear wall at corner structural system provides more flexibility in planning interior space and façade of the building. Shear wall at corner structural system provides more flexibility in planning interior space and façade of the building.

The overall results suggested that shear wall at corner is excellent seismic control for high-rise symmetric Buildings.

Most of the present structural systems are highly advanced in terms of structural efficiency and aesthetic quality, but lacks the much-needed geometric versatility. As we have seen, the latest mutation of tubular structures, has in addition to strength and aesthetics, that extra quality of geometric versatility, making it the most suited structural system to this respect. Thus, with an optimal combination of qualities of aesthetic expression, structural efficiency and geometric versatility is indeed the language of the modern-day builder.

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Design of a Structure with Glass Fiber Reinforced Gypsum Panels

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Abstract—A global market for carbon credits is a promising instrument to reduce the impairment of adverse human activities on nature. As long as the problems which are related to the introduction of a global market for carbon credits (to achieve emission targets) have not been solved sufficiently, the initiative of people who are conscious about environmental conservation is needed. Unsustainable technologies have to be improved or replaced by sustainable substitute technologies, because virtually no one seriously suggests that mankind can continue to emit increasing amounts of CO2 into the atmosphere without any adverse consequences. Rapidwall, also called gyperete panel is an energy efficient green building material with huge potential for use as load bearing and non load bearing wall panels. Rapidwall is a large load bearing panel with modular cavities suitable for both external and internal walls. It can also be used as intermediary floor slab/roof slab in combination with RCC as a composite material. Since the advent of innovative Rapidwall panel in 1990 in Australia, it has been used for buildings ranging from single storey to medium -high rise buildings. Light Weight Rapidwall has high compressive strength, shearing strength, flexural strength and ductility. It has very high level of resistance to fire, heat, water, termites, rot and corrosion. Concrete infill with vertical reinforcement rods enhances its vertical and lateral load capabilities. Rapidwall buildings are resistant to earthquakes, cyclones and fire.

Index Terms—Glass fiber, Gypsum panels, CO_2 emission, Green house and Rapidwall panel

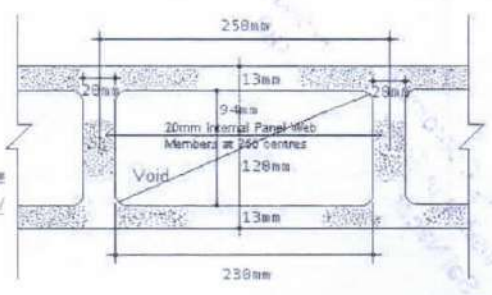
I. Introduction

The threat of climate change caused by the increasing concentration of greenhouse gases in the atmosphere is pushing the whole world into a catastrophic crisis situation with universal concern. The need of the 21st century is for energy efficient and eco-friendly products. The building industry accounts for 40% of CO2 emissions. Building construction causes CO2 emissions as a result of embodied energy consumed in the production of energy intensive building materials and also the recurring energy consumption for cooling and heating of indoor environment Highlighted. Herein the scope of environmental impacts caused through human behavior has been introduced. This was important on the one hand to create a general view about the role of the economy, with the aim of creating assets and progress and the awareness and conservation of nature on the other hand. Both are closely linked, where only a balanced emphasis is logical for ecologically sustainable development and human welfare. A few strategies and instruments for environmental conservation were mentioned. A global market for carbon credits is a promising instrument to reduce the impairment of adverse human activities on nature. As long as the problems which are related to the introduction of a global market for carbon credits (to achieve emission targets) have not been solved sufficiently, the initiative of people who are conscious about environmental conservation is needed. Unsustainable technologies have to be improved or replaced by sustainable substitute technologies, because virtually no one seriously suggests that mankind can continue to emit increasing amounts of CO2 into the atmosphere without any adverse consequences.

II. Production of Rapid Wall

Preparation: Rapidwall is precast gypsum based walling panel produced by the company Rapid Building Systems. Rapidwall is manufactured off site in a Rapidwall production unit. The system, also called Rapid Building System, is a patented production process and therefore unique. The Rapid Building System streamlines the construction process by transferring the majority of on-site work to the Rapidwall factory. It is within the factory that the large single Spanning walls, roofs and ceilings are produced. These building components are then easily erected on site in a matter of hours rather than weeks.

Also the application of clay does not produce nearly the same volume of void space as Rapidwall where no loss in load bearing is accepted. The weight of Rapidwall is just 44 kg/m2, without any loss of durability and longevity in any weather condition. The bricks for a m2 average brick wall have a weight of approximately 140 kg, which is four times more than Rapidwall. The Rapid Building System has fire, moisture and sound resistance properties and is also secure against insects and would attack. A basic panel is manufactured commonly in the size 12 x 2.85 m (34.2 m2)



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on a casting table, which is the production unit for Rapidwall, and in a large enough size to form an entire wall of a building structure. It is cut easily either at the factory or site and can be tailored to a great variety of designs, including window and door requirements.

Figure 1: Cross section of Rapid panel and internal web members.

Drying Method: Once a panel is removed from the table it is still too wet to be further processed. Panels gain their full product strength when they reach certain dryness. Rapid Building Systems has improved two different drying methods. During the production, a decision has to be made, which drying method is used, because as mentioned either Rapidwall 9100 or Silicon Rapid Water Repellent and Plaster Waterproofing Emulsion have to be added. Rapidwall 9100 needs to be heated above 50°C to activate its water repellent capability. This is only possible in the drying chamber (drying room).

Cutting of Rapidwall and Preparing for Dispatch: The Cutting Area is located directly next to the drying room. Cutting is essential in the manufacturing process of Rapidwall. A dried panel is ready for the construction of a dwelling, but in most cases has to be cut to size to match design applications of architects. Once drying is finished Rapidwall can be tailored to a great variety of designs. Most common are vertical or horizontal cuts by a circular saw on basic panels. Panels are cut to a smaller size or door and window cut-outs are performed. If diagonal or detailed cuts e.g. Rebate cuts, are necessary, a hand chain saw is used.

A Rebate is a connection between two panels on a wall, which are set up on site on an angle of 45or 90. It is the most common way to set up two walls on an angle, but setting up on an angle can also be done without a Rebate. To achieve a Rebate, 12 cm of one skin and One web member at the end of one panel is cut out vertically, leaving the other skin intact to create a joint to another wall.

III. Product Features and Applications

The construction of walls to enclose buildings is being carried out today, with few exceptions, almost the same way as it was done two hundred years ago. Although new construction methods, new products and new look finishes have not been as readily accepted by designers and builders, attitudinal changes are occurring as building owners become more conscious of cost and environmental factors in building design, particularly in the area of energy savings.

Rapid Building System is a revolutionary building technology and innovative product, which will have a significant impact on future construction methods. The concept's strengths are extraordinary product features, such as suitability for single leaf, load-bearing construction of internal and external walls, ceiling, roofs and trusses. A Rapid Building

System panel by composition is environmentally friendly and is easily maintained and retains its characteristics through varying conditions.

- Gypsum naturally occurring worldwide abundant & very low cost.
- Low drying energy is needed for reasonable heat requirement
- Low cutting energy; easily cut either at factory
- Safe manufacturing process
- Lightweight modular building panel of 35 kg/m^2
- Very good load bearing capability
- Fire, moisture and sound resistant
- Secure against insect attack.

Design Criteria and Practice: The design capacities derived are based on ultimate strengths determined from tests. The ultimate strengths have been determined allowing a safety margin (mean strength divided by safety factor k) to account for the variations or scattering in the test results. Accordingly this provides a safety index of 3.0 for a confidence level of 90%.

For strength design a reduction factor K is further applied to the ultimate strength capacities obtained from the tests. This design strength reduction factor has been included in the various design charts presented. The strength reduction factors used are generally in Accordance with AS 3600-2001 but with some minor modifications to account for the differences between Rapid wall panel design and concrete structural design. Table 2.1 lists the design strength reduction factors K that are adopted in this thesis.

Table 2.1 Design strength reduction factors K.

Type of action effect	Strength reduction factor K
Concentric or eccentric axially loaded walls	0.6
Bending without axial load	0.8
Shear strength	0.6
Flexural in-plane strength of walls	0.7
Compressive strength of wall cross-section	0.6
Tensile strength of wall cross-section	0.8

Product Dimensions: Rapidwall panel is world's largest loadbearing lightweight panels. The panels are manufactured with size 12 m lengths, 3m height and 124 mm thickness. Each panel has 48 modular cavities of 230 mm x 94 mm x 3m dimension. The weight of one panel is 1440 kg or 40 kg/sqm. The density is 1.14g/cm, being only 10-12% of the weight of comparable concrete /brick masonry. Reinforcement in the form of 300-350mm long glass fiber roving's is located randomly but centrally within the panel faces and their connecting ribs.

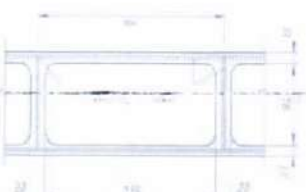

Fig. 2.2(a) cross section

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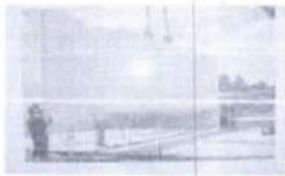

Fig. 2.2(b) World largest load bearing lightweight panel being used in Australia

Figure 2.2 (b) indicates the various uses of the Rapidwall cells. Rapid wall panels are generally used structurally in six ways:-

1. As a lightweight load-bearing walling product in cottage construction- the panels can be used with or without non-structural core-filling such as insulation, sand, polyurethane or lightweight concrete.
2. As prefabricated lost-formwork for high capacity vertical and shear load-bearing structural walling- the panel's cores are filled with concrete, either reinforced or not, to provide load-bearing walls in medium-rise residential constructions of up to twenty storeys.
3. As partitions- the panels can be insulated for use in hospitals and offices;
4. As fencing- the panels can be used from ground level with inserted SHS structural posts embedded into the ground. Alternatively the Rapidwall panels can be trenched and filled with sand without a need for foundations.
5. As cladding- for industrial buildings or sports facilities etc...
6. As suspended slab formwork- used in this way the panels become the flush plaster ceiling.

Basic Design Procedure for (Pud- Mud) Interaction Diagram Generation: Generation of the interaction diagram of a typical GFRG building panel is based on a simplified procedure; certain assumptions are made to develop the approximate interaction curve from the principles of mechanics. The cross section of a typical GFRG panel filled with concrete and reinforcement bars in each cell. The behavior of the GFRG panel infilled with concrete depends on the bond between the concrete and the GFRG panel. This is reflected in the variation of normal strain along the length of the wall.

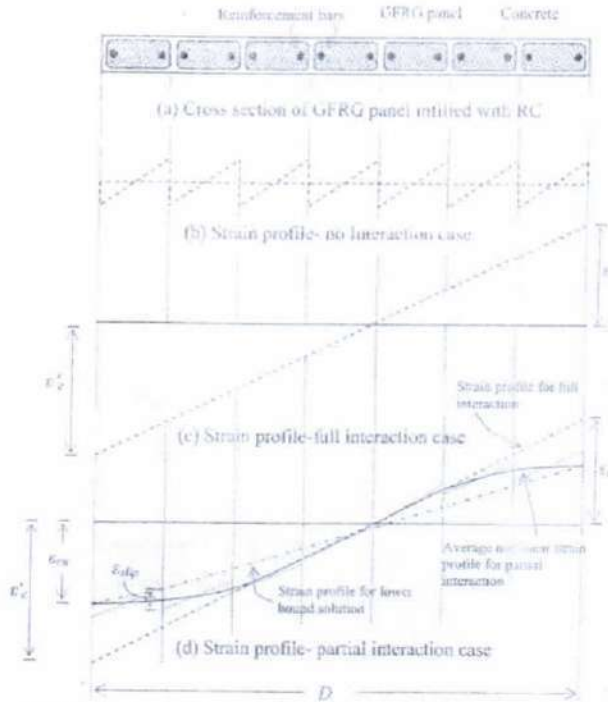

Fig. 3.4 Strain profiles for Nil, Full and partial interaction between GFRG panel and Concrete

If there is no bond, there would not be any interaction between them, resulting in small strain with multiple neutral axes, if it is assumed that the concrete cores are fully bonded to the GFRG panel, then the plane section remains plane assumption is valid for the entire section and the strain profile will be a straight line with a single axis, the probable strain profile can be assumed with the ultimate compressive strain ε_{cu}. The value of ε_{cu} is limited by the out of plane buckling strength of the panel and includes enhancement due to strain gradient for short wall lengths.

Distribution of Strain at Ultimate Limit State: Fig. 3.1 depicts how the value ε_{cu} is to be computed depending on the location of the neutral axis x_u (from the extreme compression location), which in turn depends on the eccentricity of loading.

$$e = M_{ud}/P_{ud}$$

Case 1: Pure Compression

Under pure compression, ($e = 0$, $Xu=\infty$) $\varepsilon_{cu} = P/E$

$$E = Ec\,Ac + Eg\,Ag/Ac + Ag$$

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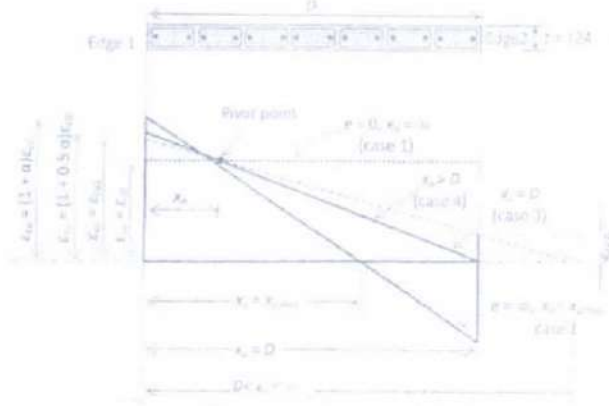

Figure 3.5 recommended strain profile

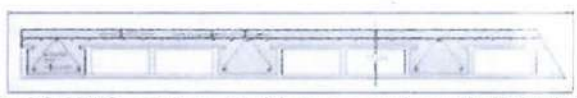

Fig. 3.9 GFRG –recomposed slab system can be used efficiently in floor slabs and Roof slabs.

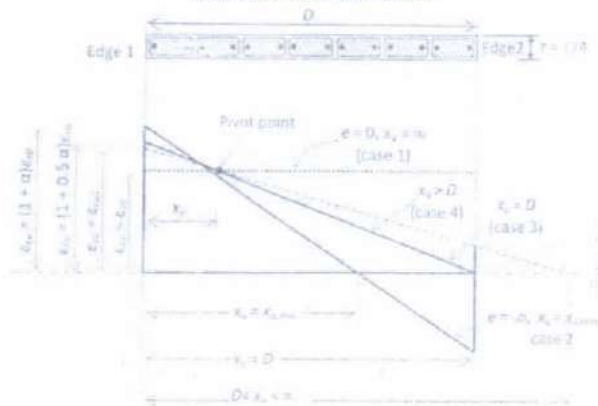

Fig. 3.5 recommended strain profile

DESIGN OF FOUNDATION

Design of Stem Wall
Assume, width of stem = 200mm
The vertical load per meter length of the wall = 100KN Design vertical load = 100x1.5 =150KN
Bearing strength fbr = 0.45 fck =0.45x20 = 9Mpa
Limiting bearing resistance = 9x1000x200 1800KN >150KN
Hence, a minimum reinforcement of 0.25 percentage of gross cross sectional area may be provided in each direction (IS13920, cl.9.1.4).

Minimum vertical reinforcement, Asst min = 0.0025x1000x200 = 500mm2 Spacing of 12 mm reinforcement on each of stem wall, in vertical direction
= 1000x113/(500/2)>300mm (provided)

Spacing of 8 mm reinforcement on each face of stem wall, in horizontal direction =1000x50/(500/2) = 200mm
Hence provide 12mm diameter bars at 300mm spacing along vertical direction, and 8mm diameter bars at 200mm a pacing along horizontal direction on each side of stem wall

Size of Footing: The vertical load per meter length of the foundation = 100KN x 1.1= 110KN A strip footing can be selected as the type of foundation.
Area of the footing per meter length = 110KN/100KN/m = 1.16m
Width of the footing = 1.2m

Thickness of Footing: The uniform pressure at bottom of slab = 100x1.5/1.3 = 0.119N/mm2 Shear force at a distanced' from face = 0.119x1000x(500-d) Permissible shear stress for Pt = 0.25 and M20 concrete, is 0.36MPa Shear resistance = 0.36x1000xd
Equating equations d, = 124.2 mm Overall depth D= 125+75+16/2 = 210mm

Check for Gross Soil:
Pressure: Gross Soil Pressure
qmax =[110+24x(1.1x0.2+0.4x1.3)+18x1.1x1.2]=10.55kn/m2 <110 kn/m2.
Hence, ok

IV. CONCLUSION

- The selected engineering models for GFRG panels in roof slabs, lintels, wall columns have been discussed in a rational way under different loading conditions and the results have been found accordingly.
- The design panels have been found suitable as per the conventional concrete building.
- This thesis has introduced GFRG walls and the associated building system, with the structural characteristics of that system de-scribed.
- The experimental and theoretical investigations undertaken since 2002 have been presented from the structural element and overall building performance points of view.
- The accurate calculation of the in-plane flexural strength of GFRG walls is a difficult, if not impossible, task due to the relative slips between the infill concrete cores and the GFRG panel.
- Lower bound solutions for the in-plane flexural strength have been presented, of which the lower bound solution is most suitable for design use.
- Based on the results of the experimental and theoretical investigations and on a rational analysis of the existing design frameworks, a methodology and associated procedure for the design of GFRG buildings has been offered.

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T-BEAM DECK SLAB BRIDGE ANALYSIS

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Abstract: ***Before Design of Any Structure we should know what the structural components in the structure, should know the specifications of the components, what are the loads to be considered in the design of structure and should know the analytical concepts. So This thesis gives the brief idea about the meaning of bridge and its classification, loads to be considered and the different methods to be adopted for the analysis of T-Beam deck slab bridge(only deck Slab with girders). This project Analyze the simple T-Beam Deck Slab. In T-Beam Deck Slab consists Slab with Longitudinal and Cross Girders. Girders have analyzed with three different Rational Methods (Courbon theory, Guyon-Massonet, Hendry Jaegar) for four IRC Loadings (Class-AA, Class-A, Class-B, Class-70R) and three Different country Loadings which are AASHTO Loading, British Standard Loading, Saudi Arabia Loading. Also this project Compare the All the Loadings and All the Methods which are mentioned above and the same bridge is analyzed as a three- dimensional structure using software STAAD ProV8i. Analysis of girders in the Bridge means Calculation of Moments and Shear forces induced in the longitudinal and cross girders at different positions for above mentioned loadings. Also analyzed the Moments induced in the Slab due to IRC Loadings Only. A simple example problem could be taken from the Text book (Design of Bridges by N. Krishna Raju) for this Project and also taken some of the curves and Graphs.***

Keywords: Courbon theory- Hendry Jaegar- Guyon Massonet-Class-AA,Class-A-Class-70R-Class-B- AASHTO-Saudi Arabia- British Standard-STAAD Pro

I. METHOD OF ANALYSIS OF DECK SLABS

1.1. Analysis of Slab Decks:

- The analysis of deck slabs can be done in two ways depending upon the importance and classification of bridge
- They are Solid slabs spanning in one directionSlabs spanning in Two directions
- According to our project we are using slabs spanning in two directions.
- The moments develop due to wheel loads on the slab both in the longitudinal and transverse directions.
- These moments are computed by using the design curves developed by "westergard" or "Pigeaud's
- method".
- Pigeaud's method is applicable to rectangular slabs supported freely on all the four sides.
- The bending moments Can be calculated using the following Formula's

$M1=(m1+\mu m2)W$
$M2=(m2+\mu m1)W$
μ=poission's ratio for concrete from IRC-21:2000 = 0.15
m1,m2=coefficients for moments along short span and long span (from pigeaud's curves)
W= wheel load under consideration
K=Ratio of short to long span direction= (B/L)
u and v =Dimensions of the load spread after allowing for dispersion through the wearing coat and structural slab.
L=Long span length
B=short span length

1.2. Analysis of Girders:

A typical Tee beam deck slab generally comprises the longitudinal girder, continuous deck slab between the Tee beams and cross girders to provide lateral rigidity to the bridge deck. The longitudinal girders are spaced at intervals of 2 to 2.5 m and cross girders are provided at 4 to 5 m Intervals. The distribution of live loads among the longitudinal girders can be estimate by any of the following rational methods.

- Courbon method
- GuyonMassonet method
- Hendry Jaegar method

1.2.1.Courbon's method:

Among these methods, courbon method is the simplest and is applicable when the following conditions are satisfied:
a) The ratio of span to width of deck is greater than 2 but less than 4
b) the longitudinal girders are interconnected by at least five symmetrically spaced cross girders.
c) The cross girder extends to a depth of at least 0.75 times the depth of the longitudinal girders.
Courbon method is popular due to the simplicity of computations as detailed below:
The center of gravity of live load acts eccentrically with the center of gravity of the girder system. Due to this eccentricity, the loads shared by each girder is increased or decreased depending upon the position of the girders. This is calculated by courbon theory by a reaction factor given by,

$R_i=[P \times I_i / \sum I_i] \times [1+(\sum I_i / \sum I_i d_i^2) \times e \times d_i]$

P= total live load (kN)
I_i=moment of inertial of longitudinal girder (i)
e=eccentricity of the live load (m)
d_i= distance of girder (i) from the axis of the bridge.

1.2.2.Guyon-Massonet:

This method has the advantage of using a single set of distribution co-efficient for the two extreme cases of no torsion grillage and a full torsion slab thus enabling the determination of the load distribution behavior of any type of bridge.

$M_{mean} = (M/n)$

Design bending Moment=(1.10 x K x M_{mean} x I.F.)

K=distribution co-efficient (which is depends on flexural parameter and torsional parameters) they are:

$\theta = b/2a\,[i/j]^{0.25}$

$\alpha = G(i_o+j_o)/(2E\sqrt{ij})$

2a= span of the bridge

2b=effective width of the bridge

i=second moment of area per unit transverse width

j=second moment of area per unit longitudinal width

We should find the K_α value as interpolation formula

$K_\alpha = K_0+K_1-K_0\sqrt{\alpha}$

K_0, K_1 values from morice and little tables for five reference stations (0,b/4,b/2,3b/4 and b)

The equation of transverse moment for a concentrated load 'W' at a distance 'u' from the left support is given by

My=Wb/a [$\mu_{1\theta}$sin($\prod$u/2a)- $\mu_{3\theta}$ sin(3$\prod$u/2a)+ $\mu_{5\theta}$ sin(5$\prod$u/2a)+----------]

If there is uniformly distributed load 'p' acting over a distance '2C' then

My=4pb/$\prod$ [$\mu_{1\theta}$ sin ($\prod$C/2a)+ (1/3) $\mu_{3\theta}$ sin(3$\prod$C/2a)+ (1/5) $\mu_{5\theta}$ sin(5$\prod$C/2a)+----------]

1.2.3. Hendry-jaegar Method:

Hendry and Jaegar assume that the cross beams can be replaced in the analysis by a uniform continuous transverse medium of equivalent stiffness. According to this method, the distribution of loading in an interconnected bridge deck system depends on the following three dimensionless parameters.

$A = (12/\prod^4) \times (L/h)^3 \times (nEI_T/EI)$

$F = (\prod^2/2n) \times (h/L) \times (CJ/EI_T)$

C=2E (1+ μ) =0.4E---------- (where μ=0.15)

Where L= the span of the bridge

h=spacing of longitudinal girders

n=number of cross beams

EI, CJ=flexural and torsional rigidities, respectively, of one longitudinal girder

EI_T=flexural rigidity of one cross beam

The parameter A is the most important of the above three parameters. It is a function of the ratio of the span to the spacing of longitudinal and the ratio of transverse to longitudinal flexural rigidity.

Graphs giving the values of the distribution co-efficient(m) for different conditions of number of longitudinal (two to six) and two extreme values of F, i.e., zero and infinity, are available in ----------. Co-efficient for intermediate values of F may be obtained by interpolation from

$$m_F = m_0+(m_\infty - m_0)[(F\sqrt{A})/(3+F\sqrt{A})]$$

Where m_F is the required distribution co-efficient and m_0, m_∞ are respectively the co-efficient for F=0 and F=∞.

II. T-BEAM ANALYSIS USING RATIONAL METHODS

Clear width of road way=7.5m

Span (center to center bearings)=16m

Thickness of wearing coat=80mm

CROSS SECTION OF DECK:

Assume thickness of slab initially=200mm

Assume Three main girders are spaced 2.5m center to center

Kerbs=600mm wide and 300 mm deep

Cross girders are provided 4m interval center to center

Depth of Main girder=1600 mm

Width of Main girder=300 mm

Depth and width of cross girders same as main girders

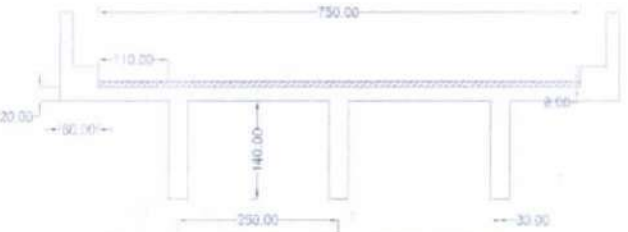


Fig1. Cross Section View Of Deck Slab

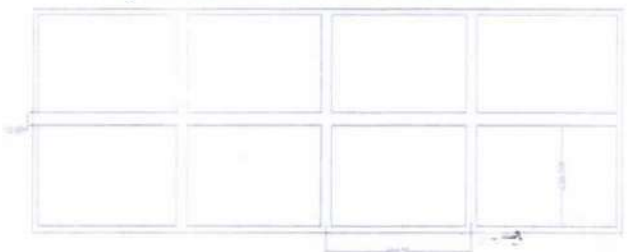


Fig.2. Top View Of The Deck Slab

OUTER GIRDER	D.L. B.M. = 1218	2679.5 kN. m
	L.L. B.M. = 1461.5	
	D.L. S.F.= 292	563.93 kN
	L.L. S.F. = 271.93	
INNER GIRDER	D.L. B.M. = 1218	2097.95 kN.m
	L.L. B.M.= 879.95	
	D.L. S.F.= 292	680.09 kN
	L.L. S.F. = 388.09	
CROSS GIRDER	D.L. B.M. = 25.10	294.1 kN.m
	L.L. B.M.= 269	
	D.L. S.F.= 30.47	213.77 kN
	L.L. S.F. = 183.3	

Table 1: Courbon's B.M. And S.F. For Class-AA

OUTER GIRDER	D.L. B.M. = 1218	2679.5 kN. m
	L.L. B.M. = 1461.5	
	D.L. S.F.= 292	563.93 kN
	L.L. S.F. = 271.93	
INNER GIRDER	D.L. B.M. = 1218	2097.95 kN.m
	L.L. B.M.= 879.95	
	D.L. S.F.= 292	680.09 kN
	L.L. S.F. = 388.09	
CROSS GIRDER	D.L. B.M. = 25.10	294.1 kN.m
	L.L. B.M.= 269	
	D.L. S.F.= 30.47	213.77 kN
	L.L. S.F. = 183.3	

Table2: Courbon's B.M. & S.F. For Class-70R

OUTER GIRDER	D.L. B.M. = 1218	2439 kN. m
	L.L. B.M. = 1221.5	
	D.L. S.F.= 292	496.98 kN
	L.L. S.F. = 204.98	
INNER GIRDER	D.L. B.M. = 1218	2078.16 kN.m
	L.L. B.M.= 860.16	
	D.L. S.F.= 292	548 kN
	L.L. S.F. = 256.99	
CROSS GIRDER	D.L. B.M. = 25.10	129.98 kN.m
	L.L. B.M.= 104.88	
	D.L. S.F.= 30.47	121.67 kN
	D.L. B.M. = 1218	

Table3: Courbon's B.M.& S.F. For Class-A

OUTER GIRDER	D.L. B.M. = 1218	2007.5 kN. m
	L.L. B.M. = 789.53	
	D.L. S.F.= 292	424.70 kN
	L.L. S.F. = 132.70	
INNER GIRDER	D.L. B.M. = 1218	1731.39 kN.m
	L.L. B.M.= 513.39	
	D.L. S.F.= 292	445.69 kN
	L.L. S.F. = 153.39	
CROSS GIRDER	D.L. B.M. = 25.10	87.65 kN.m
	L.L. B.M.= 62.55	
	D.L. S.F.= 30.47	84.86 kN
	L.L. S.F. = 54.39	

Table 4: Courbon's B.M. And S.F. For Class-B

OUTER GIRDER	B.M.	2283.71kN.m
	S.F.	897.28 kN
INNER GIRDER	B.M.	1935.87 kN.m
	S.F.	737.73 kN
CROSS GIRDER	B.M.	585.62 kN.m
	S.F.	370.17 kN

Table 5: Guyon-Massonet B.M. And S.F. For Class-AA

OUTER GIRDER	B.M.	2281.69 kN.m
	S.F.	910.76 kN
INNER GIRDER	B.M.	1885.78 kN.m
	S.F.	722.48 kN
CROSS GIRDER	B.M.	547.63 kN.m
	S.F.	362.36 kN

Table 6: Guyon-Massonet B.M.& S.F. For Class- 70R

OUTER GIRDER	B.M.	1792.90 kN.m
	S.F.	441.18 kN
INNER GIRDER	B.M.	1612.6 kN.m
	S.F.	515.32 kN
CROSS GIRDER	B.M.	102.62 kN.m
	S.F.	81.97 kN

Table 7: Guyon- Massonet B.M. & S.F. For Class-A

OUTER GIRDER	B.M.	1443.71 kN.m
	S.F.	406.789 kN
INNER GIRDER	B.M.	1328.21 kN.m
	S.F.	430.59 kN
CROSS GIRDER	B.M.	73.40 kN.m
	S.F.	62.47 kN

Table 8: Guyon-Massonet B.M. And S.F. For Class-B

OUTER GIRDER	B.M.	2732.36 kN.m
	S.F.	572.10 kN
INNER GIRDER	B.M.	2141.92 kN.m
	S.F.	694.60 kN
CROSS GIRDER	B.M.	318.47 kN.m
	S.F.	229.39 kN

Table 9: Hendry-Jaegar B.M. And S.F. For Class- AA

OUTER GIRDER	B.M.	2746.02 kN.m
	S.F.	568.93 kN
INNER GIRDER	B.M.	2141.92 kN.m
	S.F.	680.09 kN
CROSS GIRDER	B.M.	294.10 kN.m
	S.F.	213.77 kN

Table 10: Hendry-Jaegar B.M. And S.F. For Class- 70R

OUTER GIRDER	B.M.	1942.45kN.m
	S.F.	413.77kN
INNER GIRDER	B.M.	1735.24kN.m
	S.F.	378.94kN
CROSS GIRDER	B.M.	87.65kN.m
	S.F.	84.86kN

Table 11: Hendry-Jaegar B.M. And S.F. For Class- B

OUTER GIRDER	B.M.	2431.79 kN.m
	S.F.	496.02 kN
INNER GIRDER	B.M.	2084.62 kN.m
	S.F.	550.91 kN
CROSS GIRDER	B.M.	129.98 kN.m
	S.F.	121.67 kN

Table 12: Hendry-Jaegar B.M. And S.F. For Class- A

LOADING SYSTEM	MX (KN.M)	MY (KN.M)
CLASS-AA	33.68	14.02
CLASS-70 R	34.89	15.35
CLASS-A	21.91	14.81
CLASS-B	14.09	11.31

Table 13: Slab Moments Using Piegaud's Theory

OUTER GIRDER	B.M.	2078 kN.m
	S.F.	473.37 kN
INNER GIRDER	B.M.	2009 kN.m
	S.F.	587.67 kN
CROSS GIRDER	B.M.	136.61 kN.m
	S.F.	156.12 kN

Table 14: Courbon B.M. And S.F. For IRS 20-44 Loading

OUTER GIRDER	B.M.	2584.6 kN.m
	S.F.	622.5 kN
INNER GIRDER	B.M.	2474.3 kN.m
	S.F.	831.03 kN
CROSS GIRDER	B.M.	165.9 kN.m
	S.F.	255.79 kN

Table 15: Courbon B.M. And S.F. For Saudi Loading

OUTER GIRDER	B.M.	3450 kN.m
	S.F.	1291 kN
INNER GIRDER	B.M.	2429.9 kN.m
	S.F.	834.38 kN
CROSS GIRDER	B.M.	212.6 kN.m
	S.F.	180.47 kN

Table 16: Courbon B.M. And S.F. For British Loading

III. ANALYSIS USING STAAD PRO V8i

Fig.4. 3d-Model Of The T-Beam Deck Slab In STAAD

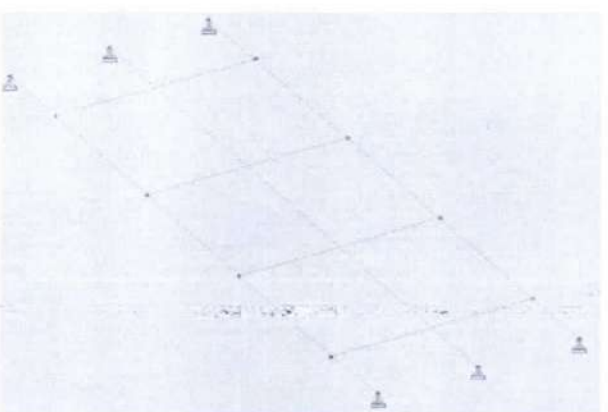


Fig.4. Model Of The T-Beam Deck Slab In STAAD

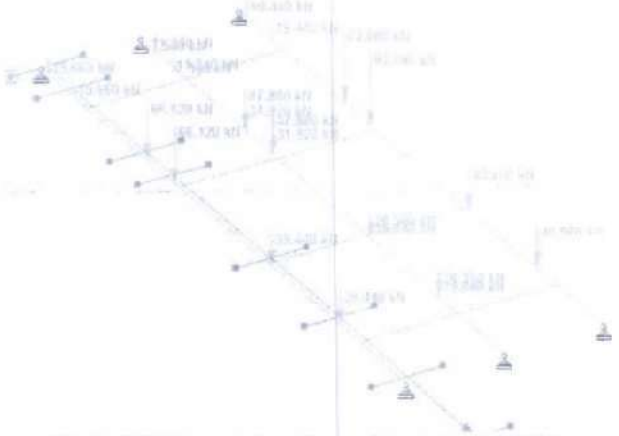


Fig.5. IRC Class-A Loading InSTAAD PRO V8I

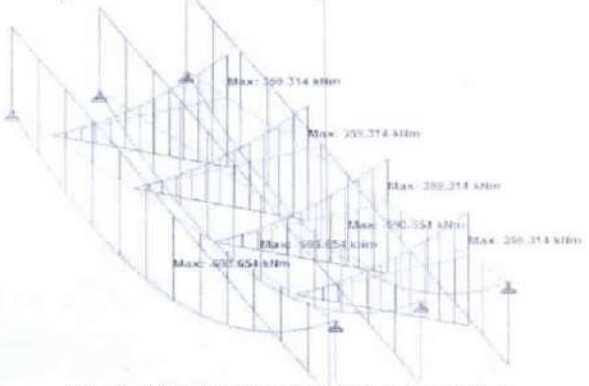


Fig.6. B.M. And S.F. For Class-A Loading

INNER GIRDER	Bending Moment	1449.94 kN.m
	Shear Force	353.12 kN
OUTER GIRDER	Bending Moment	1471.96 kN.m
	Shear Force	357.40 KN
CROSS GIRDER	Bending Moment	359.31 kN.m
	Shear Force	171.73 KN

Table 17: STAAD Analysis For Class-A

INNER GIRDER	Bending Moment	2484.65 kN.m
	Shear Force	879.73 kN
OUTER GIRDER	Bending Moment	1647.80 kN.m
	Shear Force	444.84 KN
CROSS GIRDER	Bending Moment	312.31 kN.m
	Shear Force	255 KN

Table 18: STAAD Analysis For Class-AA

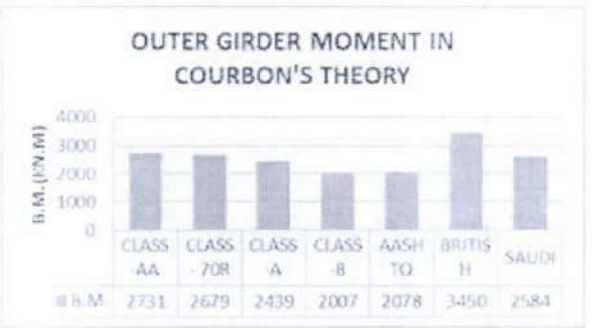
INNER GIRDER	Bending Moment	3048.6kN.m
	Shear Force	858.95kN
OUTER GIRDER	Bending Moment	1594 kN.m
	Shear Force	433.73 KN
CROSS GIRDER	Bending Moment	359.31kN.m
	Shear Force	143.73 KN

Table 19: STAAD Analysis For Class-70R

INNER GIRDER	Bending Moment	1144.9 kN.m
	Shear Force	278.87 kN
OUTER GIRDER	Bending Moment	1067.4 kN.m
	Shear Force	262.15 KN
CROSS GIRDER	Bending Moment	74.40 kN.m
	Shear Force	132.0 KN

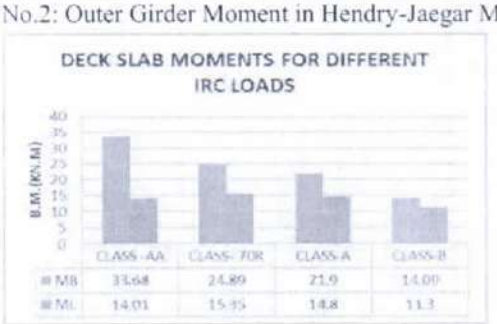
Table 20: Staad Analysis For Class-B

IV. COMPARISION OF LOADINGS WITH GRAPHS



Graph No.1: Outer Girder Moment in Courbon theory

Graph No.2: Outer Girder Moment in Hendry-Jaegar Method



Graph No.3: Deck Slab Moments for Different IRC Loads

Graph No.4: CLASS-AA loading for Inner Girder

Graph No.5: CLASS-AA loading for Outer Girder

Graph No.6: CLASS-AA loading for Cross-Girder

V. CONCLUSION

- This Thesis has been done the Analysis of T-Beam deck slab Bridge for four IRC Loadings and other three countries (AASHTO, Saudi Arabia, British) Loading.
- For Each IRC loading has done in the three different rational methods and STAAD Pro software also.
- In this Analysis British Standard Loading has given the highest B.M. and S.F. values as compared to all the Loadings.
- As per this Analysis the highest B.M. and S.F. values Decrement order is British Standard, Class-AA,Class-70R, Saudi Arabia, Class-A, AASHTO, Class-B.
- In the overall Analysis as per our Indian Standard Class-AA and Class-70R are gives the highest B.M. and S.F. values compared to all the IRC Loadings.
- According to the three rational Methods, each method has given the highest importance to the Outer Girder and Second for Inner Girder and then Cross Girder.
- From the STAAD Pro Analysis, it has given more importance to Inner Girder and Next for Outer Girder.
- Out of all the Methods of Analysis of this Deck Slab Bridge, STAAD Pro has given highest Bending Moment, Shear Force for Inner Girder and Hendry JaegarMethod for Outer Girder and Guyon-Massonet for Cross Girder.
- The STAAD pro result nearly reaches the values obtained by Guyon-Massonet method for class AA tracked vehicle. For class AA Tracked vehicle the STAAD pro result is reduced by (13%) as compared to Guyon-Massonet method and increase in result compared to Courbon's method by (14%) for Bending Moment for Inner Girder. For class AA Tracked vehicle the STAAD pro result is Increased by (39.71%) as compared to Hendry-Jaegar method and increase in result compared to courbon's method by (0.036%) for Outer Girder.

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Analytical Approach on Women Education in India

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Abstract

The importance of education had been recognized since the dawn of civilization as the most crucial element of becoming a human being. Women are a very important key factor in the development of human society. In India half of the population consists of women. The 11th five year plan (2007-2012) gave importance to women empowerment in all social, economic and political areas along with continuation of priority keeping over the issues like education, health, and income generating activities. The education and stated that there cannot be educated people without education of women. In India women have a much lower literacy rate than men. Literate women are better decision makers and they contributed more to the life of the community. An African proverb says "If a man is University Education Commission of India (1948–49), just after independence, felt the need of women's e educated, an individual is educated. If a women is educated the entire family is educated". Many states have large rural - urban differential in female literacy rate. Women power is crucial to the economic growth of any country. In recent times, people are realizing the value of women education. Even the low income families are willing to educate their children. Women are very important segment in development at local to global levels. Economic independence and education of women will go a long way in attaining self-reliance for women. The United Nations Development programme constituted eight Millennium Development Goals (MDG) for ensuring equity and peace across the world. The third Millennium Development Goal is directly related to the empowerment of women in India. What Indian women need therefore is not just empowerment, but a complete "Identity Revolution".

Keywords: Literacy Rate, India, Education, Women.

1. Introduction

The importance of education had been recognized since the dawn of civilization as the most crucial element of becoming a human being. Women are a very important key factor in the development of human society. In India half of the population consist of women resources. They have been identified as key agents of sustainable development and women's equality is regarded as central to a more holistic approach towards establishing new patterns and processes of development. The contribution of women and their role in the family as well as in the economic development and social transformation are important. Their work participation is less when compared to men. Women empowerment has emerged as an important issue in India of late. The importance of women development has been noticed by the Government of India from the day of the implementation of first five year plan (1951-56). The second five year plan (1956-61) continued to reflect the welfare concept besides giving importance and priority to women's education. The 11th five year plan (2007-2012) gave importance to women empowerment in all social, economic and political areas along with continuation of priority keeping over the issues like education, health, and income generating activities.

Education is the most powerful and effective instrument for men and women. Education not only helps in acquisition of knowledge and the required skills but also enlightens one about different occupational opportunities and mobility. Generally, a high and increasing education level gives exposure to the outer world. It empowers women and gives them the opportunity to earn their livelihood and make them independent economically, politically, and socially. The importance of education for women, therefore, is even more crucial since they have to battle discrimination from birth to death and are in a constant struggle to realize their human rights. Women are the most vulnerable human beings on earth and in order to redeem their humanity it is necessary to create possibilities by which they can access the agency of education and literacy.

The movement for improving women's status all over the world has always emphasized education as the most significant instrument for changing women's subjugated position in the society. The University Education Commission of India (1948-49, just after independence, felt the need of women's education and stated that there cannot be educated people without getting women educated. While discussing the importance of education to uplift the status of women, Chatterji (1993) points out that "education helps in raising the status of women in four ways. Education helps women to (1) earn an income in later life, (2) participate actively in public life, (3) determine her own fertility and (4) achieve personal autonomy. All these four facets can be understood easily by juxtaposing the merits of an educated woman against the demerits of uneducated one."

2. Theoretical analysis of women Education

In India women have a much lower literacy rate than men. A long string of educational programmes have been started by the Government and they have produced some results so that Indian women today have a literacy rate of more than 65 percent as per the Census of 2011, and it was 8.9 percent in 1951. But our women are still far behind men who have a literacy rate of 82 percent in 2011, and it was 27 percent in 1951. The latest census has recorded that the increase in female literacy has been sharper than the increase in male literacy in the past decade. This is very heartening news because it reflects that the Government is showing results as far as educational programmes for women are concerned.

Table 1. Literacy Rate in India

Year	Persons	Males	Females
1951	18.3	27.2	8.09
1961	28.03	40.04	15.03
1971	34.05	46.00	22.00
1981	41.04	53.04	28.05
1991	52.02	64.01	39.03
2001	65.04	75.08	52.01
2011	74.04	82.14	65.46

Source: Census of India, 2001 & 2011.

Women's education is linked to a significant improvement in the literacy and educational levels of their children and better health and nutrition standards in the family, literate women are better decision makers and they contribute more to the life of the community. Educated women are less prone to be subjected to domestic violence and other forms of exploitation. Crimes against women are reported more in urban areas and less in rural areas because illiterate women are less likely to speak out against violence and even less likely to approach a police station for help.

In India there has been some catching up in literacy rates for both men and women between rural and urban areas, the gender gaps continue to be unacceptably large especially for females. As per 2001 Census 46.70 percent women in rural areas were literate as opposed to nearly 73.20 percent women in urban areas, as per 2011 Census 58.8 percent of women in rural areas were literate as opposed to nearly 79.9 percent women in urban areas. Though there have been substantial increases in literacy rates in both urban and rural areas, the gap between the two sectors has not been narrowed appreciably. Many states have large rural-urban differentials in female literacy.

3. Education and Empowerment

An African proverb says "If a man is educated, an individual is educated; if a women is educated the entire family is educated". Education can be an effective tool for women's empowerment. It is both an indicator and an instrument of development. The human capital theory stipulates that education is an investment that yields returns for the individual and society at large. To get the full benefit of education it should be provided equally to both men

and women. In India female literacy rate is as low as 65.46 percent as compared to 82.14 percent of men. Education will work as a catalyst towards empowering women in India.

Mahila Samakhya is a women's movement, which has transformed the lives of women in 14000 Villages in 60 districts of nine states of India viz. Karnataka, Gujarat, Andhra Pradesh, Kerala, Bihar, Assam, Jharkhand, U.P. and Uttaranchal, started as an awareness programme by the Ministry of HRD in pursuance of the National Policy of Education -1986 as updated in 1992. today it has entered the areas of education, health, human rights and governance with the objective of creating a gender-just society.

Education will be used as an agent of basic change in the status of women. In order to neutralize the accumulated distortions of the past, there will be a well-conceived edge in favour of women. The national system will play a positive interventionist role in the empowerment of women and it will develop new values through re-designed curricula, text-book, the training and orientation of teachers, decision-makers and administrators, the active involvement of educational institutions. Women studies will be promoted as a part of various courses and educational institutions encouraged to take-up active programmes to further women's development. Literacy and education are the most essential inputs for empowerment of women. A critical analysis of the five year plans over the years starting from independence reflects that in the earlier phase of developmental planning, the concept of women development was mainly "welfare" oriented. During seventies there was a shift from welfare to development, which started recognizing women as participants of development. The eighties adopted a multidisciplinary approach with a special thrust on health, education and employment and number of programmes were launched to make women independent.

4. Women Empowerment and Employment

The present century has witnessed an emergence of educated and trained women in white collared jobs as teachers, engineers, lawyers, doctors, corporate executives, and the like in India's growing economy. But the real problem is that of unskilled and illiterate women who have to seek whole time unskilled jobs. Therefore there is a need for them to improve their skills and qualify themselves for semi skilled and skilled jobs. Towards this end educational programmes have to be restructured aiming to equip them with necessary skills required in modern upcoming trades. The position and status of women also varies from urban to rural areas, the educated to the uneducated, the employed to unemployed, the upper strata to the lower economic strata and also from job to job. The educated women are more productive both at home and in the work place.

5. Women Empowerment in India

The Year 2001 was declared by the Government of India as "Women's Empowerment Year" to focus on a vision where women are equal partners like men, because the constitution of India grants equality to women in various fields of life. In the past, the position of women was miserable in the society and even women were not ready to undertake any assignment or job due to many reasons like fear, male dominance in the society and purda system but time has been changed now. Women of today are not like the early days. Now, they are always ready to come forward and want more economic independence, identity, achievements, equal status in the society and greater freedom. The Government of India provides for Self- Help Groups (SHG) to them so that proper attention should be given to their economic independence through self employment, entrepreneurial development.

The Self-Help Groups have been emerged as a powerful instrument in order to alleviate poverty and for the empowerment of women in the rural economy. In this way, Self-Help Groups are important not only to reduce rural poverty, to promote rural savings but also to increase gainful employment. Empowerment of women in India has focused on three important aspects, viz. economic empowerment, integrated development, and consciousness rising.

6. New Opportunities

But in general the radical changes taking place in many countries open new opportunities for polices on women. On the one hand, this is because the extent of the disadvantaging and suppression of women is more visible. In some countries, women have been able to push through binding legal regulations (election laws, political party statutes women's quota rules for local councils), in order to guarantee their stronger participation in parties and trade unions. With the programme slogans of "empowerment" and redistribution of power, women who are organized self-help organization, associations, networks and political parties are demanding participation in political decision processes and access to the political institutions. They are striving for social power in a bid to influence the factors which cause discrimination against them.

The transitions from authoritarian to democratic forms of government in a great number of countries have placed women's organizations in a changed environment. There are now countless such bodies and their combined clout is changing the status of women and helping to broaden their scope for social action. But in some countries women are still faced with considerable difficulties in organizing themselves with formal status.

On account of progressive impoverishment, however, the women's newly-won scope for action and shaping their lives is markedly cramped. Current developments such as religious fundamentalism or economic recession have

inhibiting impacts on new approached to policies on women in part, one must speak of a "backlash". Even where the legal position of women have been improved they have not been able to assert their social, economic and political rights. In some countries, it's feared that only elitist women's organizations will have a chance to break into the political process.

7. Conclusion

Women power is crucial to the economic growth of any country. In India this is yet to meet the goal despite reforms. Little has been achieved in the area of women education, but for this to happen, this sector must introduce a chain of reforms. Though India could become one of the largest economies in the world, it is being hindered due to a lack of women's participation. Education is universally accepted as a fundamental agent of socio-economic upliftment, but women have not been fairly treated as for the access to education is concerned.

In recent times, people are realizing the value of women education. Even the low income families are willing to educate their children. Women are very important segment in development at all levels from local to global. Economic independence and education of women will go a long way in attaining self-reliance for women. Real change will come when women are treated on par with men and given equal opportunities. When that happens, India will be able to harness its women power and emerge as a respected nation. Women in India now participate in all activities such as education, sports, politics, media, art and culture, service sector, science and technology, etc.. Indira Gandhi who served as Prime Minister of India for an aggregate period of fifteen years is the world's longest serving women Prime Minister.

Conferences and discussions about women issues are welcome step but what need to be tackled are the basic perceptions of the society that gives rise to the aberrations. Today in all sectors of the economy women concerns have been flagged. But the change lies in converting these into reality, as rightly observed by Nehru," The status of women reflects the character of the country". So, we have to look into the gender issues with more sensitivity in the New Millennium. The United Nations Development programme constituted eight Millennium Development Goals (MDG) for ensuring equity and peace across the world. The third Millennium Development Goal (MDG) is directly related to the empowerment of women in India. What Indian women need therefore is not just empowerment, but a complete "Identity Revolution".

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xperimental Investigations on Beam- Column Joint with Fibers under Cyclic Loadin

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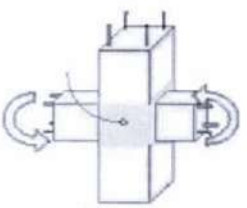
Abstract— Beam-column joint plays a main role in withstanding the horizontal and vertical shear forces under seismic excitation. The magnitudes of Beam-Column joints will be higher than other structure parts. The detailing work in Beam-Column joints have to be done carefully. If it is not done carefully then the joint will become weak link and the structure leads to fail. To prevent this detailing work should be done by following several codes. For better seismic performance ductile detailing should be done under IS 13920-1993.The beam column joint should be having high percentage of transverse hoop reinforcement in order to meet the required strength, toughness, stiffness, ductility, under cyclic loading. High percentage transverse hoop detailing is hard to execute in site. For relaxation of this difficulty steel fibers are introduced as reinforcement in some volumetric fractions and the hoop detailing can be reduced. The steel fibers will fulfils the required strength. In this project one control Beam- column joint of M-60 grade concrete with hoop reinforcement detailed as per IS 13920 and one control beam without Hoop reinforcement as per ACI-318 has been made. Then four types of Beam-Column joint specimens with volume fraction of steel fibers in 0.25%, 0.5%, 0.75%, 1% has been made. The specimens with steel fibers will not be having hoop reinforcement. The several specimens have been tested under cyclic loading and their performance has been compared.

Index Terms—Beam-Column joint, Fibers under cyclic loading & M60 grade concrete with hoop reinforcement.

I. INTRODUCTION

In RC buildings, portions of columns that are common to beams at their intersections are called beam-column joints (Figure 1.1). Since their constituent materials have limited strengths, the joints have limited force carrying capacity. When forces larger than these are applied during earthquakes, joints are severely damaged. Repairing damaged joints is difficult and so damage must be avoided. Thus, beam- column joints must be designed to resist earthquake effects.



According to Park and Paulay (1975) the essential requirements for the satisfactory performance of a joint in a reinforced concrete structure can be summed up as follows:

1. A joint should exhibit a service load performance equal to that of the members it joins.
2. A joint should possess a strength that corresponds to at least the most adverse load combinations that the adjoining members can possibly sustain, several times if necessary.
3. The strength of the joint should not govern the strength of the structure and its behavior should not impede the development of the full strength of the adjoining member.
4. Ease of construction and access for placement and compacting concrete are the prominent issues of joint design.

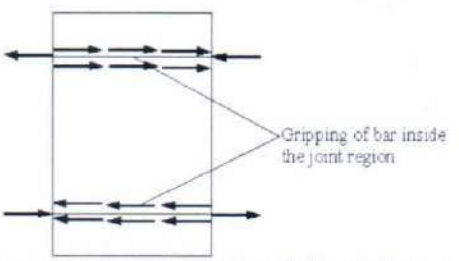


Fig 1.2: Earthquake behavior at joints (Pull-push Forces on Joints)

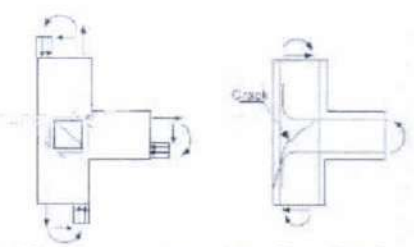


Fig 1.3a: Forces acting at joint (Poor Reinforcement)

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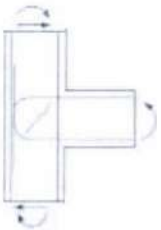

Fig 1.3b: Forces acting at joint (Satisfactory Reinforcement)

Damage Pattern of RC Beam Column Connections:

Designing beam–column joints is considered to be a complex and challenging task for structural engineers, and careful design of joints in RC frame structures is crucial to the safety of the structure. Although the size of the joint is controlled by the size of the frame members, joints are subjected to a different set of loads from those used in designing beams and columns.

The two major failure modes for the failure at joints are (a) joint shear failure and (b) end anchorage failure. A typical example of a beam–column joint failure during the 1999 Turkey earthquake is shown in figure.

Fig. 1.4 Beam-Column joint failures

II. EXPERIMENTAL STUDY

The experimental study consists of casting of fourteen large scale continuous (two-span) rectangular reinforced concrete beams. All the beams weak in flexure are casted and tested to failure,

The materials used for casting of beam-column joint samples are coarse aggregate, fine aggregate, steel fiber, silica fume and super plasticizer (High Range Water Reducer) are as shown below.

Fig. 1.5 Steel fiber

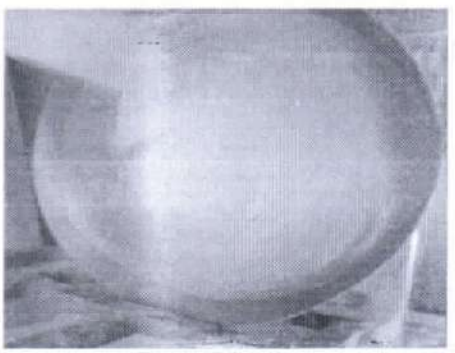

Fig. 1.6 Silica fume

Fig. 1.7 GLENIUM B233 (High Range Water Reducers)

Specimen Details

The specimens has been casted on mix 2 which is having 9% silica fume replacement and 1.75% replacement of HRWR.

Six numbers of Beam-Column joint Specimen has been casted with a dimension of Beam (800X200x150) column (1000x200X150) having 0.054m^3 volume.

The control specimen has been casted with Hoop reinforcement as per IS 13920 and without hoop reinforcement as per ACI 311and the other specimens has been casted without Hoop reinforcement.

The specimens without Hoop reinforcement has been casted with adding some percentage of steel fibre

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Detailing of Reinforcement:
The Beam-Column joint reinforcement details

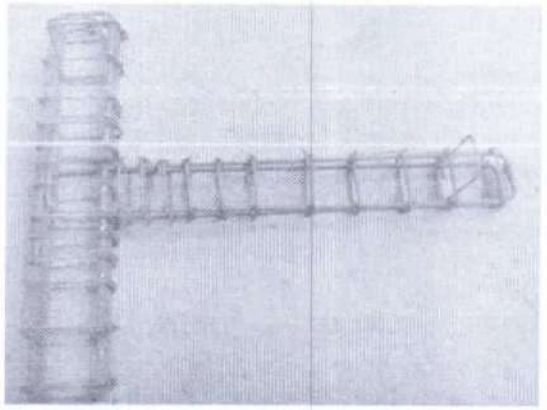

Fig. 1.8: Detailing of reinforcement (Beam-Column joint)

Table. 1 Reinforcement details of Beam and Column

Specimen Reinforcement details
For beam: Size:150x200mm Main reinforcement:
2nos .12mm dia (Ae=200mm2)
Top reinforcement: 2 nos. 12 mm dia (Ae=200mm2) Shear reinforcement:
6mm dia at 100mm c/c(up to 800mm from column face)
Confinement:
Provide 6mm diameter at 50mm c/c (up to 400mm from column face)
For column :
Size :120x 230mm Longitudinal reinforcement :
4 nos. 12 mm dia (Ae=452mm2) Later ties :
6 mm dia meter at 100 mm c/c Confinement:
6mm dia at 50mm c/c (up to 400mm from beam face)
Provide 6mm dia at 150mm c/c (remaining length)

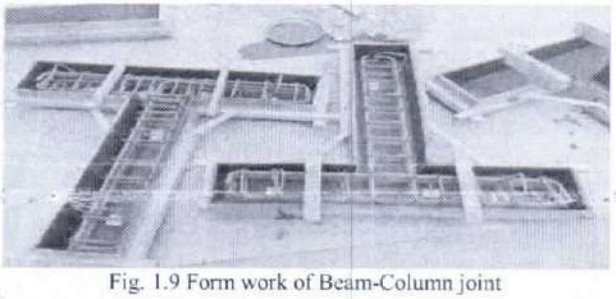

Fig. 1.9 Form work of Beam-Column joint

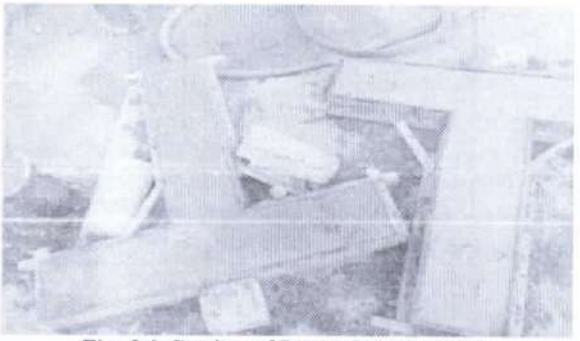

Fig. 2.0 Casting of Beam-Column joint.

Fig. 2.1 Curing of sample

IV. EXPERIMENTAL RESULTS

Testing Procedure
The testing of cubes, cylinders and beam-column specimens have been done after 28 days of curing. The following tests were performed in the present research work:
1. Stress strain behavior of concrete by conducting compression test on cylinder
2. Compression test on concrete cubes.
3. Cyclic load test on beam-column joint

Compressive Strength Test
Compressive strength measurements are primarily concerned in testing the strength of concrete. Cube specimens were tested using the 2000 kN capacity Automatic

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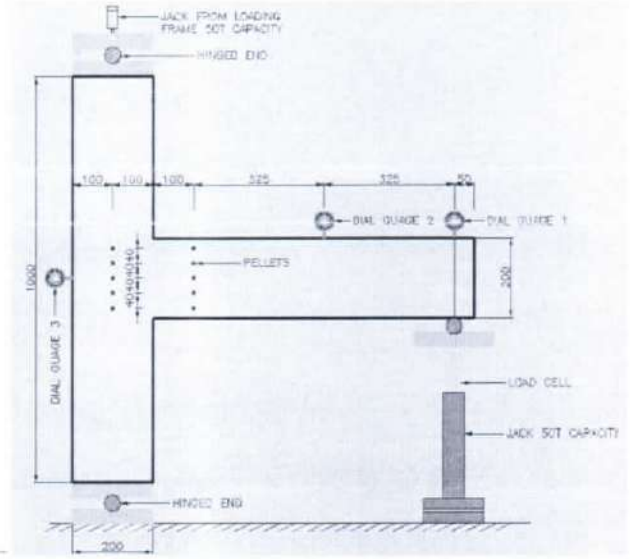

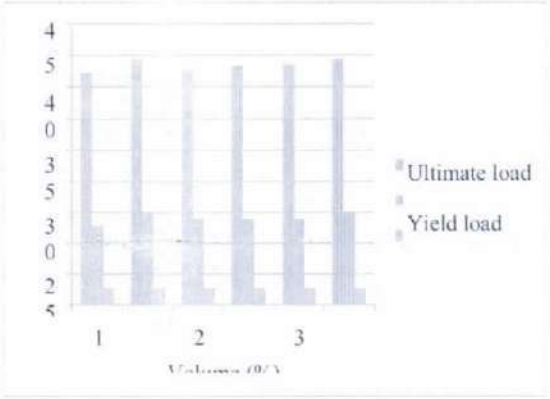

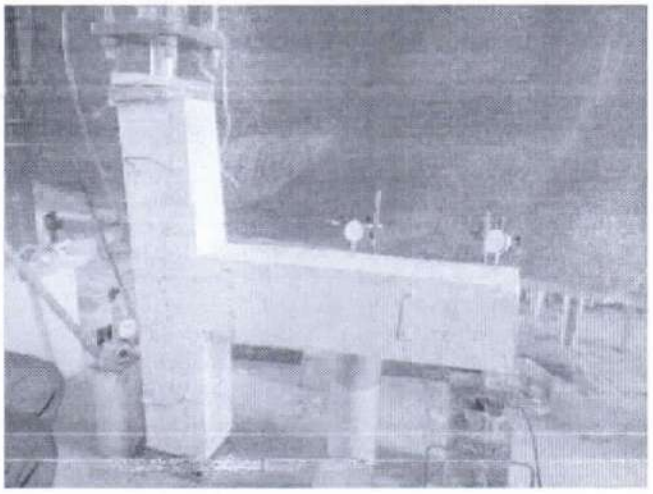

Fig. 2.2 Experimental setup

Table 2.1: Compressive Strength test for Control cylinders of Specimen

Specimen	Cylinder 1	Cylinder 2	Avg. Strength
ASC	61.54	63.22	62.38
ASCH	62.54	68.25	65.39
A1	68.26	64.13	66.19
A2	65.42	65.12	66.27
A3	61.74	66.17	63.95
A4	60.21	63.12	61.66

Table 2.2: Performance Comparison of Specimens

Specimen Name	Yield load (KN)	Ultimate Load (KN)	Deflection Ductility
ASC	13	37.26	2.86
ASCH	15	39.28	2.61
A4	14	37.54	2.68
A3	14	38.24	2.73
A2	14	38.56	2.75
A1	15	39.32	2.62

Fig 2.3 Comparison of Ultimate Load, Yield Load, and Deflection Ductility

V. CONCLUSION

In this thesis, four number of Fiber reinforced high strength concrete specimens and two number of control specimen (with and without Hoop reinforcement) tested under cyclic loading and has concluded that the effective application of steel fibers in the beam column joint concrete mix results in significantly improved joint behavior under seismic loading, in particular with an increased ductility and ultimate load than control specimen.

- The experimental specimens of beam column joints having increasing in percentage of Steel fiber with same geometrical and mechanical properties.
- It is clearly shown that an increase in fibers percentage leads to increased load carrying capacity and ductility.
- This permits to reduce the anchorage value of reinforcement in the joint region, hence limiting steel congestion in joints.
- In general, it is concluded that the effect of adding steel fibers influence the behavior of beam column joint by increasing the ductility characteristics and initial ultimate load and load carrying capacity.

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EXPERIMENTAL INVESTIGATION ON MECHANICAL PROPERTIES OF HYBRID FIBER REINFORCED CONCRETE

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Abstract: Plain concrete has a low tensile strength, ductility and little resistance towards splitting. By adding firmly divided and consistently scattered fibers to concrete this splitting can be controlled to a limit and considerably enhances its static and dynamic properties. This paper presents impact on mechanical properties of fiber reinforced concrete, for example, density, workability, compressive strength and split tensile strength. The aspect ratio of the fiber is the proportion of its length to its diameter used. A composite is named as hybrid, if at least two sorts of fibers are soundly joined to create a composite that gets advantage from every one of the individual fibers and shows a synergetic reaction. Cube and cylindrical samples have been outlined with steel fiber reinforced concrete containing fibers of 1.0, 1.5, 2.0% volume division of hooked end steel fibers of 65 and 80 aspect rations. The test outcomes demonstrated that the compressive strength and split tensile strength of HFRC with two diverse aspect rations at same volume fraction demonstrates an improvement. However, inclusion of fiber to the concrete influences the workability of concrete and can be overwhelmed by utilizing super plasticiser.

In producing the specimens, the volume content of the fiber was held at 1%,1.5% & 2% (if only one type of fibre is been mixed) and if combination is mixed means the volume fraction is held at 0.5%+0.5%, 0.75%+0.75%& 1%+1%, an improvement was obtained from the hybrid mixes when compared to all the other samples.

Key words: fibre reinforcement, hybrid composite, compressive strength, tensile strength, crimpled & hooked fiber

I. INTRODUCTION:

Concrete is a construction material made out of cement (usually Portland cement) and additionally different cementations materials, for example, fly ash and slag cement, aggregate (coarse aggregate made of smashed rocks, for example, limestone, or granite, in addition to a fine aggregate, for example, sand), water, and synthetic admixtures. The paste fills the voids in the aggregate and after the concrete is put and vibrated it solidifies to shape a strong structural part. Concrete has high compressive strength and low tensile strength. Concrete solidifies and hardens subsequent to blending with water because of a chemical procedure known as hydration. The water responds with the cement, which bonds alternate segments together, in the end making a stone-like material.

Recent earthquakes in various parts of the world have uncovered again the significance of outline of reinforced concrete structures with high ductility. Strength and ductility of structures depend for the most part on enumerating of the reinforcement in beam-column joints. The stream of forces inside a beam-column joint might be hindered if the shear quality of the joint isn't enough given. Under seismic excitations, the beam column joint zone is subjected to even and vertical shear forces whose extents are ordinarily higher than those inside the adjoining bars and sections. Regular concrete loses its tensile protection after happening of various cracks. In any case, fiber concrete can manage a part of its protection following splitting to oppose more cycles of loading. Beam-column joints have a vital part in the structural integrity of the structures. Consequently they should be given sufficient firmness and quality to support the heaps transmitted from columns to beams. The development of plastic hinges in columns must be averted since it influences the whole structure. For sufficient ductility of beam-column joints, utilization of firmly divided hoops as transverse reinforcement was prescribed in the ACI-ASCE Committee 352 .report (ACI, 2002).

All in all, when fibers are added to concrete, tractable strain in the area of fibers enhances fundamentally. On account of SFRC, since concrete is thick even at the microstructure level, tensile strain would be considerably higher than that of the traditional SFRC. This, thusly, will enhance the breaking conduct, ductility and vitality assimilation limit of the composite. With a specific end goal to tap the capability of SFRC, the current group of information must be extended. Henceforth, an endeavor has been made to think about the conduct of SFRC beam-column joint under the positive cyclic loading.

The objective of the present investigation is to evaluate the mechanical properties, physical properties, crack studies and life estimation of hybrid fiber reinforced concrete and comparing with the conventional concrete.

II. MATERIAL USED:

Cement:

In this examination, Ordinary Portland cement of 53 Grade of Brand ULTRATECH confirming to IS 12269-1987 has been utilized.

Physical properties

Specific gravity	:	3.145
Consistency	:	31%
Initial setting time	:	88 min
Final setting time	:	176 min

Coarse aggregate:

In this examination, Coarse aggregates confirming to IS 383-1970 with particle size equal to or greater than 4.75mm has been utilized.

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An Empirical Study on Family Related Issues in Health Sector

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Abstract

This study "Women in Profession" is conducted on the basis of my observation and interaction with working women, especially professional women and the realization of the fact that they are passing through strenuous period of adjustment between work at home and profession. In order to get to the root of the problem it seemed necessary to study women in their social relations at work and to discover the processes whereby their social relations have changed over time. The present study is an attempt to depict the family related issues in selected hospitals.

Keywords: Family Related Issues, Hospitals, Satisfaction, Women.

INTRODUCTION

The major problems for working wives arise out of the dual responsibilities of the working women- house work and the factory work. Even though the employment of women is accepted,

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Short Communication

Facile Magnesium Doped Zinc Oxide Nanoparticle Fabrication and Characterization for Biological Benefits

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Abstract

Zinc oxide (ZnO) is the most common and widely utilized nanomaterial for biological applications due to their unique characteristics, such as biocompatibility, biosafety and antimicrobial along with thermal stability and mechanical strength. Magnesium (Cu) is considered as a significant dopant for ZnO due to their almost similar ionic radii and their role in biological activities which enhances the biological properties of ZnO. Thus, pure and magnesium doped nanocrystalline ZnO particles were synthesized through sol-gel approach in the current study. The concentration of the dopant is varied from (0.1% - 0.3%) and the composition, structural and optical characterizations were performed by using X-Ray Diffraction (XRD), Transmission Electron Microscopy (SEM), Fourier Transform Infrared (FTIR) spectroscopy, UV-Vis optical absorption and photoluminescence (PL) spectrometer. The structural analysis confirmed that magnesium ions substitute Zn ions without altering their wurtzite structure with a high degree of crystallization. Morphological analysis confirmed that the magnesium doping process strongly influences the morphology of ZnO nanoparticles. PL measurement had been carried out at room temperature in which high intensity broad emission peaks were observed in the visible region around 450 - 700 nm that indicates the superposition of green emission bands. Thus, green photo luminescent magnesium doped ZnO nanoparticles from the current study are proposed to be highly beneficial as biosensors, photocatalysts and light-driven antibacterial agents.

Keywords: *ZnO nanoparticles, Magnesium dopants, Sol-gel approach, Photoluminescence, Wurtzite crystal.*

1. INRODUCTION

The deliberate addition of impurities into a polycrystalline material to modify their specific properties, is named as doping process. This process has become an usual technique in the fabrication of nano-particles to enhance their properties required for desired applications [1]. Especially in metal oxide nanoparticle synthesis, the introduction of metal ions as dopants are widely accepted to alter their intrinsic bandgap [2]. Generally, metal oxide nanoparticles possess narrow bandgap which makes them beneficial as semiconductor and photocatalyst [3-5]. The introduction of dopants will further enhance their electrical conductivity [6], photon absorption and release, due to the formation of dual stage bandgap [7]. Several other properties of the nano-particles are also engineered, as dopants alter their basic crystal structure and reduces bandgap, which eventually helps

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Involvement of Women in Handloom Segment: An Empirical Study With Reference To Krishna District, Andhra Pradesh

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Abstract

The handloom is a traditional craft work of India and it provides employment opportunities to lakhs of people in the rural and urban areas of our country. In the world women constitutes approximately 50% of the total population but society is still male dominated one. In India women contributed substantially to the economic growth of the country.The relationship between gender and the economy has considerable importance in Indian society. In general attitude of the people women are second grade citizens and they are makers of food, pickles, papads, masalas etc,. But their role is very important in every economic activity, either it is household work or cultivation or industry or service sector etc,. Like the other sectors the role of women weavers is very much important in handloom sector. Handloom sector is unique in India. The handloom weaving is household profession, followed by generations. In these households, women play an important role. Handloom sector is the only manufacturing sector in which women producing for women.

Keywords: Women Weavers, Participation of Work, Handloom Sector, Krishna District, Andhra Pradesh

Introduction

Handloom sector in India is growing and has been undergoing many changes within its structure that affect its main features. Handloom weaving plays an important role in the growth process of the state as well as the country. This sector has been considered prominent because of the traditional artisan craft skills of the weavers which meet the local needs and demands.Irrespective of gender the Handloom sector has self sustaining mechanism.There is a sufficient flexibility for all types of communities to take up handloom production as a profession. In modern times the handloom sector has different strengths. It is simple, and is associated with appropriate technology. Women as a whole in the world wide suffer from secondary status .In India also they are in lower most hierarchy.The discrimination of women is related to her socio-economic status but differs from region to region ,in rural and urban areas.

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Pragmatic Analysis on Staff Related Issues in Selected Hospitals

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Abstract

For the efficient management of an organization, it is pertinent that personnel working in different capacities in the different departments make possible friendly relations. Superiors would remain superiors even if they are influenced by ego. The supervisors acting like a superior and behaving like an officer/administrator, the possibilities of degeneration in the relations can't be overruled. The service of hospitals based on the staff it is essential for all the personnel irrespective of the rank and position they hold make sincere and honest efforts to accomplish the organizational goals. The present study is an attempt to portray the staff related issues in selected hospitals like GEMS, KIMS, RIMS, GMR.

Keywords: Employees, Health Sector, Hospitals, Staff Related Issues.

1. Introduction

From time immemorial women have been working – working everywhere - at home, in fields, factories and many other workplaces. However, women as a distinct segment of workers emerged and got recognition only with the emergence of industrial production After the industrial revolution, the social situations changed throughout the world and so in India. The family no more remained a centre for production. Due to industrialization and urbanization new social norms and values emerged. Job opportunities, economic hardship and favorable cultural and social situation encouraged the women to seek employment outside the home.

After independence of Country the number of women to come out of their houses for work increased day by day. They also took the education. In the early period women were mostly engaged in unskilled or semi-skilled occupations, as ayahs, nurses, mid wives, water women, cooks, domestic servants, as laborers on construction sites, in agricultural farm and on plantations. But now they are increasingly being employed in services, industries, shops, establishments, offices and professional / technical occupations. This change enhanced the status of women on the one hand and Country prosperity on the other, but it gave rise to many problems and difficulties for them by way of exploitation, discrimination and dismal working conditions. They have to perform dual responsibilities respectively termed "reproductive" and productive. This is not an easy task for women to work at home and working place. The problems and difficulties got multiplied due to their peculiar social, biological and psychological conditions and due to their illiteracy and ignorance.

2. Purpose of the Study

- The purpose of the study is to analyze the staff related issues in selected hospitals like GEMS, KIMS, RIMS, GMR.

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Work Place Related Issues in Health Sector: An Empirical Study With Reference To Selected Hospitals

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Abstract
The condition of working women in India as well as in the entire world in general is considered to be very distressing. Working women in general are subject to discrimination at various levels. The problems and difficulties of working women are multi-dimensional, varying from woman to woman at personal level, and section to section at general level and hence need to be analyzed in depth. There are very serious problems of wages, employment, income and standard of living and sexual harassment among working women. They are not able to get any advantage of social security schemes. Due to their ignorance and illiteracy they are not benefited from present welfare schemes. There has indeed been a growing realization that the women workers form an integral part of the process of national development. This has made the government make continuous effort to give women workers a better deal in spheres of work and to recognize their contribution to the socio-economic development of the Country. However, what has been done remains a drop in the ocean and the women worker remain exploited and unprotected working hours, conditions of work, wages, types of job and other situation is still not favorable to women workers. Women workers have many problems and problems of working women are more serious and server. The present study is an attempt to portray the work related issues in selected hospitals (i.e. GEMS, KIMS, RIMS, GMR).

Keywords: Appearance, Hospitals, Modern Equipment, Working Hours

1. Introduction

The Statement of the American Nurses Association for the Institute of Medicine's Committee on Work Environment for Nurses and Patient Safety reported that the conducive work environment should first enable nurses with decision-making authority and professional autonomy at the point of care delivery and in all areas where decisions related to care delivery are made. Second, provide safe and appropriate nurse staffing levels. Third, all healthcare facilities and agencies should be required to participate in the collection and external reporting of standardized nursing-sensitive data - both to assess the sufficiency of staffing and to quantify the safety and quality of care for consumers and payers. Fourth, it is time to actively invest in research around staffing, fatigue, safety, and outcomes.

2. The Hospital has Modern Looking Equipment

Modern Hospitals need to address improving the patient experience not as a short term fix but as a long term strategic goal that leads to continued growth. "Improving patient satisfaction is a key to future survival," says Irwin Press (Improving the patient experience in healthcare organizations can lead to higher quality care, more satisfied staff, fewer preventable medical mistakes, fewer malpractice, law suits and an improved financial bottom line. It also can lead to significant competitive growth strategy word of mouth publicity about how a hospital maintains its relationships with patients can either increase visits or send potential patients to another hospital. The manner and environment in which care is delivered, how well a doctor explains the treatment, how a nurse administers medication, the level of noise, all contribute to a patients care experience. Thus, to promote change in the

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Impact of General Elections on Stock Markets in India

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ABSTRACT

Stock market fluctuation is based on news. The news which is related to economy, political events weather conditions and relationship between countries could impact on stock market fluctuations. The objectives of the study is to analyze the effect of general elections on both NSE and BSE returns in pre-elections and post-elections period and to analyze and compare the volatility i.e. variance of daily returns in the stock market for short term (10 days), medium term (20 days) & long term (30 days) in pre-elections and post- elections period.The analysis has been emphasizing to measure the volatility, average returns and impact of elections . For this analysis 5 election sessions were considered that is 1998 – 2014. To analyse the data t test, f test are used. The daily closing prices of NIFTY & SENSEX index have been collected from the yahoo finance website for a period from 1998 to 2014 which includes a total of 5 Lok Sabha. The time period of the study has been classified into pre-elections and post elections period. It is concluded that the Election has more effect in short term, less in medium term and it diminishes in the long term after the Election announcement.

Keywords: *Stock market, election, Nifty, Sensex, Lok Sabha, etc.*

INTRODUCTION

History has demonstrated that stock market (financial system) plays important role in economy for economic growth. Stock market is also reflects the country's status. Now a days,stock market has been impacted by many factors which are political, weather condition etc., we are in technological world where news could be spread all over the world within a short span of time. Because of this, every news could be reached to the public so that investors could analyse news which is related to stock market. So stock market fluctuation is based on news. The news which is related to economy, political events weather conditions and relationship between countries could impact on stock market fluctuations.

We have taken an event which has been an important reason of stock market fluctuations in India. The event is Lok Sabha Election in India 2014. Political events usually have great impact on the stock market. In many cases, the stock market fluctuates because of political announcements such as regulation promulgation, law amendments and national elections.This study discusses the impact of Lok Sabha elections on stock market. BSE and NSE Index have been taken for the analysis. Events study has been conducted in this paper. The events is 12th to 16th Lok Sabha election and the previous elections result date is 16th may 2014.

The present study analyses the reaction of stock market on the announcement of elections. The previous researches suggest that immediate response can be considered important after the elections announcement and markets can also be given some time to digest the information. In the light of this effect, elections impact has been studied on 10 days (short term), 20 days (medium term) and 30 days (long term).

The study will help investors to invest cautiously and act as guidance on their investment decision around the elections pre and post period. The investors are able to understand volatility in the market due to announcement of elections in a particular financial year. It helps the investors to minimize their overall risk and maximize returns of their investment during this period.

REVIEW OF LITERATURE

Ling-Chun Hung (2011)

Has describedthat History has demonstrated the fact that politics and economyare intertwined. Presidential election is considered the

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Genesis for Increase of Npas in Indian Banks – An Empirical Analysis

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ABSTRACT

A strong banking sector is essential for a flourishing economy. A major hindrance faced by most banks today is the problem of non-performing assets (NPA's).A high level of NPA's suggests a high degree of credit defaults which, in turn affects the profitability of banks. Decreased profitability implies an unfavourable financial statement which in turn discourages investors from investing in the banks under consideration. Thus, the banks lose out on investments in the long run. Non-Performing Assets are a burning topic of concern for the public sector banks, as managing and controlling NPA is very important. This paper discusses the causes for increase of NPAs and they are ranked with the help of Garrett Ranking Technique. Therefore banks need to effectively control their NPAs in order to increase their profitability and efficiency.

Keywords: *Efficiency, Garrett Ranking, NPAs, Profitability.*

INTRODUCTION

The banking system is the heart of the financial system. The major function of the financial system is the mobilisation of the public savings and its allocation in different sectors of the economy as an investment. All over the world, the banking industry acts as a catalyst for the country's economy and growth. Banks provide financial assistance to a wide range of sectors such as iron and steel, automobiles, infrastructure, health care etc. In developing economies, banks play an important role not only in the economic development but overall development of the economy which is linked to the upliftment of the weaker sections of the society by providing loans to priority sectors like agriculture, rural housing etc. In the starting when the financial reforms were undertaken by the Government of India based on the Narasimham Committee report I and II, Reserve Bank of India introduced some prudential norms to address the credit monitoring policy, which were being pursued by the banks and other NBFCs. Thus, banking fulfills the social agenda of the government also. However, granting loans indiscriminately without taking into consideration the credibility of the borrower has harsh consequences for the banks in terms of generation of NPAs.

In the past decade or so, the problem of nonperforming assets has been faced by economies around the world. A high level of NPA's can adversely affect the economy in various ways ,one of them being the utilization of banking resources towards resolving the loss due to NPA's. This makes the banks more vigilant and strict in providing new loans, particularly to small and medium sized companies which maybe reliable companies but have nothing to show for their credibility. This, in turn hampers the development of the country especially developing countries whose growth depends upon the development of these industries. Thus, large scale NPAs ,if left unattended can cause financial and economic degradation of the country.

But statistics shows NPA level is ever increasing day by day, and the said act, which was introduced by the Government of India, is not serving the purpose, they were actually formed. The reason behind it can be the bank's approach and attitude towards financing and recovery of loans especially from the small and medium enterprises and also the lack of knowledge about the law and its practice in banking and also violations of the RBI directives/circulars, which are essential to follow by every bank and financial institutions.

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Participative Management of Employees in Decision-Making: An Empirical Study

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Abstract

Participative management of employees in decision-making is considered as a mechanism where workers have a say in the decision making process of an organization. In India WPM is an element of government labour policy. The concept behind this is to improve better relations among employees and workers. The present paper tries to explore about the workers participation in management in Visakhapatnam Steel Plant (VSP) by considering 604 respondent employees of steel plant in order to know their opinions regarding the above mentioned topics by using convenient sampling method, because VSP is big organization consisting of more than 20,000 employees (Both Permanent and Contract). All the employees are busy at their work and it will be difficult to collect the first hand information from the employees by using any other sampling methods except convenient sampling method.

Keywords: Employees, Joint Consultative Machinery, Participative Management, Visakhapatnam Steel Plant, Visakhapatnam.

1. Introduction

The highlights of the Indian experience, with regard to workers' participation in management is that, the schemes have although been initiated by the government. Taking into account the economic, political and worker/trade union situation in India, the government's initiative for participative management is justified. The global experience also stands testimony to such initiative. The trade unions in India who have demanded for nationalization of industry that culminate in people's participation in the economic activity have been conspicuous by their silence with regard to workers' participation in the industrial activity.

There has been a phenomenal growth in number of units adopted by JMCs in public sector (augmented from eight in 1958 to 140 in 1976). JMCs in some of the public sector undertakings, for example, Bharat Heavy Electricals Limited have provided an appropriate forum for effective communication, and management unreservedly furnished all facts and information sought for, the unions have responded by moderating their enthusiasm and exercising reasonable restraint in demanding information, disclosure of which could be detrimental to the interest of the organization. Deliberations in JMCs are characterized by mutual understanding and a high level of objectivity in the appreciation of problems without acrimony or emotionalism.

2. Objectives of the Research

- To present the scenario of participative management in VSP.
- To recognize various participative forums in Visakhapatnam Steel Plant.
- To know the opinions of the respondents regarding the success of Participative Management.
- To identify the reasons for limited success of workers participation.

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Impact of Group Dynamics on Team

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Abstract

After a brief review of integrative small group learning models that have appeared in the educational psychology literature, this article then looks into the group dynamics literature and describes one of that field's most well-documented findings: that interactions among group members change somewhat predictably over time. How theorists from various traditions within educational psychology might explain and explore the phenomenon of "group development" is proposed, followed by a description of the theoretical and practical features of an increasingly popular post-secondary instructional strategy designed to stimulate group development and leverage it to instructional ends. So group dynamics can be called as a life base of a team. So in this study the researcher has conducted a study on various aspects of group dynamics. The researcher has collected data using collection techniques and has used various tools to analyze the outcomes to get considerable results.

Keywords: Group Dynamics, Team, India.

1. Introduction

The term group dynamics usually refers to the study of individuals interacting in small groups and this thumbnail definition gives rise to a number of questions related to groups. What is a group? Is the concept group needed? If group exist, how do they function? Are there principles or laws governing group behavior? As a point of reference, I would like to suggest that a group is a living system, self-regulating through shared perception, interaction, sensing, feedback and through interchange with its environment. Each group has unique wholeness qualities that become patterned, by way of members' thinking, feeling and communicating into structured sub systems. The group finds some way to maintain balance while moving through progressive changes, creating its own guidelines & rules and seeking its own goals through recurring cycles of interdependent behavior. We are all familiar with another usage of group.

We may define a group of people who lack motivation, or designate a group of people who succeed. In all these cases the groups of individuals are not interacting together, but separately as individuals and are being used for statistical or comparative purposes. By looking at the dynamics we will quickly see how our focus is better defined as which implies forces that are complex and interdependent in a common reference or setting.

1.1 Why look at group dynamics

Understand that much of our lives are spent with one group or another. Therefore, a better comprehension could make our time more productive and fulfilling. If we make an assessment of our time, our contributions, our productivity, and the usefulness of our interactions or return on our investment, we will more demanding of all group activities. If you have goals for your life the only way you will ever see them become reality is to stay

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GRID CONNECTED PV SYSTEM USING CURRENT FED DUAL ACTIVE BRIDGE DC –DC CONVERTER BASED CASCADED MULTILEVEL INVERTER WITH LOW FREQUENCY RIPPLE FREE MPPT

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Abstract- A Grid tied photovoltaic system consisting of modular current-fed dual-active-bridge (CFDAB) dc–dc converter with cascaded multilevel inverter is proposed. The proposed converter allows a small dc-link capacitor in the three-phase wye-connected PV system; therefore, the system reliability can be improved by replacing electrolytic capacitors with film capacitors. The low-frequency ripple-free maximum power point tracking (MPPT) is also realized in the proposed converter. First of all, to minimize the influence resulting from reduced capacitance, a dc link voltage synchronizing control is developed. Then, a detailed design of power mitigation control based on CF-DAB dynamic model is presented to prevent the large low-frequency voltage variation propagating from the dc-link to PV side. Finally, a novel variable step-size MPPT algorithm is proposed to ensure not only high MPPT efficiency, but also fast maximum power extraction under rapid irradiation change. This proposed work is carried out using MATLAB/Simulink Platform.

Index Terms- Current-fed dual active bridge (CF-DAB), optimized operation, photovoltaic (PV), root-mean-square (RMS) current, soft switching.

I. INTRODUCTION

Photovoltaic (PV) energy has become one of the most popular sustainable energy sources nowadays [1]. Due to continuous cost reduction and government incentives, the installation of grid-integrated PV system has grown rapidly in the past few years [2]. As a promising topology for grid-tied PV system, the cascaded multilevel inverter (CMI) has many advantages, such as modularity, high ac voltage application with low device rating, low harmonic spectra and low electromagnetic interference, etc. [3], [4]. In addition, distributed maximum power point tracking (MPPT) terminal for segmented PV arrays can be achieved by a CMI PV converter [5], [6]. In MW-scale high-voltage grid-tied PV systems, galvanic isolation between the PV panel and the grid is required to prevent electric shock on PV panel due to insulation damage and to suppress leakage current. Hence, compared to single-stage CMI converter, the cascaded multilevel inverter integrated with high frequency-link (HFL)-based dc–dc converters has advantage of providing galvanic isolation between the PV panel and the grid without using bulky line-frequency transformer. However, in a three-phase wye-connected CMI PV system with dc–dc stage, electrolytic capacitors are used as the dc-link energy buffers between dc–dc stage and inverter stage to provide the double-line-frequency (2ω) power to the grid [7]. Though electrolytic capacitor has high capacitance density, it has been considered as a particularly unreliable component, which is on average 30 times less reliable than non electrolytic capacitor under identical conditions [8], [9]. Therefore, capacitance reduction is highly desirable in order to achieve high reliability with non electrolytic film capacitor [10]–[12], especially for the high-voltage CMI PV system. Nonetheless, the small dc-link capacitance will make the converter suffer from large 2ωvoltage ripple on the dc-link.

If this voltage ripple propagates to the PV side, it will deteriorate the MPPT performance and decrease the MPPT efficiency [13]–[15]. To solve this issue, current-fed isolated dc–dc converters have inherent advantages over the voltage-fed types because the input current of current-fed converter can be controlled directly, and thus, it is possible to eliminate the input low-frequency power ripple in the PV side by special designed current control. Several isolated current-fed dc–dc converters have been studied for various applications [16]–[22]. Jiang et al. [16] have proposed a current-fed boost-half-bridge PV micro inverter; due to the high reverse recovery loss of the diodes at transformer secondary side, the switching frequency is relatively low. To alleviate the loss on the diodes, a resonant operating mode with ZCS condition based on the same topology is proposed in [17]. Nonetheless, the dc-link capacitor is still large and the lower switch suffers from hard switching of high peak current. The current-fed full-bridge converters are suitable for high-power applications [18], however, start-up circuits are needed since the duty cycle can never be smaller than 0.5. Active clamp circuits are usually adopted to extend the duty-cycle range as well as enable ZVS operating [19], [20]. In [21], a three-phase current-fed dual-active-bridge (CF-DAB3) converter is proposed for PV application on a dc distributed system. Although it has high power capability, the converter faces phase current unbalancing issues. The current-fed dual-half-bridge (CF-DHB) converter with small dc-link capacitor for fuel cell applications has been proposed by authors in [22], and the input low-frequency ripple current is successfully mitigated by applying direct feedback compensation in the phase-shift control. Unfortunately, the half-bridge topology will suffer from unbalanced capacitor voltage if the duty cycle is not 0.5. Moreover, low-frequency resonance may occur between the reduced dc-link capacitor and transformer magnetic inductor, resulting in large transformer current. This thesis proposes a grid-tied CMI PV system based on a current-fed dual-active-bridge (CF-DAB) dc–dc converter that enables using small film capacitors. A dc-link voltage synchronizing control, i.e., "d=1" control, is applied to reduce the high current stress and consequent loss in the converter resulting from unbalanced dc-link voltage between primary side and secondary

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A SOFT SWITCHING TWO STAGE BUCK – BOOST CONVERTER FOR WIND POWER APPLICATIONS

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***Abstract*- A novel two – stage buck boost converter with soft switching operation for renewable energy applications is proposed in this paper. Two identical buck boost converters connected to each other through an inductor works in parallel in the proposed converter. This inductor plays an important role in the soft switching operation of the converter by maintaining the voltage applied to switches at zero at switching intervals. Zero voltage switching method of control is being used for switching. This method of switching proposed converter is efficient in the reduction of switching losses and improvement in efficiency of converter. Moreover, because of the parallel operation of two identical converters, the output voltage and the input current contain fewer ripples than those of a single converter with the same specifications. Also, utilizing only one inductor as an extra element to achieve this goal makes the proposed converter more economical and reliable with a simpler structure. The detailed analysis of the circuit operation is provided in eight modes. The performance of the proposed converter is also analyzed by using it in wind power generation system. The proposed converter is simulated in MATLAB/Simlink platform.**

***Index Terms*-** DC-link voltage balance, Zero voltage switching, Renewable Energy (RE).

I. INTRODUCTION

DC/DC converters are used for many purposes when the conversion between two dc voltage levels such as electrical vehicles, active filters, power factor correction circuits, distributed generations, dc/dc regulated power supplies, etc., is required [1]–[3]. These types of converters are divided into several types depending on the increase or decrease of the output voltage level with respect to the input voltage. This paper focuses on the buck-boost dc/dc converters which can operate in either buck or boost modes, i.e., they can be used in both step-up and down applications. Another counterpart of these converters is the Cuk converter with a large number of circuit elements in its structure. The main application of step-up/down converters is in regulated dc power supplies, where the output negative polarity may be desired with respect to the common terminal of the input voltage supply.

The efficiency of the dc/dc converters is an important issue which has received great attention in literature works. In this regard, various control strategies and converter topologies are proposed for the soft switching operation of the converters to achieve minimum switching losses leading to more efficient operations [1], [4]–[6]. Soft switching techniques utilizing the features of Zero-Voltage Switching (ZVS) or Zero-Current Switching (ZCS) substantially reduce the switching losses [7]–[10]. Some of these approaches include active clamps [11], and passive and active snubbers [12]–[14]. In some cases, a combination of ZVS and ZCS techniques has also been discussed [12], [15], [16]. Nowadays, interleaved converters are utilized in many applications and provide many advantages such as increasing efficiency, reducing the voltage and current ripple, and supplying more load power. The ZVS operation of the parallel boost converters has been investigated. The inductor placed between two parallel converters is called the interleaved inductor and displaces the resonating current between two converters at particular time intervals in order to perform the soft switching operation of the set. The operation procedure of this kind of converters is described in two sets of symmetric scenarios depending on the situation of the resonating current.

In this paper, a double-deck buck-boost converter with an effective ZVS technique is proposed. The operational principles of the proposed converter are surveyed and summarized in eight modes. It is shown that the switching process can perform with the minimum losses by applying the gate signals at particular time intervals. Moreover, it is also concluded that utilizing of two converters in parallel causes less ripple in the output load voltage. In addition, the fact of using only one inductor as an extra element to achieve the main goal of this paper suggests that the proposed converter is more economical than the soft switched converters by adopting coupled inductors or transformers.

II. OPERATION OF CONVERTER

The configuration of the proposed converter is shown in Fig. 1. It is consist of two identical buck-boost converters working in parallel. The source and the output capacitor Co are shared between two converters. The inductor Ls is placed in parallel with two switches, as shown in Fig.1. This element plays an important role in main plot of the soft switching manner of the converter. It discharges the intrinsic capacitances of the switches by creating a resonant circuit. Then, the switching could be done

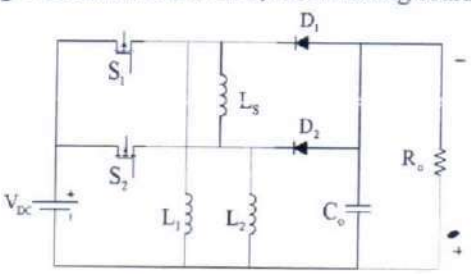

Fig. 1. Configuration of the parallel buck-boost converters.

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COMMON COUPLED FIXED POINT THEOREMS FOR FOUR MAPPINGS IN DISLOCATED QUASI b-METRIC SPACES

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ABSTRACT

In this paper, we prove two common coupled fixed point theorems for four mappings in dislocated quasi b-metric spaces and provide two examples to support our theorems. Our results generalize some existing results in the literature.

Mathematics Subject Classification: *47 H 10, 54 H 25.*

Keywords: *Dislocated quasi b-metric, coupled fixed points, w-compatible pair of maps, Cauchy sequence.*

1. INTRODUCTION

Hitzler [7] and Hitzler and Seda [6] introduced the notion of dislocated metric spaces and generalized the celebrated Banach contraction principle in such spaces.

Zeyada *et.al* [15] initiated the concept of dislocated quasi metric spaces and generalized the results of Hitzler and Seda [6] in dislocated quasi metric spaces.

The notion of b-metric space was introduced by Czerwic [3] in connection with some problems concerning with the convergence of non measurable functions with respect to measure.

Recently Klin-eam and Suanoom [8] introduced the concept of dislocated quasi b-metric spaces and which generalize b-metric spaces [3] and quasi b-metric spaces [13] and proved some fixed point theorems in it by using cyclic contractions.

The authors [1,5,8,10,11,12,14] etc. obtained fixed, common fixed points and common coupled fixed point theorems in dislocated quasi b-metric spaces using various contraction conditions for single and two maps.

In this note, we prove two common coupled fixed point theorems for four maps in dislocated quasi b-metric spaces and we also give examples to support our theorems.

Bhaskar and Lakshmi kantham [4] developed some coupled fixed point theorems in partially ordered metric spaces. Lakshmi kantham and Ciric [9] defined common coupled fixed points for a pair of mappings. Abbas *et al.* [2] introduced w-compatible mappings and proved some common coupled fixed point theorems in cone metric spaces.

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Improvement of Power Quality by Hybridized Seven Level Inverter

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ABSTRACT

Distributed generation (DG) with converter interface to the grid is found in many of the green power resources applications. This paper presents a novel single phase seven level inverter to reduce harmonic content in output voltage and load current. Level shifted multi carrier pulse width modulation (LS-PWM) is used as the switching scheme for the proposed inverter. The validity of proposed inverter is verified through simulation for RL load.

KEYWORDS: *Distributed power generation, multilevel inverter, LS-PWM, modulation index*

I. INTRODUCTION

A renewable energy application such as photovoltaic (PV) system has been widely used for a few decades since PV energy is free, abundant and distributed throughout the earth. The focus of the Engineers is to make use of abundantly available PV energy and so to design and control an inverter suitable for photo voltaic applications. Power electronic circuits with pulse width modulation (PWM) are mostly used in energy conversion systems to achieve closed loop control. But even updated pulse width modulation (PWM) techniques do not produce perfect response which strongly depends on the semiconductors switching frequency. Also, it is well known that distorted voltages and currents waveforms produce harmonic contamination, additional power losses, and high frequency noise that can affect not only the load power but also the associated controller. The conventional single-phase inverter topologies for driving induction motor include half bridge and full bridge [1]. They are transformer less configuration.

The half-bridge inverter is configured by one capacitor arm and one power electronic arm. The output ac voltage of the half-bridge inverter is two levels. The full- bridge inverter is configured by two power electronic arms. The popular modulation strategies for the full-bridge inverter are bipolar modulation and uni-polar modulation [2]. The output ac voltage of the full-bridge inverter is two levels if the bipolar modulation is used and three levels if the uni-polar modulation is used. Bipolar modulation has less leakage current, but causes more harmonics and more losses.

In order to reduce the losses, uni-polar PWM (Pulse width modulation) is commonly used. All power electronic switches operate in high switching frequency in both half -bridge and full bridge inverters. The switching operation will result in switching loss. The loss of power electronic switch includes the switching loss and the conduction loss. The conduction loss depends on the handling power of power electronic switch. The switching loss is proportional to the switching frequency, and the current of the power electronic switches. The power efficiency can be advanced if the switching

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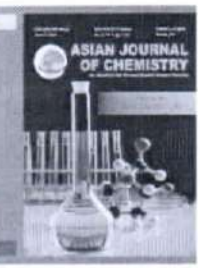

Effect of Precursors on Structural and Optical Properties of Sol-Gel Synthesized ZnO Nanopowders

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The present work aims at evaluating the outcome of zinc precursors on the crystal structure, shape, surface and optical properties of ZnO nanopowders. Zinc oxide nanopowders are fabricated *via* simple, cost-effective, low-temperature, the sol-gel method using different zinc precursors such as zinc nitrate and zinc chloride. The structural properties of the obtained ZnO nanopowders are studied using X-ray diffraction spectra and their morphology from SEM micrographs. Further, Fourier transform infrared spectra reveals the existence of functional groups that supports the formation of zinc oxide. Moreover, optical absorption and emission of ZnO nanopowders were evaluate during ultraviolet-visible and photoluminescence spectra. The results of this study revealed that the precursor is significant in altering the crystallite size, shape, optical absorption and emission entities of nanopowders. In addition, the role of zinc precursors to fabricate nanopowders that is suitable for various optoelectronic device applications were also discussed.

Keywords: ZnO nanopowders, Crystallite size, Morphology, Opto-electronic devices.

INTRODUCTION

In the past, semiconductor nanoparticles gained importance innumerous industrial, biomedical and electronic applications due to their extremely large surface area with quantum size effect [1]. The synthesis and characterization of semiconductor nanoparticles are crucial in determining their exclusive properties and applications [2]. In recent times, these nanoparticles are successfully utilized in various commercial products including solar cells, catalysts, light-emitting diodes and opto-electronic devices [3]. Metal oxide nanoparticles are unique semiconductors that possess enhanced large surface area, chemical stability, biocompatibility, improved electrical characteristics, elevated optical absorption with less toxicity, compared to other nano-sized semiconductors. Further, these nanoparticles are utilized as building blocks for optoelectronic and electronic devices [4]. Among metal oxide nanoparticles, ZnO is extensively used in several applications due to their direct, extensive band gap of 3.37 eV, elevated exciton binding energy of 60 meV, eclectic transparency, increased electron mobility, robust room temperature luminescence, enhanced chemical stability, improved flexibility and absorption during fabrication. These properties of ZnO nanoparticles have attracted researchers to fabricate optoelectronic devices and luminescent materials [5].

Several studies reported chemical approaches for the fabrication of ZnO nanopowders with different sizes, morphologies and surface properties [6-8]. In recent times, coprecipitation, microemulsion, laser ablation, solid state reaction method, melt mixing and ball milling is used to synthesize ZnO nanopowders for desired applications [9-11]. However, utilization of toxic chemicals and tedious synthesis procedures are considered as challenges to use these approaches for down streaming processes [12-15]. Thus, the present study focuses on utilizing simple sol-gel procedure with commonly available, less toxic and cost-effective zinc precursors to fabricate ZnO nanopowders for optoelectronic device applications [16]. Further, literatures suggested that the synthesis parameters such as concentration and type of precursor, reaction time, pH variations, temperature, concentration of reagents and catalysts, phase transition in sol-gel process and calcination has ability to influence the size

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IOT BASED E-BILLING AND E-AUDITING USING CLOUD INTEGRATION

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ABSTRACT

IOT design and implementation is presented in this paper electronic billing and electronic-auditing (e-auditing) system to provide an easier and more reliable method for billing from any area of the world using internet, and perhaps to ensure the auditing procedures of the daily consumed electricity, It provides a systematic routine for the customers to remind them to pay the bill on time with an SMS alert on correct schedule, or else the electric power connectivity can be turned off autonomously from the distant host i.e. the created web page using, Dot NET and # C .Daily consumption reports as well as a comparison of the previous month and present month average is displayed on web portal page as well as SMS alert. In order to save energy all over the designed system is concentrating on the automation of electronic devices based on the visitor counter, using sensors.

KEYWORDS: Internet of thing (IoT), power consumption, smart devices-auditing-billing.

INTRODUCTION

Network of things may be defined as IOT or various applications. So IoT has become the host and most important subject in current digitalized world since it promises to be most reliable method in the internet connectivity for all kinds devices and physical objects (analog and digital devices).The studies held over the digitalized devices have proven the functionality of IoT. The studies held over the digitalized devices have proven the functionality of IoT, to modify the shape of living by ensuring cost effective living including safety, security and entertainment.

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19-20

A Novelty on Mobile Devices Fast Authentication and Key Agreement

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ABSTRACT--*Gadget to-gadget correspondence is generally utilized for cell phones and Internet of Things. Validation and key understanding are basic to manufacture a safe channel between two gadgets. In any case, existing methodologies frequently depend on a pre-fabricated unique mark database and experience the ill effects of serene age rate. We present GeneWave, a quick gadget confirmation and key assention convention for item cell phones. GeneWave first accomplishes bidirectional starting verification dependent on the physical reaction interim between two gadgets. To keep the precision of interim estimation, we wipe out time vulnerability on ware gadgets through quick flag location and excess time crossing out. At that point, we infer the underlying acoustic channel reaction for gadget verification. We structure a novel coding plan for productive key assention while guaranteeing security. Hence, two gadgets can confirm one another and safely concur on a symmetric key.*

Keywords*—Device authentication, key agreement, acoustic communication, security.*

I. INTRODUCTION

DEVICE-to-device (D2D) communication has been widely used as the fast development of mobile and Internet of things (IoTs) technology in recent years. For example, mobile and IoT devices use D2D communication for file sharing, mobile paying, data collection, etc. Despite of its prevalence and convenience, D2D communication has security vulnerability issues in practice. It faces attacks such as eavesdropping, impostor attacks, and man-in-the-middle attacks due to the use of open communication channels [6]. For example, it is common that a wearable device (e.g. smart watch) shares health data with a mobile device through open channels. Under an insecure communication channel, private data such as personal identity information, health conditions, and movement trajectory is easily leaked. To support secure D2D communication in open wireless channels such as Wi-Fi, Blue Tooth and Zig Bee, device authentication and key agreement should be performed among mobile devices. Before communication, two devices authenticate each other and agree on a symmetric key. Then those two devices can build a securecommunication channel on open wireless channels by using the symmetric key to encrypt their data. Traditional device authentication methods rely on a trust management center, and not suitable for IoT devices which may not have Internet access. Message transmission of online authentication service may lead to privacy leakage. Secure device authentication and key agreement among mobile devices have attracted many efforts [1]. A large portion of methods use the physical proximity of devices as the feature for device authentication. Those methods are based on an observation that two devices in physical proximity can usually obtain similar physical

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RESEARCH ARTICLE OPEN ACCESS

Conceptual Oriented Analysis on the Modern Tools and Techniques to Enrich Security Vulnerabilities in Ethical Hacking

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ABSTRACT

The state of security on the internet is bad and getting worse. One reaction to this state of affairs is termed as Ethical Hacking which attempts to increase security protection by identifying and patching known security vulnerabilities on systems owned by other parties. As public and private organizations migrate more of their critical functions to the Internet, criminals have more opportunity and incentive to gain access to sensitive information through the Web application. Thus the need of protecting the systems from the trouble of hacking generated by the hackers is to promote the persons who will punch back the illegal attacks on our computer systems. So, Ethical hacking is an assessment to test and check an information technology environment for possible weak links and vulnerabilities. Ethical hacking describes the process of hacking a network in an ethical way, therefore with good intentions. This research paper describes what ethical hacking is, what it can do, an ethical hacking methodology as well as some tools which can be used for an ethical hack.

Keywords :— Vulnerabilities, Hacker, Cracker, Port and Intrusion.

I. INTRODUCTION

The vast growth of Internet has brought many good things like electronic commerce, email, easy access to vast stores of reference material etc. As, with most technological advances, there is also other side: criminal hackers who will secretly steal the organization's information and transmit it to the open internet. These types of hackers are called black hat hackers. So, to overcome from these major issues, another category of hackers came into existence and these hackers are termed as ethical hackers or white hat hackers. So, this paper describes ethical hackers, their skills and how they go about helping their customers and plug up security holes. Ethical hackers perform the hacks as security tests for their systems. This type of hacking is always legal and trustworthy. In other terms ethical hacking is the testing of resources for the betterment of technology and is focused on securing and protecting IP systems. So, in case of computer security, these tiger teams or ethical hackers would employ the same tricks and techniques that hacker use but in a legal manner and they would neither damage the target systems nor steal information. Instead, they would evaluate the target system's security and report back to the owners with the vulnerabilities they found and instructions for how to remedy them. Ethical hacking is a way of doing a security assessment. Like all other assessments an ethical hack is a random sample and passing an ethical hack doesn't mean there are no security issues. An ethical hack's results is a detailed report of the findings as well as a testimony that a hacker with a certain amount of time and skills is or isn't able to successfully attack a system or get access to certain information. Ethical hacking can be categorized as a security assessment, a kind of training, a test for the security of an information technology environment. An ethical hack shows the risks an information technology environment is facing and actions can be taken to reduce certain risks or to accept them.

II. OPERATIONAL MECHANISM OF HACKER

The working of an ethical hacker involves the under mentioned steps:

1. *Obeying the Ethical Hacking Commandments:* Every Ethical Hacker must follow few basic principles. If he does not follow, bad things can happen. Most of the time these principles get ignored or forgotten when planning or executing ethical hacking tests. The results are even very dangerous.
2. *Working ethically:* The word ethical can be defined as working with high professional morals and principles. Whether you're performing ethical hacking tests against your own systems or for someone who has hired you, everything you do as an ethical Hacker must be approved and must support the company's goals. No hidden agendas are

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Risk Factors And Security Issues In Various Cloud Storage Operations

K.Sai Manoj, K. Mrudula, K.phani Srinivas

Abstract: *Presently a days, cloud computing is a rising and method for registering in software engineering. Cloud computing is an arrangement of assets and administrations that are offered by the system or web. Distributed computing broadens different figuring methods like framework registering, appropriated processing. Today distributed computing is utilized as a part of both mechanical, research and scholastic fields. Cloud encourages its clients by giving virtual assets through web. As the field of distributed computing is spreading the new procedures are producing for cloud security. This expansion in distributed computing condition likewise expands security challenges for cloud designers. Customers or Users of cloud spare their information in the cloud subsequently the absence of security in cloud can lose the client's trust. In this paper we will discuss about on cloud database and information mining security issues in different viewpoints like multi-occupancy, flexibility, unwavering quality, accessibility on different divisions like modern and research regions, and furthermore examine existing security methods and methodologies for a safe cloud condition through enormous information ideas. What's more, this paper additionally study different parts of mechanical, training and research areas. This paper will empower scientists and experts to think about various security dangers, models and apparatuses proposed in existing distributed storage.*

Keywords: *Cloud Computing, Cloud Security, Security Threats, Security Techniques, Cloud Security Standards.*

I. INTRODUCTION

In now a days is a critical requirement to securely storage , managing , sharing along with analyze immense, vast amounts of multipart records organizing to conclude various pattern and trend into proper orderly to get better the high excellence of healthcare, much better safeguard the nation and explores alternative different sources of energy. Because of the critical status or nature of their applications, it possibly to important role that clouds environment is secure, the most important role on safety challenges through clouds is that the authenticated owner of the data may not have control of different sectors where the data is placed, because if one needs to make use of the benefits of via cloud computing, single be required to also exploit the various resource memory allocations and arrangement process provide by cloud platforms, consequently, we require to maintain the data in the midst of untrusted process. Cloud computing is for the most part known as Internet figuring. The general meaning of distributed computing was given by National Institute of Standards and Technology (NIST), USA says that: "Cloud or Distributed computing is a specialized model for empowering on-request administrations and client helpful system access to a mutual tremendous of configurable figuring assets with the aim can quickly development provisioned and discharge with required least management endeavors and specialist co-op association in existing condition. For another case it is general a worldview that gives required processing assets and capacity while for others, it is only an approach to get to programming and information tasks from the distributed computing. Presently wherever generally utilized as a part of Cloud processing, it is prominent in association, logical, research and scholarly, resistance today since cloud condition gives, its clients decipherability adaptability, trustworthiness, dependability, adaptability and accessibility of information. Cloud computing give distinctive offices and recompense, until now emerges hardly several issue through esteem toward wellbeing access along with immense stockpiling of information. Numerous more issues are there ordinarily identified with cloud security as: merchant validated secure; multi-mode occupancy, loss of control tasks, basic administration interruption, easygoing information misfortune and so on are a portion of the innovative work issues in distributed computing. In this manuscript we examine the safety measures issue acknowledged through cloud computing reproduction and their administrations, applications [1]. This paper for the most part centered around to ponder unique type of attack and technique toward protected the cloud computing. Cloud computing characteristics: On Demand self-benefit

- Broad Network Access
- Resource Pooling
- Rapid Elasticity
- Measured Services

The accompanying portrayals are speaks to essential thought on inner ideas of topic, and perusers can without much of a stretch comprehend principal with productive way.

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- Access to Servers and Applications
- Data Transmission
- Virtual Machine Security
- Network Security
- Data Security
- Data Privacy
- Data Integrity
- Data Location
- Data Availability
- Data Segregation
- Security Policy and Compliance
- Patch administration

IV. RELATED WORK

Cloud security issues speaks to one of central point of each association or organizations are utilizes different cloud administrations, for example, IaaS, PaaS, SaaS and the models like open, private, half breed. These models and administrations have distinctive cloud security issues. Each administration show is related with some security issues. Security issues are considered in at least two perspectives, first in the perspective of specialist organization who protects that cloud administrations gave by them ought to be secure and furthermore deals with the client's or clients character administration. Other view is customer or client see that guarantees that security benefits that they are utilizing is secure way enough.

- **Multi-tenure:** A cloud-based model is worked for various reasons, Multi-residency security gives capable organization utilization of advantages, keeping cost cut down the level. It gathers sharing of each and every computational resource, organizations storing and cloud applications with various inhabitants harping on the equivalent reasonable/physical stages at provider's premises. Thusly, it harms the mystery of data and results in spillage of information and encryption and grows the probability of attacks, and diminishes the security spills.
- **Elasticity:** It portrays how much a structure can acclimate to the data outstanding burden changes by provisioning and disrupted existing resources in an autonomic possible manner, to such a degree, that the open resources organize the current on-demand at whatever point as almost to as possible to share including resources. Adaptability, generally, derives versatility, genuineness, and relentless quality. It answers that purchasers or genuine customers can scale all over as need required. This scaling enables tenants to use a present resource that is allotted as of now to another equal occupant. In this may incite order and risk issues.
- **Insider attacks:** Private Cloud show is a multitenant based objective showcase that is under the pro association's single organization movement region. This is a view on the peril that develops inside including the affiliation. There are no obliged obtaining checks and providers for cloud laborers disentangle these issues. So a pariah merchant can be easily hacking the data of one association or affiliation and may spoil or pitch that data to some other affiliation.

- **Outsider assaults:** It is one of the genuine attacks concerning issue in affiliation or association since it releases the ordered or discharges information of a relationship in open access. Fogs in enlisting, detest a private framework district, they have more Application Process interfaces than the private framework. So developers and aggressors have a good position of mishandling the API, weakness and may finish an affiliation breaking and adequately hacking information from various sources. These strikes are less or least damaging than the insider attacks in light of the way that in the later we to a great extent unfit to recognize the security ambush.
- **Data Loss:** As in any cloud, there are different mode occupants, data uprightness and security couldn't be given. Data hardship can realize the budgetary stage, customer or client count incident for an affiliation. A basic instance of this can be reviving and deletion of any data without having any fortification of that data.

Network Security: Every association or business organizations are sharing information on numerous channels utilizing system activities; along these lines at first security issues are emerges in recovery process. The accompanying conceivable assaults are summoned in organizes sharing tasks.

- **Man in the center assault:** In this strike, an attacker makes a self-ruling affiliation and gives between the cloud customers on its private framework where all control is in the hand of the assailant.
- Distributed foreswearing of organization strikes: In DDOS attack, servers and frameworks are brought around an immense proportion of framework development and clients or customers are denied the passageway to explicit Internet-based Service exercises.
- **Port sifting:** Port is where information exchange occurs and perceiving article affirms in every way that really matters. Port inspecting is happening when a supporter orchestrates the social occasion. Port analyzing is done therefore when you structure the web so this harms the security reason concerns.
- **Malware Injection Attack Problems:** In circulated registering, a bit of enormous data is traded between cloud pro association and authentic client or customer, there is a requirement for customer approval and endorsement. Exactly when the main data is traded between cloud expert center and customer, the aggressor can bring ruin or pernicious code into it. As a possible result, the principal real customer may need to hold up until the completing of the movement that was maliciously displayed.

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A Two Stage Buck – Boost Converter with Soft Switching for Wind Power Applications

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Abstract- **A novel two – stage buck boost converter with soft switching operation for renewable energy applications is proposed in this paper. Two identical buck boost converters connected to each other through an inductor works in parallel in the proposed converter. This inductor plays an important role in the soft switching operation of the converter by maintaining the voltage applied to switches at zero at switching intervals. Zero voltage switching method of control is being used for switching. This method of switching proposed converter is efficient in the reduction of switching losses and improvement in efficiency of converter. Moreover, because of the parallel operation of two identical converters, the output voltage and the input current contain fewer ripples than those of a single converter with the same specifications. Also, utilizing only one inductor as an extra element to achieve this goal makes the proposed converter more economical and reliable with a simpler structure. The detailed analysis of the circuit operation is provided in eight modes. The performance of the proposed converter is also analyzed by using it in wind power generation system. The proposed converter is simulated in MATLAB/Simulink platform.**

Index terms- **DC-link voltage balance, zero voltage switching, Renewable Energy (RE), Buck-boost converter, Induction wind turbine.**

I.INTRODUCTION

DC/DC converters are used for many purposes when the conversion between two dc voltage levels such as electrical vehicles, active filters, power factor correction circuits, distributed generations, dc/dc regulated power supplies, etc., is required [1]–[3]. These types of converters are divided into several types depending on the increase or decrease of the output voltage level with respect to the input voltage. This paper focuses on the buck-boost dc/dc converters which can operate in either buck or boost modes, i.e., they can be used in both step-up and down applications. Another counterpart of these converters is the Cuk converter with a large number of circuit elements in its structure. The main application of step-up/down converters is in regulated dc power supplies, where the output negative polarity may be desired with respect to the common terminal of the input voltage supply.

The efficiency of the dc/dc converters is an important issue which has received great attention in literature works. In this regard, various control strategies and converter topologies are proposed for the soft switching operation of the converters to achieve minimum switching losses leading to more efficient operations [1], [4]–[6]. Soft switching techniques utilizing the features of Zero-Voltage Switching (ZVS) or Zero-Current Switching (ZCS) substantially reduce the switching losses [7]– [10]. Some of these approaches include active clamps [11], and passive and active snubbers [12]–[14]. In some cases, a combination of ZVS and ZCS techniques has also been discussed [12], [15], [16]. Nowadays, interleaved converters are utilized in many applications and provide many advantages such as increasing efficiency, reducing the voltage and current ripple, and supplying more load power. The ZVS operation of the parallel boost converters has been investigated. The inductor placed between two parallel converters is called the interleaved inductor and displaces the resonating current between two converters at time intervals in order to perform the soft switching operation of the set. The operation procedure of this kind of converters is described in two sets of symmetric scenarios depending on the situation of the resonating current. In this paper, a double-deck buck-boost converter with an effective ZVS technique is proposed. The operational principles of the proposed converter are surveyed and summarized in eight modes. It is shown that the switching process can perform with the minimum

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A Converter for Bipolar Dc Link Based on SEPICCUK Combination for Microgrid Applications

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Abstract- **The use of dc technology was almost discarded in the power transmission systems. DC power systems have been used in applications like avionic, automotive, marine, rural areas, telecommunication infrastructures and point-to-point transmissions over long distances or via sea cables and for interconnecting ac grids with different frequencies. This Paper describes a new application of single-ended primary converter (SEPIC) and Cuk converter for dc bipolar network. A dc–dc converter configuration based on a combination of both converters is proposed. In the resulting topology, the switching node is shared by the SEPIC and Cuk converter since they have the same instantaneous duty cycle. The main advantage of this topology is that synchronization of various switches is not required and control terminal is connected to ground which simplifies the design of the gate drive. On the other hand, this configuration allows the connection of renewable energy sources to microgrids (MG)-type bipolar dc link and to cover the current needs of new distributed generation units with efficient, economical, and easy way. To verify its performance, MATLAB/Simulink platform is used.**

Index terms- **DC-link voltage balance, PMBLDCM, power quality (PQ), Air conditioner (AC)**

I.INTRODUCTION

The use of dc technology was almost discarded in the power transmission systems. DC power systems have been used in applications like avionic, automotive, marine, rural areas, telecommunication infrastructures and point-to-point transmissions over long distances or via sea cables and for interconnecting ac grids with different frequencies. Today's consumer equipment such as computers, fluorescent lights or LED lighting, households, businesses, industrial appliances, and equipment need the dc power for their operation. However, all these dc loads require conversion of the available ac power into dc for its performance. The majority of these conversion stages typically use inefficient rectifiers. On the other hand, most of renewable energy units generate in dc form or they have outputs voltage/frequency variable, which requires power electronic devices to adapt its output to network conditions. These dc–ac– dc power conversion stages result in substantial energy losses. Therefore, in many cases, it is justified to use dc microgrids since it would avoid all this conversions. DC microgrids have mainly the following advantages over ac microgrids [1]–[5]: more efficiency and more power transmission, require few wires, more stable, no reactance in the line, frequency is zero (so no need of frequency monitoring), no transient stability problems, no electromagnetic interference, and have lower line resistance. In a dc microgrid, energy can be transmitted with single cable, two cables, or even three cables, what leads to consider three dc-link types: Monopolar, Bipolar, and Homopolar. Of all these topologies, bipolar dc link is one of the most used. Bipolar dc link has two wires (see Fig. 1): one with positive polarity and one with negative polarity. In normal operation, the current through ground is zero. It has two voltage levels allowing fault conditions a monopolar operation.

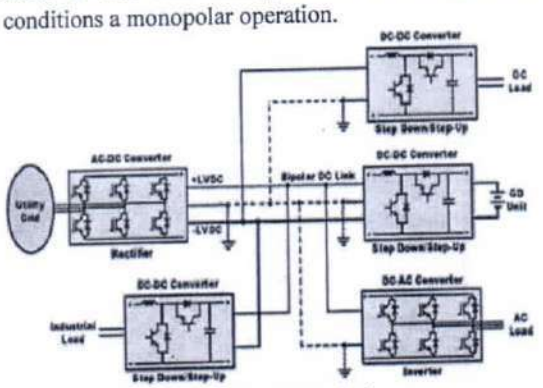

Fig.1. Bipolar dc link

It is also possible a metallic return with appropriate control strategies. This topology has a higher technical complexity and cost than the monopolar dc link, but has going for it the following advantages:

INFLUENCE OF GEOGRAPHIC AND CULTURAL FACTORS ON CONSANGUINITY IN CERTAIN COMMUNITIES OF KANYAKUMARI DISTRICT

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Abstract: The rate of consanguineous unions or blood related marriages varies by region and religion influenced by so many geographic and cultural factors. Marital distance, residential area, caste and parental consanguinity were some of the geographic and cultural factors chosen to study their influence over consanguinity among certain communities in Kanyakumari district. The communities chosen were Pallar, Sambavar, Bharathar, Paravan, Thandan, Chetty, Chakkalar, Kammalar, Kanikkar and Kattunayakan. Spouses resided below 10 Km radius contracted consanguineous unions at a higher rate (Paravans, 71.4%, Thandans, 66.3%, Sambavars, 50.5%, Chakkalars, 67.8% and Kanikkars, 51.4%) followed by 30 to 39 km. The percentage of consanguinity was more among the rural residents of Pallar (58.5%), Bharatar (59.4%), Paravan (69.3%), Thandan (58.7%), Chakkalar (58.8%) and Kammalar (62.3%) and in urban residents of Sambavars (51.2%), Chetty (64.6%), Kanikkar (52.2%) and Kattunayakan (70.6%). The percentage of consanguineous unions was higher among Kattunayakans (69.6%) and low among Sambavars (40.6%). More than 60% consanguinity was recorded among Kattunayakans (69.6%), Kammalars (60.5%) and Paravans (66.1%), between 50 to 60% among Bharatars (59.2%), Chakkalars (57.4%), Thandans (55.5%) and Pallars (54.6%). The rate of consanguinity below 50% was noticed among Kanikkars (47.1%) and Sambavars (40.6%). Highly significant association between caste system and the practice of consanguinity was found. The rate of offspring consanguinity was higher in families with previous history of parental consanguinity. Significant association between parental consanguinity and rate of consanguinity was observed only among Kammalars (high) and Chakkalars (low). The present study shows the influence of caste on the rate of consanguinity in the selected communities of Kanyakumari District than the other factors.

Index Terms - Consanguineous, Communities, Factors, Geographic, Cultural

I. INTRODUCTION

The rate of consanguinity is found more in Muslim countries especially in Middle East, Pakistan and Iran (Ullah et al., 2017, Shavazi *et al.*, 2008). In Western world, Europe, USA, Lebanon, Morocco, Saudi Arabia, Kuwait, Israel, Arab, Jordan and Palestine territories, declining trend of consanguinity has been noticed (Khlat, 1985, Lamdouar, 1994, Al-Abdul Kareem and Ballal, 1998, Radovanovic *et al.*, 1999, Jaber *et al.*, 2000, Zlotogora *et al.*, 2002). So many socio-economic, socio-demographic, geographic and cultural factors are responsible for the varied rate of consanguinity. Consanguinity is very much associated with the residential area of the subjects, whether rural or urban (Hussain and Bittles, 2004). Pillai and Mathew (1995) have shown strong urban-rural effect in a few castes of closely located Thiruvananthapuram District of Kerala state. However, Jurdi and Saxena (2003) observed no statistically significant difference in the prevalence of consanguinity by place of residence and geographical region in Yemen. The studies highlighting correlation between marital distance and inbreeding rate was made in Brazil, Japan, India etc (Babu *et al.*, 1994). Negative association between marital distance and level of consanguinity was noticed by Joseph (2001). The reason for higher percentage of consanguinity at least distance may be due to the indigenous, isolated nature and possibilities of selecting marriage partners. Deshorjit and Nabakumar (2010) compared their findings with those of an earlier one (Manibabu, 1997) on Phayeng, a tribal population of Manipur, that decrease in the

Energy, Exergyand Energy Audit Analysis of Vijayawada Thermal Power Station

B. Sairamkrishna, P. Vijaya Kumar, Y.Appala Naidu

Abstract:*Vijayawada 210MW coal-based thermal power plant's energy and exergy analyses were conducted to assess the energetic and exegetic efficiencies and losses of various parts and the plant's general scheme. This coal-fired power plant, which consumes approximately 2,000 metric tons of coal, produces approximately 170 MW to 180 MW of electricity every day against installation ability of 210 mw the supply of energy to demand is declining throughout the world day by day. The increasing demand for energy has made power plants of science concern, but most power plants are built solely by the vigorous performance criteria based on the First Thermodynamics Law. The actual useful loss of energy cannot be justified by thermodynamics ' First Law because it does not distinguish between the quality and amount of energy. Thus, this current research deals with the comparison of coal-based thermal power plants electricity and exergy analyses. For calculation purposes, the entire plant cycle was divided into three areas: (1) only the turbo-generator with its inlets and outlets, (2) turbo-generator, condenser, feed pumps and regenerative heaters, (3) the entire cycle of boilers, turbochargers, condensers, feed pumps, regenerative heaters and auxiliary plants. The analyses were carried out considering information on this power plant's layout (50 percent, 80 percentand 100 percent) and operation information (57 percent and 67 percent loading condition). The plant's general energy efficiencies are 35.48 percent, 56.77 percent, 70.96 percent and 75.67 percent, and the general exergy efficiencies are a44.25 percent, 33.31 percent, 30.78 percent, and 30.21 percent, 50%, 80 percent, 100 percent of the design information. But the power plant's general energy and exergy efficiencies in operational information are 39.2%, 46.6% and 27.9%, 27.2% for 57% and 67% loading lower than the design value Specific CO2, SOx, NOx and particulates are also used to study the environmental impactof power plants. To find the irreversibility of the method, the distribution of exergy losses in power plant parts was evaluated. The comparison between the energy losses and the exergy losses of the plant's individual parts indicates that the highest power losses of 49.92% happen in the condenser, while the maximum exergy losses of 68.27% happen in the boiler. The analyses were also carried out one by one by inactivating the heater. Exergy assessment can be particularly efficient in defining methods to optimize the efficiency of current activities and plant design while energy equilibrium transfers heat between the device and its environment. Exergy-based operating and maintenance choices have been shown to be more efficient in decreasing inefficiencies in working power plants***

Index Term: *energy analysis, exergy analysis, power plant flow scheme, energy and energy effectiveness, mass energy and exergy equilibrium equation, thermodynamics second law*

I.INTRODUCTION

High energy expenses and the need to reduce them, as well a s environmental issues, make optimized energy use and ener gy consumption management very important. Indeed, by acc urate thermodynamic evaluation of thermal systems, we can obtain results for energy planning and optimization. To this end, we need a tool for data analysis, which can be found in two thermodynamic laws. The first law deals with the assessment of energy, while the second deals with irreversibility and exergy (job potential). The first law points to the fact that total energy is constant I n a system, and converting thermal energy into mechanical e nergy, for example, is only the quality of that energy.A tool called exergy was developed based on first and second thermodynamic laws to analyse the energy system. Thermodynamic process exergy demonstrates that process's effectiveness or inefficiency. Exergy gives us a better knowledge of energy qualification processes. Therefore, to find, qualify and quantify energy destruction, it would be better to use exergy. Exergy can play a significant part in the strategic growth of power plants and in providing directions for use in current power plants. In addition, a picture of exergy destruction of the parts of power plants must be accessible to enhance the accessible power plants, which involves exergy assessment of power plants. The energy and exergy assessment will provide a full image to enhance the effectiveness of the plant Boiler: Boiler is an enclosed vessel that heats and circulates water until at the necessary pressure the water is transformed into steam. Water tube boilers are being used.

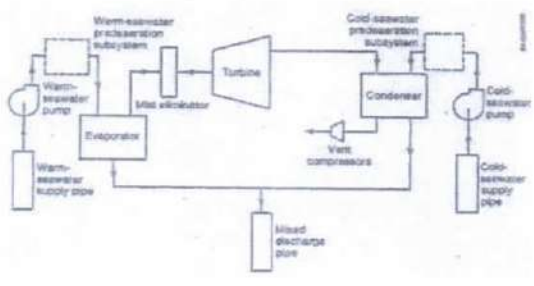

Fig.1 basic line diagram of power plant

Super heater: The purpose of the super heater is to heat the s team from the boiler cabinet before it enters the turbine.Re-heater: vapor from high-pressure turbine is re-heated before entering intermittent and low pressure turbines Economizer: The flow gas from the boiler carries a lot of heat.

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Leakage Current Attenuation of Three-Phase Cascaded Inverter for Transformer less Grid-Connected PV Systems

Vattem. Lakshmi Priyanka [1], Mallam Sreenu [2]

Abstract
Three-phase cascaded inverter with leakage current reduction for the transformer less PV system is investigated in this paper. The common mode loop model of conventional three-phase cascaded H4 grid-connected inverter is established. The relationship among the leakage current, common-mode voltage and differential mode voltage is analyzed. The inherent reason that the conventional cascaded H4 grid-connected inverter fails to reduce the leakage current is clarified. In order to solve the problem, a novel three-phase cascaded H5grid-connected inverter and its modulation strategy are proposed. It can significantly reduce the leakage current. Finally, the performance tests of the cascaded H4 and H5 grid-connectedinverters are carried out. The results verify the effectiveness of the proposed solution.

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Contents

1. Introduction

Power electronic converters, especially dc/ac PWM inverters have been extending their range of use in industry because they provide reduced energy consumption, better system efficiency, improved quality of product, good maintenance, and so on. For a medium voltage grid, it is troublesome to connect only one power semiconductor switches directly As a result, a multilevel power converter structure has been introduced as an alternative in high power and medium voltage situations such as laminators, mills, conveyors, pumps, fans, blowers, compressors, and so on. As a cost effective solution, multilevel converter not only achieves high power ratings, but also enables the use of low power application in renewable energy sources such as photovoltaic, wind, and fuel cells which can be easily interfaced to a multilevel converter system for a high power application. The most common initial application of multilevel converters has been in traction, both in locomotives and track-side static converters. More recent applications have been for power system converters for VAR compensation and stability enhancement, active filtering, high-voltage motor drive high-voltage dc transmission, and most recently for medium voltage induction motor variable speed drives. Many multilevel converter applications focus on industrial medium-voltage motor drives, utility interface for renewable energy systems, flexible AC transmission system (FACTS), and traction drive systems. The inverters in such application areas as stated above should be able to handle high voltage and large power. For this reason, two-level high-voltage and large-power inverters have been designed with series connection of switching power devices such as gate-turn-off thyristors (GTOs), integrated gate commutated transistors (IGCTs), and integrated gate bipolar transistors (IGBTs), because the series connection allows reaching much higher voltages. However, the series connection of switching power devices has big problems , namely, non equal distribution of applied device voltage across series-connected devices that may make the applied voltage of individual devices much higher than blocking voltage of the devices during transient and steady-state switching operation of devices.

2. PV effect and connection of solar cells

Photovoltaic is the field of technology and research related to the devices which directly convert sunlight into electricity using semiconductors that exhibit the photovoltaic effect. Photovoltaic effect involves the creation of

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Enhancement of Grid Connected PV Arrays Fault Ride Through and Post Fault Recovery Performance

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Abstract
Now a days in Power Systems, the addiction on renewable energy sources is increasing rapidly. The grid-connected applications are important with the deficiency in Non Renewable energy sources due to fuel shortage. As the PV plants penetration increasing rapidly, the fault ride through [FRT] improvement has become a critical issue. This paper presents a Fractional order PID Controller based Grid connected PV array for Fault ride through Capability Improvement. The proposed control system improve the DC Link voltage and injected Reactive power under fault conditions. The validity of the proposed controller is extensively verified by the simulation results, which are carried out using MATLAB/SIMULINK Software. With the proposed FOPID based grid connected PV array, the fault ride through capability of such system can be improved.

Keywords
fault ride through [FRT], Grid connected PV array, Control system, Photovoltaic System, Fractional order PID controller.

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Contents

1. Introduction

To overcome the problems related to Environmental pollution and fuel shortage, the generation of electrical power from various Renewable energy sources has been increasing rapidly. Solar and Wind power generation can be used conveniently, are pollution free, and has become one of the most widely used distributed generation technologies in recent years. In recent years, the efforts are going on to integrate the photovoltaic systems into the grid to meet the essential demand of pollution free and reliable electrical power generation. The high penetration of PV systems into the power applications has resulted the power system operators revising the grid code requirements for interconnection of this type of generation. The high integration of photovoltaic power plants (PVPPs) has started to affect the operation, stability, and security of utility grids. Thus, many countries have established new requirements for grid integration of solar photovoltaic to address the issues in stability and security of the power grid. The following conditions should be considered while discussing about stability: System management: Security analysis, availability analysis and information about temporary limitation for present and forecasted situations should performed by production unit. Frequency stability: To keep the balance in demand and generation, power plants should Provide with necessary control. Voltage stability: In order to balance the voltage network operators have to advise the power production units to supply the reactive power. Robustness of System: In case of any perturbation power Plants have to be robust. Restoration: The Power plant has to restore the voltage or operate voltage in control mode after a disturbance. Several methods were presented in literature for intensifying the fault ride through capability of grid connected PV arrays. A sliding mode controller is proposed to improve the fault ride through of GCPA by controlling grid side converter. But there is a problem of mismatching of power between extracted power from the PV array and the power delivered to the grid remains to be solved. To improve the fault ride through capability, a new system is proposed for 2-stage GCPA's. According to this control system, the controller of boost converter switches to a PI controller that controls DC-link voltage during the voltage sags. First order sliding mode control is used for boost DC/DC converter to control the DC Link voltage. The zero dynamic stability was lost by effect of control of DC link voltage.

Analyze Different Types of Connector for Design of MSA

Samiran Chatterjee, Mukundu Mounika, Patlolla Akhila, Veeramalla Pratyusha, and Korni Madhavi

Abstract In this major project, proposed the analysis of different feeding techniques and try to find that which feeding technique is better in terms of connector. Here in this project proposed antenna analyzed by use of different connector with different feeding techniques. In antenna structure, is applying two feeding methods i.e. Transmission Line feeding and co-axial feeding and also use different connector for different feeding methods. For transmission line feeding uses both transmission line connector and CPW (Co-planar waveguide) connector and in coaxial feeding connects the connector by soldering method. In this project, the antenna is analyzed for different feeding with different connectors for the same antenna structure. The proposed antenna presents in this project with high return loss and 2:1 VSWR range for any feeding technique analysis. This project achieves good result by applying the transmission line feed with CPW connector. At the above mentioned condition achieved four resonant frequencies of about 2.54 GHz, 6.73 GHz, 7.66 GHz and 9.85 GHz with −22.45 dB, −27.94 dB, −10.62 dB and −16.69 dB return loss respectively. Whereas for the Transmission line feed with transmission line connector the proposed structure achieves single resonant frequency for the above mentioned condition. But when using the coaxial feeding method, the proposed antenna does not work properly and does not achieve a single resonant frequency. The proposed structure has good resonant frequency for which it is intended. The main achievement is increased frequency ratio which has no ISI (Inter Symbol Interference).

Keywords CPW · Feed · Layer · Connector · Transmission line · VSWR

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Analyze DGS Antenna Structure

Samiran Chatterjee, Uppuluri Shyamala Seshadri, R. Vani, and K. Pravallika

Abstract Here, we proposed the single feed, dual-layer DGS microstrip antenna for application of any microwave band frequency. In this proposed antenna, antenna consists of cutting two rectangular slots in addition with one circular slot from the patch and added some small rectangular slits with the slots and add two rectangular slits in top layer. Same as from bottom layer use *H*-shaped slots. The proposed antenna simulated with high return loss, increased frequency ratio and VSWR within 2:1 range. From the above-mentioned design of proposed antenna, we achieved a resonant frequency of about 4.23 GHz with − 12.75 dB return loss. For the above frequency, we also achieved a − 10 dB bandwidth of about 14.70 MHz. Also we achieved a resonant frequency of about 8.82 GHz with − 10.96 dB return loss. For the second resonant frequency, we got a bandwidth of about 26.86 MHz. Also, for first resonant frequency measure, the gain of about 2.04 dBi with 165.14° beamwidth (− 3db HPBW) and for second resonant frequency measure, the gain of about 1.53 dBi with 165.05° beamwidth (− 3db HPBW). The main achievement is that the proposed antenna has no intersymbol interference (ISI).

Keywords Beamwidth · DGS · Radiation pattern · Gain · VSWR

1 Introduction

In modern communication scenario, DGS antenna design creates a challenge with high bandwidth and gain with increasing frequency ratio [1–6] for young engineers. Microstrip antenna is essentially limited to some substrate [7]. Each substrate has two layers, i.e., the top layer and the bottom layer. For simple design of microstrip antennas, we use only the top layer, so it does not give off bandwidth. To get the

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Water Supply System Optmization with CAD Systems Implementation – A multimodel Perspective

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ABSTRACT

The design of water supply systems is considered a combinatorial optimization task in which the diameter of each one of the pipes can be considered as a decision variable. The problem is to determine a set of diameters so that the cost function is minimized (depending on the length, diameter and material of the pipes) subject to hydraulic and commercial constraints. However, the chosen set of diameters will have a significant influence on the energy losses due to the hydraulic balance of the system. Therefore, it is necessary to use techniques that allow finding solutions that are viable under multiple criteria. In the present work the incorporation of the human factor in the decision-making process during the multi-objective optimization of the design of the water supply system is shown. The development of algorithms, products of the practical experience and implementation in CAD systems, influences the decrease of the search universe in the optimization as measured using the notation of India. Benefits provided by the CAD System to help the designer are presented. The paper ends with conclusion and recommendation of future works.

Keywords: decision-making, water supply, CAD system

I.INTRODUCTION

Due to its high cost the water supply systems are comparatively neglected areas in the rural areas of the developing countries.The mathematical modeling application with the incorporation of the human factor through computer packages allowing the authorities the chance to take preventive actions in the decision-making process.To solve combinatorial optimization problems, a wide variety of algorithms have been developed to try to solve them.These algorithms can be classified as accurate or approximate. While the former guarantee obtaining the optimum of any finite instance of the problem in a limited time, the latter place emphasis on obtaining satisfactory solutions in a short time.Since a large number of combinatorial problems are NP-Complete,the use of approximate algorithms is and will be an area of intense activity.In the last decades, special attention has been devoted to the optimal dimensioning of water distribution networks. To this end, various optimization techniques are applied that allow a greater reduction of the capital costs of these systems.Some of these methods are restricted in their application to branched networks. Such as, the Linear Programming model,are not applicable to the design of meshed networks that, due to the need to maintain the service in any circumstance, cannot be subject to the fragility of a single supply conduit per supply area, which requires considering circuits. The use of metaheuristics is based on problems whose solution is not satisfactory by traditional methods and the implementation of

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BANKS' HOLISTIC APPROACH TO CYBER SECURITY: TOOLS TO MITIGATE CYBER RISK

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ABSTRACT

Information security is a set of practices intended to keep data secure from unauthorized access or alterations. Cyber security has become a unique challenge for financial sector to prevent massive financial losses. It's not a clandestine that Cyber Crime is only escalating in this day and age and hence Cyber risk is receiving growing attention. Of late, Cyber security has risen to become a national concern as threats concerning it now need to be taken more seriously. Much of a bank or financial institution's operations take place with the use of technology, including through the Internet. Without solid cyber security measures in place, bank's sensitive data could be at risk. Banks and other finical institutions should understand how cyber criminals could invent complex new cyber attacks. The banking sector is considered as one of the most vulnerable as far as cyber crime is concerned. No single security technology is sufficient to foolproof a bank's IT system. Building up a bank's cyber security is not a one-time exercise but a continuous process. Systems need to be continuously monitored through surveillance technologies to identify any loophole that has been generated. Software and hardware need to be updated and upgraded as new and improved versions often address the vulnerabilities present in previous ones. This paper aims to help understanding the banks approach to toward mitigation of cyber risk.

Key words: cyber attacks, cyber risk, financial institutions, technology, cyber security.

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1. INTRODUCTION

Banking services are moving to digital at an ever-faster rate and, in developing economies, are increasingly being used by low-income and low-literacy users. However, concurrent with this progress, sector actors are facing a growing risk from cyber criminals seeking to attack their

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STSTEMATIC OUTLINE OF COMPUTER ORIENTED SAFETY AND EVALAUTES ITS THREATS

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Abstract: ***Nowadays, this contemporary world becoming digital world because all over people in the world based on electronic gadgets, transmission like information, amount from one place to another, knowledge and so on. Unfortunately, if there is over addiction or belief in this systematic gadgets, surely there will be an equal amount of consequence in the side of computer oriented crime or cybercrime. Nowadays many applications are found to control and monitor these threats. Here also a field that controls and analyse the extract systematic data which is threated by cybercrime. That field is known as analytics of big data. It important role is to monitor and protect the information from threats of cyber. Threats in cyber, monitor and protect the violation are the main matter in the safety of cyber. Flowing of network and computerized matters handles information and leads to face the problems like violation and monitoring with good level and correct perfection. Here this research focuses on the veracity, variety and volume of information in web server and threats. A group of information with various matter types like information in numbers and category are investigated with the support of programming language. This language is used to detect the fake information, detect the missing data and analyse the quality of information. It also analyse the false pretence used by different users in the world. And also it analyse the correlation of numbers and congregate depend on K language also discussed in this paper.***

Keywords: ***Computer Oriented safety, threats in network field, loss of information, false pretence ,analytics of big data.***

1. INTRODUCTION

Nowadays, United States faces challenges like safety, struggle and protection against computer oriented crime in the current situation. Here the struggle against computer oriented crime contains different problems that can be differentiated into spying to avoid computer oriented crime and threats in cybercrime. This attack takes place in different methods. They are distributed denial of service, malware, viruses, worms, denial of service, Trojans, insiders of malicious attack and botnets. Networks with critical service were the important point of cyber struggle. The cyber defense plays a major role to protect the gadgets from computer oriented crime. It is divided into two types, they are active and passive protection for cybercrime. Here passive defense of cyber have the features like patches, wall of fire, monitor the attacks and virus. By comparing passive defense to active defense, defense of active plays a vital role to investigate, finding attacks, alleviate the danger and so on. This active defense also differentiated into finding criminal activity, dissimulation and to terminate the threats.[2,3]

The problem of safety faces genuine problems, monitor to access, decipherment codes

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Energy Optimization Hierarchical Clustering for WSN

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Abstract

Wireless Sensor Networks (WSN) are the networks with the highest degree of unpredictability. These networks connect with one another and pass on the data collected from each node. The vast majority of applications for these include any kind of environment, such as a heterogeneous natural setting. The term "energy consumption" is most frequently applied to the nodes. There has been a lot of research done on WSN. In the currently available methods, the energy efficiency between the nodes becomes the most challenging, and due to the adaptive and mobile character of these techniques, the amount of energy that is consumed is significantly higher. In this article, the problem that was present in the previously used system, namely the calculation of cluster head, was addressed by the approach that was proposed. In order to circumvent this problem, the EEHCA that was presented has been implemented in order to keep the energy levels stable amongst the nodes and calculate the cluster head in a more effective manner. The results demonstrate how well both the old and new EEHCA are working.

Keywords: - Sensor Networks, Clustering, LEACH, EEHCA.

1.Introduction

In recent years, Wireless Sensor Networks, also known as WSNs, have attracted a large number of analysers due to the potential vast applications that they offer as well as the multiple examination issues that they present. Earlier research on wireless sensor networks (WSNs) focused mostly on making breakthroughs based on the concept of a homogenous WSN, in which all hubs have the same infrastructure assets[1-3]. In spite of this, heterogeneous wireless sensor networks are winding up noticeably more mainstream. This is because the advantages of using heterogeneous WSNs with a scope of capacities with the end goal to satisfy the prerequisites of diverse applications have been presented in recent writing. Because of the limited battery capacities of sensor hubs and the impossibility of replacing the batteries, one of the most significant challenges that must be overcome in order to connect WSNs is ensuring the reliability and efficiency of the use of electrical power. Because of this, sensor hubs consume a significant amount of energy in the process of information transmission and collecting [4-6]. As a consequence of this, new steering conventions that are more energy efficient are required to reduce overall energy use [7-10].

In this paper, we present an original Energy- Efficient Clustering and Data Aggregation (EECDA) protocol for heterogeneous wireless sensor networks (WSN). In this strategy, an additional Cluster Head (CH) race and information correspondence component are brought into play in order to extend the system's lifetime and increase its level of security. Following the CHs race, the method of information transmission that utilizes the greatest aggregation of residual vitality will be selected rather than the method that makes the least amount of use of the energy resource. In this fashion, first each CH adds up the information it has obtained, and then it sends the entire information it has accumulated to the Base Station (BS)[11-13].

In comparison to Low-Energy Adaptive Clustering Hierarchy (LEACH), Energy-Efficient Hierarchical Clustering Algorithm (EEHCA), and Effective Data Gathering Algorithm (EDGA), the primary commitments of the EECDA convention are to provide the longest stability (when the primary hub is dead) and to enhance the system lifetime. This is in contrast to the other two algorithms mentioned earlier (EDGA). Fig1 shows the Wireless Sensor Network

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Energy Optimization Hierarchical Clustering for WSN

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Abstract

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1.Introduction

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Voltage Sag & Swell Compensation By An Novel Adaptive FLC Methods For Transformer Less DVR

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ABSTRACT: In Restructured power systems, Power quality is one of the major concerns in the present era. The problem of voltage sags and swells and its major impact on sensitive loads are well known. To solve this problem, custom power devices are used. One of those devices is the Dynamic Voltage Restorer (DVR), which is one of the most efficient and effective modern custom power devices used in power distribution networks. A new FLC control algorithm for the DVR is proposed in this paper to regulate the load terminal voltage during sag, swell in the voltage at PCC. This new control scheme, it is based on adaptive fuzzy rules is used for the generation of reference voltages for a dynamic voltage restorer (DVR). These voltages, when injected in series with a distribution feeder by a voltage source inverter (VSI) with PWM control, can regulate the voltage at the load terminals against any power quality problem in the source side. THD with fast Fourier transformation based analyzes the power circuit of the system in order to come up with appropriate control limitations and control targets for the compensation voltage control through the DVR. The control of the DVR is implemented through derived reference load terminal voltages.

INTRODUCTION

There are many different methods to mitigate voltage sags and swells, but the use of a custom power device is considered to be the most efficient method, e.g. FACTS for transmission systems which improve the power transfer capabilities and stability margins. The term custom power pertains to the use of power electronics controller in a distribution system, especially, to deal with various power quality problems. Custom power assures customers to get pre-specified quality and reliability of supply. This pre-specified quality may contain a combination of specifications of the following: low phase unbalance, no power interruptions, low flicker at the load voltage, and low harmonic distortion in load voltage, magnitude and duration of over voltages and under voltages within specified limits, acceptance of fluctuations, and poor factor loads without significant effect on the terminal voltage. There are different types of Custom Power devices used in electrical network to improve power quality problems. Each of the devices has its own benefits and limitations. A

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A Novel DC-DC Converter Based Closed Loop Control of BLDC Motor for SPV fed Water Pumping System

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ABSTRACT

This Paper Presents Novel DC-DC Converter Based Closed Loop Control of BLDC Motor for SPV fed Water Pumping System Solar Photovoltaic (SPV) Array fed Water pumping System Utilizing Buck-boost DC-DC Converter in order to extract the maximum available power from Solar system. Solar energy has the greatest availability compared to other energy sources. For such solar PV systems, maximum power point tracking control is preferred for efficient operation. This concept is dealing with INC method which is one of the MPPT methods. This study deals with a buck–boost converter controlled solar photovoltaic (SPV) array fed water pumping in order to achieve the maximum efficiency of an SPV array and the soft starting of a permanent magnet brushless DC (BLDC) motor. The current sensors normally used for speed control of BLDC motor are completely eliminated. The speed of BLDC motor is controlled through the variable DC-link voltage of a voltage-source inverter (VSI). The VSI is operated by fundamental frequency switching, avoiding the losses due to high-frequency switching, in order to enhance the efficiency of the proposed system.

KEYWORDS: *BLDC Motor, Solar PV Array, Buck-Boost Converter, Incremental & Conductance MPPT Method, Voltage source Inverter*

I. INTRODUCTION

Severe environmental protection regulations, shortage of fossil fuels and eternal energy from the sun have motivated the researchers towards the solar photovoltaic (SPV) array generated electrical power for various applications [1]. Water pumping is receiving wide attention nowadays amongst all the applications of SPV array. To enhance the efficiency of SPV array and hence the whole system regardless of the operating conditions, it becomes essential to operate SPV array at its maximum PowerPoint by means of a maximum power point tracking (MPPT)algorithm [2-4]. Various DC-DC converters have been already employed to accomplish this action of MPPT.

The PV inverters dedicated to the small PV plants must be characterized by a large range for the input voltage in order to accept different configurations of the PV field. This capability is assured by adopting inverters based on a double stage architecture where the first stage, which usually is a dc/dc converter, can be used to adapt the PV array voltage in order to meet the

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Intelligent Hybrid-Fuzzy Controller using VLLMS Based Shunt Active Filter

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ABSTRACT

The power quality problem in the power system is increased with the use of non-linear devices. Due to the use of non-linear devices like power electronic converters, there is an increase in harmonic content in the source current. Due to this there is an increase in the losses, instability and poor voltage waveform. To mitigate the harmonics and provide the reactive power compensation, we use filters. There are different filters used in the power system. Passive filters provide limited compensation, so active filters can be used for variable compensation. In this work, a shunt active filter has been made adaptive using a Variable Leaky Least Mean Square (VLLMS) based controller. Proposed adaptive controller can be able to compensate for harmonic currents, power factor and nonlinear load unbalance. DC capacitor voltage has been regulated at a desired level using a PI controller and a self-charging circuit technique. But, this scheme as two disadvantages such as, tuning issues of current controller pre-requisites the traditional PI controller, which is controlled by intelligent based Hybrid-Fuzzy-Logic controller for achieving good performance features. The design concept of proposed intelligent Hybrid-Fuzzy controller for shunt active filter has been verified through simulation analysis and results are presented with proper comparisons.

KEYWORDS: *Terms—APF, harmonics, neural network, power quality, Variable Leaky Least Mean Square (VLLMS).*

I. INTRODUCTION

Early equipment was designed to withstand disturbances such as lightning, short circuits, and sudden overloads without extra expenditure. Current power electronics (PE) prices would be much higher if the equipment was designed with the same robustness. Pollution has been introduced into power systems by nonlinear loads such as transformers and saturated coils; however, perturbation rate has never reached the present levels. Due to its nonlinear characteristics and fast switching, PE creates most of the pollution issues. Most of the pollution issues are created due to the nonlinear characteristics and fast switching of PE. Approximately 10% to 20% of today's energy is processed by PE; the percentage is estimated to reach 50% to 60% by the year 2010, due mainly to the fast growth of PE capability. A race is currently taking place between increasing PE pollution and sensitivity, on the one hand, and the new PE-based corrective devices, which have the ability to attenuate the issues created by PE, on the other hand.

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PV/Battery Hybrid System with Three Port Converter fed Induction Motor Drive for Electric Vehicle Application

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ABSTRACT

In this paper, a classic proportional–integral (PI) control strategy as an energy management strategy (EMS) and a microgrid stand-alone power system configuration are proposed to work independently out of grid. The proposed system combines photovoltaics (PVs), and Battery. The system supplies a dump load with its demand power. The system includes DC/DC and DC/AC converters, as well as a maximum power point tracking (MPPT) to maximize the harvested energy from PV array. The classic PI control strategy is used to control the main system parameters like state-of-charge (SOC) for the battery. The corresponding energy management and control strategy are proposed to realize the power balance among three ports in different operating scenarios, which comprehensively takes both the maximum power point tracking (MPPT) benefit and the battery charging/discharging management into consideration. The simulations are conducted using the Matlab/Simulink software to verify the operation performance of the proposed PV/battery hybrid distributed power generation system with the corresponding control algorithms, where the MPPT control loop, the battery charging/discharging management loop are enabled accordingly in different operating scenarios.

KEYWORDS: *DC microgrid; energy management; hybrid power system; energy efficiency, Induction motor drive, EV Application*

I. INTRODUCTION

In power system grids, the microgrid is identified as a distributed energy system (DES), including generators, energy storage elements like batteries (B) and supercapacitors to balance the generated power and the consumed power [1–3], an energy management system to control the entire operation of the microgrid sources [4,5], and load. All of these items are combined together and work in parallel with the utility grid, or out of grid as a stand-alone system used for a small area and few consumers [6,7]. Generally, the microgrid is considered a cluster of the utility grid [8], as shown in Figure 1. Using a utility grid for power distribution has some disadvantages, 0073uch as transmission losses, especially when the generating plants are far away from the consumers, bad environmental impact because of emission, and climate change due to the use of conventional resources in the generation phase. Microgrids represent an alternative option that has the potential to overcome these problems.

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An Improved Power Factor Correction with Control of Leakage Inductance

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ABSTRACT

Nowadays the use of electronic equipment finds a progressive development in the modern world. Hence it becomes a mandate to check whether the harmonic content of line current of any electronic device which is connected to the ac supply meets the appropriate standards. This demand is satisfied by implementing the Power Factor Correction (PFC) circuit in order to make the input current to be in sinusoidal in nature and in-phase with the input voltage. Numerous solutions are available to make the line current almost sinusoidal. This paper describes an isolated power factor corrected power supply that utilizes the leakage inductance of the isolation transformer to provide boost inductor functionality. The bulk capacitor is in the isolated part of the power supply allowing for controlled startup without dedicated surge limiting components. A control method based on switch timing and input/output voltage measurements is developed to jointly achieve voltage regulation and input power factor control.

KEYWORDS: *AC-DC power conversion, power factor correction, transformer leakage inductance.*

INTRODUCTION

The widespread use of electronic devices from single-phase ac supplies necessitates thincreasing use of power factorcorrected (PFC) power supplies in many applications includingelectronic equipment, computer servers, and consumer products. PFC power supplies provide low total harmonic distortion(THD) in the current drawn from the line and this is an increasingly important requirement.Power factor correction techniques have been researchedwidely in the literature [1], [2] and an active PFC using highfrequency switching techniques [3] are now commonlyused.

The overarching principle involves controlling the input currentdrawn from the mains input to achieve the required current shapefor low THD and high power factor. The power supply must provide a regulated dc output voltage and for many applications,galvanic isolation is also required.The basic boost or step-up converter [4] forms the core ofmost architectures as it has an input inductor that allows inputcurrent control to be readily achieved. The well-known flybackconverter can be derived from the buck-boost converter, but witha transformer for output voltage isolation [4].

Traditionally for PFC supplies, fly back converters have beenused for lower power levels (≤100 W). For higher power levels(≥500 W), a separate boost converter for PFC and separate dcto dc converter with transformer isolation for output dc voltageregulation is used.

PROPOSED PFC ARCHITECTURE

In this paper, an active PFC power supply is described,whereby the leakage inductance of the high-frequency isolation transformer is used to

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An Evaluation of Research and Practices - Industrial Production Technology in Manufacturing

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ABSTRACT

This paper is based on a survey conducted on awareness and understanding an evaluation in Indian industrial production Technology in manufacturing Process. The main objective of this paper is to provide empirical evidence on top management's awareness and understanding of an evaluation of technique and its role towards business survival and competitiveness. The survey results and findings revealed that almost 20% are in the very good category, about 50% of the respondents companies are still in the moderate category, nearly 18% are in the low category and 12% have very little understanding and knowledge as regards to an evaluation . In summary, the survey analysis showed large majority of the Indian production Process involves in the manufacturing sector still experiencing lack of knowledge as regards to an evaluation of concept and its role towards enhancing their business process effectiveness and competitiveness.

Keywords: An evaluation, Competitiveness, Survey, Performance, Survival

INTRODUCTION

In this day and age, stiff competition, technology advancement and the globalisations of markets, most of the companies have been forced to consider and implement a wide variety of innovative management philosophies, approaches, and techniques (Lee et al. 2006). The globalisation of markets, growing inter-diffusion of economies, and increased inter-dependence of economic agents are reshaping national and international competitive environment and economic performance (Ghobadian and Gallear, 1996; OECD, 1993). These fundamental changes are prompting the far-sighted organizations to re-examine and modify their competitive strategies. To survive in the global competition and the ever-increasing customer demands, local business organizations must demonstrate the ability to understand and assess things quickly like their international competitors. Competitive analysis has been utilized by organizations for decades as a way of collecting data and measures regarding the markets, sales, products, production costs, or budgets of competitors (Yasin, 2011). Gathering intelligence about competitors is not a new idea. Historically, industries growth and development has been advanced by imitation of technology, business practices and organizations of the other countries. Bolton (1993) as quoted by Drew (2017) describes how industrialization in the United States of America benefited from imitating and exploiting Britain's knowledge of technologies such as metallurgy and steam engine. For example, in the

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CYBER RISK IN BANKING SERVICES: THE EXTENT OF CYBER RISKS PREVISIONS AND SECURITY MEASURES

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ABSTRACT

Banks play a pivotal role in financial system and economic building of the country. Indian Banking is competing with global players in the industry in terms of customer service, enhancing efficiency through technology. Financial institutions and online banking providers certainly understand the risk of cybercrime activities and therefore different legislations have been drafted to be implemented to provide security environment in banking and financial operations. Cyber-attacks can also be used to undermine customers' confidence in an institution. Cyber security is a complex and multifaceted challenge that is growing in importance. It is an issue that not only affects the banks but also government agencies. This research paper mainly focuses on the security aspect of the internet banking.

Key words: Cyber crime, Cyber security, financial institutions, Cyber attacks, Information Technology, Customers

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1. INTRODUCTION

Modern banks are using electronic channels to do their banking operations with both domestic and international customers. Of late, banks are mostly using Information Technology to receive instructions and deliver their products and services to their clients. In recent years, customers of banking corporations increasingly use technology to avail banking services. This phenomenon is also evident worldwide. Cybercrime is a growing threat in the virtual world because individuals and organizations are relying more on internet at an increasing rate. The use of internet and other technologies have enhanced the risk of attack from cyber criminals across the globe. With the number of incidents of theft, phishing, computer viruses, hacking, on the rise, there is a need to explore the cybercrime scenario. Information theft is the most expensive and fastest rising consequence of cybercrime. Cyber risk has emerged as a key threat to financial stability, following recent attacks on financial institutions. To counter new and

Implementation of Soil Moisture Monitoring System and Value Prediction Using Machine Learning

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Abstract: Exponential growth within world's population requires an increasing food supply. There is a significant need towards sustainability to satisfy future nutritional requirement. In order to enhance production, it is critical to identify soil moisture levels. However, most farmers cannot afford high-cost soil moisture measuring system. Our research in this paper tends to focus with efficiency of soil moisture monitoring system. We introduce a method in this article about the generation accurate moisture level by providing information on the water source required for successful farming. A system of soil moisture monitoring based on the sensors that have been linked to Arduino Nano is the primary objective of the document. The humidity sensor DHT11 is the sensor used in the process. Connected the device and stationed on the floor with Arduino Nano. The sensor is analyzed to ascertain what level of moisture value in different Substance. The implementation of a sensor of soil moisture reduces the water content to a certain locations. It also has proved intuitive in all the values obtained in wet and normal conditions.

Keywords: Humidity Sensor, DHT11, Accurate moisture value, Types of soil, Arduino Nano

1 Introduction

A qualitative strategy incorporating the existing system for moisture levels, salinity and PH quality monitoring is the Soil Monitoring System for Precision Agriculture. This system has several parts: one is a notification system used to alert or send farmers (users) information on whether the moisture, Ionic strength ratios and saline of the soil are low or high relative to normal values, and are used to monitor process data in its totality. A Wi-Fi shield would've been expected for monitoring system (that works when we execute the program). In order that perhaps the users can use functions in the application comfortably, fundamental provision underlying robustness the Wi-Fi shield is incorporated on the notification. This should store the data because this is a statistics device. A service is available for everybody reason. The paper attempts to develop a prototype product using IOT [1] technology, which reflects on soil moisture and humidity control and maintenance.

In this paper, we are focused primarily on overcoming management issues for farming technologies acquisition in the water-related domain and improving a moisture measuring system based on captors. We too try to understand the outcomes of representation position of liquid measurements. Major determinants for the farming technologies are the temperature control [2] and water management that are in connection with wholesome growth of agricultural Manufacturing as well as research concentrates on water and moisture management [3]. Moisture is tightly correlated to the various characteristics and forces of the soil. The ability to maintain water and strong farming in sand and clay is different. The different devices which demonstrate the moisture [4] concentration are related to the force needed to extract water from the soil, instead of merely showing the liquid with the percentage (percent). Correspondingly, calculations of water content have indeed been strongly correlated with pF values with tensiometer [5].

2 Problem Statement

Throughout India, farming is the breathing need of most Indians and is a large livelihood source. The economy of such a country is also impacted via agriculture. Water consumption improves hour after hour, which could also lead to water scarcity. Now a day is not just challenging for crops beyond their households. This paper is mostly designed to inform farmers of an intense moisture value, who've been talking about reducing the worldwide usage of water. When moisture is limited; The farmer is ready towards prepare use Liquid consequently. Dumping

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Cop Enhancement of Vapour Compression Refrigeration System

B Sairamakrishna, T Gopala Rao, N Rama Krishna

Abstract: *This experimental investigation exemplifies the design and testing of diffuser at compressor inlet and nozzle at condenser outlet in vapour compression refrigeration system with the help of R134a refrigerant. The diffuser with divergence angle of 12°,14° and the nozzle with convergent angle 12°,14° are designed for same inlet and outlet diameters. Initially diffusers are tested at compressor inlet diffuser is used with inlet diameter equal to exit tube diameter of evaporator and outlet tube diameter is equal to suction tube diameter of the compressor. Diffuser helps to increases the pressure of the refrigerant before entering the compressor it will be helps to reduces the compression work and achieve higher performance of the vapour compression refrigeration system. Then nozzles are testing at condenser outlet, whereas nozzle inlet diameter equal to discharging tube diameter of condenser and outlet diameter equal to inlet diameter of expansion valve. Additional pressure drop in the nozzle helped to achieve higher performance of the vapour compression refrigeration system. The system is analyzes using the first and second laws of thermodynamics, to determine the refrigerating effect, the compressor work input, coefficient of performance (COP).*

Key words: *Diffuser, Nozzle, Coefficient of performance, Refrigeration effect*

I. INTRODUCTION

...r system, the refrigerant under goes phase changes from liquid to vapor and then vapor to liquid in a closed cycle by absorbing the heat in the evaporator and reject the heat at condenser. The coefficient of performance (cop), which is a ratio of heat transfer rate at the evaporator to the power input to the compressor in the refrigeration system. The coefficient of performance can be increased either by decreasing the compressor work or by increasing the refrigeration effect. Different type of methods have been tried out for improving the cop of the vapour compression refrigeration system, as reported in literature.

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G.Naga Raju et al [1] in this paper have studied enhancement of cop of vapour compression refrigeration system by using the diffusers at compressor inlet and as well as condenser inlet.When using the diffuser at compressor inlet the coefficient of performance is increased by 6% and using the diffuser at condenser inlet the coefficient of performance is increased by 3%.

Neeraj Upadhyay et al [2] to studied the analytical study of vapour compression refrigeration by using diffuser and sub-cooling.to improve the cop of the system either by decreasing the compressor work are increasing the refrigeration effect. In this paper to increasing the refrigeration effect by incorporating of diffuser and sub cooling preoces. By using the diffuser consumption power is by compressor and cop is enhanced from 2.65 to 3.38.

Vivek Kumar et al [3] have developed a new configuration by inducting 1. Diffuser in between the condenser inlet and compressor,2. Heat exchanger at condenser outlet. By using these two to evaluate the different parameters like coefficient of performance, refrigerating effect and compressor work of this system with the help of R134a refrigerant. Compared these parameters with convectional system the cop of modified system increased by approximately 1.14.

P.G.Lohote et al [4] have studied the performance of different condenser by changing the pressure and change in cop of refrigeration system. When changing the convectional condenser by micro channel heat exchanger the pressure changes there are change in rate of heat transfer. This will helps to control the heat losses occurring in the condenser section. So that system of different condenser is gives the batter cop than the convectional system.

Nurul Seraj1 et al [5]In this paper to studied to enhanced the coefficient of performance of vcr system the Initially The Diffuser Of Increasing Cross-Sectional Area Profile Was Designed, Fabricated And Introduced In Our VCR Apparatus. The Size of Diffuser Selected Was Of 15 Degree Divergence Angle. By Using Diffuser Power Consumption Is Less for Same Refrigerating Effect So Performance Is Improved. The Size of The Condenser Can Also Be Reduced Due To More Heat Transfer.

S.Saboor et al [6] to study the experimental analysis of of vapour compression refrigeration system by using the diffuser at condenser inlet concept experimental approach to compensate the compressor work by providing a diffuser at the inlet of the condenser. Diffuser converts the high velocity available at the compressor discharge into the pressure energy.

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Development of Audio driver through ASIC implementation of FFT Engine

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ABSTRACT

FFT Engine has been designed at three different level of abstraction, Algorithmic level, Microdesign or low level design and RTL code generation. FFT engine is divided into three blocks, Memory block, FFT engine and Analysis block. FFT block is commuting FFT using radix-4 algorithm and it has been implemented using Memory based architecture. FFT block will compute 216 (65536) point FFT. CORDIC multipliers are used to save the memory. Analysis block has been designed for audio application that uses audio range (20 Hz to 20 kHz) for analysis as well as for ADC application that uses entire first Nyquist zone (zero to half of the sampling frequency). FFT engine can compute the parameters SNR, SNDR ,SFDR, THD and DC component for the noise floor up to -120 dB with an error less than 0.5 dB. There is huge saving of resources utilized by FFT Engine in comparison to HDL optimized FFT block given in Simulink HDL Coder library . HDL optimized FFT block itself uses 28 multipliers, 366 adders/subtractors, 1439 registers, 34 RAMs and 924 multiplexers. Our FFT block along with Memory block and analysis block needs only 16 multipliers, 689 adders/subtractors, 87 registers, 2 RAMs and 525 multiplexers. Number of adders are more because of logarithmic block and CORDIC block that have been designed for 21 stages and 19 stages respectively and each stage needs 6 adders/subtractors. Generated RTL code (Verilog) has is simulated using ModelSim and results have been verified with the results computed by Cadence tool as well as the result computed by Fixed point FFT Engine. In CORDIC block, Adder/Subtractor block has been used where a control bit decides whether this block will act as Adder or Subtracter. HDL Coder is generating one Adder, one Subtractor and one multiplexer to select the appropriate hardware according to control signal. In digital design, one can use xor gates and adder to perform the operation. We can save huge number of adders using this technique.

Keywords: FFT Engine, CORDIC Multipliers, Microdesign, Nyquist Zone, Audio Driver

I.INTRODUCTION

Dynamic performance of an audio driver is measured in using using the parameters SNDR (Signal to Noise plus Distortion Ratio), SFDR (Spurious Free Dynamic Range), THD (Total Harmonic Distortion), SNR (Signal to Noise Ratio) and DC component in the signal. To improve the dynamic performance of audio driver system, we need to monitor the these performance parameters of the signal. We can design a system that accepts analog audio signal as input, converts it into a digital signal using an ADC, calculates its various performance parameters and feed back to a control block. Control block takes these

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Developing a Systematic Blockchain System for Security and Privacy Management in Iot

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Abstract

Presently, BlockChain (BC) gained significant interest because of its undeniable nature and related advantages of security and privacy, BC has the power to resolve the limitations of Internet of Things(IoT) such as data protection and privacy. At the same time, BC has high computation complexity, restricted scalability, high bandwidth overhead and latency that is unsuitable to IoT. In this paper, efficient Lightweight integrated Blockchain (ELIB) model is developed to meet necessitates of IoT. The presented model is deployed in a smart home environment as an important illustration to verify its applicability in various IoT scenarios. The resource constrained resources in a smart home takes the advantages from a centralized manager which generates shared keys to transmit data, process every incoming and outgoing requests. The presented ELIB model generates an overlay network where highly equipped resources can merges to a public BC which verifies dedicated security and privacy. A set of three optimizations are carried out in the presented ELIB model include lightweight consensus algorithm, certificate ess (CC) cryptography and Distributed Throughput Management (DTM) scheme. A detailed simulation takes place under different scenarios in terms of processing time, energy usage and overhead. The ELIB attains a total of 50% saving in processing time on comparing to baseline method with the minimum energy consumption of 0.07mJ. The obtained experimental outcome indicated that the ELIB shows maximum performance under several evaluation parameters.

Keywords: IoT, Blockchain, Security, Privacy, and Certificate less cryptography

1. Introduction

Recently, the field of BlockChain (BC) becomes more familiar which keeps hold of structured peer to peer digital ledger *Ts* and distribute the *T* details to all coordinated nodes in the chain [1]. The concept of centralization is eliminated in BC network. The nodes in the network regularly monitor the new *Ts* in the network and activate the remaining nodes to participate in the network. The computationally complicated, complicate-to-solve and easy-to-verify puzzle are the various processes managed by the new block in BC and this new block have been enhanced by the new puzzle. The consensus algorithm has the specific computation resources and manages the number of blocks to get activated by the node. The blocks in the network has been restricted to get mined in order to protect the node from adversaries mining of blocks. The new coming node (miners) has to solve the puzzle and this puzzle is not same for all the available nodes. It is randomly generated to all available new miners. The existing Consensus algorithm is been based with the following techniques Proof of Work (POW) [2] or Proof of Stake (POS) [3] is been typically implemented by the Existing BC. The POS technique needs is highly complicated and needs memory resources to solve a cryptography puzzle. In addition, the POW request high computational resources and the encrypted message are communicated between the nodes to protect the nodes against eavesdropping. The encrypted message is decrypted by the Public Keys (PK) and these PK is randomly changed in BC and these are process is continuously updated to

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A META HEURISTIC MULTI-VIEW DATA ANALYSIS OVER UNCONDITIONAL LABELED MATERIAL: AN INTELLIGENCE OCMHAMCV

SRINIVAS KOLLI *, PRAVEEN KRISHNA A.V † AND M. SREEDEVI‡

Abstract. Artificial intelligence has been provided powerful research attributes like data mining and clustering for reducing bigdata functioning. Clustering in multi-labeled categorical analysis gives huge amount of relevant data that explains evaluation and portrayal of qualities as trending notion. A wide range of scenarios, data from many dimensions may be used to provide efficient clustering results. Multi-view clustering techniques had been outdated, however they all provide less accurate results when a single clustering of input data is applied. Numerous data groups are conceivable due to diversity of multi-dimensional data, each with its own unique set of viewpoints. When dealing multi-view labelled data, obtaining quantifiable and realistic cluster results may be challenge. This study provides unique strategy termed OCMHAMCV (Orthogonal Constrained Meta Heuristic Adaptive Multi-View Cluster). In beginning, OMF approach used to cluster similar labelled sample data into prototypes of dimensional clusters of low-dimensional data. Utilize adaptive heuristics integrate complementary data several dimensions complexity of computational analysis data representation data in appropriate orthonormality constrained viewpoint. Studies on massive data sets reveal that proposed method outperforms more traditional multi-view clustering techniques scalability and efficiency. The performance measures like accuracy 98.32%, sensitivity 93.42%, F1-score 98.53% and index score 96.02% has been attained, which was good improvement. Therefore it is proved that proposed methodology suitable for document summarization application for future scientific analysis.

Key words: Clustering, Document summarization, Data mining, Meta heuristic technique.

AMS subject classifications. 68T05

1. INTRODUCTION. Large amounts data gathered from several study fields, such image processing, computer vision data fusion, natural language and processing in real time as result of fast computer-related technology deployment. A wide range of dimensions associated to a wide variety of properties are examined in these data, which include many high-dimensional features with complicated structures [1, 2]. High-dimensional data represents the abundance of data curse dimensionality, therefore managing high-dimensional data general concern big challenge for optimizing the dimension's dimensions. Using hidden data to represent low dimensionality and reducing dimensionality in relation to input data is an effective method for large amounts of data [3].

Theoretically optimized matrix factorization has emerged as the research hotspot with the easiest implementation for multi-labeled data reduction. It's possible extract low-dimensional attribute relations high-dimensional data relations using factorization matrix-related methodologies such ICA (Independent Component Analysis), PCA (Principal Component Analysis), & VQ (Vector Quantization). No components in matrices are decomposed; this implies that in order to maximize matrix representation, negative elements must be included in the low-dimensional representations of data [4]. Deep learning has recently proven exceptional performance in include representation projects [5]. Lattice factorization has been enriched by various analysts who have incorporated substantial learning into the process [6]. A multi-layer non-negative MF technique presented (MNMF) [7]. First, MNMF degraded the grid many times to produce the fundamental part-based representation that may remove profoundly different degrees of information from the original information. To propose

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A Digital Record for Privacy and Security in Internet of Things

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ABSTRACT

For privacy and security, a digital transactional record method plays a major role for its excellent nature of work. This digital method used to solve the check the problems like privacy and protection of data. It also had some unfit things like high bandwidth, computation complexity, latency and restricted scalability which are inadequate for internet of things. This research paper focuses on Efficient Lightweight Integrated Block chain model which is expanded to show the development of internet of things. Especially, this paper presents a model of a digital home which is attempted to prove the various applications used by internet of things. The benefits of this smart home are information transmission, activity of outgoing and incoming in every action. Efficient Lightweight Integrated Block chain model connected with digital transactional method with powerful provided sources to prove privacy and security. Algorithm, Certificate less Cryptography, Distributed Throughput Management schemes and Lightweight Consensus are used to present the Efficient Lightweight Integrated Block Chain model. Various methods are used to prove this model by using time processing, usage of energy and so on. This model saves 60% of time processing while consuming the energy of 0.08 Jm. Many parameters are used to show outcome done by this method.

Keywords : Internet of things, Digital Transactional Record, CC method, Privacy and Security

I. INTRODUCTION

The field of Block Chain becomes more familiar like DLtimes per second dispense the timecharacteristic of joints in the BC (Kosba et al., 2016). Centralization concept is disqualified in BC web. The joints in the web continuously differenttime per second in the network and operate other joints to work. Thecomplicate-to-find, easy-to-verify puzzle, and computationally complicated managed by the block of bitcoin and the block have handled the puzzle which is new. An Algorithm of consensus had particular systematic work and to handle the block which is counted to operate the joints get small parts because to save the joint form adversaries blocks which is mined. The joint which is new has to find answer for the mystery and this mystery is not identical for all the other joints. The mining thing which is new is

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Automatic Defect Detection and Depth Visualization in Mild Steel Sample Using Quadratic Frequency Modulated Thermal Wave Imaging

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Abstract

Deeper defect detection and depth resolution capabilities of quadratic frequency-modulated optical stimulus became a viable approach for material inspection in active infrared non-destructive testing modality. But the limitations of complex and non-linear analytical models associated with processing techniques propel towards automated defect assessment techniques in infrared thermography. This paper introduces a deep neural network-based automatic defect detection and depth visualization technique in quadratic frequency modulated thermal wave imaging. The neural network classifier uses the modified loss function of a one-class support vector machine to classify defects. The regression network estimates the depth of classified defects. A mild steel specimen with artificial

Impact of Plug-In Electric Vehicles Integrated into Power Distribution System Based Dynamic Voltage Restorer with Ultra Capacitor

Sayala Uday Kumar[1], Kommavarapu Sabari Nath[2]

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Abstract: This project proposes the impact of plug-in electric vehicles (PEVs) integrated into a power distribution system based on voltage-dependent control. The gasoline gate situation has many people turning to electric vehicles as a more environmentally friendly option, especially in smart community areas. The advantage of PEVs is modern vehicles that can use several types of fuel cells and batteries as energy sources. The proposed PEVs model was developed as a static load model in power distribution systems under balanced load conditions. Dynamic voltage restorer (DVR) is one product that can provide improved voltage sag and swell compensation with energy storage integration. Ultracapacitors (UCAP) have low-energy density and high-power density ideal characteristics for compensation of voltage sags and voltage swells, which are both events that require high power for short spans of time. The novel contribution of this paper lies in the integration of rechargeable UCAP-based energy storage into the DVR topology. With this integration, the UCAP-DVR system will have active power capability and will be able to independently compensate temporary voltage sags and swells without relying on the grid to compensate for faults on the grid like in the past. The entire system is modeled using MATLAB SIMULINK, the real time controllers are done by Raspberry pi development board and the results prove the feasibility of the proposed idea.

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Minimization of Unbalanced voltage in Low Voltage Micro grid Using Voltage Compensator with Advanced FOPID Controller

Chennu Revanth Varma, Ch Chinna Veeraiah

ABSTRACT

This paper presents an adaptive add-on controller for the unbalance voltage compensation in low voltage microgrid (LVMG) constituting multiple voltage source converters (VSC) based distributed generation. Since, the VSC based LVMG is almost inertia-less system and any kind of load variations have very significant impact on voltage profile, which is highly undesirable. Presence of unbalance load at point of common coupling (PCC) further exaggerates the problem. In order to mitigate the negative effect of unbalance load, an ANFIS based add on control loop has been added in to the conventional VSC control. Here, the add-on controller sets the reference current gains equivalent to voltage unbalance factor. These reference current gains obtained from add-on controller are added to the output of voltage control loop to set the modified reference current for inner current control loop. The outer voltages can be controlled using FOPID controller to reduces the unbalances in the voltages and total harmonic distortions in the load voltage and current.

INTRODUCTION

In the recent time, the concept of microgrid is gaining lot of popularity worldwide due to their ability of working independently in islanding mode. The microgrid also al-lows the optimal utilization of available renewable energy sources (RES) in a coordinated way in order to feed remotely placed isolated locations where grid is not readily available. Thus, the microgrid is expected to work both in grid tied mode and off grid (islanded) mode. In grid tied mode, the grid voltage sets the reference for DG interfacing VSC's and chances of internal conflict among different VSC's are very rare. However, in islanded mode of operation, the different VSC's are needed to be controlled in such a way that the load demand must be shared by all interconnected VSC's in pro-portion to their individual rating [1]-[4]. Therefore, the VSC's in microgrid may either be controlled in centralised manner with dedicated communication channel between them or they may be controlled individually with droop control which may require low bandwidth communication channel or no communication channel at all [5]- [7]. The later one is more preferable; as it is easily implementable with enhanced security and reliability. The traditional droop control method have some issues related to the inaccuracy in deter-mining the power to be shared by individual DG and deviation in voltage at PCC due to fluctuation as well as unbalance in load demand [8]-[11].

To mitigate the aforementioned disadvantages of conventional droop control, several control algorithms have been proposed by researchers all over the world. As a primary control measure, virtual impedance and negative-sequence impedance methods have been proposed to share the unbalance load demand by various DG's [12]-[13]. In such kinds of methods, a measurement unit is required to transmit the negative-sequence component of unbalanced load to all interconnected DG's. Moreover, any mismatch in actual impedance of feeder due to connected transformer, filtering inductor or capacitor and cable connection may result in inaccurate power sharing among DG's. Therefore, within a control loop the virtual

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Comparative Study of Fault Ride Through Capability For Convention And PV Fed UPQC With Improved Power Quality Features.

PRODDUTURI SAI MANIKANTA[1], Mr. CH. CHINNA VEERAIAH[2].

ABSTRACT

The objective of the project is to minimize the power quality problems with the implementation of power quality enhancement device PV UPFC. This device has the capacity to improve the power quality at the point of installation. Without PV UPFC the system voltage and currents are unbalanced under fault condition with THD of 6.02%. When we applied PV UPFC with PI controller the vo output voltage is balanced and still some distortions observed in current waveforms under fault conditions the THD is reduced to 2.74%. By using the proposed Hybrid controller with PV UPFC the system output voltage and currents are balanced without any distortion and the THD is reduced finally to 0.08%. Hence the analysis proves that the proposed Hybrid controller with UPFC achieved better results when compared to the existing models.

INTRODUCTION

Electric systems and grids are complex dynamic systems. These systems suffer usually from unexpected or sudden changes of the currents and voltages. These changes are due mainly to the different types of linear and non-linear loads to which they are connected. In addition, to different types of accidents which can intervener into the grid. With the increasing use of power semiconductors in the most of industrial and domestic procedures, the electric grids are polluted with different harmonic currents and voltages. These harmonics affect the normal function of the most of the grid connected devices; in addition to considerable economic losses. Many classic and modern solutions have been proposed in the literary for the harmonic problems. In this chapter, the harmonic problem as one of the most common power quality problems will be presented. The different modern and traditional solutions will then be discussed.

Power quality is a term that means different things to different people. Institute of Electrical and Electronic Engineers (IEEE) Standard IEEE1100 defines power quality as "The concept of powering and grounding sensitive electronic equipment in a manner suitable for the equipment." As appropriate as this description might seem, the limitation of power quality to "sensitive electronic equipment" might be subject to disagreement. Electrical equipment susceptible to power quality or more appropriately to lack of power quality would fall within a seemingly boundless domain. All electrical devices are prone to failure or malfunction when exposed to one or more power quality problems. The electrical device might be an electric motor, a transformer, a generator, a computer, a printer, communication equipment or a household appliance. All of these devices and others react adversely to power quality issues, depending on the severity of problems.

A simpler and perhaps more concise definition might state: "Power quality is a set of electrical boundaries that allows a piece of equipment to function in its intended manner without significant

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DesignandAnalysisOfBidirectionalBuck-BoostConverter ForDCMachineandBLDCMachineForBasedElectrical Vehicle

Kunda Swapna[1], Mr. P. Venkateswara Rao[2].

ABSTRACT

It is necessary that alternating sources for oil reserves that are exhaustible in future need to be found. Due to combustion of oil, it will create environmental pollution problem. Most of the vehicles now a day are dependent on internal combustion engine for their operation which is cause of worry because they are responsible for air pollution so, vehicle manufacturer now a day are looking for alternative sources that can reduce pollution. Due to arising problem of pollution plug in hybrid electric vehicles are very essential for the future. As we know that a brushed DC motor uses a configuration of wound wire coils, the armature, acting as a two-pole electromagnet. A brushless motor, by contrast, utilizes a permanent magnet as its external rotor. In addition, it uses three phases of driving coils and a specialized sensor that tracks rotor position This project provides the comparative analysis of DC machine powered electric vehicle and BLDC powered electric vehicle and corresponding effect on state of charge and ripples in the dc voltage at the battery. This comparison is carried out in the MATLAB software comparative results are givenindividually.

INTRODUCTION

Transportation sector occupies a fundamental place in the world. Fossil fuels used in conventional vehicles technology emit greenhouse gases such as carbon dioxide, carbon monoxide and methane. The excessive consumption of these gases causes air pollution, climate change and global warming. In order to reduce these effects, there is a tendency to electric vehicle (EV) technology. The EV has much lower fuel cost according to fossil fueled car since they are mainly composed of battery system, power electronic circuits and electric machine. The battery system in an EV is the most crucial component in charge control time and determining distance [1,2]. The electric machines of an EV are operated in both motor and generator modes due to regenerative breaking feature that enables electric machine to be operated in generator mode which is impossible in conventional internal combustion engine (ICE) vehicles. Therefore, electric machine charges the battery by operating in generator mode during the regenerative braking and it ensures recharging the batteries [3,4]. EV are classified into two types as hybrid EVs (HEVs) and all-electric vehicles. The HEV technology is used in conjunction conventional vehicle technology. The main system in HEV technology includes fuel tank and ICE such as diesel or gasoline engine, and auxiliary system which is comprised by electric machine, power electronic circuits and battery. HEVs are classified as parallel and series hybrid vehicles [5] that the parallel HEV consists ICE and electrical machine together as shown in Fig.1. As the parallel electric vehicles operates at electric mode during the acceleration of electric machine, the motor operation is supplied frombattery

The designed EV motor driver is comprised by four sections such as battery, bi-directional dc-dc converter, FLC and dc machine as shown Inthisstudy, the starting voltage of battery is set to 378V

Deep Learning in Quadratic Frequency Modulated Thermal Wave Imaging for Automatic Defect Detection

G. T. Vesala, V. S. Ghali, R. B. Naik, A. Vijaya Lakshmi, and B. Suresh

1 Introduction

Non-destructive testing (NDT) techniques promise to improve the quality and produce defect-free products in various industries. Over the other conventional NDT techniques, active infrared non-destructive testing (IRNDT) is gaining interest due to its subsurface analysis characteristics with the whole field, non-contact, and remote inspection capabilities [1]. Active thermography (AT) uses the heat map over the test object surface to distinguish the subsurface anomalies under a controlled external stimulus. However, deeper defect detection and depth resolution characteristics promote quadratic frequency modulated optical stimulus as a viable excitation scheme in AT over other conventional stimulation mechanisms [2]. The recent trend in post-processing research introduced fascinating feature extraction methodologies in quadratic frequency modulated thermal wave imaging (QFMTWI) for efficient defect detection [3]. Though these techniques feature an enhanced detection, they require human expertise for qualitative and quantitative assessment which is prone to human errors. Besides, the present trend in the industrialization and NDT techniques are enabling with artificial intelligence and deep learning based techniques to automate the defect detection, without human intervention.

Machine learning has been introduced in conventional thermography in the late 1990s, but extensive research on deep learning was initiated in the recent past with

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RESEARCH ARTICLE OPEN ACCESS

Behaviour of M50 Grade Self Compacting Concrete by Partial Replacement of Portland Slag Cement with Metakaolin

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Abstract:

Self-compacting concrete is one of the most significant advancements in concrete construction. Because it compacts itself, it can be compacted without the use of a mechanical vibrator.

The current study develops M50 grade self-compacting concrete (SCC) with metakaolin substitution. Plasticizers based on Poly-Carboxylic Ether were shown to be compatible with concrete-making materials. The goal of this research work is to look at the strength and durability of self-compacting concrete with and without Metakaolin in place of Portland slag cement at a constant water-cement ratio calculated using the efficiency principle.

The best percentage substitution of Portland Slag cement with Metakaolin has been determined to be 15%. The percentage increase in strength was found to be 7.85 percent higher than control concrete at 28 days (without replacement).

The ideal dosage of superplasticizer was found to improve the concrete's properties during the experimental examination. As a result, overall improvements in the self-compacting concrete's flow and filling ability have been noticed, and the specimens containing metakaolin have a higher strength value and are more durable when exposed to greater temperatures.

Keywords —**Metakaolin, M50, Self-Compacting Concrete.**

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I. INTRODUCTION

The problem of concrete construction durability has been a prominent topic of interest in Japan for several years, commencing in 1983. Sufficient compaction by competent workers is essential to create enduring concrete buildings. However, as the quantity of competent workers in Japan's construction industry declines, so does the quality of the job. The use of self-compacting concrete, which can be compacted into every corner of a formwork merely by its own weight and without the need for vibrating compaction, is one approach for achieving long-lasting concrete buildings regardless of the quality of construction work. Okamura recommended the requirement for this sort of concrete (1986).

II. OBJECTIVE

- Casting is done for various mixes by increasing the percentage of Portland Slag Cement replaced with metakaolin, and the optimum dosage of metakaolin is determined.
- A comparison of the M50 grade Self-Compacting Concrete with optimum percentage replacement of Portland slag cement with Metakaolin at constant W/C (using efficiency concept) ratio of 0.27 and 1% optimum dosage of superplasticizer

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Accumulator Based 3-Weight Pattern Generation for Complex Large Scale Integration Packages

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ABSTRACT

We describe a method for on-chip generation of weighted test sequences for synchronous sequential circuits. For combinational circuits, three weights, 0, 0.5 and 1, are sufficient to achieve complete coverage of stuck-at faults, since these weights are sufficient to reproduce any specific test pattern. For sequential circuits, the weights we use are defined based on subsequences of a deterministic test sequence. Such weights allow us to reproduce parts of the test sequence, and help ensure that complete fault coverage would be obtained by the weighted test sequences generated. In this paper an accumulator-based 3-weight test pattern generation scheme is presented. The proposed scheme copes with the inherent drawbacks of the scheme proposed more precisely. First, it does not impose any requirements about the design of the adder i.e., it can be implemented using any adder design and then it does not require any modification of the adder; and hence it does not affect the operating speed of the adder. Furthermore, the proposed scheme compares favorably to the scheme proposed in terms of the required hardware overhead. The weighted random test pattern generation represents a significant departure from classical methods of generating test sequences for complex large scale integration packages. The virtue of this technique is its simplicity and the fact that test-generation time is virtually independent of or gates in the logic package to be tested. This technique can be used both in a conventional tester and in a tester where the weighted random test pattern generation is implemented in hardware.

Keywords: Sequential Circuits , Combinational Circuits , Patterngeneration

I.INTRODUCTION

Arithmetic operations include operations of adding, subtracting, multiplying, dividing, comparing, and finding a square root. The multiplication operation is the second operation in the computers after the addition. There are several methods of multiplication acceleration: a way to change the encoding system of multipliers, which can reduce the amount of summating partial products (Booth's algorithm), using more efficient variants of partial products adding that exclude time- consuming spreading of transfer and the method of parallel computing of all partial products. All these three approaches are usually implemented using combinational devices. Parallel computation of partial products takes place in all multiplication schemes. The difference is mainly observed in the method of summing up the obtained partial products, and from this position, the usage of multiplication schemes can be divided into matrix-like and multilayer with a tree structure. The difference between matrix and multilayered multipliers is expressed in the number of one-bit adders used, their type, and the method of spreading the transfers that arise in the process of summation. The most well-known matrix multipliers are: Brown's multiplier, a multiplier with horizontal spreading of transfer and multipliers that are constructed using Baugh-Wooley's [13] and Pezaris's [14] algorithms for multiplying binary numbers in complementary codes. In matrix multipliers, the

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summation is made by a matrix of adder, which consists of successive rows of one-bit adders with transfer saving. As the data moves down the array of adders, each line of the adder with transfer saving adds another partial product to the sum of partial products. With high performance, the important achievements of matrix multipliers are their regularity, which is especially significant when implementing such multipliers in the form of an integrated circuit. On the other hand, such circuits occupy a large area on the crystal of the chip, and with the increase of the bit-capacity of multipliers, this area increases in proportion to the square of the number of bit-capacity.

II. LITERATURE REVIEW

Irith Pomeranz and Sudhakar M. Reddy-"Built-In Generation of Weighted Test Sequences for Synchronous Sequential Circuits"

Description: Here the description of this method is used for on-chip generation of weighted test sequences for synchronous sequential circuits. The weights we used were defined based on subsequences of a deterministic test sequence. The use of a deterministic test sequence to define the weights allowed us to reproduce parts of the test sequence, and helped ensure that complete fault coverage would be obtained. It described a procedure for defining a set of weights from which weight assignments can be constructed, a procedure for selecting weight assignments so as to detect target faults, and presented experimental results to demonstrate that complete fault coverage can be achieved by this method. It also investigated the tradeoff between the number of weight assignments and the number of observation points required to achieve complete fault Coverage. The use of pure-random sequences as part of the weight scheme, followed by the synthesis of the on-chip test generation hardware, is the subject of future work.

Disadvantages of existing system: This method is not applicable when a single test sequence is given for the circuit.

Advantages of our proposed system: In accumulator based 3-weight pattern generation is easy to used and applicable for a single test sequence is given circuit.

Ioannis Voyiatzis- "An Accumulator-Based Compaction Scheme for Online BIST of RAMs"

Description : The utilization of accumulator modules for output data compaction in symmetric transparent BIST for RAMs is proposed. It is widely accepted by the test community that the utilization of modules that typically exist in the circuit, e.g., accumulators or arithmetic logic units, for BIST test pattern generation and/or response verification possesses advantages, It is shown that in this way the hardware overhead, the complexity of the controller, and the aliasing probability are considerably reduced.

Disadvantages of existing system: Lower hardware overhead and elimination of the need for multiplexers in the circuit path; furthermore, the modules are exercised. Therefore, faults existing in them can be discovered.

Advantages of Our Proposed systems: The comparison will be performed with respect to the hardware overhead and no elimination of the need for multiplexers in the circuit path.

Katarzyna Radecka, Janusz Rajski-"Arithmetic Built-In Self-Test for DSP Cores"

Description: It is demonstrated how components are themselves tested, and subsequently used to perform more complex testing functions. The need for extra hardware is either entirely eliminated or drastically

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reduced, test vectors can be easily distributed to different modules of the system, test responses can be collected in parallel, and there is virtually no performance degradation.

Disadvantages of existing system: The existing data-path BIST schemes are unfortunate examples of having sophisticated modules on the chip, but remain unable to translate this advantage into efficient nonintrusive testing schemes.

Advantages our proposed systems: Redesign of the accumulator is imposed, thus resulting in reduction in test application time.

III. PROPOSED SYSTEM

Generally, the accumulator-based compaction technique uses an accumulator to generate a composite fault signature for a circuit under test. The error coverage for this method has been previously analyzed. We describe an alternative technique for calculating the error coverage of accumulator-based compaction using the asymmetric error model. This technique relies on the central limit theorem of statistics and can be applied to other count-based compaction schemes. The data paths of most contemporary general and special purpose processors include registers, adders and other arithmetic circuits. If these circuits are also used for built-in self-test, the extra area required for embedding testing structures can be cut down efficiently. Several schemes based on accumulators, subtracters, multipliers and shift, resisters have been proposed and analyzed in the past for parallel test response compaction, whereas some efforts have also been devoted in the bit-serial response compaction case.

The utilization of accumulators for time compaction of the responses in built-in self test environments has been studied by various researchers. One of the well-known problems of time compactors is aliasing, i.e. the event that a series of responses containing errors result in a signature equal to that of an error-free response sequence. In this paper we propose a scheme to reduce aliasing in accumulator based compaction environments. With the proposed scheme, the aliasing probability tends to zero, as the number of the patterns of the test set increases.

We use a pseudo random generator made using Linear Feedback Shift Register (LFSR). These patterns generated using LFSR have all the desirable properties of random numbers, but are algorithmically generated by the hardware pattern generator and are therefore repeatable, Which is essential for BIST? We no longer cover all the 2^ncombinations, but a large number of test pattern sequences will still be necessary to attain sufficient fault coverage.In general, pseudo random pattern generation requires more patterns than completely deterministic Automatic Test Pattern Generation (ATPG), but obviously, fewer than the exhaustive testing. However, it was found that the stuck-fault coverage rises in a logarithmic fashion towards hundred percentage, but at the cost of enormous numbers of random patterns. On top of it, certain circuits are random pattern resistant circuits in that they do not approach full fault coverage with an unbiased random pattern. Such circuits require extensive insertion of testability hardware or a modification of random pattern generation to _weighted pseudo random pattern generation' in order to obtain an acceptable fault percentage.

ACCUMULATOR CELL

The main object of the weighted pattern generation is an accumulator cell. To implement the accumulator in the proposed weighted pattern generation scheme is based on presented in Figure.

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proposed scheme. it is trivial to see that the proposed scheme presents an important decrease in the hardware overhead, while the number of tests is comparable It is interesting to note that the hardware overhead with respect to the hardware overhead of the benchmarks is practical. which sometimes exceeds the benchmark hardware (c2670, s5378, s9234, s13207, s15850,s38584). The average increase in the number of tests, while the average decrease in hardware overhead to 98%.

Finally, we have presented an accumulator-based 3-weight (0, 0.5, and 1) test-per-clock generation scheme, which can be utilized to efficiently generate weighted patterns without altering the structure of the adder. Comparisons with a previously proposed accumulator-based 3-weight pattern generation technique and it indicates that the hardware overhead of the proposed scheme is lower, while at the same time no redesign of the accumulator is imposed, thus resulting in reduction in test application time. Comparisons with scan based schemes show that the proposed schemes results in lower hardware overhead. Finally, comparisons with the accumulator- based scheme proposed and reveal that the proposed scheme results in significant decrease in hardware overhead.

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CONCLUSION

When the battery is charged, the dc machine is operated generator mode and bi-directional dc-dc converter is operated in buck mode. Variable negative torque values are applied to the dc machine and effect on the battery is observed. According to simulation result, the battery SoC is increased from 87.47% to 87.55%. In all-electric vehicle, regenerative breaking is occurred in this state. Charge and discharge states of the battery are the most essential for distance to determining. When the battery is charged, the dc machine is operated generator mode and bi-directional dc-dc converter is operated in buck mode. Variable negative torque values are applied to the BLDC machine and effect on the battery is observed. According to simulation result, the battery SoC is increased from %88 to %87.8. In all-electric vehicle, regenerative breaking is occurred in this state. Charge and discharge states of the battery are the most essential for distance to determining.

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A Comparative Study of Isolated and Non Isolated Based Bidirectional Electric Vehicle In MATLAB

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ABSTRACT

The level of exhaust gases is rising with increasing usage of internal combustion engine vehicles. In order to reduce carbon emission, researchers and industry head up for improving electric vehicle technologies in all over the word. This paper deals with design and simulation of a bi-directional power converter of electric vehicle. The power electronics block is comprised by batteries, bi-directional dc-dc converter and dc machine. The initial state of battery charge is set around 90% where the discharge current is 44.5 A during motor mode. The nominal voltage of battery stack is 350 V and maximum capacity is 100 Ah. The rated power of dc machine is set to 250 HP with 500 V armature voltage and 300 V field voltage. The operating mode of power converter is determined according to the torque values of dc machine which is operated in motor and generator modes. The charge and discharge conditions of batteries have been controlled regarding to operating modes of dc machine. The bi-directional dc-dc converter is controlled with fuzzy logic controller in both modes. The proposed converter and controller are designed to meet charge control and motor drive requirements of an all-electric vehicle.

INTRODUCTION

Transportation sector occupies a fundamental place in the world. Fossil fuels used in conventional vehicles technology emit greenhouse gases such as carbon dioxide, carbon monoxide and methane. The excessive consumption of these gases causes air pollution, climate change and global warming. In order to reduce these effects, there is a tendency to

electric vehicle (EV) technology. The EV has much lower fuel cost according to fossil fueled car since they are mainly composed of battery system, power electronic circuits and electric machine. The battery system in an EV is the most crucial component in charge control time and determining distance [1,2]. The electric machines of an EV are operated in both motor and generator modes due to regenerative breaking feature that enables electric machine to be operated in generator mode which is impossible in conventional internal combustion engine (ICE) vehicles. Therefore, electric machine charges the battery by operating in generator mode during the regenerative braking and it ensures recharging the batteries [3,4]. EV are classified into two types as hybrid EVs (HEVs) and all-electric vehicles. The HEV technology is used in conjunction conventional vehicle technology. The main system in HEV technology includes fuel tank and ICE such as diesel or gasoline engine, and auxiliary system which is comprised by electric machine, power electronic circuits and battery. HEVs are classified as parallel and series hybrid vehicles [5] that the parallel HEV consists ICE and electrical machine together as shown in Fig.1. As the parallel electric vehicles operates at electric mode during the acceleration of electric machine, the motor operation is supplied from battery

PROPOSED SYSTEM

The designed EV motor driver is comprised by four sections such as battery, bi-directional dc-dc converter, FLC and dc machine as shown In this study, the starting voltage of battery is set to 378 V while the operating voltage of dc machine

RESEARCH ARTICLE OPEN ACCESS

An Experimental Study on Effect of Bottom Ash as partial Replacement of Sand on Properties of Concrete

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Abstract:

Concrete is the most significant engineering material, and its qualities can be altered by adding additional materials. Studies have been carried out to see if a wide range of materials could be used as partial replacements for cement, sand, and aggregate in the manufacturing of concrete. The current experimental investigation attempts to reduce waste and conserve resources. The goal of this research was to see how using coal bottom ash as a partial replacement for fine particles at different percentages (0–25%) affected concrete qualities like workability, compressive strength, split tensile strength, and flexural strength.Workability declines as the proportion of coal bottom ash increases, but compressive strength, split tensile strength, and flexural strength increase up to 20% replacement of coal bottom ash, according to the findings. Bottom ash can be used up to 20% along with sand in concrete with a relatively low strength requirement, according to the study.

Keywords —**Bottom Ash, Sand Replacement, Compressive Strength, Split Tensile Strength.**

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I. INTRODUCTION

The availability of power determines a country's economic and industrial growth. Coal is an important source of energy generation in India as well. Coal is used to generate about 60% of the electricity. Indian coal has a low calorific value (3000-3500 Kcal) and a high ash content (30-45%), resulting in a large amount of ash being produced in coal-fired thermal power plants. In the years 2005-06, 125 of these power plants produced around 112 million tonne of ash. With the current increase in the power sector, ash production is predicted to reach 175 million tonnes per year by 2012. The following four types of ash may be found in any coal-fired thermal power plant:

Ash, the Fly: This type of ash is collected in dry form from flue gases using an Electrostatic Precipitator. This ash is a high-quality substance with excellent pozzolanic properties. Fly Ash: This type of ash is collected in dry form from flue gases using an Electrostatic Precipitator. This ash is a high-quality substance with excellent pozzolanic properties.

Bottom Ash is ash that collects at the bottom of the boiler furnace. It is a coarser substance with a higher percentage of unburned carbon. It has no or very little pozzolanic properties.

Pond Ash is created when fly ash and bottom ash, or both, are combined in any proportion with a considerable amount of water to form a slurry, which is then deposited in ponds where the water is drained away. Pond ash is the term for the ash that has been deposited.

Mound ash is made up of fly ash and bottom ash (or both) combined in any proportion and deposited dry in the shape of a mound.

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Fuzzy Logic Control Based Wind PV Cogeneration Using Back to Back Voltage Source Converters

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Abstract: This project establishes a new topology for performance of grid connected wind P cogeneration system. The utility grid via btb (back to back) voltage source converter is interface to a synchronous generator based wind turbine. In this system a PV solar generator is connecte to the dc link capacitor of VSC. The switching approach of the grid side converter is intended t pick up voltage drop caused by the fault in the grid while maximum obtainable active power wind turbine system is injected to the grid and the DC link voltage in the converter is regulate The efficiency of the system is improved as there is no requirement of dc to dc conversion. In th project the wind and photovoltaic generators uses independent maximum power point tracking t extract the maximum power and improve the efficiency the control of vsc uses FLC contr scheme. The dynamic models of the system components were developed to explore the stability. Th system is verified by using simulation results.

Index Terms--**AC-DC power converters, DC-AC power converters, maximum power poin trackers, permanent magnet machines, solar power generation, wind power generation.**

I. INTRODUCTION

Among the environmental benefits of renewable energies, the launch of new technologies in the management and control of renewable energy sources and the growing demand for high quality and constant supply lead to greater attention to this type of energy source. [1-4]. In addition to the optimal operation of a power system under normal conditions, checking the system under fault conditions is one of the most difficult concerns [5-7]. Energy quality is one of the most important issues in the use of distributed generation (DG) [8-9]. In addition to the frequency and active power, the voltage and reactive power should be limited and controlled in predefined intervals [10-11]. To achieve this, generators must be properly controlled to prevent voltage drop and voltage surge at maximum or low demand, respectively [12-15]. One of the most important advantages of the DGs, in addition to the injection of active power and the supply of local load, is the injection of reactive power at the common coupling point (PCC) [16-17]. By controlling the reactive power of a DG, the voltage profil and the quality of the power supply can b improved in different operating modes of th network, especially in the event of faults. Win turbine generation is one of the most commo sources used in distributed generation system for this purpose. Constant speed wind turbine that were more popular and efficient tha recent wind turbine systems where electroni power technology has helped to improv efficiency by implementing variable speed win generators in power generation. Due to th periodic and unrestricted nature of wind an solar energy, electronic power converters ar used as an interface with the load side or th public grid and therefore distributed generatio units are produced. To maximize the benefit of available renewable resources, th combination of wind and solar energy in th same neighborhood was considered. Th cogeneration of wind and solar energy has th following characteristics; 1) The availability o wind and solar energy is generally harmonizing and therefore the combination of both forms o energy increases the overall efficiency provided 2) The combination of wind and solar c generator optimizes the use of land resource

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Intelligent Control Based Cascaded Multiport Converter for SRM based Hybrid Electrical Vehicles

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Abstract: This article about a cascaded multiport switched reluctance motor (SRM) drive for hybrid electric vehicle (HEV), which gives two performances first thing flexible energy conversion among the generator/ac grid, the battery bank, solar panel and the SRM, second achieves battery management (BM) function for state-of-charge (SOC) balance control and bus voltage regulation. SRM accelerate the excitation and demagnetization processes during the commutation region. [illegible] speed range, reduce the voltage stress on the switches, and improve the torque capability and system efficiency by integrating the battery packs into the AHB converter, the cascaded BM modules are designed to control the [illegible] bus voltage and current capacity for SRM drive. It includes different operation requirements like the [illegible] modes, regenerative braking modes, and charging modes. The feasibility and effectiveness of the [illegible] multiport SRM drive are verified by the simulation experiment on a three-phase SRM.

Index Terms—Fuzzy Logic Control (FLC), **Cascaded multiport converter, battery management (BM), state-of-charge (SOC) balance, switched reluctance motor (SRM), hybrid electric vehicles (HEVs).**

1. INTRODUCTION

Need of suitable and reliable [illegible] resources safer & pollution free [illegible] without all time. Electric vehicles [illegible] for reducing air, sound pollution, CH_4, NO_2 emission. There are different types of electric motors that can be used [illegible] which via induction motor, brushless [illegible] motors and switched reluctance [illegible] fulfill the above motor [illegible] complex construction due to the [illegible] distributed winding except SRM. The [illegible] SRM such as simple [illegible] with concentrated [illegible] structure free rotor, [illegible] source, high efficiency [illegible].

Below [illegible] principles distributed [illegible] and Performance [illegible] effort converter [illegible] feedback connection [illegible] action and demagnetization [illegible] terms over high power density. D. Moon in that rolls of current source inverter at multilevel is important. The new configuration is adopted for drastically change in reduction in high current for output side for electrical vehicle motor. A. Kulvanitchaiyanunt in this gives best guidelines about control regional hybrid electrical vehicle station. The program supported to system run linearly follows. L. Herrera in that networked control and small signal modeling of charging facility for EV With the need to supply clean, renewable energies, integrations of Distributed Energy Resources (DERs) into Plug in Hybrid Electric Vehicle (PHEV) charging facilities are expected.

2. Proposed Converter Topology

To achieve the high-efficiency energy conversion among the generator/ac grid, the battery bank, solar panel and the SRM for HEV applications, a highly integrated multiport converter is proposed with BM function, as shown in Fig. 1. A relay *J* is used to connect the generator and the rectifier; a plug is used to connect the ac

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Enhancement of Solar PV- Battery and Diesel Generator Based Electric Vehicle Charging Station

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Abstract:

In this project, to provide incessant charging during islanded, grid-connected and DG-connected modes, a solar PV (Photovoltaic) array, a Battery Energy Storage (BES), a Diesel Generator (DG) set and a grid-based EV Charging Station (CS) are used .The charging station is mainly designed to charge the Electric Vehicle (EV) battery using a solar PhotoVoltaic (PV) array and a BES. However, the charging station intelligently takes power from the grid or DG (Diesel Generator) set in the event of an empty storage battery and inaccessible solar PV array generation. However, in order to achieve optimum fuel efficiency under all loading conditions, the power from the DG collection is drawn in a way that often operates at 80-85% loading. In addition, the charging station controls generator voltage and frequency without a mechanical speed controller in conjunction with the storage battery. In addition, to obtain ceaseless charging, the PCC (Point of Common Coupling) voltage is synchronized to the grid/generator voltage. In order to improve the operating efficiency of the charging station, the charging station also conducts the vehicle to grid active/reactive power transfer, vehicle to home and vehicle to vehicle power transfer. Using the Matlab/Simulink software, the operation of the charging station is validated

I. INTRODUCTION

Currently, electric vehicles (EVs) are recognized as one of the most efficient modes of transportation with zero trailing emission. Considering the advantage of EVs, 3 million vehicles are already deployed on the road, and it is expected to cross 100 million by 2030 [1]. However, the execution of proposed plan demand for huge charging infrastructure and enormous electrical energy. Moreover, EVs can only be sustainable when the electrical energy required for charging is generated from renewable and sustainable energy sources. However, the use of fossil fuels for electricity generation, does not reduce the emission but merely shift it from vehicles to the power plant. Therefore, the use of renewable energy sources for electricity generation can completely eliminate the emission and provides an environmental benefit. Among various available renewable energy sources, solar PV array, wind energy, hydro energy and fuel cell based energy, solar PV based generation is a most feasible solution for EV charging because it is available almost everywhere irrespective of the rural or urban region [2]. As far as the

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Power Quality Enhancement of Wind Turbines Under Unbalanced Voltage Conditions using A Sliding Mode Approach

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Abstract—An integral terminal sliding mode-based control design is proposed in this paper to enhance the power quality of wind turbines under unbalanced voltage conditions. The design combines the robustness, fast response, and high quality transient characteristics of the integral terminal sliding mode control with the estimation properties of disturbance observers. The controller gains were auto-tuned using a fuzzy logic approach. The effectiveness of the proposed design was assessed under deep voltage sag conditions and parameter variations. Its dynamic response was also compared to that of a standard SMC approach. The performance analysis and simulation results confirmed the ability of the proposed approach to maintain the active power, currents, DC-link voltage and electromagnetic torque within their acceptable ranges even under the most severe unbalanced voltage conditions. It was also shown to be robust to uncertainties and parameter variations, while effectively mitigating chattering in comparison with the standard SMC.

Index Terms—Doubly fed induction generators (DFIG), fuzzy approach, integral terminal sliding mode control (ITSMC), observer, power quality, voltage unbalances, wind turbines.

I. INTRODUCTION

ONE of the most challenging issues with wind energy nowadays is its integration into the power grid network [1]. Wind turbines are required to comply with several technical requirements and remain connected to the grid in the presence of different grid voltage disturbances such as voltage unbalances and harmonics [2]. Moreover, the amount of harmonics in the total current injected into the grid by the wind turbine is limited by the standard requirements [3]. Doubly fed induction generators (DFIG) are widely deployed in variable speed wind turbines. A challenging problem with DFIG's though is their extreme sensitivity to voltage fluctuations in the grid network. Even the smallest variations in grid voltages can lead to a sharp increase in stator and rotor currents which can cause damages to the DFIG's converters and deteriorate the wind turbine's output power quality [4]. Various approaches have traditionally been considered to protect wind turbines from the effects of voltage fluctuations. Crowbar circuits [5] are among the most common approaches. Nevertheless, DFIG typically absorbs large amounts of reactive power

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Implementation of Soil Moisture Monitoring System and Value Prediction Using Machine Learning

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Abstract: Exponential growth within world's population requires an increasing food supply. There is a significant need towards sustainability to satisfy future nutritional requirement. In order to enhance production, it is critical to identify soil moisture levels. However, most farmers cannot afford high-cost soil moisture measuring system. Our research in this paper tends to focus with efficiency of soil moisture monitoring system. We introduce a method in this article about the generation accurate moisture level by providing information on the water source required for successful farming. A system of soil moisture monitoring based on the sensors that have been linked to Arduino Nano is the primary objective of the document. The humidity sensor DHT11 is the sensor used in the process. Connected the device and stationed on the floor with Arduino Nano. The sensor is analyzed to ascertain what level of moisture value in different Substance. The implementation of a sensor of soil moisture reduces the water content to a certain locations. It also has proved intuitive in all the values obtained in wet and normal conditions.

Keywords: Humidity Sensor, DHT11, Accurate moisture value, Types of soil, Arduino Nano

1 Introduction

A qualitative strategy incorporating the existing system for moisture levels, salinity and PH quality monitoring is the Soil Monitoring System for Precision Agriculture. This system has several parts: one is a notification system used to alert or send farmers (users) information on whether the moisture, Ionic strength ratios and saline of the soil are low or high relative to normal values, and are used to monitor process data in its totality. A Wi-Fi shield would've been expected for monitoring system (that works when we execute the program). In order that perhaps the users can use functions in the application comfortably, fundamental provision underlying robustness the Wi-Fi shield is incorporated on the notification. This should store the data because this is a statistics device. A service is available for everybody reason. The paper attempts to develop a prototype product using IOT [1] technology, which reflects on soil moisture and humidity control and maintenance.

In this paper, we are focused primarily on overcoming management issues for farming technologies acquisition in the water-related domain and improving a moisture measuring system based on captors. We too try to understand the outcomes of representation position of liquid measurements. Major determinants for the farming technologies are the temperature control [2] and water management that are in connection with wholesome growth of agricultural Manufacturing as well as research concentrates on water and moisture management [3]. Moisture is tightly correlated to the various characteristics and forces of the soil. The ability to maintain water and strong farming in sand and clay is different. The different devices which demonstrate the moisture [4] concentration are related to the force needed to extract water from the soil, instead of merely showing the liquid with the percentage (percent). Correspondingly, calculations of water content have indeed been strongly correlated with pF values with tensiometer [5].

2 Problem Statement

Throughout India, farming is the breathing need of most Indians and is a large livelihood source. The economy of such a country is also impacted via agriculture. Water consumption improves hour after hour, which could also lead to water scarcity. Now a day is not just challenging for crops beyond their households. This paper is mostly designed to inform farmers of an intense moisture value, who've been talking about reducing the worldwide usage of water. When moisture is limited, The farmer is ready towards prepare use Liquid consequently. Dumping

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Enhancement of Solar PV- Battery and Diesel Generator Based Electric Vehicle Charging Station

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Abstract:

In this project, to provide incessant charging during islanded, grid-connected and DG-connected modes, a solar PV (Photovoltaic) array, a Battery Energy Storage (BES), a Diesel Generator (DG) set and a grid-based EV Charging Station (CS) are used .The charging station is mainly designed to charge the Electric Vehicle (EV) battery using a solar PhotoVoltaic (PV) array and a BES. However, the charging station intelligently takes power from the grid or DG (Diesel Generator) set in the event of an empty storage battery and inaccessible solar PV array generation. However, in order to achieve optimum fuel efficiency under all loading conditions, the power from the DG collection is drawn in a way that often operates at 80-85% loading. In addition, the charging station controls generator voltage and frequency without a mechanical speed controller in conjunction with the storage battery. In addition, to obtain ceaseless charging, the PCC (Point of Common Coupling) voltage is synchronized to the grid/generator voltage. In order to improve the operating efficiency of the charging station, the charging station also conducts the vehicle to grid active/reactive power transfer, vehicle to home and vehicle to vehicle power transfer. Using the Matlab/Simulink software, the operation of the charging station is validated

I. INTRODUCTION

Currently, electric vehicles (EVs) are recognized as one of the most efficient modes of transportation with zero trailing emission. Considering the advantage of EVs, 3 million vehicles are already deployed on the road, and it is expected to cross 100 million by 2030 [1]. However, the execution of proposed plan demand for huge charging infrastructure and enormous electrical energy. Moreover, EVs can only be sustainable when the electrical energy required for charging is generated from renewable and sustainable energy sources. However, the use of fossil fuels for electricity generation, does not reduce the emission but merely shift it from vehicles to the power plant. Therefore, the use of renewable energy sources for electricity generation can completely eliminate the emission and provides an environmental benefit. Among various available renewable energy sources, solar PV array, wind energy, hydro energy and fuel cell based energy, solar PV based generation is a most feasible solution for EV charging because it is available almost everywhere irrespective of the rural or urban region [2]. As far as the

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Power Quality Enhancement of Wind Turbines Under Unbalanced Voltage Conditions using A Sliding Mode Approach

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Abstract—An integral terminal sliding mode-based control design is proposed in this paper to enhance the power quality of wind turbines under unbalanced voltage conditions. The design combines the robustness, fast response, and high quality transient characteristics of the integral terminal sliding mode control with the estimation properties of disturbance observers. The controller gains were auto-tuned using a fuzzy logic approach. The effectiveness of the proposed design was assessed under deep voltage sag conditions and parameter variations. Its dynamic response was also compared to that of a standard SMC approach. The performance analysis and simulation results confirmed the ability of the proposed approach to maintain the active power, currents, DC-link voltage and electromagnetic torque within their acceptable ranges even under the most severe unbalanced voltage conditions. It was also shown to be robust to uncertainties and parameter variations, while effectively mitigating chattering in comparison with the standard SMC.

Index Terms—Doubly fed induction generators (DFIG), fuzzy approach, integral terminal sliding mode control (ITSMC), observer, power quality, voltage unbalances, wind turbines.

I. INTRODUCTION

ONE of the most challenging issues with wind energy nowadays is its integration into the power grid network [1]. Wind turbines are required to comply with several technical requirements and remain connected to the grid in the presence of different grid voltage disturbances such as voltage unbalances and harmonics [2]. Moreover, the amount of harmonics in the total current injected into the grid by the wind turbine is limited by the standard requirements [3]. Doubly fed induction generators (DFIG) are widely deployed in variable speed wind turbines. A challenging problem with DFIG's though is their extreme sensitivity to voltage fluctuations in the grid network. Even the smallest variations in grid voltages can lead to a sharp increase in stator and rotor currents which can cause damages to the DFIG's converters and deteriorate the wind turbine's output power quality [4]. Various approaches have traditionally been considered to protect wind turbines from the effects of voltage fluctuations. Crowbar circuits [5] are among the most common approaches. Nevertheless, DFIG typically absorbs large amounts of reactive power

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Fuzzy Logic Control Based Wind PV Cogeneration Using Back to Back Voltage Source Converters

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Abstract: This project establishes a new topology for performance of grid connected wind P' cogeneration system. The utility grid via btb (back to back) voltage source converter is interfaced t a synchronous generator based wind turbine. In this system a PV solar generator is connected t the dc link capacitor of VSC. The switching approach of the grid side converter is intended to pic up voltage drop caused by the fault in the grid while maximum obtainable active power of win turbine system is injected to the grid and the DC link voltage in the converter is regulated. Th efficiency of the system is improved as there is no requirement of dc to dc conversion. In thi project the wind and photovoltaic generators uses independent maximum power point tracking t extract the maximum power and improve the efficiency the control of vsc uses FLC control schem The dynamic models of the system components were developed to explore the stability. The syste is verified by using simulation results.

Index Terms--**AC-DC power converters, DC-AC power converters, maximum power poin trackers, permanent magnet machines, solar power generation, wind power generation.**

I. INTRODUCTION

Among the environmental benefits of renewable energies, the launch of new technologies in the management and control of renewable energy sources and the growing demand for high quality and constant supply lead to greater attention to this type of energy source. [1-4]. In addition to the optimal operation of a power system under normal conditions, checking the system under fault conditions is one of the most difficult concerns [5-7]. Energy quality is one of the most important issues in the use of distributed generation (DG) [8-9]. In addition to the frequency and active power, the voltage and reactive power should be limited and controlled in predefined intervals [10-11]. To achieve this, generators must be properly controlled to prevent voltage drop and voltage surge at maximum or low demand, respectively [12-15]. One of the most important advantages of the DGs, in addition to the injection of active power and the supply of local load, is the injection of reactive power at the common coupling point (PCC) [16-17]. By controlling the reactive power of a DG, the voltage profile an the quality of the power supply can b improved in different operating modes of th network, especially in the event of faults. Win turbine generation is one of the most commo sources used in distributed generation system for this purpose. Constant speed wind turbine that were more popular and efficient than recen wind turbine systems where electronic powe technology has helped to improve efficiency b implementing variable speed wind generators i power generation. Due to the periodic an unrestricted nature of wind and solar energy electronic power converters are used as a interface with the load side or the public gri and therefore distributed generation units ar produced. To maximize the benefits of availabl renewable resources, the combination of win and solar energy in the same neighborhood wa considered. The cogeneration of wind and sola energy has the following characteristics; 1) Th availability of wind and solar energy i generally harmonizing, and therefore th combination of both forms of energy increase the overall efficiency provided. 2) Th combination of wind and solar co generato optimizes the use of land resources an

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Intelligent Control Based Cascaded Multiport Converter for SRM based Hybrid Electrical Vehicles

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Abstract: This article about a cascaded multiport switched reluctance motor (SRM) drive for hybrid electric vehicle (HEV), which gives two performances first thing flexible energy conversion among the generator/ac grid, the battery bank, solar panel and the motor, second achieves battery management (BM) function for state-of-charge (SOC) balance control and bus voltage regulation. SRM accelerate the excitation and demagnetization processes during the commutation region, extend the speed range, reduce the voltage stress on the switches, and improve the torque capability and system efficiency by integrating the battery packs into the AHB converter, the cascaded BM modules are designed to configure multilevel bus voltage and current capacity for SRM drive. It includes different operation requirements like the multiple driving modes, regenerative braking modes, and charging modes. The feasibility and effectiveness of the proposed cascaded multiport SRM drive are verified by the simulation experiment on a three-phase SRM.

Index Terms—**Fuzzy Logic Control (FLC), Cascaded multiport converter, battery management (BM), state-of-charge (SOC) balance, switched reluctance motor (SRM), hybrid electric vehicles (HEVs).**

1. INTRODUCTION

Need of suitable and reliable use of energy resources safer & pollution free options are being search out all time. Electric vehicles are a one of the technology for reducing air, sound pollution and CO_2, CH_4, N_2 emission. There are different types of electric motors that can be used for vehicle which via induction motor, dc series motor, brushless dc motors and switched reluctance motors. Comparisons of all the above motors are higher cost& have complex construction due to the presence of distributed winding except SRM. The capabilities of the SRM such as simple & rugged construction with concentrated winding on the stator and maintenance free rotor, four quadrant operation, fault tolerance, high efficiency & reliability.

Below could be a literature review of works distributed in previous few years for the Design and Performance Analysis of cascaded multiport converter for EV. S. Kimura in this DC to DC back connection makes down the size of magnetization , and demagnetization .that control all components over high power density. D. Moon in that rolls of current source inverter at multilevel is important. The new configuration is adopted for drastically change in reduction in high current for output side for electrical vehicle motor. A. Kulvanitchaiyanunt in this gives best guidelines about control regional hybrid electrical vehicle station. The program supported to system run linearly follows. L. Herrera in that networked control and small signal modeling of charging facility for EV With the need to supply clean, renewable energies, integrations of Distributed Energy Resources (DERs) into Plug in Hybrid Electric Vehicle (PHEV) charging facilities are expected.

2. Proposed Converter Topology

To achieve the high-efficiency energy conversion among the generator/ac grid, the battery bank, solar panel and the SRM for HEV applications, a highly integrated multiport converter is proposed with BM function, as shown in Fig. 1. A relay J is used to connect the generator and the rectifier; a plug is used to connect the ac

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Power quality Enhancement of Wind and Battery Storage Systems using Three Phase Inverter

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Abstract— in this paper, a novel configuration of a Three Phase inverter that can integrate solar photovoltaic (PV)-Wind with battery storage in a grid-connected system is proposed. The vigor of the proposed topology lies in a novel, elongated unbalance three-level vector modulation technique that can engender the correct ac voltage under unbalanced dc voltage conditions. This paper presents the Fractional order PID design philosophy of the proposed configuration and the theoretical framework of the proposed modulation technique. An incipient fraction order PID controller for the proposed system is additionally presented in order to control the puissance distribution between the solar PV, battery, and grid, which simultaneously provides maximum power point tracking (MPPT) operation for the solar PV. The efficacy of the proposed methodology is investigated by the simulation of several scenarios, including battery charging and discharging with different calibers of solar irradiation. The proposed methodology and topology is tested on MATLAB/SIMULINK Environment.

Index Terms—Battery storage, solar photovoltaic (PV), space vector modulation (SVM), three-level inverter.

I. Introduction

DUE to the world energy crisis and environmental quandaries caused by conventional power generation, renewable energy sources such as photovoltaic (PV) and wind generation systems are becoming more promising alternatives to supersede conventional generation units for electricity generation [1], [2].Advanced power electronic systems are needed to utilize and develop renewable energy sources. In solar PV or wind energy applications, utilizing maximum power from the source is one of the most consequential functions of the potency electronic systems[3]–[5]. In three-phase applications, two types of potency electronic configurations are commonly used to transfer power from the renewable energy resource to the grid:

Single-stage and double-stage conversion. In the Double-stage conversion for a PV system, the first stage is customarily a dc/dc converter and second stage is a dc/ac inverter. The function of the dc/dc converter is to facilitate the maximum power point tracking (MPPT) of the PV array and to engender the congruous dc voltage for the dc/ac inverter. The function of the inverter is to engender three-phase sinusoidal voltages or currents to transfer the potency to the grid in a grid-connected solar PV system or to the load ina stand-alone system [3]–[5].In the single-stage connection, only one converter is needed to consummate the double-stage functions, and hence the system will have a lower cost and higher efficiency, however, a more intricate control method will be required. The current norm of the industry for high power applications is a three-phase, singlestagePV energy systems by utilizing a voltage-source converter(VSC) for power conversion [4].One of the major concerns of solar and wind energy systems is their capricious and fluctuating nature. Grid-connected renewable energy systems accompanied by battery energy storage can surmount this concern. This withal can increment the flexibility of puissance system control and raise the overall availability of the system [2]. Conventionally, a converter is required to control the charging and discharging of the battery storage system and another converter is required for dc/ac power conversion; thus, a threephasePV system connected to battery storage will require two converters. This paper is concerned with the design and study of a grid-connected three-phase solar PV system integrated with battery storage utilizing only one three-level

computers

MDPI

Article

Physical Activity Recommendation System Based on Deep Learning to Prevent Respiratory Diseases

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Abstract: The immune system can be compromised when humans inhale excessive cooling. Physical activity helps a person's immune system, and influenza seasonally affects immunity and respiratory tract illness when there is no physical activity during the day. Whenever people chill excessively, they become more susceptible to pathogens because they require more energy to maintain a healthy body temperature. There is no doubt that exercise improves the immune system and an individual's fitness. According to an individual's health history, lifestyle, and preferences, the physical activity framework also includes exercises to improve the immune system. This study developed a framework for predicting physical activity based on information about health status, preferences, calorie intake, race, and gender. Using information about comorbidities, regions, and exercise/eating habits, the proposed recommendation system recommends exercises based on the user's preferences.

Keywords: communicable diseases; immunity; exercises; meditation; yoga; influenza

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1. Introduction

The prevention of communicable and non-communicable diseases can be achieved by promoting a healthy lifestyle, diet, and physical activity. Heart attacks and kidney failure are more likely to occur when we have high blood pressure, diabetes, or hypertension [1]. It has been shown that moderate exercise reduces morbidity and mortality after viral infection [2,3]. Exercises and meditation are detrimental to the treatment of respiratory viral infections in preclinical studies [4].

A traditional Indian health practice promotes strength and immunity through exercise, meditation, and yoga poses. Stress and depression can be reduced through these exercises as well as improving sleep patterns and boosting immunity [5,6]. Focusing on a particular thought or object combats stress, and exercise-induced adaptations enhance the immune system and mental health [7,8]. The immune system is influenced by physical activity. Increasing fitness can reduce cancer risk, cardiovascular disease risk, type 2 diabetes risk, and obesity risk [9]. Physical activity is recommended by the World Health Organization (WHO) for battling viral infections [10].

Communication technology has made it possible for people to share and motivate physical activity through recommendation systems. A healthy lifestyle and balance can be found on health websites [11,12]. Online communities provide quality healthcare, but their inconsistent advice may negatively impact health, leading to untrustworthiness and the need for filtered accurate information [13–15]. In addition, the disclaimer on healthcare solutions does not apply to health recommendations [16–18].

The recommendation system based on physical activity promotes individual health and prevents communicable and non-communicable diseases. The effects of high-volume

Analysis of Fake News Detection Algorithms in Machine Learning

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Abstract: **One can easily say in today's world, information aka news to few is more precious than money itself. This news needs to be in authentic form which is usually found in adulterated version. Leading us to have a dire need for an identification of real news from any possiblefake news. News, being a form of information can be subjective to the proofs and source for its authenticity. As a human, one can easily identify real news from fake news withthe help of one's innate capability to deduce logic and outlandish source of the information piece. Just that one needs few trusted sources to check for the facts and myths. But on a real time basis, there is a dire need for some software which can nip such 'false news' in its bud. Leadingit to be one of the most researched area nowadays. Primarilybeing a part of Information Retrieval, this area is taking up a lot of attention from researchers worldwide to come up with a real-time solution for such an issue.**

In this article we have checked and analysed many research articles along with many survey articles and summed up this paper so as to provide the readers with a short idea of what fake news is, it's different flavours in the news spectrum, its characteristics and identification basic. We also included the different methods used by prior researchers in the same field. Using few researches as examples we learned about the basics of those methods usedin fake news identification. The future aspects are also included in this article along with the challenges one faces while doing research in this very field.

Keywords: Fake News, survey, identification, real news, dataset, types of fake news,

I. INTRODUCTION

Fake News being the hype of world nowadays, in layman terms, refers to the intentional or unintentional spread of false information on public platform. One prime example for that can be given as, 'Indian 2000- Rupee currency Bill came equipped with spying technology that tracked bills 120 meters below theearth'[1], every person aware of the demonetization issue is well aware of this hoax spreading in early 2017swhich actually took over the Indian Public. DigitalMedia users going in a panic about the height of digitization with a slight doubt of possibility that the news may be fake. At the time, this news seemed to bea plausible set of information considering the sudden demonetization along with Prime Minister Narendra Modiji's claims of ceasing the Black money from Indian Market and the height of digitization being pressurized in Indian environment, one could have beeneasily fooled by the ongoing news which later turned out to be a big hoax going around in the world of socialmedia. Not only this, the problem of hoax news or fakenews have engulfed almost all the spheres in this world.The main idea is to manipulate the emotions and thinking of humans to make them believe something that isn't true. And, the sources of such fake news include mainstream social media platforms including Facebook, WhatsApp, Twitter, Instagram etc [2]. As per the reports of TechCrunch, WhatsApp has hit the
400 million monthly active users mark [3]. While earlier in 2017, Facebook had already crossed the 200 million users mark in India [3] alone. The most mind- boggling fact being that the mere people who are worried about the increasing growth of fake news in this society, are the majority who do not think twice about the authenticity of information before sharing it forwardhence being a part of that influential group who create and spread fake news.
It needs to be pointed out that this is a universal problemwhich affects all the people around the world. And, it has also been there since the start of time. Though in earlier times as there was no access to worldwide information, the detection of fake news was relatively difficult and cost inefficient. But nowadays it is very easy, feasible and worthy to identify whether a news snippet is fake or real. Which brings us to the actual problem of analysing and identifying the fake news from real news in Gigabytes of information. It may be amystifying fact that There are 2.5 quintillion bytes of data created each day at our current pace and this pace is nondecreasing overtime [4]. Hence, to identify and eradicate fake news from so much data won't be a child's play. This needs real time, quick, feasible and cost friendly method. In today's world of digital era, Internet of Things and most importantly Artificial Intelligence, there can surely be much easier ways that can do the job, had it been just simple matching and comparing but as already mentioned this task requires

much deeper knowledge of Literature, humanbehaviour, human speech, logics, possibility etc. This makes it a much worse situation to encounter. To summarise the existing concepts, we have wrappedthose in section III after the types of fake news in section II, with some standard tools and datasets for usein section IV, the applications and future aspects for fake news detection field in section V along with a conclusion in section VI to wrap up the paper.

II. DIFFERENT FLAVORS OF FAKE NEWS

One may wonder the emphasis paid on Fake news is fargreater than the actual identification of the same. Well,its identification is

FAST BINARY COUNTERS AND COMPRESSORS GENERATED BY SORTING NETWORK

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ABSTRACT Parallel counters are vital components in numerous number juggling circuits, particularly in quick multipliers. The summation of multiple operands in parallel forms part of the critical path in various digital signal processing units. To speed up the summation, high compression ratio counters and compressors are necessary. In this project, A novel method of fast saturated binary counters and exact/approximate (4:2) compressors based on the sorting network. The inputs of the counter are asymmetrically divided into two groups and fed into sorting networks to generate reordered sequences, which can be solely represented by one-hot code sequences. Between the reordered sequence and the one-hot code sequence, three special Boolean equations are established, which can significantly simplify the output Boolean expressions of the counter. Further, this project is enhanced by using parallel sorting algorithms for finding/ sorting M largest values from N inputs and then design scalable architectures based on proposed algorithms. For finding the largest values the iterative sorting techniques also proposed. BITONIC SORTING is one type of efficient such algorithm for implementing with optimized parameters.

Index Terms –Binary counter, exact/approximate 4:2 compressor, multiplier, one-hot code, sorting network.

INTRODUCTION

Energy minimization is major requirements in almost any electronic systems, especially the portable ones such as smart phones, tablets, and different gadgets. It is extremely desired to attain this minimization with minimal performance penalty. Digital signal processing (DSP) blocks are most wanted in transportable components for realizing various multimedia applications. The computational core of these blocks is the ALU where the multiplications and additions are the major part. The multiplications play foremost operation in the processing elements which can leads to high consumption of energy and power. Many of the DSP cores implement image and video processing algorithms where

Low-Cost Open Source IoT-Based SCADA System for a BTS Site Using ESP32

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Abstract:

A low-cost open source IoT-based SCADA system for a rural BTS site using ESP32 and Arduino IoT Cloud is presented in this work. Current, voltage, temperature, and humidity sensors are programmed to measure relevant parameters of interest, and the measured Data is processed and parsed to the Arduino IoT Cloud via a Wi-Fi network communication channel. A widget-based dashboard is created on the Arduino IoT Cloud to monitor and control the system. A mobile application is also deployed to aid remote monitoring and control as well. LEDs are used to implement a high temperature and low voltage control logic. A prototype is used to demonstrate this as an illustration of what is obtainable in a Base Transceiver Station (BTS), where the voltage must be within a specific value (48 V) and the temperature within an acceptable value too.

Introduction:

Monitoring, control, and data acquisition are all referred to as SCADA. All of these functions comprise both hardware and software components. In addition to collecting, monitoring, and processing real-time data, it also allows industrial organizations to control processes in real-time from either local or remote locations. In a SCADA system, a humanmachine interface (HMI) is used to interact with sensors and devices, and log files are generated. Industrial organizations depend on SCADA systems to eliminate downtime and increase efficiency while processing data and making smarter decisions. As depicted in Figure 1, a programmable logic controller (PLC) or remote terminal unit (RTU) is among the essential components of SCADA systems. A PLC or RTU is a microcomputer that communicates with objects of various types (a factory machine, a human-machine interface, a sensor, or an end device are some examples) and routes the information to a computer running SCADA software. As a result of SCADA software, data are processed, distributed, and analyzed, enabling operators to make important decisions.

SCADA leverages the coalescence of hardware components like sensors and actuators and software programs like the Human Machine Interface (HMI) to perform its four primary functions: data acquisition, networked data communication, data presentation, and monitoring and control. To carry out these functions effectively, SCADA relies on various elements. These elements are Field Instrument Devices (FIDs) like sensors and actuators, Remote Terminal Units (RTUs) like microcontrollers and microprocessors, Master Terminal Units (MTUs) in this case, the Arduino IoT Cloud and the communication network in the case a Wi-Fi network provided by my home router. This work is based on the fourth generation of SCADA architecture which is the Internet of Things (IoT) configuration. IoT SCADA have several advantages, including remote assess/control, realtime monitoring and alarming, data sharing, data manipulation and visualization, system optimization, trend analysis, flexibility, and increased productivity. our previous work on designing, sizing, and dynamic modeling of a DC hybrid power system for a remote telecommunication facility in Nigeria was examined. This work presents the SCADA aspect of the work using a prototype.

Identification of Bird Species Using Deep Learning

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***Abstract*: Now a day some bird species are being found rarely and if found classification of bird species prediction is difficult. Naturally, birds present in various scenarios appear in different sizes, shapes, colors, and angles from human perspective. Besides, the images present strong variations to identify the bird species more than audio classification. Also, human ability to recognize the birds through the images is more understandable. So this method uses the Caltech-UCSD Birds 200 [CUB-200-2011] dataset for training as well as testing purpose. By using deep convolutional neural network (DCNN) algorithm an image converted into grey scale format to generate autograph by using tensor flow, where the multiple nodes of comparison are generated. These different nodes are compared with the testing dataset and score sheet is obtained from it. After analyzing the score sheet it can predicate the required bird species by using highest score. Experimental analysis on dataset (i.e. Caltech-UCSD Birds 200 [CUB-200-2011]) shows that algorithm achieves an accuracy of bird identification between 80% and 90%.The experimental study is done with the Ubuntu 16.04 operating system using a Tensor flow library.**

Index Terms: Autograph; Caltech-UCSD; grey scale pixels; Tensorflow

I. INTRODUCTION[1]

BIRD behavior and population trends have become an important issue now a days. Birds help us to detect other organisms in the environment (e.g. insects they feed on) easily as they respond quickly to the environmental changes [2]. But, gathering and collecting information about birds requires huge human effort as well as becomes a very costlier method. In such case, a reliable system that will provide large scale processing of information about birds and will serve as a valuable tool for researchers, governmental agencies, etc. is required. So, bird species identification plays an important role in identifying that a particular image of bird belongs to which species. Bird species identification means predicting the bird species belongs to which category by using an image.

The identification can be done through image, audio or video. An audio processing technique makes it possible to identify by capturing the audio signal of birds. But, due to the mixed sounds in environment such as insects, objects from real world, etc. processing of such information becomes more complicated. Usually, human beings find images more effective than audios or videos. So, an approach to classify bird using an image over audio [8] or video is preferred. Bird species identification is a challenging task to humans as well as to computational algorithms that carries out such a task in an automatic fashion.

Since many decades, ornithologists are facing problems in bird species identification. Ornithologists require studying all the details of birds such as their existence in environment, their biology, their distribution, their ecological impact, etc. Bird identification is usually doneby ornithology experts based on classification proposed by Linnaeus: Kingdom, Phylum, Class, Order, Family, andSpecies [1].

As image based classification systems are improving the task of classifying, objects is moving into datasets with far more categories such as Caltech-UCSD. Recent work has seen much success in this area. Caltech-UCSD Birds 200(CUB-200-2011) is a well-known dataset for bird images with photos of 200 categories [4]. Thedataset contains birds that are mostly found in Northern America. Caltech-UCSD Birds 200 consists of 11,788 images and annotations like 15 Part Locations, 312 Binary Attributes, 1 Bounding Box.

In this paper, instead of recognizing a large number of disparate categories, the problem of recognizing a large number of classes within one category is investigated – that of birds. Classifying birds pose an extra challenge over categories, because of the large similarity between classes. In addition, birds are non-rigid objects thatcan deform in many ways, and consequently there is also a large variation within classes. Previous work on bird classification has deal with a small number of classes, or through voice.

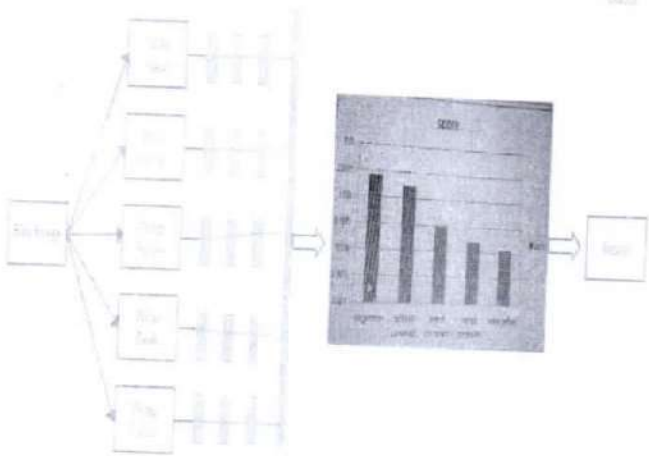

Figure No.1: Process of classification

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Power quality Enhancement of Wind and Battery Storage Systems using Three Phase Inverter

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Abstract— in this paper, a novel configuration of a Three Phase inverter that can integrate solar photovoltaic (PV)-Wind with battery storage in a grid-connected system is proposed. The vigor of the proposed topology lies in a novel, elongated unbalance three-level vector modulation technique that can engender the correct ac voltage under unbalanced dc voltage conditions. This paper presents the Fractional order PID design philosophy of the proposed configuration and the theoretical framework of the proposed modulation technique. An incipient fraction order PID controller for the proposed system is additionally presented in order to control the puissance distribution between the solar PV, battery, and grid, which simultaneously provides maximum power point tracking (MPPT) operation for the solar PV. The efficacy of the proposed methodology is investigated by the simulation of several scenarios, including battery charging and discharging with different calibers of solar irradiation. The proposed methodology and topology is tested on MATLAB/SIMULINK Environment.

Index Terms—Battery storage, solar photovoltaic (PV), space vector modulation (SVM), three-level inverter.

I. Introduction

DUE to the world energy crisis and environmental quandaries caused by conventional power generation, renewable energy sources such as photovoltaic (PV) and wind generation systems are becoming more promising alternatives to supersede conventional generation units for electricity generation [1], [2].Advanced power electronic systems are needed to utilize and develop renewable energy sources. In solar PV or wind energy applications, utilizing maximum power from the source is one of the most consequential functions of the potency electronic systems[3]–[5]. In three-phase applications, two types of potency electronic configurations are commonly used to transfer power from the renewable energy resource to the grid:

Single-stage and double-stage conversion. In the Double-stage conversion for a PV system, the first stage is customarily a dc/dc converter and second stage is a dc/ac inverter. The function of the dc/dc converter is to facilitate the maximum power point tracking (MPPT) of the PV array and to engender the congruous dc voltage for the dc/ac inverter. The function of the inverter is to engender three-phase sinusoidal voltages or currents to transfer the potency to the grid in a grid-connected solar PV system or to the load ina stand-alone system [3]–[5].In the single-stage connection, only one converter is needed to consummate the double-stage functions, and hence the system will have a lower cost and higher efficiency, however, a more intricate control method will be required. The current norm of the industry for high power applications is a three-phase, singlestagePV energy systems by utilizing a voltage-source converter(VSC) for power conversion [4].One of the major concerns of solar and wind energy systems is their capricious and fluctuating nature. Grid-connected renewable energy systems accompanied by battery energy storage can surmount this concern. This withal can increment the flexibility of puissance system control and raise the overall availability of the system [2]. Conventionally, a converter is required to control the charging and discharging of the battery storage system and another converter is required for dc/ac power conversion; thus, a threephasePV system connected to battery storage will require two converters. This paper is concerned with the design and study of a grid-connected three-phase solar PV system integrated with battery storage utilizing only one three-level

Agricultural Data Analysis using Machine Learning Algorithms

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Abstract: **Agriculture is undoubtedly the largest livelihood provider in India and also contributes a significant figure to the economy of our Country. The technological factors affecting the crop production includes practices used and also managerial decisions. So, predicting the crop yield prior to its harvest would help farmers to take appropriate steps. We attempt to resolve theissue by building a user-friendly prediction system. The results of the prediction are suggested to the farmer such that suitable changes can be made in order to improve the produce. There are different techniques or algorithms which help to predict crop yield. By analyzing all the parameters like location, soil nutrients, pH value, rainfall, moisture a potential solution can be obtained to overcome the situation faced by farmers. This paper focuses on the analysis of the agriculture data and finding optimal yield to provide an insight before the actual crop production using data mining techniques and Machine Learning algorithms.**

Keywords: **Yield, Random Forest regress or, Decision Tree regress or, GDP, Digitalisation.**

I. INTRODUCTION

Today, India is one of the leading producers across the world in the agriculture sector[1]. Agriculture is the broadest economic sector and plays an outstanding role in the socio-economic part of India. Agriculture is an eccentric business crop production which is influenced by many climate and economic factors. Andhra Pradesh, basically being an agro-Based economy contributes more than 29% of the GDP as against 17% in the country's GDP. Periodical advice to the farmers either in terms of improved agricultural strategies or advancements in factors affecting the production of crops may strengthen the state in the agriculture sector. Yield prediction is one among the agricultural advancements. Due to these kinds of innovations agriculture is driving the interest of modern man. In the past farmers used to predict their yield from previous experiences[2]. Digitalisation in farming gives awareness about the cultivation of the crops at the right time and at the right place even to young farmers. These kinds of advancements need the use of data analytics. This is one such system that can be used to address yield prediction. The main objectives are:

1) To analyse different parameters (soil nutrients, rainfall, area etc)
2) To use machine learning techniques to predict crop yield.
3) To provide an easy to use User Interface

II. HOW DATA MINING IS USED IN AGRICULTURE SECTOR

Data mining techniques are used in performing several activities in the agricultural sector such as pest identification, detection and classification and prediction of crop diseases. It can also be used in yield prediction, input management (planning of irrigation and pesticides), fertilizer suggestion and predicting soil. In a world full of data , data mining is the computational process for discovering new patterns[3]. Data mining techniques provide a major advantage in agriculture for detection and prediction for optimizing the pesticides. Techniques for agriculture related activities provide a lot of information. The yield of agriculture primarily depends on diseases, pests, weather conditions, planning of various crops for the harvest productivity are the results.

Crop production for reliable and timely requirements for various decisions for agriculture marketing. Predictions are very useful for agriculture data. For instance, by applying data mining techniques, the government can fully benefit from data about farmers' buying patterns and also to achieve a superior understanding of their land to achieve more profit on the farmer's part.

Data mining techniques followed in two ways[4]:

1) Descriptive data mining.
2) Predictive data mining.

Descriptive data mining tasks characterize the final properties of the info within the database while predictive data mining is employed to predict the direct values supported patterns determined from known results. Prediction involves using some variables or fields within the database to predict unknown or future values of other variables of interest.

As far as data mining techniques are concerned, in most cases predictive data mining approaches are employed. Predictive data mining techniques are employed to predict future crop, forecasting, pesticides and fertilizers to be used, revenue to be generated and so on. These techniques are used for pre-harvest forecasting for the agriculture field and are able to provide a lot of data on agricultural-related activities. Data of agriculture in data mining can be presented in the form of datasets.

III. PROPOSED SYSTEM

The main objectives of proposed work is to analyse the agricultural parameters using data mining algorithms and predict the yield.In our proposed work, agriculture data has been collected from various sources which include:

Dataset in agricultural sector[5] ,Crop wise agriculture data:[6], Soil data of different districts:[7]

In this proposed system , we mainly focussed on Andhra Pradesh State in India. As the state has two major rivers flowing , it has a

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DETECTING AND TRACKING: ASSESSMENT OF WELL-ORGANIZED POSES IN VIDEOS DYNAMICALLY

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Abstract

Detection and tracking of human body key points in a multi-person video is the focus of this research article. In this, we use the most recent developments in video-based human-key point identification. Our technique uses key point estimate in frames or short video clips that include numerous people. Human position estimate and tracking is a newer method for locating a person's most important physical features. Human body language may be deciphered by computers using posture detection and tracking. It also aids in estimating the positions of human body parts and joints in photos and films, which is a huge benefit. It is Move Net, which uses temporal information from short video clips to anticipate quick and reliable outcomes that are utilized to estimate posture at the frame level. There are 17 critical points in an individual's movement that the Move Net model of motion estimation algorithm can identify. It is a highly quick and accurate model. Individual key points, and sometimes the affinities between them, are identified in a bottom-up model known as Move Net and then the predictions are aggregated into instances, which also employs heat maps to precisely locate key points on a human body. A feature extractor and a group of prediction heads make up this system's design. Multi-person video pose estimation, or MPII, is a technique we use to test different aspects of our model.

Keywords: occlusions, key points, pose estimation, Move Net

INTRODUCTION

Recently, visual understanding like object recognition, has observed a deep visual representations. Understanding of human behavior in normal images has been the control center of visual tasks due to its significance in the practical application. Usually, person and pose detection and estimation from a single image have emerged as a leading and challenging visual recognition problem because it isa bit complex task to work on. Initially, single image understanding was a very difficult and complex task ,so later on video understanding made a slower improvement compared to image recognition i.e; they grew into more complex task compared to image recognition because a video is that which contains different number of frames . Combination of many frames is equal to video it may be a short video or long video.

In this, we point on the issue of human pose tracking in multi-person videos which tracks and estimates the pose of a person or human over time. In this there are many challenges which are occurred including the pose changes of a person throughout the video and also presence of multiple overlapping of instances over time. The tracking optimization is only managed for linking the frame-level predictions whereas the system has no capability to improve the location of key points on the frames. So, the key points are said to be imperfectly localized in a particular frame which leads to motion blur, occlusions also .To remove this limitation we use a model

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A META HEURISTIC MULTI-VIEW DATA ANALYSIS OVER UNCONDITIONAL LABELED MATERIAL: AN INTELLIGENCE OCMHAMCV

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Abstract. Artificial intelligence has been provided powerful research attributes like data mining and clustering for reducing bigdata functioning. Clustering in multi-labeled categorical analysis gives huge amount of relevant data that explains evaluation and portrayal of qualities as trending notion. A wide range of scenarios, data from many dimensions may be used to provide efficient clustering results. Multi-view clustering techniques had been outdated, however they all provide less accurate results when a single clustering of input data is applied. Numerous data groups are conceivable due to diversity of multi-dimensional data, each with its own unique set of viewpoints. When dealing multi-view labelled data, obtaining quantifiable and realistic cluster results may be challenge. This study provides unique strategy termed OCMHAMCV (Orthogonal Constrained Meta Heuristic Adaptive Multi-View Cluster). In beginning, OMF approach used to cluster similar labelled sample data into prototypes of dimensional clusters of low-dimensional data. Utilize adaptive heuristics integrate complementary data several dimensions complexity of computational analysis data representation data in appropriate orthonormality constrained viewpoint. Studies on massive data sets reveal that proposed method outperforms more traditional multi-view clustering techniques scalability and efficiency. The performance measures like accuracy 98.32%, sensitivity 93.42%, F1-score 98.53% and index score 96.02% has been attained, which was good improvement. Therefore it is proved that proposed methodology suitable for document summarization application for future scientific analysis.

Key words: Clustering, Document summarization, Data mining, Meta heuristic technique.

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1. INTRODUCTION.

Large amounts data gathered from several study fields, such image processing, computer vision data fusion, natural language and processing in real time as result of fast computer-related technology deployment. A wide range of dimensions associated to a wide variety of properties are examined in these data, which include many high-dimensional features with complicated structures [1, 2]. High-dimensional data represents the abundance of data curse dimensionality, therefore managing high-dimensional data general concern big challenge for optimizing the dimension's dimensions. Using hidden data to represent low dimensionality and reducing dimensionality in relation to input data is an effective method for large amounts of data [3].

Theoretically optimized matrix factorization has emerged as the research hotspot with the easiest implementation for multi-labeled data reduction. It's possible extract low-dimensional attribute relations high-dimensional data relations using factorization matrix-related methodologies such ICA (Independent Component Analysis), PCA (Principal Component Analysis), & VQ (Vector Quantization). No components in matrices are decomposed: this implies that in order to maximize matrix representation, negative elements must be included in the low-dimensional representations of data [4]. Deep learning has recently proven exceptional performance in include representation projects [5]. Lattice factorization has been enriched by various analysts who have incorporated substantial learning into the process [6]. A multi-layer non-negative MF technique presented (MNMF) [7]. First, MNMF degraded the grid many times to produce the fundamental part-based representation that may remove profoundly different degrees of information from the original information. To propose

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E-Voting system using Blockchain Technology

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ABSTRACT

Nowadays, normal voting using EVM(Electronic voting machine) which stores the votes of each voter in a centralized database. And after researching many different e- voting applications, most of the application used centralized data storage as the database. As, these centralized databases stores the complete data at a single location and is easy hackable and can be tampered with. Hence, due to this the data can be inconsistent while voting count and will not provide us with the correct result.Hence, using blockchain technology, we create a decentralized application where the tampering of data becomes almost impossible as Blockchain uses the decentralized algorithm for the data storage where the data is stored at a single location.

The main objective of E-voting system using blockchain is to create a e-voting system underneath using a blockchain technology. This system is just like a normal voting system, of which same process is conducted on e-voting which used to be conducted on the normal paper-based voting with the use of mobile, web browser for the voting purpose by the voters. Therefore, this paper will give a review of blockchaintechnology and how this technology will be used in E-votingsystem.

Key words: Bitcoin, Blockchain technology, cryptographic function, Decentralized application, digital signature,distributed ledger technology (DLT), E-voting, hashing, Merkle tree, time stamp.

1. INTRODUCTION

To construct a secure electronic voting system is a difficult task.The US Pentagon had proposed the online voting system in year the 2005, but this system does not work well due to lack of legitimacy of votes.[1][2]Hence, to come up with an application which is less hackable and in which data cannot be tampered we can used blockchain technology in an e-voting application. Blockchain is the revolutionary way of stored data in a decentralized way and has many future applications.

Blockchain

Blockchain has become an important technology in all the fields. Blockchain is a decentralized and distributed ledger technology that records the provenance of a digital asset.

Blockchain is sometimes referred as distributed ledger technology (DLT) that makes any digital asset transparent with the help of decentralization and cryptographic hashing. An easy example to explain blockchain technology is the Google Doc. When wecreate a document and shared with many people, this document will get distributed rather than copying and transferring. This creates a decentralizeddistributed chain that can provide access to everyone at the same time. [3] No one will wait other party for making changes and all this modification will be recorded in real time which are transparent to everyone. However, blockchain is more complicated than a Google Doc but the concept is same.Blockchain is said to as a promising technology as it helps to reduce risk, eliminate fraud and brings transparency in a scalable way.[2][5] Blockchain has a distributed database that maintains an ever-growing list of data records secured for tampering. Also, it is decentralized that avoids a single point failure which may occur in centralized systems.

As the name indicates blockchain is chain of blocks where each block is linked with other using cryptography. Blockchain consists of two cryptographic keys that are private key and public key. These keys help to perform successful transaction between two parties. Each person has two keys which is used to produce a secure identity reference. This identity is referred as digital signature and is used for controlling transactions. [4] Each block consists of a cryptographic hash value of the previous block, a timestamp and transaction data. For using distributed ledger, blockchain manages peer-to-peer network which helps in inter-node communication and validating new blocks. The structure of blockchain is shown in figure 1:

Brain Tumor Detection Using Convolutional Neural Network

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Abstract— **Brain Tumor segmentation is one of the most crucial and arduous tasks in the terrain of medical image processing as a human-assisted manual classification can result in inaccurate prediction and diagnosis. Moreover, it is an aggravating task when there is a large amount of data present to be assisted. Brain tumors have high diversity in appearance and there is a similarity between tumor and normal tissues and thus the extraction of tumor regions from images becomes unyielding. In this paper, we proposed a method to extract brain tumor from 2D Magnetic Resonance brain Images (MRI) by Fuzzy C-Means clustering algorithm which was followed by traditional classifiers and convolutional neural network. The experimental study was carried on a real-time dataset with diverse tumor sizes, locations, shapes, and different image intensities. In traditional classifier part, we applied six traditional classifiers namely Support Vector Machine (SVM), K-Nearest Neighbor (KNN), Multilayer Perceptron (MLP), Logistic Regression, Naïve Bayes and Random Forest which was implemented in scikit-learn. Afterward, we moved on to Convolutional Neural Network (CNN) which is implemented using Keras and Tensorflow because it yields to a better performance than the traditional ones. In our work, CNN gained an accuracy of 97.87%, which is very compelling. The main aim of this paper is to distinguish between normal and abnormal pixels, based on texture based and statistical based features.**

Keywords— CNN, FCM, Medical Image, segmentation, SVM

I. INTRODUCTION

Medical imaging refers to a number of techniques that can be used as non-invasive methods of looking inside the body [1]. Medical image encompasses different image modalities and processes to image the human body for treatment and diagnostic purposes and hence plays a paramount and decisive role in taking actions for the betterment of the health of the people.

Image segmentation is a crucial and essential step in image processing which determines the success of a higher level of image processing [2]. The primary goal of image segmentation in medical image processing is mainly tumor or lesion detection, efficient machine vision and attaining satisfactory result for further diagnosis. Improving the sensitivity and specificity of tumor or lesion has become a core problem in medical images with the help of Computer Aided Diagnostic (CAD) systems.

According to [3], Brain and other nervous system cancer is the 10th leading cause of death, and the five-year survival rate for people with a cancerous brain is 34% for men and 36% for women. Moreover, the World Health Organization (WHO) states that around 400,000 people in the world are affected by the brain tumor and 120,000 people have died in the previous years [4]. Moreover, An estimated 86,970 new cases of primary malignant and non-malignant brain and other Central Nervous System (CNS) tumors are expected to be diagnosed in the United States in 2019 [5].

A brain tumor occurs when abnormal cells form within the brain [6]. There are two main types of tumors- Malignant and Benign. Malignant brain tumors originate in the brain, grows faster and aggressively invades the surrounding tissues. It can spread to other parts of the brain and affect the central nervous system. Cancerous tumors can be divided into primary tumors, which start within the brain, and secondary tumors, which have spread from elsewhere, are known as brain metastasis tumors. On the other hand, a benign brain tumor is a mass of cells that grow relatively slowly in the brain.

Hence, early detection of brain tumors can play an indispensable role in improving the treatment possibilities, and a higher gain of survival possibility can be accomplished. But manual segmentation of tumors or lesions is a time consuming, challenging and burdensome task as a large number of MRI images are generated in medical routine. MRI, also known as Magnetic Resonance Imaging is mostly used for a brain tumor or lesion detection. Brain tumor segmentation from MRI is one of the most crucial tasks in medical image processing as it generally involves a considerable amount of data. Moreover, the tumors can be ill-defined with soft tissue boundaries. So it is a very extensive task to obtain the accurate segmentation of tumors from the human brain.

In this paper, we proposed an efficient and skillful method which helps in the segmentation and detection of the brain tumor without any human assistance based on both traditional classifiers and Convolutional Neural Network.

II. LITERATURE REVIEW

One of the most challenging as well as demanding task is to segment the region of interest from an object and segmenting the tumor from an MRI Brain image is an ambitious one. Researchers around the world are working on this field to get the best-segmented ROI and various disparate approaches simulated from a distinct perspective. Nowadays Neural Network based segmentation gives prominent outcomes, and the flow of employing this model is augmenting day by day.

Devkota et al. [7] established the whole segmentation process based on Mathematical Morphological Operations and spatial FCM algorithm which improves the computation time, but the proposed solution has not been tested up to the evaluation stage and outcomes as- Detects cancer with 92%

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IMPROVED GENETIC GAUSSIAN ADAPTIVE APPROACH USING ML FOR PAPR REDUCTION IN 6G APPLICATIONS

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Abstract:

With the advent of Network power reduction capabilities in mobile communication have impacted the design that could sustain the latest model design in communication trends. One such feature is PAPR for the mobile communications that have to be reduced while implementing the network model for communication. Most techniques in recent trends in MC have effects the PAPR reduction values less than 10. This paper improvises a novel PAPR reduction filter and optimization characteristic using ISGA for 5G + with improved PAPR values as tabulated. The ISGA algorithm on the OFDM would implicate the power calculation based on mathematical analysis for PAPR. This paper also compares with other existed techniques such as SLM, PTS and clipping.

Keywords: Orthogonal Frequency division multiplexing (OFDM), forward error correction (FEC), Filtered Orthogonal Frequency Division Multiplexing (F- OFDM), Peak to Average Power Ratio (PAPR), Long Term Evolution (LTE), selective mapping (SLM), Partial Transit Scheme (PTS), IGMSGA (Improved Genetic Model using Stochastic Gaussian Approach).

1) INTRODUCTION

In wireless communications, Orthogonal Frequency Division Multiplexing (OFDM) is one of the modulation techniques that is employed. The modulation with multi carriers has been improvised in mobile communication standard from Third to 5th generations as (3G-4G (LTE)-5G) to ensure better network speed and hybrid protocol for communication. Since the complexity of the design for the communication model with the generations (3-5 G's) have their own benefits while utilizing the OFDM. This technology allows for transmission at high data speeds and with a broad bandwidth. In addition, OFDM has the capability of dealing with selective fading and harsh channel circumstances without the need of an equalization filter, which is advantageous. In addition to being appropriate for 5G and multi-service systems, filtered version of OFDM improvising different spectrum features for network sliced values for efficient filter values observed [2]. The design Filtered version of OFDM implicating the data values for each set of cyclic prefix values would add to the network features. Now, as the length of the filter exceeds CP- length which enables the OFDM with different frequency bands with a low signal and carrier interferences [3]. Even if the PAPR values for both of the filtered case and normal structure of OFDM would improvise a newer statistical strategy for implicating the different

Proximity: An Automatic Approach for Defect Detection and Depth Estimation in Infrared Non-destructive Testing

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Abstract Non-destructive testing (NDT) is a technique used to assess the integrity and reliability of industrial components without impairing their future functionalities. Thermal non-destructive testing (TNDT) is an evolving NDT technique to assess the subsurface details of various test objects. For the past two decades, non-stationary stimulation schemes have been promoting as a prominent stimulation approach by surpassing the shortfalls in conventional stimulation techniques. Nevertheless, the requirement of enhanced defect detection propelled towards fascinating post-processing research with the aid of various signal processing techniques. On the other hand, recent advancements in NDT toward automation recommended various machine learning algorithms as efficient data processing techniques in thermal NDT. However, in the thermographic data point of view, a small defect in the test sample at subsurface layers is covered by significantly fewer thermal profiles than the non-defective region. These fewer thermal profiles become local or global outliers to the thermal response of the non-defective region, depending on the depth and size of the defect. The present work introduces a proximity-based outlier detection algorithm for defect detection or classification in quadratic frequency modulated thermal wave imaging. Further, the thermal profiles of detected defects are fed to K-nearest neighbor regression model to estimate their depths. A carbon fiber-reinforced polymer sample is used to validate the proposed methodology with the aid of local and global outliers created by deeper and shallowest defects, respectively. Furthermore,

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UITILIZING BIOMATERIAL AND GLASS WASTE FOR PARTIALLY REPLACEMENT OF CEMENT AND SAND IN CONCRETE

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ABSTRACT

The purpose of this study was to determine the optimal replacement percentage for sand with glass powder waste, which has excellent pozzolanic properties, and the effect of replacing Pozzolonic Portland cement (PPC) with Rice Husk Ash (RHA), a local biomaterial additive. The primary motivation for this study was to find solutions to the problems that arise while trying to properly dispose of agricultural waste like rice husk ash. The project was also designed to address the increasing problem of glass waste's low breakdown characteristics. Because of the growing demand for construction materials and the subsequent increased exploitation of raw materials and generation of hazardous gases (such as SO2 and NOX) during cement manufacturing, the ultimate goal was to lessen the reliance on cement, which is extensively used in construction. Compressive strength values at 7, 14, 21, and 28 days were measured as 20.27, 28.34, 33.67, and 37.00 N/mm2 in previous investigations where the replacement fraction was set at 20%.

1. INTRODUCTION

1.1 GENERAL

Recently, there has been a lot of interest in investigating whether or not biomaterials and glass waste may be used as partial cement and sand substitutes in concrete. This new area of study is focused on reducing the amount of waste produced by building projects and increasing the use of eco-friendly, renewable resources. Rice husk ash, fly ash, and groundnut shell ash are only some of the biomaterials that have showed promise as cement substitutes in concrete mixes. Large amounts of silica and alumina, both of which are required for cement manufacturing, can be found in these biomaterials. Many beneficial enhancements can be accomplished by putting them into concrete. Concrete's compressive strength, water resistance, and resistance to chemical deterioration are all improved by the use of these biomaterials.

Like sand, glass shards have recently been recognised as a potential alternative in the production of concrete. Recycled glass can be effectively used as a sand replacement after being crushed and processed, lowering the demand for natural sand and reducing the trash produced by glass recycling processes. Adding glass aggregate to concrete has additional advantages, such as making the material better at insulating against heat loss. Therefore, buildings made of concrete combined with glass trash can be more efficient in their use of energy. The industry's dedication to sustainable practises is on display in the investigation of biomaterials and glass waste as partial cement and sand replacements in concrete. Construction projects can help create a more sustainable and greener future by adopting these cutting-edge methods of waste reduction and material usage.

Design, synthesis and biological studies of tetrazole fused imidazopyridines

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Abstract

New tetrazole fused imidazopyridine derivatives (**12a–j**) were developed to exploit their cytotoxic activity towards cancer cell lines-MCF7, A549, and MDA-MB-231, utilizing MTT reduction assay with doxorubicin as standard drug. The compounds **12 h** and **12j** demonstrated strong anticancer activity bearing IC_{50} values 1.44 µM and 1.33 µM against A549 cell line.

Graphical abstract