



SHRI GAJANAN SHIKSHAN SANSTHA'S
SHRI SANT GAJANAN MAHARAJ COLLEGE OF ENGINEERING
SHEGAON – 444203, DIST. BULDANA (MAHARASHTRA STATE), INDIA
“Recognized by A.I.C.T.E., New Delhi” Affiliated to Sant Gadge Baba Amravati University, Amravati
“Approved by the D.T.E., M.S. Mumbai”

Ph : +918669638081 / 82
Fax : 091-7265-252346

[Email: principal@ssgmce.ac.in](mailto:principal@ssgmce.ac.in), registrar@ssgmce.ac.in
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Principal

A NOVEL APPROACH TO DISCRIMINATE BETWEEN INRUSH AND INTERTURN FAULT CURRENTS OF TRANSFORMER

Ganesh Bonde,* Sudhir Paraskar,* Saurabh Jadhao,* and Dwarakadas Kothari*

Abstract

Transformer protection is an important issue in electrical power system. This article presents a new approach to detect and classify amongst the inter-turn fault current and inrush current in a transformer using the teager energy operator (TEO) and support vector machine (SVM) algorithm. The inrush and inter-turn current signals are captured from the trailer made experimental set-up in the laboratory. The detection and classification algorithms are implemented using PC with MATLAB and Python script. The features are extracted using the TEO threshold-based algorithm. Those are used for training SVM. In this article, the linear kernel, polynomial kernel, radial basis function kernel, and sigmoid kernel are used for classification. All these kernels are compared based on the accuracy of classification with different values of regularization factors and changing the size of training and testing cases. The GridSearchCV optimization algorithm with a support vector classifier is also used to validate the best accuracy kernel. The computation time of TEO and classification of events is less than 10 ms.

Key Words

Teager energy operator (TEO), support vector machine (SVM), signal processing

1. Introduction

The transformer plays the role in electrical power system from generation to distribution stations. So it is important to avoid the miss-operation of the protection system. From the last few decades, primarily differential current-based protection of a transformer has been used for the protection of electrical power systems. The differential relay is used for the classification of internal fault in the transformer.

* Department of Electrical Engineering, Shri Sant Gajanan Maharaj College of Engineering, Sant Gadge Baba University, Amaravati, Shegaon, India; e-mail: {ganeshbonde2009, srparaskar, ssjadhao, dpkvits}@gmail.com
Corresponding author: Ganesh Bonde

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The disadvantage of the differential protection relays is that it may operate during the energization of a large power transformer. The inrush current consists of a second harmonic component. Many methods of transformer differential protection depend on the second harmonic content in current signal. The classification of inrush and inter-turn fault current is decided based on the ratio of the second harmonic component to the fundamental component of differential currents. It is found that the ratio is greater for inrush current condition than the inter-turn fault current condition [1]. The second harmonic component may also be present in the fault current of transformer, because of CT saturation. As the second harmonic component is greater than the fundamental component the differential protection based on second harmonic restrain fails to discriminate between inrush and inter-turn fault current of the transformer. Therefore, an advanced technique of protection is essential to differentiate between inrush current and inter-turn faults of a transformer [2]. Many methods have been developed to overcome this difficulty of mal-operation of differential relay which mainly includes wavelet transform-based approach. Wavelet transform is a powerful tool for classifying the inrush and inter-turn fault current because both the signals are non-stationary [3]–[7]. The wavelet transform-based approach may have good time-frequency localization. But this method requires large size data windows which get highly affected due to noise. The method discussed in [7] presents wavelet transform-based approach and ANFIS to distinguish between the inrush and inter-turn currents of a transformer. In this article, for the pattern recognition method, the $d5$ level of wavelet details coefficient is used which is too sensitive to noise. Ref. [8] presents a novel method of discrimination of inrush and inter-turn fault. In this method, the differential current is determined, then the normalization of current is done for first cycle after the occurrence of events. Then, normalized current is rearranged into ascending order. The diagnostic criterion is obtained by using the summation of sample values of the first quarter of current signal. The limitation of the method is that it requires more processing time and the first cycle can be taken for processing. Ref. [9] presents the hierarchical ensemble extreme learning machine (HE-ELM) and discrete wavelet transform (DWT)-based new

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Biographies



Ganesh Bonde received his B.E. and M.E. from the Sant Gadge Baba University, Amaravati, India in 2010 and 2012, respectively, in Electrical Power System Engineering. He is an ISTE life member. In 2016, he joined Shri Sant Gajanan Maharaj Collge of Engineering, Shegaon, where he works as a faculty member in Electrical Engineering Department. His present research interests in-

clude digital protection of transformer, FACTS, power quality.



Sudhir Paraskar received his B.E. and M.E. from the Sant Gadge Baba University, Amaravati, India in 1992 and 2001, respectively, in Electrical Power System Engineering and received his Ph.D. from the Sant Gadge Baba University, Amaravati, in Transformer Protection. He is a member of IEEE, IACSIT, and ISTE. In 1995, he joined Shri Sant Gajanan Maharaj Collge of

Engineering, Shegaon, where he works as a faculty member in Electrical Engineering Department. His present research interests include digital protection of transformer, FACTS, power quality.



Engineering Department. His present research interests include digital protection of transformer, FACTS, power quality.



Saurabh Jadhao received his B.E. and M.E. from the Sant Gadge Baba University, Amaravati, India in Electrical Power System Engineering and received his Ph.D. from the Sant Gadge Baba University, Amaravati, in Power Quality. He is a life member of ISTE. In 2011, he joined Shri Sant Gajanan Maharaj Collge of Engineering, Shegaon, where he works as a faculty member in Electrical

Dwarakadas Kothari received his B.E. (Electrical) in 1967, M.E. (Power Systems) in 1969 and Ph.D. in 1975 from BITS, Pilani, Rajasthan. From 1969 to 1977, he served as Vice Chancellor, VIT, Vellore, Director in-charge and Deputy Director (Administration) as well as Head in the Centre of Energy Studies at Indian Institute of Technology, Delhi and as Principal, VRCE, Nagpur. He is

a Fellow of the National Academy of Engineering (FNAE), Fellow of Indian National Academy of Science (FNASc), Fellow of Institution of Engineers (FIE), Fellow IEEE, Honorary Fellow ISTE, and Fellow IETE. He has published and presented 812 research papers in various national as well as international journals, conferences and guided 50 Ph.D. scholars.

Image Processing based Induction Motor Fault Detection using LabVIEW

Miss. Kalyani S. Digdeotulwar¹, Dr. A .U.Jawadekar²

¹ME(EPS)Student, Department of Electrical Engineering, SGBAU, SSGMCE, Shegaon, Maharashtra, India

²Professor, Department of Electrical Engineering, SGBAU, SSGMCE, Shegaon, Maharashtra, India

Abstract - Stator winding breakdown causes failure of induction motors which results in plant shut down, reduced production, accidents etc. in the production. Early diagnosis improves the safety of the operator and minimizes the maintenance cost. In this paper our aim is fault detection of induction motor based on image processing using particle analysis. This method uses image identification of the stator current concordia patterns. A feature based recognition of stator pattern current independent of their shape, size and orientation is the goal of the proposed method. A LabVIEW simulation has been carried out to detect the stator faults present in the Induction Motor.

Key Words: Induction Motor, Fault Detection, LabVIEW, Image Processing, Park's Vector Approach, stator current

1. INTRODUCTION

Induction Motors are a critical component of many industrial processes and are frequently integrated in commercially available equipment and industrial processes. Three phase AC induction motors are probably the most common type of three phase load and are used in a variety of equipment including refrigeration, pumps, air conditioning, conveyor drives as well as their more obvious applications. The induction motors are most widely used motors in industrial, commercial and residential sectors. Motor-driven equipment often provide core capabilities essential to business success and to safety of equipment and personnel. Induction motors play a very important role in the safe and efficient running of industrial plants and processes. Early detection of abnormalities in the motors will help avoid expensive failures. There are many published techniques and many commercially available tools to monitor induction motors to insure a high degree of reliability uptime. In spite of these tools, many companies still face unexpected system failures and reduced motor lifetime. This paper deals with fault detection of induction motor based on image processing using LabVIEW. This method is based on the image identification of the stator current Concordia patterns. A feature- based recognition of stator current independent of their shape, size and orientation is the goal of the proposed method. This paper comprises of following sections. Section II represents the Park's Vector Approach technique. Section III gives details of Image Processing in which Image composition, Particle analysis and Feature extraction are further carried out. Section IV presents experimental setup. Section V discusses LabVIEW Simulink model and result. And finally section VI is concluded with conclusion.

2. PARK'S VECTOR APPROACH

In three-phase induction motors, we know that the connection to the mains does not usually use the neutral. Hence to describe induction motor in three phase, we need to represent this phenomenon in two dimension first. This 2D representation works on the current concordia vector which is known as Park's Vector.

The current Concordia vector components (i_α , i_β) are a function of mains phase variables (i_a , i_b , i_c) as:

$$i_\alpha = \sqrt{\frac{2}{3}} i_a - \frac{1}{\sqrt{6}} i_b - \frac{1}{\sqrt{6}} i_c$$

$$i_\beta = \frac{1}{\sqrt{2}} i_b - \frac{1}{\sqrt{2}} i_c$$

7. CONCLUSION

Through Park's Vector Approach stator current I_d , I_q plot is generated. After calculating various parameters such as Area, Eccentricity, Perimeter and IOC, It is clear that stator turn fault was present. These parameters can be used to identify healthy condition from the Inter turn (20 turn) fault condition. A healthy three-phase induction motor generates a circular pattern. Eccentricity increases with severity of fault. Hence the I_d , I_q plot is elliptical in Inter turn fault condition. Differences can also be seen in the parameters calculated in table 6.4. These parameters are further used to classify the healthy and faulty condition.

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Comparative Analysis of Different UPQC

Dr. Saurabh S. Jadhao¹
Asst. Professor, Dept. of Electrical
Engineering
Shri Sant Gajanan Maharaj College
of Engineering
Shegaon, Dist-Buldhana, 444203
ssjadhao@gmail.com

Shrikant P. Kale²
Dept. of Electrical Engineering
Shri Sant Gajanan Maharaj
College of Engineering
Shegaon, Dist-Buldhana, 444203
shrikantpkale@gmail.com

Vijay S. Karale³
Asst. Professor Dept. of
Electrical Engineering
Shri Sant Gajanan Maharaj
College of Engineering
Shegaon, Dist-Buldhana, 444203
vijayskarale@gmail.com

Abstract— In the recent year's utility as well as end users are seems to be more concerned about the quality of power. Increased use of sensitive loads and emphasis on energy efficiency resulting into excessive use of nonlinear loads are the major challenges in maintaining good power quality. Power Quality (PQ) problem mostly refers to Voltage sag, voltage swell and harmonics. UPQC can simultaneously mitigate load voltage and source current problems and enhance power quality of the system. In this study the performance of new topology of UPQC namely open UPQC is investigated for the mitigation of balanced and unbalanced voltage sag, voltage swell and source current harmonics. The configurations of open UPQC namely Right Shunt Open UPQC (OUPQC-R) is analyzed with various control techniques. In this paper the capability of the OUPQC-R to enhance the power quality with reference generation and control techniques like Unit Vector Template (UVT) and Instantaneous p-q (PQ) is investigated. Various combinations of these techniques are also analyzed for the configuration of open UPQC. Simulation results carried out by using MATLAB simulink.

Keywords— unified power- quality conditioner (UPQC), pq problems, sensitive load, non linear load.

I. INTRODUCTION

The nature of electric power supply is mostly affected by the wide application of power electronic based equipment. Uninterrupted sinusoidal voltage at desired frequency and magnitude should always be provided to the consumers. On the other hand consumers should draw sinusoidal current. Many researchers are taking effort for the effective improvement of power quality. UPQC is considered as the most powerful custom power device to mitigate the problems arising due to power quality. It is necessary to take care of supply voltage disturbances such as voltage sag/swells, voltage flickers, load reactive power as well as voltage and current harmonics. UPQC is a combination of series and shunt active power filter (APF) connected through a common DC link capacitor. The series APF is connected to the supply line through a series transformer. The series APF prevents the source side voltage disturbances from entering into the load side to make the load voltage at desired magnitude and frequency on the other hand the shunt APF connected in parallel across the load limits the current related problems to the load side to make the current from the source purely sinusoidal. In this paper two different control schemes are used for series and shunt APF.

II. MODELING OF UPQC

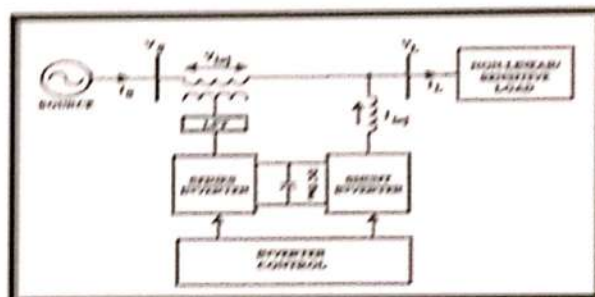


Figure.1. Configuration of UPQC

Shunt active filter

The shunt active filter has a Voltage Source Inverter (VSI), Interfacing Inductor, and ripple filter. The design of VSI includes the DC bus voltage level, the DC capacitance and the rating of IGBTs used. The design of Interfacing Inductors and the Ripple Filter is presented here. The design is carried out considering a right shunt UPQC.

The DC capacitor connected at the DC bus acts as energy buffer and provides dc voltage for the normal operation of the shunt APF. The DC bus voltage V_{dc} , DC a bus capacitance C_{dc} , interfacing inductors (L_f), and voltage and current rating of switches are calculated as below.

Selection of the DC bus voltage

The minimum DC bus voltage of VSC of shunt APF should be greater than twice the peak of phase voltage of the distribution system. The DC bus voltage is calculated as

$$V_{dc} = 2 \cdot \frac{2\sqrt{2} \cdot V_{LL}}{\sqrt{3}} \cdot m \quad (1)$$

Where m is modulation index and considered 1 and V_{LL} is the AC line output voltage of the shunt APF, during transient the energy conservation is applied as

$$\frac{1}{2} \cdot C_{dc} \cdot (V_{dc}^2 - V_{dc1}^2) = K_1 3V_{alt} \quad (2)$$

Where V_{dc} is the nominal DC voltage equal to the reference DC voltage and V_{dc1} is the minimum voltage level of the DC

Fig.11 shows simulation result of right shunt open UPQC using instantaneous p-q technique. The distorted load current is shown in Fig.11 (a). The compensating current required to be injected in the system is shown Fig.11 (b) and Fig.11 (c) shows compensated source current. The UPQC is turned ON from the beginning i.e. zero instant and it injects compensating current into system. The compensating current is in phase opposition to the harmonic current present in the source current. This results in harmonic mitigation of source current.

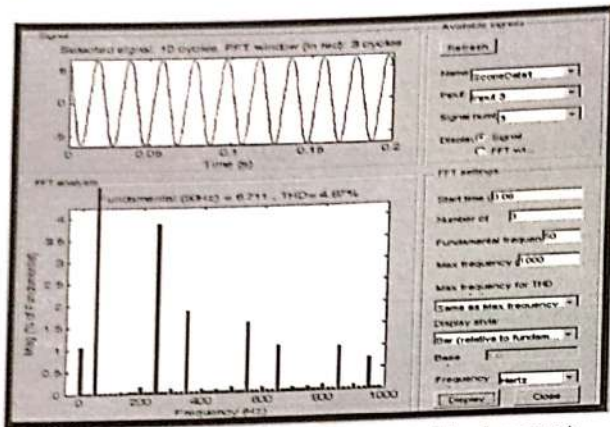


Figure.12 THD Analysis of compensated load current

FFT analysis of the source current is carried and THD of the source current is determined to be 4.87%. It is evident from the result presented in Fig 11 and Fig. 12 that right shunt open UPQC with instantaneous p-q technique for reference current generation can effectively compensates the source current harmonics. The performance of the OUPQC-R for enhancement of current quality is found adequate.

Table.2. Performance Analysis of Right Shunt Open UPQC

Factor for Performance Analysis	Performance of Right Shunt Open UPQC	
	UVT	PQ
Compensation of balanced Voltage Sag	10-30%	--
Compensation unbalanced Voltage Sag	10-30%	--
Compensation of Voltage Swell	10-30%	--
Compensation of Current Harmonics	8.70%	4.87%

CONCLUSION AND FUTURE SCOPE

It is observed from table that the OUPQC-R with the different control techniques (UVT and PQ) satisfactorily compensates the balanced voltage sag, in the range of 10% to 30%. It is also observed that the OUPQC-R with UVT technique can satisfactorily compensate unbalanced voltage sag in the range of 10% to 30%. It can be viewed from the table that

OUPQC-R can effectively compensate voltage swell in the range of 10% to 30% with UVT technique used for series control. Whereas reduction of THD from 30% to 4.87% is obtain, when PQ technique is used for shunt controller. It is also observed that reduction of THD from 8.75 % in UVT technique to 4.87% when PQ technique is used. The effectiveness of OUPQC-R configuration with UVT-PQ technique is required to be investigated experimentally. So in future an experimental study of OUPQC-R can be carried out.

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Implementation of FACTS Device to Improve Power System Stability

Ankita R. Joshi¹, Prof. U.A. Jawadekar²

¹ME Student, Department of Electrical Engineering, SSGMCE Shegaon (MS), India

²Assistant Professor, Department of Electrical Engineering, SSGMCE Shegaon (MS), India

Abstract- The demand for power and non-linear loads is increasing day by day, and thus stability problems arise. A technique that can efficiently afford compensation with growing or reducing load requirement and available transmission network resources are necessary. The FACTS devices are implemented, to increase the power flow capacity in an electric power network. The primary aim is to increase the load capability of the system to maintain stability after a fault occurrence. Here fault is created on system build in MATLAB/Simulink environment and the effect of series FACTS device i.e. TCSC controller is observed.

Key Words: FACTS devices, Stability, TCSC, MATLAB/Simulink.

1. INTRODUCTION

As transmission systems are getting closer to the limits of their stability and thermal limits whereas the main focus on the power quality delivered has increased significantly. Increased demands on transmission, absence of long-term planning, and the need to provide open access to generating companies and customers, all together have created tendencies toward less security and reduced quality of supply [5]. For both operational reliability and economical profitability, the transmission systems framework's utilization is crucial in a more effective and measured way. The FACTS technology is essential to overcome some of these difficulties by enabling utilities to get the most service from their transmission facilities and enhance grid reliability[4]. The ability of FACTS Controllers to control the interrelated parameters that regulate the operation of transmission systems parameter including -series impedance, shunt impedance, current, voltage, phase angle, and the damping of oscillations at various frequencies below the rated frequency.[5] The FACTS technology is not a single high-power Controller, but moreover a collection of Controllers, which can be applied individually or in combination with others to control one or more of the interrelated system parameters[1]. In this paper a study of series FACTS device-TCSC (Thyristor control series compensator) is been carried out and its effect on fault compensation on a considered system is been observed.

1.1 Controlling of power system-

In any power system, the generation, transmission, and usage of electrical power can be separated into three areas,

which traditionally determined the way in which electric utility companies had been organized.

These are adorned as:

- Generation
- Transmission
- Distribution.

Although power electronic based equipment is prevalent in each of these three areas, such as with static excitation systems for generators and Custom Power equipment in distribution systems. The rapt of this paper is on transmission network i.e. moving the power from where it is generated to where there is the usage.

1.2 Power system limitations-

The limitations of the transmission system can take many forms and may involve power transfer between areas or within a single area or region and may include one or more of the following characteristics:

- Steady-State Power Transfer Limit
- Voltage Stability Limit
- Dynamic Voltage Limit
- Transient Stability Limit
- Power System Oscillation Damping Limit
- Inadvertent Loop Flow Limit
- Thermal Limit
- Short-Circuit Current Limit

The cue of solving these problems in the most cost-effective and coordinated manner is by rigorous system's engineering analysis. These limitations can overcome by controlling some system parameters by the implementation of FACTS controllers that are capable to oversee these problems.

2. Thyristor Controlled Series Compensators (TCSC)-

Capacitive reactance compensator which consists of a series capacitor bank shunted by a thyristor-controlled reactor (TCR) in order to provide a smoothly variable series capacitive reactance. A TCR is used in parallel with a fixed capacitor to enable continuous control over the series compensation. An actual TCSC system usually comprises a cascaded combination of many such TCSC modules, together with a fixed-series capacitor. This fixed series capacitor is provided primarily to minimize costs.

5. CONCLUSION:

In this paper, software based study of FACTS Device TCSC controller has been carried out From the Simulink in MATLAB system analysis. The power angle (δ) and rotor speed has extracted from system simulation model for generator stability analysis. The line voltage (V_{abc}) and line current (I_{abc}) has also been extracted from model for transmission line stability analysis. The result shows that the stability of the power network and Generator has eminently afflicted by TCSC (capacitive mode). Here LLLG fault is been applied on the considered system, faults other than LLLG can also be applied and studied for power system stability analysis with the compensation technique of TCSC controller.

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Simulation of Unified Series-Shunt Compensator for Power Quality Improvement

K. M. Bhutada*, S. S. Jadhao

Shri Chhatrapati Maharaj College of Engineering, Shrigaon, Maharashtra, India

*Corresponding Author

E-Mail Id: bhutadakomal20@gmail.com

ABSTRACT

This paper is related to the simulation of a Unified series-shunt compensator (USSC) which focuses on its ability to improve energy quality in a power distribution system. The USSC simulation model encompasses two 12-pulse inverters which are linked in series and in shunt to the system. A generalized sinusoidal pulse width modulation switching procedure is created in the proposed controller design for quick control activity of the USSC. Simulations were carried out using the MATLAB electromagnetic transient program to validate the performance of the USSC model. Simulation results shows that the capabilities of the USSC in performing voltage sag compensation, voltage unbalance mitigation, flicker reduction, power factor correction, UPS mode, and harmonics elimination. USSC gives a better performance in power quality mitigation by comparing of the USSC with other custom power devices.

Keywords: Power quality mitigation, unified series-shunt compensator

INTRODUCTION

A growing demand for high quality, reliable electric power, and an increasing number of sensitive loads have directed an increasing emphasis of power quality both by end users and utilities. In the development of power electronic devices such as static VSC transmission system (HVDC) and custom power devices have introduced a new emerging branch of technology providing the power system with versatile control capabilities [1,2]. Generally FACTS devices are used in transmission control while in distribution system custom power devices are used. With the introduction of FACTS and custom power concept, devices such as unified power-flow controller (UPFC), dynamic voltage restorer (DVR), synchronous static compensator (STATCOM), solid-state transformer (SST), and solid-state transfer switch (SSTS) for improving power quality in a system.[4,5] For power quality mitigation we used a unified series-shunt compensator and improved

semiconductor switching of these devices. Investigations have been carried out to study the effectiveness of these devices in power-quality mitigation such as sag compensation, unbalance compensation, harmonics elimination, reactive power compensation, power-flow control, power factor correction and flicker reduction. These gadgets have been created for mitigating specific power-quality problems. For example, UPFC works admirably for power-flow control. STATCOM, which is a shunt compensator, is used for reactive power and voltage sag compensation, DVR, which acts as a series compensator, is used for voltage sag compensation. The STATCOM and DVR are only useful for compensating a power-quality problem and therefore, it is necessary to develop a new kind of unified series-shunt compensator (USSC) which can mitigate a wider range of power-quality problems. By using a unified approach of series-shunt compensators it is possible to compensate for a variety of power-quality problems in a distribution

by inserting a passive filter into the system. A correlation is made between the USSC and the other custom power devices, for example, D-STATCOM and DVR regarding their abilities in power-quality mitigation. It is shown that the USSC gives a superior presentation in power-quality mitigation, particularly in voltage sag compensation and power flow control, and furthermore give more power quality arrangements when contrasted with the D-STATCOM and DVR.

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APPLICATION OF SWEEP FREQUENCY RESPONNSE ANALYSIS (SFRA) METHOD TO DETECT TRANSFORMER FAULT

VISHAL M. PIMPALKAR
P. G. Students at Shri Sant
Gajanan Maharaj College of
Engineering, Shegaon-444203
vishalpimpalkar7@gmail.com

DR. MRS.A.U. JAWADEKAR
Assistant Professor at Shri Sant
Gajanan Maharaj College of
Engineering, Shegaon-444203
anjali.jawadekar@gmail.com

Abstract- Power transformer is the most important device for reliable power system. While working with it, many faults may occur in it. Diagnosis of these faults can be done with lot of techniques. Here in this paper, transformer fault detection by Sweep Frequency Response Analysis (SFRA) technique has been introduced. The SFRA is nothing but monitoring the change occur in the transformer R-L-C network parameter. SFRA measurement can be done by using sweep frequency of the range of 20 Hz to 20 MHz range. These sweep frequencies applied to transformer in healthy and faulty condition. SFRA gives the results in the form of signature curve in both healthy and faulty cases. This obtained signature curve confirms the exact location of fault. This paper presents simulation study of transformer equivalent circuit with implementation of SFRA technique and shows the SFRA results with both healthy and faulty condition.

Keywords- Power transformer, winding deformation, axial and radial deformation, sweep frequency, signature curve, sweep frequency response analysis.

INTRODUCTION

Power transformer is the heart of the electrical power system and it performs a vital role in the area of transmission and distribution [1]. Upon increasing voltage transfer capacity of transformer for transmission, it should have high grade of insulation strength [2]. In general, we generate the power at lower rating and then step up it to higher ratings for transmission by step up transformer. During this action of power transforming, power losses occur.

Number of faults occur in transformer like turn to turn fault, inter turn fault, winding deformation, core deformation, insulation breakdown and short circuit as well. These faults arise due to all day work. Sometimes fault may occur during transportation from manufacturing place to where it has to be installed. During transportation winding and core deforms.

Transformer is the complex structure of resistance, capacitance and inductance networks. When mechanical deformation is occurred inside the transformer, huge force generated in transformer due to current in it. Due to that force winding deforms radially as well as axially. As a result of this deformation, R-L-C parameters get changed with respect to their previous values.

In SFRA technique we can detect that deformation easily by applying sweep frequency inserted in the winding. If SFRA results are not similar like when transformer is in healthy condition, then it is the condition of fault.

II. SHORT CIRCUIT FORCES

Electrical and mechanical failure in transformer generates the force resulting from short circuits which may damage the transformers. Due to these forces, transformer winding deforms radially and axially. Short circuit symmetrical current is 6 to 7 times that of rated current and sometimes is high up to 15 to 18 times the rated current at peak time [3]. The formula for force acting on current carrying conductor during short circuit condition is,

$$F = BIL \text{ Newton}$$

where, B – Flux density in Tesla

I – Current in Ampere.

L- Length of conductor in meters

So, the resulting forces are very high because they will be increasing in square of current. These forces extend the current carrying conductor radially as well as axially. Due to this mechanical change occur in winding and so impedance value changes.

III. DETECTION TECHNIQUE

For the detection of fault in transformer various techniques are available. But most commonly used are,

- i. Dissolve gas analysis
- ii. Partial discharge method
- iii. Sweep frequency response analysis

i) Dissolve Gas Analysis

The breakdown of insulating materials within transformers and electrical equipment liberate gases within the unit. The distribution of these gases can be related to the type of electrical fault and the rate of gas generation can indicate the severity of fault. The identity of gases being generated by particular unit can be very useful information about fault. The types of fault depend on what type of gas is extracted from transformer oil.

comparing faulty condition with healthy condition, we notice the change in current value due to change in impedance value of complex network. So this change in current value can detect or diagnose the fault in the transformer winding.

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Implementation of Integral Mathematical Models of Single and Multiple Power Quality Disturbances

Ravishankar S. Kankale¹, Dr. Sudhir R. Paraskar², Dr. Saurabh S. Jadhao³

Assistant Professor, Department of Electrical Engineering, SSGMCE, Shegaon, India¹

Professor & Head, Department of Electrical Engineering, SSGMCE, Shegaon, India²

Assistant Professor, Department of Electrical Engineering, SSGMCE, Shegaon, India³

Abstract: Nowadays, renewable energy resources based generation is increasingly used to feed the ever-increasing power demand. The integration of this generation with the grid requires power electronic converters. These power electronic converters, switching operations, non-linear loads, and faults occurring in the network are the major causes of Power Quality Disturbances (PQDs). These PQDs cause severe problems to the sensitive equipment of end-user. Hence, Power Quality (PQ) becomes the main issue, both utility and customers are now concern about it. To mitigate the PQ problem, we need an accurate PQ monitoring system that can detect and classify the PQDs. A lot of research is going in this field. The first step of this research is to get some synthetic data to train and test the detection and classification algorithms. So, the current trend is to generate the single and multiple PQDs using integral mathematical models represented as parametric equations. This paper presents the implementation of integral mathematical models of both single and multiple PQDs such as voltage sag, voltage swell, voltage interruption, harmonics, voltage flicker, voltage notch, impulsive transient, oscillatory transient, voltage sag with harmonics, voltage swell with harmonics, and voltage interruption with harmonics using MATLAB programming. This will provide a fast and automatic way for the generation of PQDs to the researcher working in this area.

Keywords: Power Quality; Power Quality Disturbances, Power Quality Monitoring, Detection and Classification.

I. INTRODUCTION

In the present era of science and technology, the term power quality has gained more importance. Both utilities and customers are now concerned about power quality. The power quality issues are occurring mainly due to the increasing use of non-linear loads, power electronic load/converters, solid-state devices, unbalanced loads, computer systems, and data processing units [1]. The use of renewable energy resources-based distributed generation systems with power electronic converters are also acting as a major source of power quality disturbances [2]. Power quality disturbances such as voltage sag, voltage swell, interruption, harmonics, transients, and flicker are the most commonly occurring disturbances in power systems [3]. Modern types of equipment that are connected to the system may get affected or damaged due to the exposure to the power quality disturbances occurring in the power system due to any cause [5]. Hence, it is necessary to accurately detect the occurrence of power quality disturbance, and classify it. In order to execute the task of detection, classification, and characterization of power quality disturbances, it is essential to understand its properties and characteristics. This paper deals with the generation of eleven power quality disturbances using mathematical models for power quality analysis.

II. POWER QUALITY

There are several definitions of power quality. Different international standard organization define the term power quality in different way. According to IEEE, it is defined as the concept of powering and grounding electronic equipment in a manner that is suitable to the operation of that equipment and compatible with the supply system and other connected equipment. According to IEC, it is defined as the ability of a device, equipment or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment.

The power quality disturbances may cause malfunctioning of customer equipment. It may lead to the interruption of the manufacturing process which will damage the product and hamper the manufacturing results into loss of money. For



Figure 13 shows the voltage signal with interruption along with harmonics for time duration 0.4 sec generated by controlling the parameters of the parametric equation.

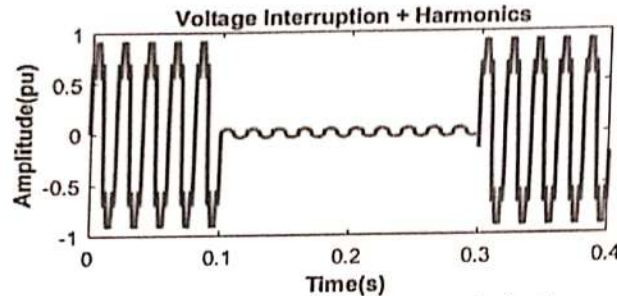


Fig. 13 Voltage Interruption + Harmonics waveform generated using the parametric equation

V. CONCLUSION

In this paper, the implementation of the integral mathematical models of power quality disturbances is done in the form of the parametric equation using the software program developed in MATLAB. Generation of both single and multiple power quality disturbances is done as per the parameters defined by IEEE1159 and IEC61000 standards. The power quality disturbance signals generated using the integral mathematical models will be useful in the research of detection and classification of power quality disturbances. Researchers working in the field of power quality can use mathematical models to generate the synthetic PQ signals and the data set required for training, validation, and testing the algorithms used for detection and classification PQDs. This will help in testing the feasibility of the algorithms, which signifies the importance of implementing the integral mathematical models of power quality disturbances. This work is of special interest in the initial stage of research which will reduce the effort and time spent on algorithm development.

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Condition Monitoring Of Three Phase Induction Motor Based on IOT

¹P.M.AKOTKAR, ²V.S.KARALE, ³Dr.A.U.JAWADEKAR

¹P.G. Student, Department of Electrical Engineering, SSGMCOE, Shegaon (M.S.), India
²Assistant Professor, Department of Electrical Engineering, SSGMCOE, Shegaon (M.S.), India
³Associate Professor, Department of Electrical Engineering, SSGMCOE, Shegaon (M.S.), India
Email: ¹akotkarpriya35@gmail.com, ²vijayskarale@gmail.com, ³anjali.jawadekar@gmail.com
Contact: ¹9604495789, ²932513086, ³9766824978

Abstract- Now a days the induction motor has become the most popular type of motor for industrial applications. The condition monitoring have become a growing technology in recent years. The industrial sectors are widely using automation platforms to increase the productivity. The condition monitoring helps to avoid unwanted shutdown of motor and improve the operating efficiency and life of motor. Monitoring is usually done based on IOT which is a system of interconnected device that offers the capabilities of real time data collection, visualizing the collected data in the form of charts, ability to create plug in and apps for collaborating with web services, social network and other APIs. The aim of this paper is to monitor the real time data of three phase induction motor based on Internet of Things for safe and economic data communication in industrial fields. This data monitored is stored on a things speak channel from serial monitor. This monitored data can also be accessed from different location through web page. Also controlling of the three phase induction motor is possible by two ways i.e controlling the three phase motor from motor end and also controlling the three phase motor at remote end.

Keywords— Internet of Things, Parameter Monitoring, Induction Motor, Parameter Controlling.

I. INTRODUCTION

Induction motors are most widely used machines in industrial sector as well as commercial sectors due to its various advantages such as reliability, ruggedness, compactness and the main advantage is its a maintenance free motor [2]. The induction motor is a singly excited machine in which the power is supplied to the rotor winding and the voltage is induced in the stator winding of the motor so this motor is called induction motor. As they have remained the most popular type of machine used in industrial sector such as squirrel cage motor is used in various industrial drives as well as used as fixed speed and variable frequency applications. As all motors generate noise and vibration, analysis of this can help to give information on condition of motor. As 95 percent of motors in industries are three phase induction motors the monitoring of these motor is very essential. So

monitoring and control of induction motor is very essential to increase reliability, maintaining performance. Condition monitoring means monitor the real time data of a machine as well as continuous evaluation of health of machine throughout its serviceable life. Due to this the operating efficiency of the machine will increase and ultimately the electricity bill will reduce, due to continuous monitoring the unexpected failures occurred on machine will reduce and the life of the machine will increase, most important the human efforts will reduce. The various methods of monitoring are model based techniques such as signal processing techniques, fast fourier transform, short time fourier transform, gabor transform, wigner ville distribution and other soft computing techniques such as artificial neural network techniques, fuzzy interference system, adaptive fuzzy neuro interference technique, wavelet transform analysis [8]. Faults and failures of induction machines can lead to excessive downtimes and generate large losses in induction motors. Even small fault can causes increased losses such as reducing efficiency and increasing temperature, which will reduce insulation lifetime, and increasing vibration, in turn may reduce bearing life time. All they are due to the operating environment condition and machine internal factors. The different type faults which are commonly occurred in the induction motor are electrical faults and mechanical faults [13]. Electrical faults include stator and rotor faults such as inter turn faults, line to ground faults whereas mechanical faults includes bearing faults. So with the help of proper knowledge and study of these faults go for condition monitoring of the motor and also control the motor from different faults occurred on it. To achieve both the monitoring and controlling of three phase induction motor Thingspeak (IOT) platform can be used effectively. IOT platform is recently used in industrial automation in order to increase the productivity by monitoring the induction motor. Thingspeak is a open source which provides various services such as offers the capabilities of real time data collection, visualizing the collected data in the form of charts,

II. Results of Abnormal Conditions of Motor on serial Monitor of Arduino Uno.

Fig.17 Shows the Over Voltage Signal obtain on serial Monitor Window of Arduino Uno.

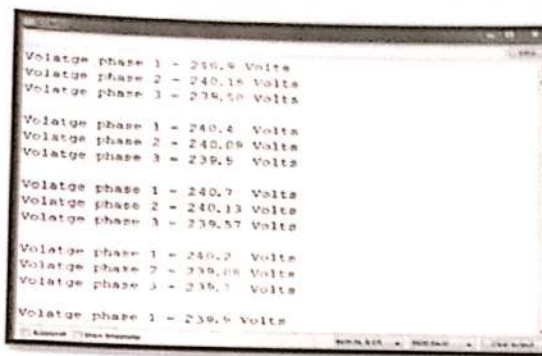


Figure. 17 Over Voltage obtain on Arduino

Fig.18 Shows the Over Current Signal obtain on serial Monitor Window of Arduino Uno.

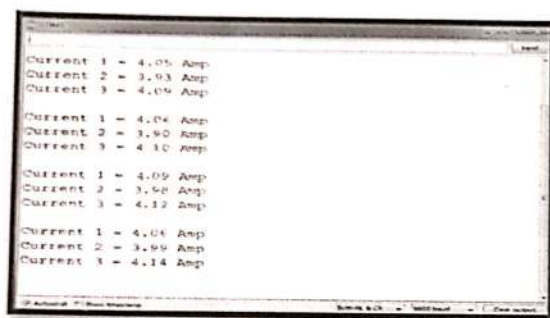


Figure 18 Over Current obtain on Arduino

After making abnormal conditions the test is performed whether the algorithm able to OFF 3 Phase Induction motor from remote location as well as From Motor End. It is observed that systems behave well and our desired output is achieved.

V. CONCLUSION

In this Paper 3 Phase Induction motor is effectively and continuously Monitored by using Different sensors and obtained data is stored in the cloud platform and is accessed from different location using web application. The health of motor is assessed by analyzing the continuous parameter. In addition to continuous condition monitoring, Controlling remote end and as well as motor end is developed.

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Bearing Faults Diagnosis of Induction Motor Using LabVIEW.

Snehal .N. Talele
PG Student
Department of Electrical
Engineering SSGMCE, Shegaon, -
444203 (M.S.) India

Dr. Mrs. Anjali. U. Jawadekar
Associate Professor
Department of Electrical
Engineering SSGMCE, Shegaon, -
444203 (M.S.) India

ABSTRACT

Early detection of faults in induction motor are of paramount importance for reliable and economical operation of induction motor in industries. This paper deals with the problem of bearing failure detection and diagnosis of induction motor. Many faults arising in induction motor are due to bearing failures. This paper proposes an experimental study to diagnose the bearing fault with the help of Park's vector approach. Laboratory analysis has been performed on 2 hp three phase induction motor. The bearings used have natural defects due to their continuous operation. NI LabVIEW 8.5 software is used to acquire the signal and is analyzed with Park's vector approach.

Keywords

Bearing faults, Induction motor, NI LabVIEW 8.5

1. INTRODUCTION

Industrial revolution started in the world, especially in Europe in the middle of the 20th century and second decade of the 21st century marks the manufacturing of ultramodern precision machineries. One of crucial machines is Induction motor. Induction motors are widely used in almost every industry and most application area of industry such as railways, conveyers, elevator transport system; material handling plants and utility of companies for mechanical equipment's e.g. machine tools, compressor, pumps, fans, extruders are the examples of the above said fact. Induction motor play very important role in industrial as well as commercial purpose due to its low maintenances, ruggedness and high reliability.

Electrical machines have a common element named 'bearings'. They are utilized to permit the rotary motion of the shafts. As the modern manufacturing has increased the reliability of bearings, they are often subjected to fail. According to some statistical data, bearing fault causes 41% of all motor failure [1]. Bearing consist of two rings called the inner and outer rings. Equidistance between the balls is assured by a set of balls or rolling elements. Bearing failures are caused by continuous stress on the bearings which causes the fatigue and failure. Small pieces break loose from the bearing called flaking or spalling. These failure cause rough running of the bearing which produces detectable vibrations and increased noise levels. External sources such as dirt, corrosion, contamination, improper lubrication, improper installation and brinelling also cause failures of the bearings. The shaft voltages and the currents are also results of bearing failures. These are the results from flux disturbances such as rotor eccentricities. Another reason for bearing failure is high bearing temperature.

There are many methods for the diagnosis of bearing faults such as temperature monitoring, vibration monitoring, chemical monitoring, current monitoring, acoustic emission monitoring, etc. [3] All these methods need expensive sensors or specialized tools except for current monitoring. The Park's vector approach falls under electric monitoring. A continuous real time tracking of bearing fault of induction motor which operates under continuous stationary conditions is allowed by this method. This method acknowledges the fault signature produced in induction motor and calculate the severity of faults. In this paper, the effects of bearing faults on motor current spectra of an induction motor are investigated using Park's vector approach. If the visualization of motor current Park's vector representation is a perfect circle, then bearing of machine can be considered as healthy and if an elliptical pattern is observed for this representation, the machine is faulty.

2. PARK'S VECTOR APPROACH

A two dimensional portrayal can be used for describing three phase induction motor phenomena, a suitable one being based on the current Park's vector [3] As the connection to the mains does not usually use the neutral in three phase induction motor, the main current has no homopolar component. As the function of mains phase variables (i_a, i_b, i_c) the current Park's vector components (i_d, i_q) are;

$$i_d = \frac{\sqrt{2}}{3} i_a - \frac{1}{\sqrt{6}} i_b - \frac{1}{\sqrt{6}} i_c \quad (1)$$

$$i_q = \frac{1}{\sqrt{2}} i_b - \frac{1}{2} i_c \quad (2)$$

Under ideal conditions, three phase currents lead to a Park's vector with the following components

$$i_d = \frac{\sqrt{6}}{2} I \sin \omega t \quad (3)$$

$$i_q = \frac{\sqrt{6}}{2} I \sin \left(\omega t - \frac{\pi}{2} \right) \quad (4)$$

where;

I – maximum value of the supply phase current

ω_s – supply frequency

t – time variable

The corresponding portrayal of $i_d - i_q$ is a circular locus centered at the origin of coordinates under balanced condition as shown in fig 1. It's a reference figure, which allows the identification of abnormal conditions by observing the deviation of acquired patterns.

pattern the induction motor was initially tested with deteriorated bearings. Fig 5 shows the current pattern for motor with healthy bearing. Fig 6 shows the current pattern for faulty motor. The shape of current pattern in fig 6 is not a perfect circular which shows the bearing fault in the squirrel cage induction motor.

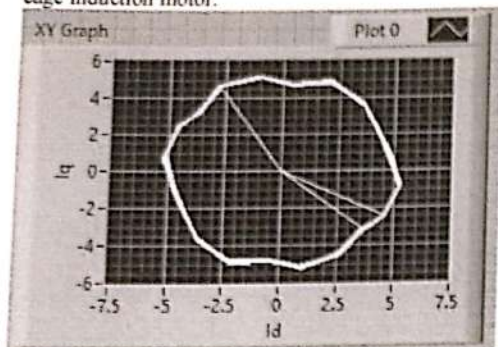


Fig No 5. Current Park's Vector For Healthy Motor Bearing.

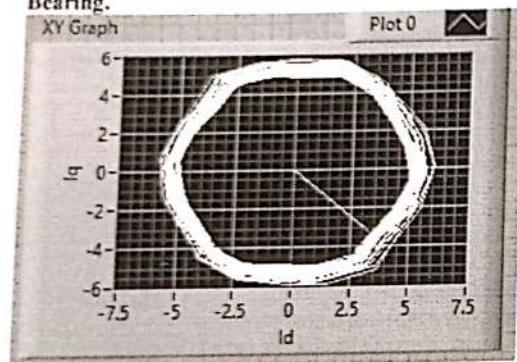


Fig No 6. Current Park's Vector For Fault Motor Bearing

CONCLUSION

A methodology of Park's vector approach is for the detection of fault of induction motor is presented. The result derived from the experiment shows that current Park's vector pattern of healthy motor was a perfect circle while for bearing fault of induction motor it was elliptical in shape. The efficiency and effectiveness of this method is proved by lab. Experiment in area of computer aided condition monitoring of induction motor. New challenges will exist in future for faults detection in case of very large /big size of induction motor. Therefore they can easily avoid the critical emergency shut-down as well as reduce the maintenance costs of induction motor others faults.

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IOT Based Garbage Monitoring System Using Sensors

RAJESHRI K TANGADE¹, Dr.Mrs.A.U.JAWADEKAR²

¹ME Student, Department of Electrical Engineering, SSGMCOE Shegaon(M.S), India

²Associate Professor, Department of Electrical Engineering, SSGMCOE Shegaon(M.S), India

Abstract - As the population is increases with the growth of the cities, the waste produced also increases. In 21st century there is tremendous increase in garbage including plastic waste of households which is a threat not only for human race but also for earth's environment. In today's sceario many cities are still lacking in the area of waste management, particularly , the collection of garbage within the cities. Because of this there is overspill of garbage bins.To provide a solution to this problem, a smart garbage monitoring system is therefore to proposed to tackle the issues faced. Nowadays sanitairiness & cleanliness are one of the agitated issues by any state all over the world. This is possible only when the network of smart bins which integrates cloud-based techniques to monitor & analyze data collected to provide predictive routes generated through algorithms for garbage bins.The main purpose of this project is to develop an IOT Based project which is cost-effective system that can monitor the everyday garbage in real time by using smart technology.

Key Words: Ultrasonic Sensors, IOT(Internet Of Things), Garbage monitoring system , Solid & liquid waste collection, Wi-Fi Modem.

1.INTRODUCTION

There is tremendous growth population across the world and due to which there is enormous amount of garbage which is generated on a daily basis, that's why the issue of waste management has been a terrible problem in India. During travelling, hundreds of people are passing the same location around one minute. Almost 60-70% of people are carrying food covers, polythene bags, plastic bottles. If they dispose all them at once, the dustbins will be filled in several minutes. With the popularity of IOT growing and the availability of low cost actuators and sensors, the benefits of this technologies can be used to solve the problems faced in the current method of waste management in cities. Also , in present day waste collection system is a time process and it requires huge labour. IOT has many application such as home, health,, environment and industry. It can also be applied in the field of waste management that would be instrumental in designing smart cities.

In many areas where people are highly affected by the environmental pollution. This leads to very harmful and poisonous effects on the human health. Certain part of the city or an organization, the overflowing of muncipal garbage bins brings daunting and detrimental consequences for

suburbs. To overcome such severe problems, there is a need to develop a smart system that safeguards the environment and reduces the human effort by informing the municipality about the filling of bins so that bins can be clean on time. The system proposed has 3 parts: Part 1 deals with data sensing and acquiring. That can be done when the ultrasonic sensor is placed inside the bin to measure and collect the information such as garbage weight, leftover space in the bins. Part 2 deals with data processing and transmission. Part 3 deals with triggering and alert.

1.1 Motivation

We can keep ourself clean and maintain our environment tidy plays a major role on making our country healthy and wealthy. This project helps to clean the garbage as soon as possible when it is nearing the fulfillment of the garbage bin. This prevents the diseases arise due to waste dumping and increases cleanliness of the city. This makes very miserable for India to become Swach Bharat.

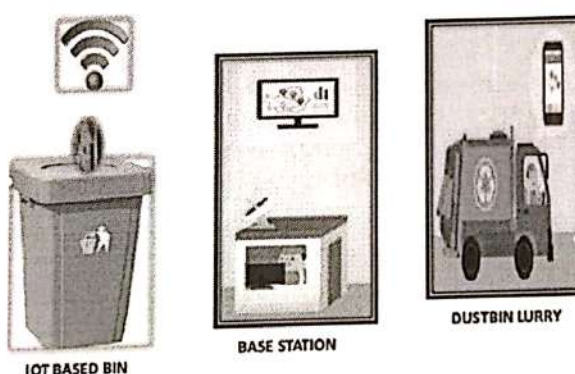


Figure1.1: Motive of Project

1.2 Aim and Objective

To detect the garbage level and compare it with the garbage bins depth. In this project the system informs about the level of the garbage collected in the garbage bins. Main aim is to stop overflow of garbage in bins to overcome this problem a IOT based garbage monitoring system is designed which measures the level of trash in the bin and remotely triggering the required controls using IOT.

liquid garbage monitoring if the distance is '1' the bin is full then at that it gives alert signal to the controller and then process is continuing.

5. CONCLUSIONS

This system which is developed provides better database for garbage collection time and quantity of garbage collection at every place. After implementation of this project, we can avoid over flowing of garbage from the container in the residential area which was earlier done manually. Also, the system will reduce the risk of overfilled garbage bins and unhygienic conditions that are caused due to low awareness that is present in the current collection system. Importantly this system is directed at a city with a high or growing population. The official authorities can use this system to keep a watch on the levels of use of harmful materials developed and use already mentioned ways to reduce these levels.

6. Future Scope

The spread of internet is happening at a fast pace in every part of the world, which can digitized many aspects of day to day life. The scope from the project is that by providing knowledge of internet and its uses from people we can make village smart by providing these features like smart garbage management, digital water supply and intensity controlled street light, etc. The garbage which is collected can be converted into compost using the traditional methods and new techniques.

The proposed design of the smart garbage alert system is very flexible and can be easily installed at more crowded regions like airports, railway station, bus-stands, shopping malls, offices, etc. The government can setup recycling stations and the profit to be gained can be calculated.

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Seven Level Inverter for Multistring Photovoltaic

Ashwini Purushottam Ganesh¹, Jawadekar A (

¹Student, Department of Electrical Engineering, Sant Gadge Baba Amravati University,

²Professor, Shree Sant Gajanan Maharaj College of Engineering, Shegaon, Maharas

Corresponding Author: ashwiniganesh72@gmail.com

Abstract: - In this dissertation report seven level inverter (SLI) is designed for multistring photovoltaic of electrical energy through thermal product is getting exhausted and world is turning towards the solar energy. The efforts are more focused about solar energy and hence, need some apparatus or system which will convert the solar energy efficiently toward the load side and that's why, the paper proposes a system which will convert the solar energy and DC electrical source will be converted to AC by efficient technique of the inverter. In the " 7 level inverter " in which inverter has several advantages over conventional inverter that uses pulse width modulation (PWM). These can generate output voltage with low distortion and lower dv/dt . In this system we can convert this higher amount of energy into electrical energy to reduce the rectification loss. This system is converting a solar generated DC source to the AC source by using 7 level inverter and hence for giving the pulses to the 7 level inverter.

Key Words: —Seven level inverter, Non-renewable energy, Pulse width modulation.

I. INTRODUCTION

This paper proposes a new seven level inverter with a solar power generation system, which is composed of a dc-dc power converter and a new seven level inverter. The dc/dc power converter integrates a boost converter and a transformer to convert the output voltage of the solar cell array into independent voltage sources with multiple relationships. The most commonly used solar cell model is introduced and the generalized PV model using Matlab/Simulink is developed. The interface is more important to grid connected solar power generation systems. In this project converts the dc power generated by a solar cell array into ac power and it feeds this ac power into utility. In which inverter is necessary in the power conversion interface, because power conversion convert the dc power into ac power. Since the output, voltage of solar cell

This system generates a sinusoidal output voltage. This circuit not provides PWM signal. This circuit traces maximum PV module output power, detection and protection. The output is restricted by duty ratio for high frequency.

The solar energy is more important than fossil fuel. The cost of fossil fuel is increasing and the cost of solar arrays is decreasing. The implementation of a PV module with maximum power point tracking (MPPT) raises the input voltage level in only one MPP (MPP Maximum Power Point). The output power varies to climatic and irradiation characteristics vary with temperature.

Design and Simulation of DC-DC Converters for Photovoltaic System

Shruti Pramodrao Patil¹, S R Paraskar²

¹Student, Department of Electrical Engineering, Sant Gadge Baba Amravati University, Amravati, India.

²Professor, Shree Sant Gajanan Maharaj College of Engineering, Shegaon, Maharashtra, India.

Corresponding Author: shruti.patil30@gmail.com

Abstract: - The importance of solar energy for future energy supply has been growing vigorously with the growing concerns about the price and availability of fossil fuels. Renewable energy sources such as solar energy has received tremendous demands since it is pollution-free from any poisonous byproducts that can pollute the environment. DC-DC converters are widely used in renewable energy generation systems that is in solar photovoltaic (PV) system. The basic PV system consists of PV panels, electric converter. The output power from the PV module or array depends upon the irradiance and temperature which are constantly varying. Therefore for these purpose we can use the converters. The converters transmits the power from PV to the load should have higher efficiency. The main advantage of the converter is that this are provide a regulated output. And this DC-DC converter are mainly designed to meet specific demand of DC loads. Therefore, a DC-DC converter are used to produce a constant voltage and deliver maximum power from PV panel to the load. We will use the converters based on MOSFETs switches.

The main objective of dissertation is 1) to design and simulate the various DC-DC converters, 2) to obtain the stable voltage of DC-DC converters and to compare their performance and 3) selection of suitable DC-DC converters for Photovoltaic System. This dissertation presents simulation and designing of PV array connected to load through DC-DC converter such as Boost converter, Cascaded Buck-Boost converter, Cuk and Single ended primary inductance converter (SEPIC) etc. are modeled in MATLAB and their results are compared.

Key Words: —PV, MATLAB, DC-DC Converters.

I. INTRODUCTION

The use of Renewable energy especially the solar energy is increasing rapidly due to its various advantages. Modeling, simulation and analysis of solar photovoltaic (PV) generator is a vital phase prior to mount PV system at any location, which helps to understand the behavior and characteristics of the solar cell or panel. The performance of PV system depends upon the sun radiation and temperature. The generalized block diagram of PV system with dc to dc converter is shown below:

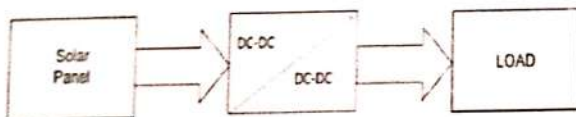


Fig.1. Block diagram of PV system with DC to DC Converter

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In these generalized block diagram the solar panel is connected to the load through DC to DC Converter. A DC-DC converter connected to produce a constant voltage and deliver a maximum power from PV panel to load. The output voltages of dc-dc converters are generally controlled by using a switching concept. Converters based on MOSFETs switches are used.

The purpose of this paper is to present an introduction and functioning of a PV device and write its basic equations as well as Simulation of PV panel and Simulation of the various types of DC to DC Converters used for the PV/Solar system with its comparison.

II. SIMULATION OF PV PANEL

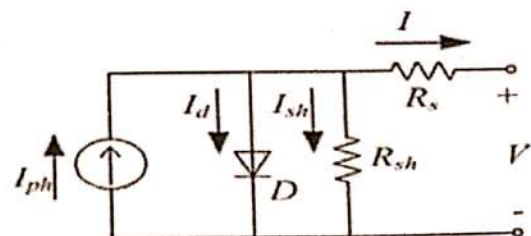


Fig.2. Equivalent circuit of Solar cell

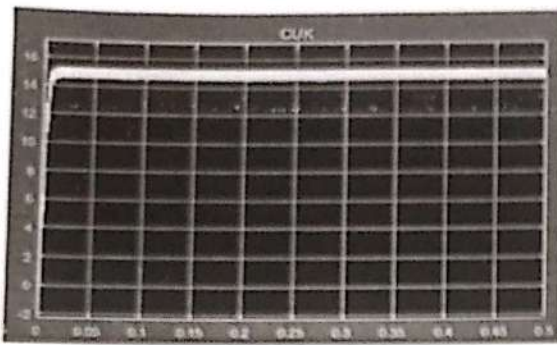


Fig.22. Cuk Converter

Fig.22. shows the simulation results of the Cuk converter. Which in turns give the output voltage of 15V.

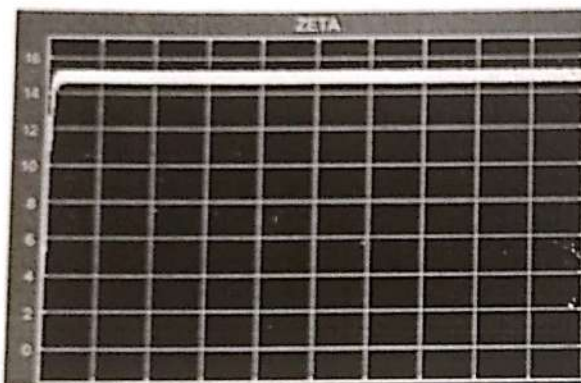


Fig.23. Zeta Converter

The output of zeta converter is shown in Fig.23. Zeta converter

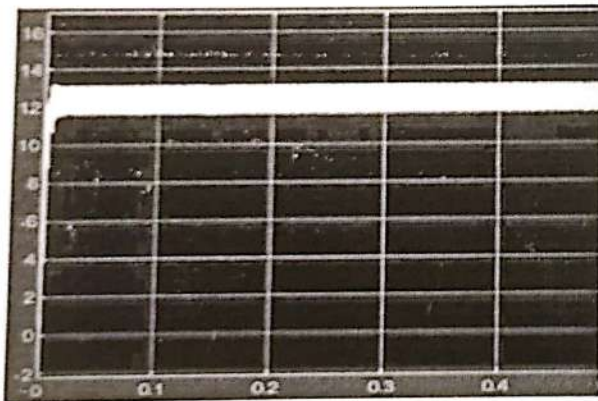


Fig.24. SEPIC Converter

Above graph shows the output of SEPIC converter

VI. CONCLUSION

This paper analyses and studies the performance of a PV system and Various Converters implemented using MATLAB/Simulink. The model including solar panel to converter is tested successfully and hence the analysis is done

for load changes converter to converter. From the proposed converters, we have simulated in these paper and compared those converters on the basis of various parameters. It is found that the converter has their unique advantages over one another. And hence the selection of converter for a particular application is depends on the type of application and the requirements of system.

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- [5]. Mr. S. Sheik Mohammed College of Engineering, Dhofar University, PB. No. 2509alalah, Sultanate of Oman E-mail: ssheikmd@yahoo.co.in Simulation and Analysis of Stand-alone Photovoltaic System with Boost Converter using MATLAB/Simulink.

Voltage Profile Enhancement using Dynamic Voltage Restorer (DVR) Under Three Phase Balance Load

POOJA SARODE¹, Dr. A. U. JAWADEKAR²

¹ ME Student, Department of Electrical Engineering, SSGMCOE Shegaon (M.S.), India

² Associate Professor, Department of Electrical Engineering, SSGMCOE Shegaon (M.S.), India

Abstract - To improve power quality in low voltage electric power distribution network the inadequate operation of the conventional compensation devices to mitigate the poor power quality problems have prompted the use of custom power device such as Dynamic Voltage Restorer (DVR). DVR aimed at improving the voltage profile, enhancing the reliability and good quality of power flows in low voltage electric power distribution networks. The DVR is highly efficient device, the principle is based on the voltage source inverter (VSI) which injects the appropriate missing voltage in series with the system voltage to correct the voltage variations experienced in the distribution feeder lengths. The power scheme in respect of the response to voltage disturbances at normal mode operation of three phase balanced loads is presented using the MATLAB simulation. This dissertation gives recommendations on effective methods for improving the voltage profile and reducing the voltage variation to an allowable standard.

Key Words: Dynamic voltage restorer, voltage source inverter, voltage profile, power quality, distribution networks, distribution feeder

1. INTRODUCTION

The electric power system serves to generate, transport, and distribute electrical energy to consumers in an efficient, economical and reliable manner. Failure operation of electrical equipment cause inadequate power quality and therefore there is power losses in the distribution system [6]. Load voltage variation, three phase voltage unbalance, waveform distortions, voltage sag, voltage swell, these are the various disturbances in the electric power network. Maintaining the voltage and frequency within the statutory limits that is $\pm 5\%$ voltage and $\pm 1\%$ frequency at the end user's terminal is a major challenge for distribution companies. The quality of electrical power, which is given to the end users, can be assessed or estimated in terms of constant voltage magnitude. Different kinds of techniques have been utilized over the years to mitigate voltage variation, voltage unbalance and improve the voltage profile along electric power distribution networks. The earlier stated techniques mostly focus on medium voltage side distribution systems. Hence, it is not enough to obtain the statutory voltage limits of $\pm 5\%$ of the nominal voltage value on the end-user side. Therefore, there is an urgent need to support secondary distribution systems with modern techniques. Hence, the simple, effective, and cheapest device for voltage profile correction in distribution network compared to other custom power devices is the Dynamic Voltage Restorer (DVR). DVR has been effectively used to find a solution to the power quality problems in the distribution network. The DVR has appeared as a promising device not only to provide voltage profile enhancement, but a fast solution to other power quality problems such as flicker suppression, power factor correction and harmonics control [8]. DVR insert a controlled voltage in distribution networks to correct the load voltage [3].

This paper presents a MATLAB/simulink model of DVR for voltage sag, voltage swell, voltage variations and voltage unbalance mitigation in low voltage electric power distribution network for different feeder lengths using control technique of VSI switching method based on sinusoidal pulse width modulation offers simplicity and better response.

2. DYNAMIC VOLTAGE RESTORER

The block diagram of DVR is shown in Fig.1. It consists of three important parts: measuring unit, control unit, and power unit.

A. Series Voltage Injection Transformer

The utmost function of series voltage injection transformer which is employed in secondary distribution system is that to step up the supply voltage from the output of the ac line filter to the desired nominal voltage level required by the customer load. For DVR to properly compensate for the missing voltage, the secondary side of the series voltage injection transformer must be equal to the main source voltage and must be properly matched to the power system network [11].

5. CONCLUSION

From the results obtained, it has been conclude that DVR installed in the low voltage electric power distribution networks for the purpose of improving the voltage profile and voltage variation and also compensate voltage sag and voltage swell from the beginning of the distribution feeder line to the end of the feeder gives a better power quality and improve the voltage profile in low voltage electric distribution networks. From the network studies carried out using the proposed DVR model and simulations using MATLAB/Simulink in Sim Power System tool box, show that a dynamic fast response, simple and cost-effective DVR effectively enhance better voltage profile and reduce voltage variation from the beginning to the end of distribution feeder lengths under steady state operation.

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Shunt Active Power Filter for Enhancement of Power Quality

Rahul R. Alat¹, Prof. Dr. Saurabh S. Jadhao², Vijay S. Karale³, Asmita Thakare⁴

Student¹, Assistant Professor^{2, 3, 4}

Department of Electrical Engineering

Shri Sant Gajanan Maharaj College of Engineering, shegaon

Corresponding Authors' E-mail: rahul.alat1@gmail.com¹, ssjadhao@gmail.com², vijayskarale@gmail.com³

Abstract

This project deals with the shunt active power filter to enhance the power quality. The performance of shunt active filter is studied through simulation result. MATLAB is the simulation tool used to study the performance of shunt active power filter. The simulation is carried out for non-linear load. The shunt active filter allows compensating harmonic current, reactive power, unbalanced load and zero sequence currents. Compensating any of the above problems always tends to enhancement of power quality

Keywords: *Shunt Active Power Filter (SAPF), p-q problems, non linear load.*

INTRODUCTION

In today's power system power quality improvement is the most focused topic. Nearly two decades ago, passive loads having linear nature were being used by consumers and various industries, with a lesser number of non-linear loads thus having less impact on the quality of power system. With the arrival of semiconductor and power electronic devices and their easier controllability have caused wide use of non-linear loads such as chopper, rectifier, etc.

The use of semiconductor devices is responsible for harmonic and reactive power disturbances. These disturbances causes various problems such as overheating of transformer, excessive neutral current, distortion of feeder voltage, damage to power electronic devices, malfunction of sensitive equipment. Harmonics play major role in disturbing power quality, called harmonic distortion. This problem of Harmonic distortion is increasing day by day in electric distribution system as the use of nonlinear loads is increasing. These harmonics are

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Department of Electrical and Electronic Engineering,
Bangladesh University of Engineering and Technology
Dhaka, Bangladesh.



Fast Restoration Technique for Distribution Power System with Multi-Terminal DC Links

Pallavi Sathige¹, Mr. U. A. Jawadekar²

ME Student (Electrical Power System)¹

Department of Electrical Engineering

Shri Sant Gajanan Maharaj College of Engineering, Shegaon, India

Abstract:

A fast power restoration operational scheme and relevant stabilizing control is proposed for distribution power systems with multi-terminal DC network in replacement of the conventional normal open switches. A nine-feeder benchmark distribution power system is established with a four-terminal medium power DC system injected. The proposed power restoration scheme is based on the coordination among distributed control among relays, load switches, voltage source converters and autonomous operation of multi-terminal DC system. A DC stabilizer is proposed with virtual impedance method to damp out potential oscillation caused by constant power load terminals. The proposed system and controls are validated by frequency domain state-space model and time-domain case study with Matlab/Simulink.

1. INTRODUCTION

Background Due to the development in power electronics industry, the capacity and switching speed of Insulated-Gate Bipolar Transistors (IGBTs) have been improved. IGBTs now meet the requirements of high power industry. The switching of IGBTs is controlled by gate voltage, and does not require external circuit to turn off. This advantage makes the IGBTs a suitable choice to regulate ac and dc networks without any complicated turn-off control circuit like the thyristors. Since the dc voltage of IGBTs is controllable via proper switching on gate, and a capacitor is usually parallel connected at the dc side which makes the dc voltage stable, the converter consists of IGBTs is normally known as Voltage-Source Converters (VSC). The VSC discussed in this dissertation normally consists of six IGBTs, which form a three phase ac to dc converter. Since each IGBT has a reverse parallel diode, the current has the capability to flow back and forth between ac and dc side. Therefore, the VSC could either operate as a rectifier or an inverter without any topology change. Proper control algorithms are needed to be designed to make it possible. Renewable energies such as wind, solar and fuel cell require advanced integration technologies. Unlike traditional energy resources such as gas, coal and oil, the output of renewable energies depends on various factors including wind speed, sunlight irradiance and temperature. Hence, power generated from renewable energies is not constant and varies from time to time, which is a big challenge from a power system operator's view. Moreover, the output of solar and fuel cell energies are normally dc power, which is not compatible with an ac power system.

2. OVERVIEW OF VSC-DC LINK

The development of distributed power generation and advance of electric vehicle (EV) are changing the configuration of the traditional power distribution system. Renewable power, such as wind and solar, are naturally dispersed and compatible for distribution side. Comparing with large renewable generation, Which are normally far away from load centre, power produced by distributed generation (DG) is more likely to be consumed locally and there is no need to build up extra high

voltage corridor to transmit bulk intermittent power to the load centre. However, mismatch between loads and generations is almost inevitable especially when a distribution substation is feeding both household and industrial load feeders at the same time as both load profiles fairly diverse. Serious mismatch at 'last mile' ends of a distribution power system can possibly give rise to severe voltage variations. In some cases, possible overvoltage can reduce their nominal life spans or even damage power equipment, which can be caused by distributed generation power that significantly overweighs local load at the far end from the distribution substation. Such problem is difficult to solve with traditional passive distribution power system. Reactive power control based voltage regulation might play a part to help but with limited performance in a more resistive distribution network. A pre-set renewable generation curtailment scheme may help, however, at a cost of certain amount of renewable energy loss. The potential rising demand from the EV battery charging is also a serious challenge to the conventional distribution network as the charging load can potentially be much larger than traditional household and commercial appliances. With varying charging demand from EV, overloading and consequent contaminated voltage profiles could be the major problems for traditional distribution systems. One possible solution to this problem is to build up centralized charging stations with a predefined energy management scheme and integrate them into the existing power system in a more grid-friendly way. To charge an EV battery array with local renewable generation would be an ideal scenario. To reduce the distribution loss and enhance power supply reliability, the concept of active distribution power system is proposed with load switch spread among certain feeders. Such reconfigurable distribution power system is able to actively redistribute power flow by switching the ties between the feeders, hence the possibility of power flow optimization in terms of distribution losses and voltage profiles. A great variety of smart management methods have been proposed for optimized power flow management based on hard switches. However, the employment of hard tie switches forces the voltages across different feeders to match each other, leading to inflexible power flow control since the real-time power flow is passively determined by the impedance distribution of a certain system configuration

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PI And PR Controller for Grid Connected Voltage Source Inverter

Mukta Rajendra Ghive¹, Jawadekar U A²

¹Student, Department of Electrical Engineering, Sant Gadge Baba Amravati University, Amravati, India.

²Assistant Professor, Shree Sant Gajanan Maharaj College of Engineering, Shegaon, Maharashtra, India.

Corresponding Author: muktaghive@gmail.com

Abstract: - Over-the year, power converters have found wide application in grid-interfaced systems, including distributed power generation systems with a renewable energy source. In a distributed energy system like a solar hydro or any diesel generation where the output of the system is DC and is expected to be converted in an AC, an inverter is used. There are various mode to have a controlled output of the inverter. We will study the three-phase voltage source inverter control scheme. The different control methods used are PI controller and PR controller. The main advantage of the PI controller is that there will be no remaining control error after the set point change or a process disturbance. In a PI control the stationary reference frame is used to transfer feedback quantities, where the decoupling of components requirements increases the complication, a new proportional reason and control strategy is employed, in which of second order very high gain ideally infinite gain is introduced at a fundamental frequency. The main advantage of the PR controller is to be reduced DC steady state error to a zero by forcing the ideally infinite gain at the resonating frequency. We will compare the PI and PR controllers and simulation in MATLAB.

Key Words: —PI controller; PR controller; alpha beta reference frame; reference tracking.

I. INTRODUCTION

In the last few years, the demand of electricity has increased tremendously and fossil fuels being depleted due to the same so it becomes mandatory to interconnect renewable energy sources with the help of wind turbines, photo voltaic etc. Hence, it is general expectations to increase the electricity generation with the help of renewable energy sources.

The use of RES is getting increased and it can be justified from the table below. Initially the generation of electricity with RES was up to 5% only but now from last few years it has been increased to 17%-25%. In year 2019-20 the use of solar energy has increase drastically from last few decades. Microgrid concept has recently adopted to connect the renewable energy sources more effectively in the system and to cope up with the power quality issues. Microgrid can operate in both grid-connected mode and isolated mode basically microgrid is a combination of RES and loads. All renewable energy sources are parallel provided to an AC common bus via inverters or AC to AC converter.

The common bus is then provided to the utility or grid and voltage source inverter is the most important functional element of an AC microgrid system the various renewable energy sources within microgrid system can perform independently or interconnected to a common DC link, which supplies constant input to the voltage source inverter.

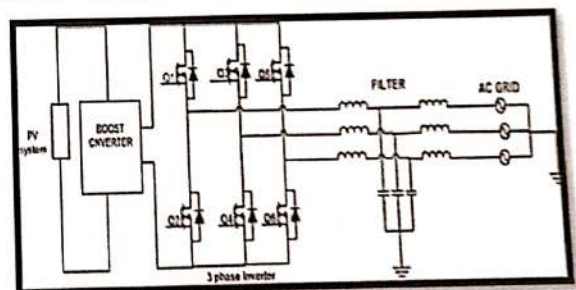


Fig.1. Power circuit of grid connected 3-phase inverter

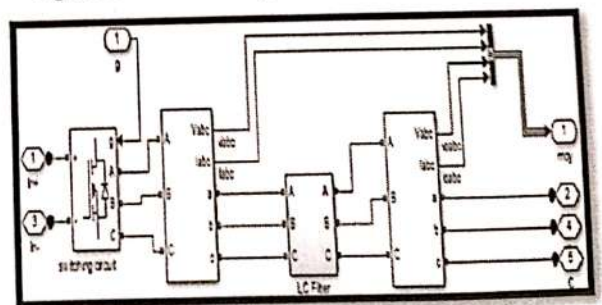


Fig.2. MATLAB simulation of Grid connected 3-phase inverter

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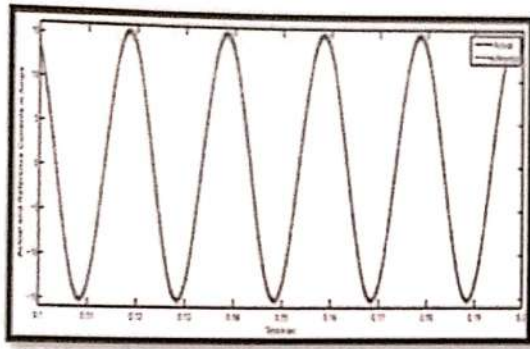


Fig.13. Actual Tracking reference quantity with for PR controller.

The fig.12. And fig.13. Gives the reference tracking of both PI & PR controller. The simulation results tracking is improved with the help of PR controller.

III. CONCLUSION

In this report, the main attempt made for showing the comparison of performance of PI and PR controllers. This report proposes the detail analysis of the various basic control strategies for voltage source inverter and also gives the study of Photovoltaic grid interconnected system. In this report, model of filter is derived in dqo reference frame and hence shown that the problem of three phase decoupling in dqo reference frame. All the sub-models are individually modelled and implemented.

The shortcomings of PI controller as more settling time, inadequate reference tracking system and complicated implementation are overcome in PR controller. Both the PI and PR controller are implemented for grid connected voltage source inverter and for droop controlled parallel inverters. Hence PI and PR controller are compared and it can be concluded that PR controller has a good performance than PI controller, but it requires an extra integrator than PI controller.

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"Power Quality Improvement by using Custom Power Device"

Dr.Saurabh S. Jadhao¹
Asst. Professor, Dept. of
Electrical Engineering
Shri Sant Gajanan Maharaj
College of Engineering
Shegaon, Dist-Buldhana,
444203

Vinod P. Sonparote²
Dept. of Electrical Engineering
Shri Sant Gajanan Maharaj
College of Engineering
Shegaon, Dist-Buldhana,
444203

Vijay S. karale³
Asst. Professor Dept. of
Electrical Engineering
Shri Sant Gajanan Maharaj
College of Engineering
Shegaon, Dist-Buldhana,
444203

Dr.G. M. Dhole⁴
Professor Dept. of Electrical
Engineering G.E.S.R.H.S.
College of Engineering,
Management Studies and
Research, Nashik

Abstract— The Power quality requirement is one of the important issue for power system. The main problems of power quality are voltage sag, swell, current harmonics. In this paper it is describes the problem of power quality and its mitigation using UPQC. The unified power- quality conditioner (UPQC) is used to mitigate the current and voltage-related power-quality (PQ) problems simultaneously in power systems. UPQC mainly consists of series and shunt Active Filters, the series active power filter compensates the load voltage on the other hand the shunt active power filter compensates the source current harmonics and also it maintains the dc link voltage unchanged in steady state. In this paper approach to compensate power quality problems using custom power device i.e UPQC based on synchronous reference frame (SRF) and instantaneous PQ technique is discussed. The control scheme is simple to design. Simulation results carried out by using MATLAB simulink.

Keywords— unified power quality conditioner (UPQC), pq problems, sensitive load, non linear load.

Introduction

Both electric utilities and end user equipment are becoming increasingly concerned about the quality of electric power. The power quality is affected by the distortion in the source due to using nonlinear loads. The main cause for distortion is sag, swell, harmonics. The usage of non linear load is increased day by day, while considering that industries power electronics drives are used for the automation of the industries Sag, swell, harmonics are the main Power quality problems which are mitigated by the various custom power device such as dynamic voltage restorer (DVR), distribution-static synchronous compensator (D-STATCOM), and unified power quality conditioner (UPQC) [1]. In this paper UPQC [2] which the combination of series and shunt active filters is used for the mitigation of the power quality problems. The series active power filter is voltage source converters and shunt active power filter is current source converter which are controlled by the PWM signals which are generated by the controllers.

The Synchronous Reference Frame technique can be employed to generate reference signal for series APF of

UPQC. The source voltage from the system is measured and positive sequence rms magnitude of the voltage is calculated. This magnitude can be considered as d-axis component of the voltage. The PLL is used to lock the phase of source voltage and obtain the components $\sin\theta$ and $\cos\theta$. The load reference voltage can be obtained. Similarly Instantaneous p-q technique is used for the control of shunt inverter of UPQC in order achieve mitigation of source current harmonics. The control requires to measure source current and source voltage from the system in order estimate a reference current using instantaneous p-q technique. Source voltage and current are transformed to $\alpha\beta 0$ reference

Basic Configuration of UPQC

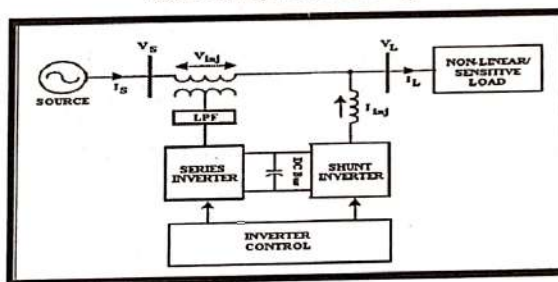


Figure.1. Configuration of UPQC

Shunt active filter

The shunt active filter has a Voltage Source Inverter (VSI), Interfacing Inductor, and ripple filter. The design of VSI includes the DC bus voltage level, the DC capacitance and the rating of IGBTs used. The design of Interfacing Inductors and the Ripple Filter is presented here. The design is carried out considering a right shunt UPQC.

The DC capacitor connected at the DC bus acts as energy buffer and provides dc voltage for the normal operation of the shunt APF. The DC bus voltage V_{DC} , DC a bus capacitance C_{DC} , interfacing inductors (L_f), and voltage and current rating of switches are calculated as below.

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DEPARTMENT OF INFORMATION TECHNOLOGY

SESSION 2020-2021

3.3.2 Number of research papers per teachers in the Journals notified on UGC website during the year

Title of paper	Name of the author/s	Name of journal	Year of publication	ISSN number
Deadline aware optimization in resource allocation for reducing migration cost	MANEKAR AMITKUMAR, DR. GERA PRADEEPINI	Advances in Mathematics: Scientific Journal (Scopus Indexed)	2020	1857-8365
Credit Card Fraud Detection using Machine Learning Technique	ABHYUDAI A. GORE, MAKARAND S. PATRIKAR, PRATIK S. KARE, VARUN H. JOSHI, PROF. A. K. SHAHADE	International Journal of Advanced Research in Computer and Communication Engineering Vol. 10, Issue 6, June 2021	2021	2278-1021
Design and Development of an Efficient Online Exam Management System	Sanket Vakil, Rashmi Dholwade, Gitesh Deshmukh, Shrutika Thotange, Aniket Shahade	International Journal of Innovative Research in Computer and Communication Engineering Volume 9, Issue 6, June 2021	2021	2320-9801
ECG Classification Using Deep Neural Networks	Sumit Singh Rajput, Shivam Makade, Shubham Potdukhe, Sumit Morkhade, Anand Sharma	International Journal of All Research Education and Scientific Methods (IJARESM), Volume 9, Issue 7	2021	2455-6211
Implementing Optical Character Recognition on Android Operating System for Poster - Posterlink	Abhishek Kakade, Ajay Bhawe, Rupam Jambhulker, Rushikesh Kaikade, Anand Sharma	International Journal of All Research Education and Scientific Methods (IJARESM), Volume 9, Issue 7	2021	ISSN: 2455-6211



Shri Gajanan Shikshan Sanstha's
SHRI SANT GAJANAN MAHARAJ COLLEGE OF ENGINEERING
SHEGAON - 444203, DIST. BULDANA (MAHARASHTRA STATE), INDIA

"Recognized by A.I.C.T.E., New Delhi" Affiliated to Sant Gadge Baba Amravati University, Amravati
"Approved by the D.T.E., M.S. Mumbai"

Ph : +918669638081/82
Fax : 091-7265-252346

Email: principal@ssgmce.ac.in, registrar@ssgmce.ac.in
Website- www.ssgmce.ac.in

Use of Asynchronous Methods to Enhance Javascript Code	Siddhant Gupta, Sagar Padiya	International Research Journal of Engineering and Technology (IRJET), Vol. 8, Issue 6	2021	2395-0056
E-Commerce Website for KB-Plastotect Company	Tushar Rathod, Sarbhak Gosatwar, Abhishek Pakhidde, Kunal Wate, Prof. Pritam Gohatre	International Journal of Advanced Innovative Technology in Engineering (IJAITE).	2021	2455-6491

Prof. A. S. Maneekar
HOD



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**SHRI SANT GAJANAN MAHARAJ COLLEGE OF ENGINEERING
SHEGAON – 444203, DIST. BULDANA (MAHARASHTRA STATE), INDIA**

"Recognized by A.I.C.T.E., New Delhi" Affiliated to Sant Gadge Baba Amravati University, Amravati
"Approved by the D.T.E., M.S. Mumbai"

Ph : +918669638081/82
Fax : 091-7265-252346

Email: principal@ssgmce.ac.in, registrar@ssgmce.ac.in
Website- www.ssgmce.ac.in

ADV MATH
SCI JOURNAL

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**DEADLINE AWARE OPTIMIZATION IN RESOURCE ALLOCATION FOR
REDUCING MIGRATION COST**

AMITKUMAR S. MANEKAR¹ AND P. GERA

ABSTRACT. Nowadays, the scheduling of various tasks using the available resources is attaining a larger attention in cloud computing owing to the improved performance in cost optimization. Unluckily, scheduling approaches in traditional distributed computing are not able to work in an effective manner since, it is large-scale and dynamic. With virtualization techniques big data applications surges up to many extend. Compromises of cost and performance are someway achieved by these virtualized cloud computing platforms. One of the enormous challenges above virtualized platforms is managing resources. Reliance on a single cloud provider is a challenging task with respect to services like latency, QoS and non-affordable monetary cost to application providers. Managing distributed data centres and maximizing profit is a current problem. High cost and maintenance charges are leverage by data centres. We propose a multi-objective hybrid model with tight deadline (makespan) condition; for optimizes the execution time objective to meet the deadline constraint when the feasible solution hasn't been obtained. Experimental results and conclusions drew with extensive experiments based on different scales and different cloud resources. Detailed analysis of experimental results, it is shows that the proposed algorithm has a better optimization effect against the fair share policies which are presently available in most of the BDA with deadline constrained.

¹corresponding author

2010 Mathematics Subject Classification. 94A16, 49N30.

Key words and phrases. Deadline, Cost Optimization, Big Data, Cloud Computing, Data Migration Cost, PSO.



"CREDIT CARD FRAUD DETECTION USING MACHINE LEARNING TECHNIQUE"

ABHYUDAI A. GORE¹, MAKARAND S. PATRIKAR², PRATIK S. KARE³,

VARUN H. JOSHI⁴, PROF. A. K. SHAHADE⁵

Dept. of Information Technology Shri. Sant Gajanan Maharaj College of Engineering, Shegaon, Maharashtra, India 1-4

Assistant Professor Dept. of IT Shri. Sant Gajanan Maharaj College of Engineering, Shegaon,

Maharashtra, India⁵

ABSTRACT: This study primarily focused on detecting credit card fraud in the real world. For the qualified data set, we must first collect credit card data sets. Then, based on the user's responses, deliver inquiries to test the data set, use a credit card. Following the random forest algorithm employing a classification approach with a data set that has previously been examined and supplying a current data set. Finally, the data accuracy of the outcomes is improved. After then, a number of attributes will be processed so that fraud detection can be noticed when looking at the graphical model's depiction. Credit Card Fraud Detection is a typical sample of classification. In this process, we have focused on analyzing and pre-processing data sets as well as the deployment of multiple anomaly detection algorithms such as Local Outlier Factor and Isolation Forest algorithm on the PCA transformed Credit Card Transaction data.

1. INTRODUCTION

Risk assessment is utilised by banks all over the world. Risk rates are analysed using a number of methodologies since credit risk assessment is so critical. Banks divide their customers into groups based on certain characteristics. Client's financial histories and subjective consumer considerations are assessed throughout the exam. Those figures are objective, which reflect the financial statements of the company. Fraud detection includes observing and analyzing the behavior of various users in order to estimate the detection of undesired behaviour. We need to understand the many technologies, algorithms, and types involved in detecting credit card fraud in order to identify it efficiently. There are several algorithms for detecting credit card fraud, each with its own set of benefits and accuracy. The methods include:- K-nearest neighbour, Linear regression, Ada Boost, Naive Bayes, J48, Logistic Regression, Random Forest algorithm etc. The null hypothesis is that the credit card transaction is legitimate. As a result, whether it is a correct and real transaction is a false positive, and hence the system model is predicted to be a fraudulent transaction, and a warning is issued. This signifies regular clients looking to make a purchase would defer faraway from making purchases. False negative is a major problem since the transaction is fraudulent but the system model indicates that it is not. A false negative is significantly more serious in our instance than a false positive, because our system model would be costly if it predicted fraudulent transactions as legitimate.

2. LITERATURE SURVEY

1. ACTUAL SYSTEM

In a review of a contextual investigation, which included the identification of Credit Card misrepresentation where information standardization is applied prior to cluster analysis, as well as results obtained from the use of Cluster Analysis and Artificial Neural Network on the discovery of extortion, has revealed that neuronal data sources may be limited by bundling properties in the existing system. Moreover, good results can be obtained by utilising standardised data, which should be MLP prepared. This exam required independent study. The accuracy of estimates is about 50%. The discovery of an estimate and the reduction of the cost measure were noteworthy aspects of this work. The result was 23%, and the formula they came up with was the Bayesian minimal chance [3]. A collective replacement comparison metric that quantifies gains and losses owing to fraud detection is proposed in this system. A cost-sensitive technique based on the Bayes minimum risk is utilised with the existing cost measure.



Face Recognition and Attendance System

S.A.Shete¹, Varun Dhumal², Atharva Jagtap³, Aniket Jaiswar⁴, Prajwal Kamble⁵

Lecturer, Dept. of IT, AISSMS's Polytechnic, Pune, Maharashtra, India¹

Final Year Student, Dept. of IT, AISSMS's Polytechnic, Pune, Maharashtra, India²

Final Year Student, Dept. of IT, AISSMS's Polytechnic, Pune, Maharashtra, India³

Final Year Student, Dept. of IT, AISSMS's Polytechnic, Pune, Maharashtra, India⁴

Final Year Student, Dept. of IT, AISSMS's Polytechnic, Pune, Maharashtra, India⁵

ABSTRACT: Daily attendance marking is a common and important activity in schools and colleges for checking the performance of students. Manual Attendance maintaining is difficult process, especially for large group of students. Some automated systems developed to overcome these difficulties, have drawbacks like cost, fake attendance, accuracy, intrusiveness. To overcome these drawbacks, there is need of smart and automated attendance system. Traditional face recognition systems employ methods to identify a face from the given input but the results are not usually accurate and precise as desired. The system described in this we aims to deviate from such traditional systems and introduce a new approach to identify a student using a face recognition system, the generation of a facial Model. This describes the working of the face recognition system that will be deployed as an Automated Attendance System in a classroom environment

KEYWORDS: Attendance system, Simple User Interface, Time saver.

I. INTRODUCTION

Nowadays Attendance is considered as an important factor for both the student as well as the teacher of an educational organization. With the advancement of the deep learning technology the machine automatically detects the attendance performance of the students and maintains a record of those collected data by using some face-recognition library in Python. In general, the attendance system of the student can be maintained in two different forms namely, Manual Attendance System, Automated Attendance System.

Manual attendance may be considered as a time-consuming process or sometimes it happens for the teacher to miss someone or students may answer multiple times on the absence of their friends. So, the problem arises when we think about the traditional process of taking attendance in the classroom. To solve all these issues we go with Automatic Attendance System using face-recognition. Automated Attendance System is a process to automatically estimate the presence or the absence of the student in the classroom by using face recognition technology.

II. RELATED WORK

[1] Face Detection and Recognition using OpenCV and Python Tejashree Dhawle¹, Urvashi Ukey², Rakshandha Choudante³ 1-3 Student, Department of Computer Engineering, Dr. Babasaheb Ambedkar Technological University Raigad, India This research paper gives an ideal way of detecting and recognizing human face using OpenCV and python which is part of deep learning. This report contained the way in which deep learning an important part of computer science field can be used to determine the face using several libraries in open CV along with python. This report will contain a proposed system which will help in the detecting the human face in real time. This implementation can be used at various platforms in machines and smartphones, and several software application

[2] Automatic face recognition (AFR) technologies have made many improvements in the changing world. Smart Attendance using Real-Time Face Recognition is a real-world solution which comes with day to day activities of handling student attendance system. Face recognition-based attendance system is a process of recognizing the students face for taking attendance by using face biometrics based on high - definition monitor video and other information



ECG Classification Using Deep Neural Networks

Sumit Singh Rajput¹, Shivam Makade², Shubham Potdukhe³, Sumit Morkhade⁴,
Prof. Anand Sharma⁵

^{1,2,3,4,5}Department Of Information Technology, Shri Sant Gajanan Maharaj College of Engineering, Shegaon, India

ABSTRACTION

Electrocardiogram (ECG) is an important diagnostic tool for analysing cardiac tissues and structures. It includes information about the heart structure and the function of its electrical conduction system. Time series classification (TSC) is the area of machine learning interested in learning how to assign labels to time series. Now a days, Deep learning has received enormous attention because of its high scalability. The accuracy of deep learning for TSC has been raised to a competitive level. In our study, we developed different Neural Network which are used in TSC. We used simple CNN, LSTM, GRU and Inception Time out of which Inception Time showed great results. Inception Time uses power of CNN in efficient way. With Inception Time we got about 98.89 percent of accuracy. We also cross checked our results with doctor and the results were matching with his diagnosis too.

Keywords: Deep Learning, TSC (Time Series Classification), Imbalanced Data, ECG, DNN

INTRODUCTION

Patients of Cardiovascular disease is increasing day by day. ECG is used to monitor and primarily diagnose cardiovascular disease. An ECG transitioned to digital from analog has gained importance in medical diagnosis. However, limited performance of classical algorithms precludes its usage as a standalone diagnostic tool and relegates them to an ancillary role.

Deep Neural Networks are gaining tremendous popularity nowadays because of its subtleness and accuracy. Deep Neural Networks are being used in lots of areas like image processing, processing and in natural language processing[1]. Time Series classification and forecasting is one of the branch which is emerging as newer technologies like DNN are being introduced. It is reaching that part of the data where humans cannot reach for sure. Different DNN are being trained to classify and diagnose different disease like different pulmonary diseases, fractures, but for that we require lots of data[2]. Gathering that data is a big challenge in because of confidentiality and security of personal health information. One of the great feature of DNN is that we do not have to pick the feature manually. DNN automatically do it for you which provide us more accurate representation of ECG which is more understandable by machine[3]. DNN contains large amount of variables which requires massive amount of data to be trained[4].

We used two types of neural networks CNN and RNN[2]. CNN stands for Convolution Neural Network and RNN for Recurrent Neural Network. In CNN we used simple and a more advanced neural network known as Inception Time which uses potential of CNN in efficient way[5]. In RNN we used LSTM and GRU which are recurrent neural network with some variation in them[1].

Inception Time is an ensemble of five deep learning models for TSC, each created by cascading multiple Inception modules, having the same architecture but different initial weight values. Fig. 1 illustrates the details of an Inception module, where multiple filters are applied simultaneously to an input time series. The module includes filters of varying lengths, which as we will show, allows the network to automatically extract relevant features from both long and short time series[5].

In Section II we will have more information about dataset and its authenticity and in Section III we will see methodology how we used different DNN architectures to get the results and in Section IV we will discuss about the results which is good among them. Finally Section V concludes the paper.

DATASET

In this experiment we are using PhysioNet MIT-BIH Arrhythmia ECG Databases as data source for labelled ECG records. The MIT-BIH arrhythmia database is publicly available dataset which provides standard investigation material for the detection of heart arrhythmia[6]. MIT-BIH arrhythmia database is mostly used for medical and research purpose of different heart arrhythmia detections and analyses. This database tries to provide a fully automated environment to



Implementing Optical Character Recognition on Android Operating System for Poster - Posterlink

Abhishek Kakade¹, Ajay Bhav², Rupam Jambhulker³, Rushikesh Kaikade⁴,
Prof. Anand Sharma⁵

^{1,2,3,4,5}Information Technology Department, Shri Sant Gajanan Maharaj College of Engineering Shegaon, India

ABSTRACT

A software tool is developed to extract relevant information from any poster or a paper (date, venue, contact number). Digital image processing methods are being used to pre-process the image. The images may be unclear and have various issues like difficult perspective, intensity related conditions and partial occlusions. There is also complex background which is being dealt with to make it easier to locate the area with the text. After locating the text bounding boxes, the text would be extracted by an optical character recognition (OCR) engine – Google Vision API, and parsed to get the required relevant information like time, date, venue and contact number. The image processing part is done and concatenated text would be pushed back into a text file. This text file will be parsed through time and date parser to extract the date and location and number. More specified information can also be found by developing the above tool. Test results show that the algorithm performs well to locate the text area and extract the key information as required.

Keywords: Information Extraction, perspective distortion, pattern matching, ocr, parsing, Google vision api.

INTRODUCTION

A lot of event's information is posted on the hallway walls, entrance doors and elevators in our surroundings in the form of flyers and posters. It may be a competition, an information leaflet, concert or a seminar; they all have a date, time and venue and contact number on it. Everyone wants to keep a record of interested events when they come across those posters. Since the information on the poster is not present in a digital form and it needs to be remembered or be saved for the viewer's convenience it should be available somewhere in a digital form. Therefore, an OCR based mobile image processing system is developed that can automatically extract event information from flyer pictures. The goal is to design a small tool that enables the user to extract important key points like (time, date, number and location) by snapping a picture on the related flyer/poster. Posters, hoardings or any other image which contains text can be processed with this tool, but the tool is mainly focused on posters, which have more variations and involve more complex image components. Therefore, it would be more challenging to get accurate results of various posters and once this works it can be further implemented to hoarding. Users are allowed to take photos from different angles and illumination conditions and still get quality results. The illumination and perspective distortion errors will all be taken care by this tool and a output with the time, date, location and number present on the poster will be given out as the output. This information then can be saved easily on the phone.

LITERATURE REVIEW

Information extraction is a part of text mining which is used to extract information to make the data structured from unstructured data. Generally, for getting information, the schemas, relations or PDF are easy to find. Identification of each entity is not structured data or by simply identifying an entity is not the chronological way of information extraction rather it must be a part of machine learning through Natural Language process. Text Document Images Approach given by S. Nirmala for extracting text in the complex background color document images, the method used was canny edge detector for detecting edges. Due to the presence of dilation operation on the edges which creates holes in the nearest components which rather creates a character string. The components which are not nearest for the dilation they are eliminated automatically. But here the problem can be only connected sets will be identified if there will be more conditions, based on situation then this method may not provide accuracy. For eliminating other non-text components, the method used was analysis of standard deviation from connected component and computing. Performing segmentation an unsupervised local threshold was reprocessed. At the end text regions are found and reprocessed. The methods like canny edge detector, dilation operation, unsupervised local threshold, connected component analysis are giving 97.12% accuracy in handling degradation as blur or wavy text format. Based on the report by Davod .et.al a dynamic threshold used in the detection of edges from wavelet coefficient. But for further



Use of Asynchronous Methods to Enhance Javascript Code

Siddhant Gupta¹, Sagar D Padiya²

¹B.E. in Information Technology, SSGMCE, Maharashtra, India

²Professor, Dept. of Information Technology, SSGMCE, Maharashtra, India

Abstract - Since 1996, when JavaScript and its features were first released, there has been no stopping for it. Because of its pace, JavaScript is used to implement some of the language's features in almost all major technologies. Although the development of JavaScript was initially guided solely by implementation, the ECMA standardization process is now gaining traction. The asynchronous function provided by JavaScript is one such feature. Why use Asynchronous JavaScript when you can do whatever you want with standard JavaScript? In this article, we'll look at all of the benefits and enhancements that Asynchronous JavaScript offers over standard JavaScript. We'll look at how to make our web apps load quickly and are easily readable. We will systematically compare the old features such as callbacks, single threading with promises, async await, and error handling.

Key Words: JavaScript, Asynchronous, async, await, promise, Callback

1. INTRODUCTION

When we talk about making websites, the first thing that comes to mind is probably HTML and CSS and we can build a static website with HTML and CSS. For developers developing cloud, web, or IoT applications, JavaScript code running in the Node.js runtime is a big platform. The use of asynchronous callbacks and event loops to provide highly sensitive applications is a fundamental principle in Node.js programming. This programming model, though conceptually simple, contains several subtleties and behaviors that are described implicitly by the current Node.js implementation. We can include graphics, add colors and static content, make animations (2D/3D) but the websites will not be user responsive. User responsive means that the dynamic nature of the website will be absent. We'll not be able to submit form data, respond with different data every time a user clicks on a button. To make all of this possible, we use JavaScript. JavaScript is a fully fledged programming language capable of making websites, apps and games etc. JavaScript abbreviated as JS uses scripts to interact with the webpage.

Asynchronous JavaScript is a part of JavaScript and is considered fairly advanced bit of JS Language. To get a good grasp of Asynchronous JavaScript, we have to first understand the Synchronous section of JavaScript. JS is single threaded language and this means that only one process at a time can be executed by JavaScript. It starts from line one and executes all the lines of code one by one and all

the process are stopped until that line of code is fully executed.

For example:

```
const button = document.querySelector('button');  
button.addEventListener("click", () => {  
    alert("CLICKED");  
    let paragraph = document.createElement("p");  
    paragraph.textContent = "New paragraph added.";  
    document.body.append(paragraph);  
});
```

When we execute this bit of code, we will find that the alert () will be executed first and until and unless we terminate the alert, the paragraph element below the alert () will not run or we can say that the rendering is paused. Browsers allow us to run such operations asynchronously to solve certain issues. Promises allow you to start an operation (for example, fetching an image from the server) and then wait until the result is returned before continuing with another operation. Since the operation is happening somewhere else, the main thread is not blocked while the async operation is being processed. This was the problem that was faced by programmers all around the world and hence Asynchronous JavaScript was introduced. Asynchronous JavaScript has made life easier for programmers who wanted to run some kind of files from external resources such as fetching files from server, using the database, accessing the webcam, etc. Asynchronous means multiple things can be done at the same time or multithreading. In this paper, we will dive into the world of Asynchronous JavaScript and all the advantages it has to the regular way of writing scripts in JS. We will take a look at the traditional methodology of creating scripts and how we can improve them by using asynchronous methodology and how it improves the quality and readability of the code.

2. PROBLEM STATEMENTS

2.1 The Call Stack

Call stack is the mechanism by which the JS interpreter keeps track of its place in the script that calls multiple functions. This is the way JavaScript knows where it currently



E-Commerce Website for KB-Plastotect Company

¹Tushar Rathod, ²Sarthak Gosatwar, ³Abhishek Pakhidde, ⁴Kunal Wate, ⁵Prof. Pritam Gohatre

Abstract— E-commerce could be a large use within the modern business. E-commerce means electronic commerce. E-commerce includes buying and selling of products and services, or the transmitting of funds or data, over a system, predominantly the net. Rather e-commerce is simple just differently to spice up the prevailing business practices. It's leading to a whole change in the traditional way of doing business. This significant change in business model is witnessing an amazing growth round the globe and India isn't an exception. A large internet penetration has added to growth of E-commerce and more particularly start-ups are increasingly using this selection as a differentiating business model. More E-Commerce has significant influences on the environment. Although the model is very employed in current business scenario but the choice has not been explored at its fullest.

Keywords—E-Commerce, Internet, Self-service, Technology, Internet banking

I. INTRODUCTION

E-commerce means electronic commerce. It means dealing in goods and services through the electronic media and internet. E-commerce involves carrying on a business with the help of the internet and by using the information technology like Electronic Data Interchange (EDI). E-Commerce relates to a website of the vendor on the Internet, who trades products or services directly to the customer from the portal. The portal uses a digital shopping cart or digital shopping basket system and allows payment through credit card, debit card or EFT (Electronic fund transfer) payments. A more complete definition is: E-commerce is the use of electronic communications and digital information processing technology in business transactions to create, transform, and redefine relationships for value creation between or among organizations, and between organizations and individuals (C. Nisha and G. Sangeeta, 2012). The main types of electronic commerce are: business-to-business (B2B); business to- consumer (B2C); business-to-government (B2G); consumer-to-consumer (C2C); and mobile commerce (m-commerce).

A. E-Commerce Facilitators: Internet

A massive internet penetration has added to growth of E-commerce. Internet and smart phones are becoming an integral part of every life. Internet is no more a source of information but has become an important tool for shopping, learning, communicating and even getting service from plumbers, carpenters, doctors etc. Supply chain is also becoming leaner and smarter as digital platforms are helping to better connect with the customers who significantly reduces the waste and supporting to green businesses. The internet user population was small during the 1980s, experiencing a slow but steady growth until 1994 due to an increasing number of text-based users (e.g., those using email and file transfer functions). Then, with the introduction of the World Wide Web and subsequent multimedia content expansion, the number of net users exploded. In fact, the internet has grown much more quickly than any other medium in history (Strauss et al., 2007). The International Telecommunication Union (ITU), a United Nations body, recently predicted in 2015 that 3.2 billion people will be online. The population in May 2015 stood at 7.2 billion. In the year 2000 there were just 400 million internet users worldwide.

B. Analytics

Analytics is the scientific process of converting data into insight for making superior decisions. Analytics helps businesses to collect, organize, examine, and report on all their customers do. The immense increase in the volume of data has mandated the businesses to focus on analytics to know the behavior of the customer. Etailors must have real time access to information to measure return on online investments and optimize the channel mix. There are basic analytics capabilities readily available with the E-commerce players like average order value, basket size analysis, conversion ratio but deeper analytics solution for actionable insights of the consumer is required.

C. Social Media

Businesses are increasingly using social media in order to market their products. Social media comprises of websites and computer programs that enable people to communicate and share information on the internet using a computer or mobile phone. Social media plays a greater role in brand building and informing various offers to the customers. It is

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Tushar Rathod et. al. Department of Information Technology And Engineering, Shri Sant Gajanan Maharaj College of Engineering, Shegaon, SGBAU University, Amravati, India.

Prof. Pritam Gohatre, Assistant Professor, Department of Information Technology And Engineering, Shri Sant Gajanan Maharaj College of Engineering, Shegaon, SGBAU University, Amravati, India.



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Fax : 091-7265-252346

Email: principal@sngmce.ac.in, registrar@sngmce.ac.in

Website- www.sngmce.ac.in

3.3.2 Index Number of research papers per teachers in the Journals notified on UGC website during the year

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3.3.2	Index Number of research papers per teachers in the Journals notified on UGC website during the year	Research papers per teachers in the Journals notified on UGC website during the year	Implementation on Brain Tumor detection using CNN	Dr.D.R.Dhotre	Computer Science and Engineering	International Journal for Research and Development in Technology	2020	2349-3585	https://www.ijrdt.org/full_paper/50917/1023/implementation-on-brain-tumor-detection-using-cnn
			A review on: Content Base Image retrieval using Intelligence Techniques	Dr.D.R.Dhotre	Computer Science and Engineering	International Journal of Innovation research in computer and communication engineering	2020	e-ISSN:2320-9801 p-ISSN: 2320 - 9798	http://ijircce.com/admin/main/storage/app/pdf/s8HBaTj0H2TzZ1xO3opXnIHkXYDS9IHNahAAQTZl.pdf
			Good physician's prediction for Health care planning using Big Data Analytics	Prof. C.M.Mankar	Computer Science and Engineering	Journal of Emerging Technologies and Innovative Research	2020	2349-5162	https://www.jetir.org/papers/JETIR2007126.pdf
			The role of Predictive data Analytics in retailing	Prof. C.M.Mankar	Computer Science and Engineering	Journal of Emerging Technologies and Innovative Research	2020	2349-5162	https://www.jetir.org/view?paper=JETIR2006427



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			A review on: Content Base Image retrival using Intelligence Techniques	Prof. V.S.Mahalle	Compute r Science and Engineeri ng	International Journal of Innovation research in computer and communication engineering	2020	e-ISSN:2320- 9801 p-ISSN: 2320 - 9798	http://ijircce.com/admin/main/storage/app/pdf/s8HBaTj0H2TzZ1xO3opXnlHkXYDS9IHNahAAQTZl.pdf
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A STUDY ON AWARENESS OF RISKS AND RISK MANAGEMENT PRACTICES AMONG CONTRACTORS IN AKOLA DISTRICT

¹Bilal Husain, ²Dr. S. G. CHAPKE

¹Asst. Professor, SSGMCE, Shegaon, ²Principal, L.R.T College, Akola

¹Business Administration and Research Department,
SSGMCE- Shegaon, India

Abstract : The centre part of this study is to study different risks associated with construction projects and rank them on their significance values and to study the awareness level of risk management practices amongst the contractors in Akola District. The analysis is based on theoretical framework of risk obtained from secondary research and its relevance is tested amongst the contractors by collecting primary information through submission of questionnaires.

IndexTerms - Risk management, Risk identification, Risk assessment, Risk response.

I. INTRODUCTION

A lot of public sector funds are involved in construction of roads, bridges and other civil projects in India. The development of a nation depends widely on the spending of civil projects. In India the road and other construction projects are contracted by offering bids through tendering process. Major players involved in this often subcontract the projects by dividing it into set of different contractual projects. The whole process of tendering and subcontracting creates a systematic risk on the ground level where most of the execution is done by civil contractors. Hence a civil contractor risk management capability is of immense important to execute a project on a broader level. With this motivation this paper deal with the risk management awareness of individual construction contractors with a special focus on contractors in Akola district

II. LITERATURE REVIEW

Ewelina Gajewska et al. studied “Risk Management Practices in a Construction Project” – a case study and the objective of their paper was to explore the most affecting factors in project costs and the main causes of cost overrun occurrence in the planned budget. Consequently, the better understanding of project's risks helps the project parties in identifying these factors that may cause cost overrun. Akintola S Akintoye et al studied “risk analysis and management in construction and found that risk elements associated with construction projects influences time, cost and quality performance of project”. Meti Retesh Shivasangappa et al studied- “risk management in construction projects and analysis” and found that risk management has to be followed by the all firms to maintain the decorum of construction site and organization. So, it can be concluded determination of the most effective factors enables to determine the stage per which the cost overrun takes an action. It is better to know and plan for risk in the initial stage of the project and implement that technique at the time of emergency. The study hence focuses on identification of different types of risks and risk management practices concerning a construction project and studying if the construction contractors are aware of the same. With reference to the above hence this paper uses format of risk identification, assessment and handling for the purpose of risk management.

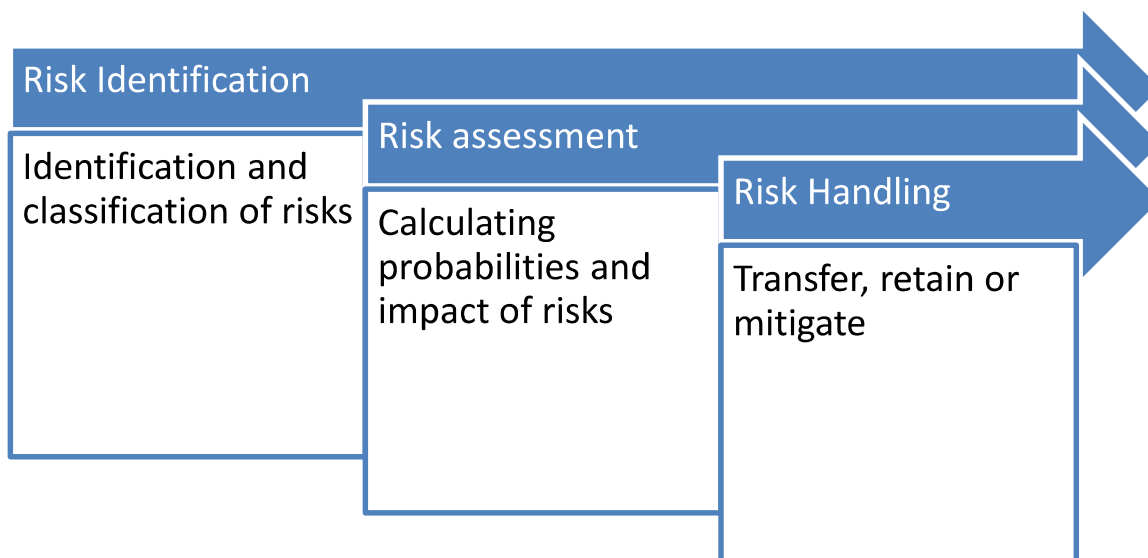


Figure 1: Risk management Steps



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A Study on Awareness of Risks and Risk Management Practices among Contractors in Buldhana District

Bilal T. Husain^{1*}, Shriprabhu G. Chapke²

^{1.*} Deptt. of Business Administration and Research, S.S.G.M.C.E Shegaon-444203, Maharashtra, India; e-mail: bilalhusain@ssgmce.ac.in, bilalhusain.bth@gmail.com

^{2.} Smt. L.R.T College of Commerce, Akola- 444001, Maharashtra, India.

ABSTRACT

This research focuses on the study of different risks which occurs in road construction projects. Further it tries to identify the awareness level and relevance of those risks and its management among the civil contractors in Buldhana district. Focusing on broader construction risks, the research deals only with specific risks concerning the civil contractors as they form the baseline of the construction projects

Keywords: Risk management, Risk awareness, Risk identification, Risk assessment, Risk response, civil contractors.

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INTRODUCTION

Civil construction projects occupy major portion of financial budget in India. In India the most preferred method of undertaking civil construction projects is by allotment through tender process. At the base level of this tender process most of the work is being done by civil contractors hence the study focuses on awareness of risks and the ability to handle risks among civil contractors in Buldhana district.

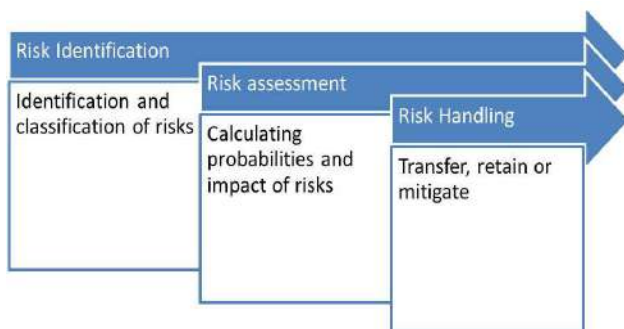


Figure 1: Risk Management Steps

Figure 1 shows steps in risk management process in construction projects as recommended by PMI 2013 [1]

Corresponding Author : Bilal T. Husain, Deptt. of Business Administration and Research, S.S.G.M.C.E Shegaon-444203, Maharashtra, India; e-mail: bilalhusain@ssgmce.ac.in, bilalhusain.bth@gmail.com

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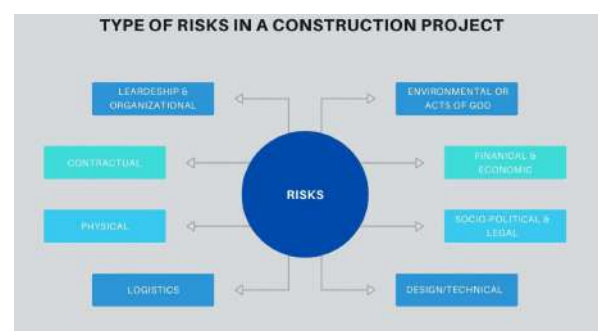


Figure 2: Types of risks in construction projects

Figure 2 represents different types of risk faced by civil contractors in a construction project.

The background of the cover is a light beige or tan color with a fine, woven texture. Overlaid on this is a complex, abstract design in red ink or paint. This design consists of a network of thin, hand-drawn lines that form various shapes, including loops, zig-zags, and clusters of small dots. Some of these clusters resemble stylized floral or cellular patterns. The lines vary in thickness and intensity, giving the design a sense of depth and movement. The overall aesthetic is artistic and modern, suggesting themes of innovation and interconnectedness.

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Delighted niche driven entrepreneurial odyssey: a case study of Maharaja Masala Udyog

H.M. Jha Bidyarthi, Mayur A. Dande, Pawan M. Kuchar, Satya Mohan Mishra and Ashish K. Shrivastava

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ABOUT

Abstract

Santosh Satyanarayanji Didwaniya, the entrepreneur of Maharaja Masala Udyog, Khamgaon led his Udyog from mere 15-16 kilograms of mixed spices sale to a monthly turnover of 25,000 kilograms of Maharaja Mix Garam Masala capturing 75% to 80% of market and claiming an annual growth of 7% to 8%. The unbelievably successful entrepreneurial odyssey of Santoshbhai is embedded with single product sale through zero level distribution channel with a negligible modernisation of processing section and a very little modernisation of packaging and storage, and use of conventional management method. His consumers are so delighted with the unique taste and flavour of the Maharaja Mix Garam Masala that his market territory is fortified even amidst the presence of many multinational companies and some leading local brands. The case comprises rich knowledge and intense thought provocation relating to entrepreneurship and innovation management based on traditional management practices and niche marketing concepts.

Keywords

niche market, entrepreneurship, product positioning, innovations, consumer delight

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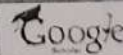
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OKM and AI Techniques – Innovation in Human Resource Management

H. M. Jha "Bidyarthi"¹, L. B. Deshmukh²

¹Professor and Head, ²Associate Professor,
Department of Business Administration and Research, Shri Sant Gajanan Maharaj College of Engineering, Shegaon

Abstract

Drawing lessons from Indian epic "Hanuman Chalisa" the author has evolved a technique called OKM (Ocean of Knowledge and Merits) technique for an effective internal communication in the organization with its human resources that ensure building a positive and energetic environment leading to maximum contribution by each of them in the organizational development. A similar approach has been developed by the western countries called as AI (Appreciative Interaction) for developing both individuals as well as organization. OKM, however, endorses the innate infinite potential of human being against AI which attempts to harness the same. An extended application of OKM technique can overpower the five devils of Kama, Krodha, Mada, Moha and Lobha which are the root causes of all the evils in an organization.

Keywords: Appreciative Inquiry (AI), Human Resource Management, Internal Communication, Ocean of Knowledge (OKM), Organisational Development

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Introduction

Management is defined as creating environment where people can give their best. Hence at the core of management is people management and managing people means managing their behavior for desired results. People behave differently on different occasions with different people and for different purposes. In all this, what is common from an organization point of view is the attainment of desired result through these behaviors. There have been several researches to unfold the dimensions of human behavior at work place. The attempts have been from both the western thinkers like Elton Mayo etc. and also the eastern thinkers like Prof. S. K. Chakraborty etc. While most of the western researches are based on experimentation like Hawthorne Studies, the eastern researches draw their inferences from *Vedas*, *Upanishads*, *epics* etc. which are treated as reservoir of experiences of our Saints and Seers. The present paper puts forth similar experiences of the Hanuman character in Indian epic named "Hanuman Chalisa" in the form of Ocean of Knowledge and Management – OKM – technique and draws a parallel with a synonymous western concept of

Corresponding Author: H. M. Jha "Bidyarthi", Professor and Head, Department of Business Administration and Research, Shri Sant Gajanan Maharaj College of Engineering, Shegaon,
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Appreciative Interaction – AI – technique.

Communication Dimensions of Human Behavior:

Human behavior is reflected through his / her communication including semantics. Communication (Koontz and Weihrich, 1990) is defined as the process of sharing and / or exchanging information, message, feelings, knowledge, emotions etc. between two or more persons. This sharing could lead to pleasant feeling, knowledge building, confidence building, team spirit and so on which are the positive dimensions (Robbins et. al., 2019) of communication. Or it could also be detrimental to the existing environment leading to