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Non-Contact Acceleration Measurement In Orthogonal Directions

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ABSTRACT

In this work determination of acceleration (using a non-contact device) in three mutually perpendicular directions (X, Y and Z) is carried out using M E M S. A Tri-axial Accelerometer ADXL335 sensor and a Bluetooth module are used to find the accelerations at a point where measuring the acceleration is normally not achievable due to inaccessibility of a small area where three accelerometers cannot be located to measure in all the three directions. They are sensed by the accelerometer sensor and the corresponding signal is transmitted to a PC or a laptop or a Wi-Fi-supported mobile. Using the Bluetooth/Wi-Fi module which involves the IOT (Internet of Things) concept is applied through MEMS here. It is possible to use these components for further processing and applications which shall be discussed depending on a few factors, they are like sensitivity, thresholds, range, rise time, precision, calibration-friendliness of the signals etc. A range of possible applications of this method is discussed. A very adequate, robust electronic packaging should entail too with MEMS connected to Wi-Fi mother boards of any fitting type inclusive of blue tooth.

Key words: Parallelepiped of acceleration, applications and extensions, demonstration experiments, Accelerometer, Bluetooth, and wide range of possible applications in different fields

1. INTRODUCTION

Measurement of accelerations in multi-directions is important in many engineering applications. Piezo electricity based Accelerometers using quartz, barium titanate etc., are known. Scientists and engineers across the globe are working for over seven decades on this topic. Traditional measurement of acceleration is normally in single direction (X-Y or Z-axis). Using MEMS (Micro Electro Mechanical Sensors) it is possible to measure the acceleration in all the three directions simultaneously.

Piezo sensors have wide range of applications. Manufacturing and industrial uses could be the highest share. Medical instruments like CT scan, patient orientation-automation occupy very attractive long time-tested applications. Currently, industrial and manufacturing sector is the largest application market for piezoelectric devices, followed by the automotive industry. Heavy demands are also conspicuous in information and telecommunications. Realizing that each and every smart phone, tablet or pad needs six sensors for requisite self-orientation, we can see demands keep increasing. Reputed and easily available sources like Wikipedia projected values of these sensors in world market even in 2010 around US \$ 15 billion. As of today, the actual figures and their growth rate will be much higher. This is more so with the advent of MEMS and Wi-Fi applications around Internet of Things (IoT).^[1]

Accelerations can be measured from about 0.1g to more than 10g using piezo devices and MEMS. Rise times will be in micro seconds. This is illustrated in ultrasonic applications and military devices like mixers, elevators, mechanical handling equipment, conveyors, handled materials, information handling devices like pads, phones etc. Where jerk or acceleration rate plays a role, machines where there is importance attached to measuring the acceleration in all the three components i.e., (X,Y and Z axes respectively). MEMS use the latest methodology which is available to sense the acceleration in the 3-directions such as a wireless tri-axial accelerometer like Bean Device AX-3DS, BZ-TECH wireless accelerometer. These available wireless accelerometers in the market are cost effective in comparison to the project cost. As the bulk needs increase, the price comes down with increasing manufacturing capabilities owing to the deployment of MEMS. While doing away with the needs of experiments that cost very high Arduino platform and MEM sensors will achieve the same purpose in the applications mentioned in a very effective way. In order to avoid the high cost experimental needs, this work uses the Arduino platform and the sensors.

2. LITERATURE REVIEW

MEMS gave rise to a lot of applications and advancements. They involve / miniaturization, process improvements in quality and quantity etc.,^[2]. The rapidly growing innovations, interest in ever growing measuring techniques especially wireless based, network friendly, easy to adopt without compromise on precision and reliability all make this highly interdisciplinary activity an attraction to many specialists.

Hardly spanning from micrometers to millimeters in size, each piece of MEMS permits possibility of production in large numbers like thousands. Batch processing techniques help in specifications and variety change.

Being of full help in detection, control and passing on decisions related to actions there on, MEMS with wireless facilitation have become real tech-assets. This is sudden and unexpected turn in industries which is



Analysis Of Slope Stability On Basal Reinforced Embankment With Slanting Load

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Abstract

Slope stability of embankments on soft soils can be enhanced by providing basal reinforcement with geosynthetics proved by many researchers. In the literature the stability of the slopes analyzed by considering horizontal axial pullout force in the reinforcement upon with full mobilization of frictional resistances on the surface of the reinforcement layer. But during the failure the reinforcement layer is pulled by the sliding mass is observed to be inclined not in horizontal. During the failure transverse deformation will occur at the intersection point of failure wedge with reinforcement layer. The amount of transverse displacement depends on the angle of rotation of the sliding mass at the center of the failure circle. Hence in this paper stability of a basal reinforced embankment by considering the geometry of the reinforcement during the failure.

Keywords: Embankment, Reinforcement, Stability, Axial Pull, Transverse Pull

1. INTRODUCTION

Basal Reinforced Embankments on Soft Soils

Reinforced soil concept (Vidal, 1969) using geosynthetics proved as the best technique, which can be used to enhance the strength and deformation behavior of soil in difficult situations. An embankment constructed on soft foundation is designed with a layer of geosynthetics reinforcement at its bottom. Jewell (1988) described the mechanism by which reinforcement could improve the performance of embankments on soft soils. This involved the recognition that the lateral earth pressure within the embankment over a soft cohesive foundation imposes shear stresses on the foundation soil. The tensile force in reinforcement resists the driving outward forces thus adding stability. Tensile forces mobilized in the reinforcement based on the effective length of reinforcement, shear strength mobilized at the contact surface of fill-reinforcement ground interface. Based on the effective length the layer of geosynthetics can be termed either extensible/inextensible material. The difference between extensible and inextensible sheet being only effective length over full mobilization of shear stresses occurs. In the case of extensible sheet only the elongated portion is considered as effective while, total length of sheet is considered in the case of inextensible sheet. The basal reinforcement can serve to resist some or all of the earth pressure within the embankment and to resist the lateral deformations of the foundation, thereby increasing bearing capacity and stability, Jewell (1988). A systematic design approach is to be followed to evaluate the embankment stability with respect to internal and external failure mechanisms. The failure mechanism of reinforced embankments are (i) lateral sliding of embankments over the base reinforcement layer, (ii) Foundation extrusion (bearing capacity failure), (iii) global stability analysis (iv) breakage or pullout of reinforcement (v) Excessive displacement. In order to prevent this failure mechanism, consideration must be given to (i) the reinforcement-soil interface shear strength under conditions where the reinforcement is pulled out from the soil above and below it, (ii) the tensile strength of the reinforcement and (iii) the stress-strain characteristics of the reinforcement relative to those of the foundation soil.

Methods of Analysis of A Geosynthetic – Reinforced Embankment

Limit equilibrium approach and finite element approach are few of the methods illustrated in literature by many researchers. Limit equilibrium methods have been used extensively to assess the short-term (undrained) stability of reinforced embankments constructed on soft foundation soils (Jewell 1988, Rowe and Soderman 1984, Rowe and Li 2005, Bergado et al. 2002). These methods have been used to examine equilibrium of bearing capacity failure mechanism, lateral sliding mechanism and slip circle type failure mechanism. Commonly used limit equilibrium method i.e. the slip circle failure mechanism considers moment equilibrium about the circle centre. The stability is obtained from the overturning moments and restoring moments. The overturning moments include part of weight of soil, lateral pressures within fill and resisting forces are part of weight and shearing strength of ground and fill along failure surface. Finite element methods consider the deformations also which are not accounted in limit equilibrium methods. Reinforced embankments are composite system consisting of three components: the foundation soil, the fill and the reinforcement. Their performance is highly dependent up on interactions and deformations within them. The finite element method has been proven to be a powerful technique in the evaluation of slopes and embankment behavior since its use. Numerous researchers have employed these techniques to interpret field behavior of reinforced embankments (Rowe et. al 1984, Bergado and Chai 1994). These techniques have also proven their versatility in analyzing time dependent behavior of reinforced embankments (Rowe and Li, 2005).

2. KINEMATICS OF REINFORCEMENT-BACKFILL RESPONSE

Experimental Investigation Of Waste Plastic Fiber In Reinforced Cement Concrete Using Recycled Coarse Aggregate

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ABSTRACT

This study is aimed at investigating the shear strength and work ability characteristics of Fiber Reinforced High Strength Concrete (FRHSC) which use recycled coarse aggregates that have originated from demolished construction wastes. Different mixes were taken with 20%, 40% replacement of natural coarse aggregate with recycled coarse aggregate. To improve the ductility and performance, 1% steel fiber is also added to the concrete. The concrete has main advantage that it has a better compressive strength. The compressive strength of concrete can be represented as cube or cylinder compressive strength. The compressive strength of concrete is depending on size and shape of the test specimens. In this study, the conventional concrete was reinforced by the plastic fibers obtained from waste plastic bottles. The cube and cylinder compressive strength of conventional concrete and plastic fibers reinforced concrete were determined in the laboratory. The M30 grades of concrete and two fiber geometry at volume fractions 0.0 % to 3.0 % were used in the experimentations. All specimens were tested after curing age 28 days. In this paper the relationship between cube and cylinder compressive strength for conventional and plastic fibers reinforced concrete were established and compared with standards.

Keywords: Experimental, Investigation, Waste Plastic Fiber, Reinforced Cement Concrete, Recycled Coarse Aggregate

1. INTRODUCTION

Since the large demand has been placed on building material industry especially in the last decade owing to the increasing population which causes a chronic shortage of building materials, the civil engineers have been challenged to convert the industrial wastes to useful building and construction materials. This experimental study which investigates the potential use of waste plastic fibre for producing a low-cost and light weight composite as a building material. These alternatives were made with plastic fibre. Any construction activity requires several materials such as concrete, steel, brick, stone, glass, clay, mud, wood, and so on. However, the cement concrete remains the main construction material used in construction industries. For its suitability and adaptability with respect to the changing environment, the concrete must be such that it can conserve resources, protect the environment, economize and lead to proper utilization of energy. To achieve this, major emphasis must be laid on the use of wastes and byproducts in cement and concrete used for new constructions. The utilization of recycled aggregate is particularly very promising as 75 per cent of concrete is made of aggregates. The use of recycled aggregates from construction and demolition wastes is showing prospective application in construction as alternative to primary (natural) aggregates. Research on the usage of waste construction materials is very important since the materials waste is gradually increasing with the increase of population and increasing of urban development. The reasons that many investigations and analysis had been made on recycled aggregate are because recycled aggregate is easy to obtain and the cost is cheaper than virgin aggregate.

2. METHODOLOGY

The methodology for the research is explain in pictorial representation in the flow chart.

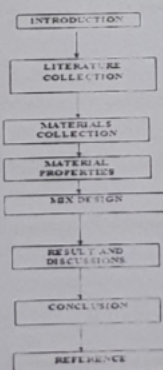


Figure1 Methodology chart

3. MATERIAL COLLECTION

Experimental Study On Coir Fibre Reinforced Fly Ash Based Geopolymer Concrete For 10m

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ABSTRACT

Background Objectives: By using the fly residue as option substance to bond in concrete it reduces the usage of normal Portland cement in usual concrete which results in the development of Geopolymer concrete furthermore in the lessening of CO₂ levels which thusly reduces the Global Warming. *Methods/Statistical analysis:* This paper presents the trial examination done on the execution of coir fibre reinforced fly residue based geopolymer concrete subjected to severe ecological conditions. The mixes were considered for molarity of 10M. The basic arrangement utilized for present revise is the blend of sodium silicate and sodium hydroxide arrangement with the proportion of 1:2.5. Coir fibre with the varying percentages of 0, 0.75, 1.5, 2.25 and 3 are used as fibre reinforcement. The test specimens of 150mmx150mmx150mm cubes, 150mmx300mm cylinders, 1000mmx150mmx150mm beams are cast and cured under encompassing temperature conditions. *Findings:* The geopolymer solid examples are tried for their compressive quality, flexural and split tractable tests at 7days, 14days and 28days. The test grades demonstrate that the blend of fly ash and coir fibre can be used for the improvement of geopolymer concrete. *Applications:* It possesses superior distinctiveness such as high strength, very little drying shrinkage, low creep, durable nature, eco-friendly, fire proof, better compressive strength etc to be used as an alternative of OPC.

Key words: Coir fibre, Fly ash, alkaline solution, Geopolymer concrete, molarity

1. INTRODUCTION

The phrase geopolymer cement was initially presented by Davidovits in the year 1978, to speak to the mineral polymers approaching about because of geochemistry. Geopolymers be shaped by the basic initiation of alumina silicates and the materials like fly powder. The utilization of fly fiery debris has consolidated potential biological advantages and much worse cost than other source materials. Low-calcium fly slag based geopolymer real has been accounted for just before comprise the magnificent compressive quality, great corrosive conflict, and imperviousness to sulphate assault¹. Geopolymer solid does not oblige any water pro framework holding, rather the soluble arrangement respond with Silicon and Aluminium here in the fly fiery remains³. Davidovits work extensively demonstrates that the assortment of the geopolymer novelty could lessen the production of CO₂ from the concrete commercial ventures. Geopolymers are persons from the collection of dead polymers². The unreal organization of the geopolymer substance is similar to attribute zeolitic resources until now the microstructure is indistinct^{5,6}. Every substance with the aim of containing the most part silicon (Si) aluminum (Al) in the indistinct structure is an imaginable basic substance for the production of geopolymer⁸. Met kaolin or calcined Kaolin, low calcium ASTM Class F fly fiery remains, normal Al-Si minerals, combine of granulated impact fly cinder plus metakaolin encompasses be contemplated as starting place resources⁹. Extensively recognized antacid fluid utilized as a part of geopolymerisation is a unity of sodium hydroxide or potassium hydroxide with sodium silicate otherwise potassium silicate. Low-calcium (ASTM Class F) fly grind is ideal as a foundation substance than high-calcium (ASTM Class C) fly fiery debris⁷. The nearness of calcium in elevated arithmetic may intervene through the polymerization system and modify the micro arrangement⁹. The nearness of fibre enhances elastic and flexural qualities of the blend, break harshness and split hindering properties of the grid. In this examination distinctive size of coir fibre is treated with common elastic latex⁴.

2. OBJECTIVE

1. To assess the diverse strength properties of geopolymer concrete blend with fly ash and various % of coir fiber (i.e. 0%, 0.75%, 1.5%, 2.25%, 3%.
2. To identify a reduction of the micro cracks by the addition of coir fibre which is usually developed in the conventional concrete.
3. To reduce the environmental pollution and the usage of landfills by using coir fibre in geopolymer concrete

3. EXPLORATORY EXAMINATION

3.1. Materials utilized

Following materials are generally used to produce Geo Polymer Concrete:

1. Low calcium elegance F fly ash
2. Coir fibre

A New Design Of Square Lattice Photonic Crystal Fiber Is Made By Borosilicate Material With Circular And Square Air Holes To Minimize Dispersion

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Abstract-The photonic crystal fibers (PCF) are more flexible than conventional optical fiber. In this paper we proposed a new design of photonic crystal fiber using borosilicate material. Square lattice is used with linear and elliptical waveguide in cladding. The PCF are very useful for optical transmission. For better transmission, ultra flattened dispersion or near to zero dispersion is desirable. To minimize dispersion we designed different air holes of different diameter. Finite Difference Time Domain (FDTD) method and transparent boundary condition (TBC) is used to analyze the dispersion property in a high-index core PCF. Through simulation and optimizing the PCF, we find that the proposed photonic crystal fibers give flattened dispersion in wavelength range of 1.2 μ m to 1.8 μ m in scalar mode then TM and TE mode of photonic crystal fiber. It is also observe that borosilicate glass PCF gives much better dispersion as compared to silica of the same structure, so such PCF can be used as a dispersion compensating fiber in optical window with high potential.

Keywords- Chromatic dispersion, photonic crystal fibers (PCFs), square lattice, Effective Refractive Index (n_{eff}), Finite Difference Time Domain (FDTD) method, Transparent Boundary Condition (TBC)

1. INTRODUCTION

Optical fiber is widely used in wavelength division multiplexing (WDM) network for optical data transmission. In WDM communication systems, it is essential to maintain a uniform response in the different wavelength channels, which requires that the transmission line approach the ideal state of ultra-flattened dispersion and ultra-low loss [1]. But flexible dispersion or losses in optical fiber have been become a major problem in high bit rate wavelength division multiplexing optical communication systems. The dispersion is a phenomenon that causes to broaden optical pulses, when they spread in the optical fibers [1]. So when a pulse come to receiver, it is not possible to differentiate whether it high or low. The intersymbol interference (ISI) can occur between the bits in communication channel, by linearly accumulated chromatic dispersion along the transmission channel, which can affects the communication process & communication quality.

Because of this, zero and flat dispersion slope with low losses are needed in high speed optical communication. Thus, a new technology of manufacturing photonic crystals has led to a new generation of optical fibers, namely Photonic Crystal Fibers. The PCF has some features such as controllable dispersion, very low confinement loss and flexible design. The photonic crystal fibers (PCFs) are also called microstructures fibers or holey fibers. The photonic crystal fiber structure is formed by a core and a cladding. The cladding is two dimensional photonic crystal types consisting of air holes that run along the fiber length show unique properties

Light guidance in PCFs are depending on the core and cladding photonic crystal materials. The refractive index difference between the core and cladding is always positive in index-guiding PCF. It can be possible by choosing a core material with a higher refractive index than the cladding refractive index. The photonic crystal fiber is also known as solid core photonic crystal fiber. These fibers guide light through a form of total internal reflection (TIR).

The refractive index of the cladding is higher than refractive index of the core in the fibers with air core. However, in fibers with air core, TIR is not possible. So light guidance in these fibers attained by coherent Bragg scattering, where light at wavelengths within well-defined stop bands is prohibited from propagating in the photonic crystal cladding and is confined to a central defect [2]. Only some wavelength bands are confined and guided down the fiber. Each band corresponds to the presence of a full two-dimensional PBG in the photonic crystal cladding. For this reason, these fibers are called photonic band gap fibers (PBGFs) or hollow core fibers in which light is guided in a low-index core by the PBG effect[1,2].

Reducing dispersion & confinement loss are main aim to designing PCF's. To designing PCF's, multiple parameters can change such as diameter & shape of the holes, the number of air hole ring and the spacing between these holes. Many designs of PCF's have been proposed for the nearly zero ultra-flattened chromatic dispersion and low confinement loss

A Study of Image Segmentation Algorithms For Different Types of Images

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Abstract

In computer vision, **segmentation** refers to the process of partitioning a digital image into multiple segments (sets of pixels, also known as superpixels). Image segmentation is typically used to locate objects and boundaries (lines, curves, etc.) in images. More precisely, image segmentation is the process of assigning a label to every pixel in an image such that pixels with the same label share certain visual characteristics. The result of image segmentation is a set of segments that collectively cover the entire image, or a set of contours extracted from the image. Each of the pixels in a region are similar with respect to some characteristic or computed property, such as color, intensity, or texture. Due to the importance of image segmentation a number of algorithms have been proposed but based on the image that is inputted the algorithm should be chosen to get the best results. In this paper the author gives a study of the various algorithms that are available for color images, text and gray scale images.

Keywords: image segmentation, region growing, marker

1. INTRODUCTION

All image processing operations generally aim at a better recognition of objects of interest, i. e., at finding suitable local features that can be distinguished from other objects and from the background. The next step is to check each individual pixel to see whether it belongs to an object of interest or not. This operation is called *segmentation* and produces a *binary image*. A pixel has the value one if it belongs to the object; otherwise it is zero. Segmentation is the operation at the threshold between *low-level image processing* and *image analysis*. After segmentation, it is known that which pixel belongs to which object. The image is parted into regions and we know the discontinuities as the boundaries between the regions. The different types of segmentations are

Pixel-Based Segmentation: Point-based or pixel-based segmentation is conceptually the simplest approach used for segmentation.

Edge-Based Segmentation: Even with perfect illumination, pixel based segmentation results in a bias of the size of segmented objects when the objects show variations in their gray values

Darker objects will become too small, brighter objects too large. The size variations result from the fact that the gray values at the edge of an object change only gradually from the background to the object value. No bias in the size occurs if we take the mean of the object and the background gray values as the threshold. However, this approach is only possible if all objects show the same gray value or if we apply different thresholds for each objects. An edge-based segmentation approach can be used to avoid a bias in the size of the segmented object without using a complex thresholding scheme. Edge-based segmentation is based on the fact that the position of an edge is given by an extreme of the first-order derivative or a zero crossing in the second-order derivative.

Region-based methods focus attention on an important aspect of the segmentation process missed with point-based techniques. There a pixel is classified as an object pixel judging solely on its gray value, independently of the context. This meant that isolated points or small areas could be classified as object pixels, disregarding the fact that an important characteristic of an object is its connectivity. If we use not the original image but a feature image for the segmentation process, the features represent not a single pixel but a small neighborhood, depending on the mask sizes of the operators used. At the edges of the objects, however, where the mask includes pixels from both the object and the background, any feature that could be useful cannot be computed. The correct procedure would be to limit the mask size at the edge to points of either the object or the background. But how can this be achieved if we can only distinguish the object and the background after comparison of the feature? Obviously, this problem cannot be solved in one step, but only iteratively using a procedure in which feature computation and segmentation are performed alternately. In the first step, the features are computed disregarding any object boundaries. Then a preliminary segmentation is performed and the features are computed again, now using the segmentation results to limit the masks of the neighborhood operations at the object edges to either the object or the background pixels, depending on the location of the center pixel. To improve the results, feature computation and segmentation can be repeated until the procedure converges into a stable result.

Analysis of Web Logs and Web User In Web Mining

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ABSTRACT

Log files contain information about User Name, IP Address, Time Stamp, Access Request, number of Bytes Transferred, Result Status, URL that Referred and User Agent. The log files are maintained by the web servers. By analysing these log files gives a neat idea about the user. This paper gives a detailed discussion about these log files, their formats, their creation, access procedures, their uses, various algorithms used and the additional parameters that can be used in the log files which in turn gives way to an effective mining. It also provides the idea of creating an extended log file and learning the user behaviour.

KEYWORDS

Web Log file, Web usage mining, Web servers, Log data, Log Level directive.

1. INTRODUCTION

Log files are files that list the actions that have been occurred. These log files reside in the web server. Computers that deliver the web pages are called as web servers. The Web server stores all of the files necessary to display the Web pages on the users computer. All the individual web pages combines together to form the completeness of a Web site. Images/graphic files and any scripts that make dynamic elements of the site function. The browser requests the data from the Web server, and using HTTP, the server delivers the data back to the browser that had requested the web page. The browser in turn converts, or formats, the files into a user viewable page. This gets displayed in the browser. In the same way the server can send the files to many client computers at the same time, allowing multiple clients to view the same page simultaneously.

2. CONTENTS OF A LOG FILE

The Log files in different web servers maintain different types of information. [6]The basic information present in the log file are

- User name: This identifies who had visited the web site. The identification of the user mostly would be the IP address that is assigned by the Internet Service provider (ISP). This may be a temporary address that has been assigned. There fore here the unique identification of the user is lagging. In some web sites the user identification is made by getting the user profile and allows them to access the web site by using a user name and password. In this kind of access the user is being identified uniquely so that the revisit of the user can also be identified.
- Visiting Path: The path taken by the user while visiting the web site. This may be by using the URL directly or by clicking on a link or trough a search engine.
- Path Traversed: This identifies the path taken by the user with in the web site using the various links.
- Time stamp: The time spent by the user in each web page while surfing through the web site. This is identified as the session.
- Page last visited: The page that was visited by the user before he or she leaves the web site.
- Success rate: The success rate of the web site can be determined by the number of downloads made and the number copying activity under gone by the user. If any purchase of things or software made, this would also add up the success rate.
- User Agent: This is nothing but the browser from where the user sends the request to the web server. It's just a string describing the type and version of browser software being used.

A Survey on Text Mining Techniques

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Abstract—As there is fast growth in digital data collection techniques it has made way for large amount of data. Greater than 85% of present day data is comprised of unsaturated and unstructured data. Determining the definite patterns and trends to examine a textual data is biggest issue in text mining. The various domains associated together in data mining are text mining, web mining, graph mining and sequencing mining. The selection of proper and correct technique of text mining enhances the hassle and by lowering the period and struggle done to mine important information. Here, we talk about text data mining. Various techniques of text data mining and also application of text data mining. Text data mining is used for obtaining stimulating and fascinating designs from the unsaturated texts which are derived from various sources. It changes words, phrases and sentences of an unstructured information into mathematical value linking with the saturated information in the database and analyses it with traditional data mining techniques. Information extraction, information retrieval, summarization, categorization and clustering are the different techniques of text mining.

Keywords—Text mining, Techniques, Clustering, Pattern, Summarization.

1. INTRODUCTION

Day by day the size of data is multiplying and expanding at an aggressive and rampant rate. Since the data is considerably huge all the corporate firms, institutions and organisations store the data in the system, electronically. Now this large amount of data is stored and exchanged through web in the form of digital libraries and textual information like blogs and other social media platforms. Hence it is difficult to extract information by using orthodox data mining techniques since they are not able to handle textual data effectively. When there is enormous amount of data and all the important and necessary information is required, Text mining is used. Text mining is also called as data text mining. Text mining examines text which is in natural language in detail and then lexical patterns are detected to extract important information. Pattern extraction from text documents and arrangements of text documents are the key goals of text mining technique development. Here both the unstructured data and semi structured data can be used for text mining. Fig. 1 represents the steps for Text Mining which is stated as follows:

- Convert unstructured data into structured data by collecting data from sources like plain text, web pages and data files.
- Pre-processing and cleansing operations are implemented to detect and remove anomalies.
- Cleansing process helps reveal the true essence of text which is available and is implemented to eliminate word stemming which is process of recognizing a certain word root and data indexing recognize the patterns from the structured data.
- Examines and inspects the designs and patterns using text mining techniques.
- In Processing technique cleaning and formatting of data is done and after the Text mining techniques like clustering and algorithms are applied to arrange to text documents.
- Extracts and roots out the useful information from the text.

Digital libraries, Web mining, drug discovery, Clustering, Social media, detection of links between lifestyle and states of health, business intelligence are some of the applications of text mining. This paper has different segments. Segment II consists of previous contribution by notable authors. Segment III defines the techniques in text mining and segments IV explains the applications of text mining. Segment V surveys the concerns of text mining and segment VI gives the conclusion of this paper.

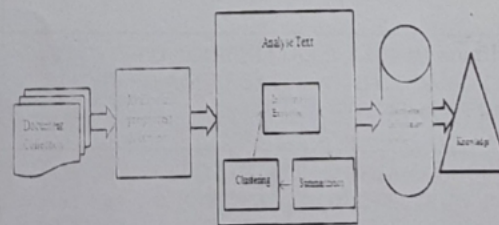


Fig.1. Example of a figure caption.

A Review on Green Concrete

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Abstract — Construction industry is growing rapidly and new technologies have evolved very fast to cater different difficulties in the construction industry. Among all materials used in the construction industry concrete is main material for construction purposes. Billions of tons of naturally occurring materials are mined for the production of concrete which will leave a substantial mark on the environment. Nowadays recycling of waste and industrial by products gaining popularity to make concrete environment friendly material and the concrete can be called as Green Concrete. This review paper will give us a brief idea about as well as advantages and disadvantages about green concrete.

Key Words — Concrete, Green Concrete, Recycled Aggregates, Quarry Dust, Recycled Aggregate Concrete, Cement, Fine Aggregate, Coarse Aggregate

1. INTRODUCTION

The size of construction industry all over the world is growing at faster rate. The huge construction growth boosts demand for construction materials. Aggregates are the main constituent of concrete. Due to continuously mining the availability of aggregates has emerged problems in recent times. To overcome this problem, there is need to find replacement to some extent. Nowadays, there is a solution to some extent and the solution is known as "Green Concrete". Green concrete has nothing to do with color. It is a concept of thinking environment into concrete considering every aspect from raw materials manufacture over mix design to structural design, construction, and service life. Green concrete is also cheap to produce because, waste products are used as partial substitute for cement, charges for the disposal are avoided, energy consumption in production is lower, and durability is greater. Waste can be used to produce new products or can be used as admixtures so that natural resources are used more efficiently and the environment is protected from waste deposits.

2. IMPACT ON ENVIRONMENT DUE TO CONCRETE

1. About 0.9 tons of carbon dioxide is produced for every 1 ton of cement produced. Carbon dioxide is one of the green house gas which is responsible for global warming.
2. Major ingredient in the production of concrete is aggregates without aggregates it is impossible to produce concrete. Aggregates are mined from the rock mines and the rate with which concrete is produced there will be significant reduction in naturally occurring materials.
3. Disposal of construction and demolition waste has become a major problem these days, according to the report of Technology, Information, Forecasting, Assessment Council the total amount of waste from construction industry is estimated to be 12 to 14.7 million tons per annum. Out of which 7.8 million tons are concrete and brick waste. Because of increasing problems of these wastes many countries have started researches to use these materials as source.

REPLACEMENT MATERIALS FOR GREEN CONCRETE

Sl. No	TRADITIONAL INGREDIENTS	REPLACEMENT MATERIALS FOR GREEN CONCRETE
1.	CEMENT	ECO-CEMENT, SLUDGE ASH, MUNICIPAL SOLID WASTE FLY ASH
2.	COARSE AGGREGATES	RECYCLED AGGREGATES, WASTE READY MIX CONCRETE, WASTE GLASS, RECYCLED AGGREGATES WITH CRUSHED GLASS, RECYCLED AGGREGATES WITH SILICA FUME.
3.	FINE AGGREGATES	FINE RECYCLED AGGREGATE, DEMOLISHED BRICK WASTE, QUARRY DUST, WASTE GLASS POWDER, MARBLE SLUDGE POWDER, ROCK DUST AND PEBBLES ARTIFICIAL SAND, WASTE GLASS, FLY ASH AND MICRO SILICA, BOTTOM ASH OF MUNICIPAL SOLID WASTE

3. USE OF RECYCLED AGGREGATES

Stabilization of Soil: A Review

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Abstract: If good earth is not available at the construction site, it becomes imperative to opt for soil stabilization. Soil stabilization is a process to treat a soil to maintain or improve the performance of the soil as a construction material. The stabilizing agent improves the strength parameters of sub grade of road pavement and leads to strengthening of embankment. The objective of this paper is to review the applications of different stabilizing agents such as lime, fly ash, cement, rice husk, expanded polystyrene geofoam and waste paper sludge for different type of soil.

Keywords: Fly ash, Lime, Cement, Expanded polystyrene (EPS) Geofoam, Waste paper sludge

1. INTRODUCTION

General: The soil which contains the silt and clay particles show considerable sign of distress accompanied by loss of strength of the soil during rainy seasons and shrinkage during summer. Black cotton soil is one such type of soil which loses its strength during rainy season due to their expansive behavior. The problems of expansive behavior of soil are as follows (N.B.O. 1962).

- Expansive soils have high plasticity and compressible when they are saturated.
- These types of soil have high strength in dry state, becomes soft after saturation. Filling up water into fissures and cracks, accentuates the process of softening causing reduction of shear strength and leading to low bearing capacity.
- Structure built in a dry season show differential heaving as a result of swelling of soils during subsequent wet season. Restriction on swelling causes swelling pressure, making the structure unstable. This causes structure supported on soils to lift up with the development of cracks.
- Structure built at the end of wet season when the natural water content is high show shrinkage crack and settlement during dry season. Shrinking cause a downward thrust on the foundation through skin friction thus increasing the foundation load.

Due to these reasons expansive soils need treatment prior to use as an engineering material. These treatments are generally classified into two process, viz. (1) soil modification and (2) soil stabilization.

Soil stabilization is the process of blending and mixing materials with a soil to improve certain properties of the soil. The process may include the blending of soils to commercially available admixtures that may alter the gradation, texture or plasticity, or act as a binder for cementation of the soil (IRC:SP:89-2010).

Soil modification is the stabilization process in which improvement in some property of the soil but does not result in a significant increase in soil strength and durability (IRC:SP:89-2010). Soil properties like strength, compressibility, workability, swelling potential and volume change tendencies may be altered by various soil stabilization and modification methods.

Chemical stabilization of non cohesive, coarse grained soil with greater than 50% by weight coarser than 75micron is also profitable if a substantial stabilization reaction achieved in the soil (Dallas and Syam, 2009).

2. QUALITY IMPROVEMENT DUE TO STABILIZATION

By the stabilization better soil gradation, increase in durability, increase in strength, reduction of plasticity index and reduction in swelling potential is achieved. Stabilization improves the properties of construction materials and gives the following attributes (IRC:SP:89-2010).

- After saturation with water substantial proportion of their strength is retained.
- Resistance to erosion.
- Surface deflection is reduced.
- The elastic moduli of layers constructed above stabilized layer are increased.
- The stiffness and strength of a soil layer can be increased through the use of admixture to reduce the thickness of the road pavement.

Possible Problems due to Stabilization

The stabilization of soil also causes the following problems (IRC:SP:89-2010).

- Due to thermal and shrinkage cracks stabilized layer may be crack.

A Survey on Electricity Consumption Forecasting using Data Mining

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ABSTRACT: Today electricity is one of the basic need for living the life comfortably. Without electricity the industrial work, domestic work can get stopped. As electricity cannot be stored it need to be generated, we need to know the electricity demand. Data mining is one of the technique which is used for predicting the electricity demand. Some of the data mining techniques are predictive modeling, clustering, link analysis and deviation detection. The survey presents the recent study on predicting the electricity demand. It is possible to do the enhancement using machine learning approach.

KEYWORD: Predictive modeling, Data mining, Artificial Neural Network.

1. INTRODUCTION

Energy consumption is very rapid process in the world. As fossil fuels are consumed rapidly there is inadequacy to meet the energy demands. Electricity is the day-to-day need of the people. Electricity could not be invented as it is a natural phenomenon. It has great importance in our life as it illuminates houses, switch on the televisions, helps in cooking food, reduces work load with the help of many electric appliances. Electricity comes from photo-voltaic energy, non-renewable fuels, hydroelectric energy, nuclear energy, wind energy. Energy is the reliable source to supply electricity which is pollution free. For no pollution, we can simply go for NAP i.e., North American Power. It offers a gas which is called "cleangas", that don't cause pollution. They also provide a product called "greenelectric". They also carry out the generation of uncontaminated energy from renewable sources.

In this survey the techniques of data mining are used to calculate the electricity demand. For this we need to know what is data mining?

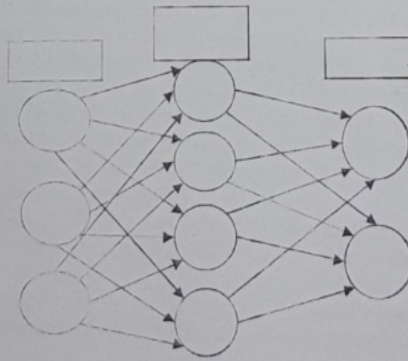
A. DATA MINING

Basically data mining is also known as knowledge discovery. Data mining is extracting data from large databases and transform it into understandable structure for further use. Data mining is the analysis step of the "knowledge discovery in databases" process or KDD. The various data mining techniques are predictive modeling, link analysis, clustering, etc.

Many of the data mining techniques involve the use of Artificial Neural Networks. So let us see what is ANN?

B. ARTIFICIAL NEURAL NETWORK

An Artificial Neural Network is a group of interconnected nodes. It is similar to the network of neurons in the brain. In machine learning an ANN is a network inspired by biological neural networks.



Boosting The Cloud Meta-Operating System With Heterogeneous Kernels: A Novel Approach Based On Containers And Microservices

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Abstract

A high SLA is a big challenge for the Cloud providers as they have to ensure the sustainability of their customers' workloads that depend closely on the underlying OS. The kernels are the cores of the OS, and the monolithic kernels are still the most performing despite of their fragility and unreliability. We think that the superposition of the kernels in such way that a healthy kernel replaces the vulnerable services of another kernel is a good track to operate. This replacement is accomplished via the transfer of system calls from the vulnerable kernel to a more reliable and efficient remote discovered kernel. We propose the architecture of a Meta-OS based on heterogeneous monolithic kernels in order to ensure reliability and performance. The features of this Meta-OS are encapsulated in microservices hosted on containers. Two technologies are used to implement our solution: Virtualization (hardware and OS based) and Web Services.

Keywords: Operating Systems, Monolithic Kernels, System calls, Mission critical and intensive applications, Virtualization, Docker, Containers, Web Services, Microservices.

1. INTRODUCTION

The Operating Systems provide services to run the applications. These services are invoked via system calls implemented into libraries and APIs. With the emergence of the Cloud, the service providers undertake on SLA levels too high to run the customers' workloads. This SLA can be closely linked to the quality of the OS that must be both reliable and efficient. The model without exceptions [1] for example has shown how the design of the OS can improve the performance of applications. The operating systems are based on the kernels which form their cores. Different approaches of design of the kernels are proposed. Nevertheless, the monolithic kernels like Linux kernels are the most powerful. Their fragility is due to the fact that the kernels include the majority of the critical features (to avoid the switches of context and gain performance). The slightest flaw in a module of the kernel may entail its interruption and the break of the entire operating system.

Today, hardware virtualization is required as a compelling solution for the consolidation of workloads and the sharing of physical resources. This technology is even supported natively in the hardware. Technologies like Intel-VT/AMD-V and SR-IOV can be cited as examples. The virtualization, in addition to the benefits of consolidation, offers by conception an ideal isolation of virtual machines. Each kernel of a given virtual machine runs in a secure and separate space independently of other kernels. Consequently, thanks to the virtualization, multiple heterogeneous systems can coexist on the same host.

Hardware virtualization can offer a solution to improve the reliability of the OS. This hypothesis is supported by VirtuOS [2] which defines architecture of an operating system subdivided functionally in service domains. Each service domain manages functionality, like storage, network, etc. and is executed in a virtual machine on the Xen hypervisor to offer a perfect isolation and security. As well, the system calls of the applications that run in the primary domain are routed to the adequate service domain. Thanks to this architecture a flaw that is registered at a service domain like a malfunction of a driver does not cause the break of the entire system. The restart of the failed domain does just affect partially the process waiting for replies from it. Other solutions implement the same principle like the domain-0 disaggregation in the new generation of Xen Server called Windsor, Qubes is also an OS containing the same architecture as VirtuOS but it is more mature and even workable in practice.

On the other hand, Docker [6] is considered as a very promising OS virtualization technique that acts at the OS level by abstracting the process execution. Although the containerization is an old technology in the Unix/Linux systems, docker provides a very interesting layer of features like the containers migration from a version of the kernel to another version or the application of resources constraints on the containers, etc. via friendly tools.

The combination of the two virtualization technologies (hardware and OS) by running containers in virtual machines provides better isolation and reliability.

The purpose of our work is to extend the architecture of VirtuOS by making collaborate several heterogeneous kernels considered as domain services. We should apply the principle of the scale cube [5] by splitting the APIs according to the Y axis in small APIs executed in containers as microservices [6] or simply as processes hosting Web Services. These small APIs will be executed on lightweight virtual machines (domain services) based on heterogeneous kernels.

This heterogeneity may engenderer a Meta-Operating System more reliable and efficient in bringing the benefits of heterogeneous kernels. The Meta-Operating System can be seen as an overlay of kernels where the kernel X offers the services of the network via its drivers as well as the implementation of the TCP stack while the kernel Y offers the service of storage for access to files for example.

IMPACT OF FDI ON INDIAN ECONOMY

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Abstract

Purpose: There have been many researches on FDI in India and its impact on Indian economy. Our study's purpose is to examine the impact of FDI on not only Indian growth variables but also on other factors which are human development index and population as well. We wanted to know how much FDI is responsible in the changes of their individual variance.

Design/ Methodology/ Approach: We used a model in which clubbed the FDI factors (foreign exchange reserves, exchange rate, import and export) into one and from it we saw the impact its making on Indian economic variables. In this study we included GDP, HDI, population, inflation and Sensex index as economic variables. we used regression model for our data analysis

Findings: We get to know that there is a considerable impact of FDI on HDI, population and Sensex index. Though there is an impact on import export also but not to that much extent.

Practical implication: This study can help the policy makers as to how much of the total FDI should be invested in which area, where the optimum use of the investments is not happening.

Keywords: Foreign Direct Investment, HDI, Population, Sensex Index, Foreign Exchange Reserves.

I. INTRODUCTION

FDI plays a pivotal role in a country. It provides a boost to working of the economy. Requirement of FDI relies on saving and investment rate of a country and in order to fulfil the gap between investment and saving, FDI plays an important role and acts as a bridge to fulfil the gap between investment and savings (Dwivedi & Kumar, 2017). Domestic saving limitations can be covered through foreign capital during the economic development process and through that it also provides superior and better technology that promotes better efficiency to the existing production capacity and thereby generate new production opportunity. It creates a window of transparency between the nations and hence accelerating bilateral trade among the countries (Hargreaves & Dermott, 1999). In the past two decades, the entire globe has witnessed the growing potential of foreign direct investment. In simple terms FDI means to the net inflows of funds into the home country which in turn leads to economic development (Noorbakhsh et al., 2001). It is a type of investment where the foreign funds are bought into an enterprise which operates in a different nation of origin from the investor. It is an important tool for any economy which acts as a lube for the economy. According to Investopedia, Foreign direct investment (FDI) is an investment which is made by a company or individual in any country in commercial interests into another country. FDI can be of two kinds namely inward foreign direct investment and outward foreign direct investment (Zekarias, Seiko Minota, 2016). As Borusztein, Gregorio, & Lee, 1998, says under the neoclassical growth model approach, FDI encourages economic development by the increase of volume of funds. In the endogenous growth model, FDI uplifts fiscal development by creating technological dispersal from the developed countries to the home country. As condensed in Salisu, et al. (1996), FDI is the combined collection of various technological knowledge, which can elevate the existing reserve of insight in the beneficiary economy through skill attainment, labour training.

There are various methods of FDI which are through setup of new business in the foreign nation, through acquiring of the share of the foreign country and through merger or acquisition of other organization of the foreign nation. Since the last thirty years, foreign direct investment (FDI) has emerged as a popular and important factor in the developing nations (Acharyya, 2009). A type of investment which caters putting of foreign funds into a venture which operates from a different country of origin that from the investor (Cai, 1999). It is an important vehicle for any developing nation as it acts as a lubricant for an economy. This paper studies what impact does FDI has in the host country and also the difficulties in analysing these impacts. Though FDI has both pros and cons but to analyse these scenarios the problems that we face are the cross-cultural diversities and the endogeneity. The impact of FDI on India is derived by using the variables-human capital index, econometric values, time series data, Inflation, Gross domestic product. By usage of these variables, the econometric model can be designed. The second component proceeds towards reviewing the literature on FDI and its effect on the economic growth of India.

II. REVIEW OF LITERATURE

The overall footprint of FDI is immense. With capital base increased in the host economy, the anticipation from FDI is growth increasing through encouraging the inculcation and availability of latest knowledge and technologies in the process of production. According to (Fensira & Markusen, 1994) when talking about the new input, the growth of output effects the usage of a wide types of goods which are transitional in FDI related manufacturing sector. Talking about the technologies, FDI is the main source

Literature Study on Satisfaction Factors of Customers in Construction Industry

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Abstract - Customer satisfaction is decisive for construction field and firms relying on customer's relationship. Measuring the customer satisfaction has several benefits such as for improving communication between parties, evaluation of progress towards goals and enabling of mutual agreement and monitoring results. This paper focuses on analysing the satisfaction factors of customers including all aspects of products and services in the construction projects. In this study factors for customer satisfaction in construction industry are taken from the past literature review. The literature reviews are summarized and various factors related to customer satisfaction in construction industry based on literature review summary.

Keywords— Customer Satisfaction, Factors, Construction

1. INTRODUCTION

Customer satisfaction is an important factor in the phenomenon of the construction process and customer relationship. As Construction Company's increases its antagonism, greater attention continues to be placed on customer relationships and satisfied customers. Customer satisfaction accredits construction companies to differentiate themselves from their competitors and create sustainable advantage. Those who buy the goods or services provided by companies are customers. In other words, a customer is a stakeholder of an organization who provides payment in exchange for the offer provided to him by the organization with the aim of fulfilling a need and to maximize satisfaction. Sometimes the term customer and consumer are confusing. Companies use numerous forms of customer satisfaction accessions in developing and monitoring service offerings in order to manage and improve customer relationships. Measuring customer satisfaction has several benedictions for organization's: Improvement in communication between parties and enable mutual agreement, A recognition of the demand of improvement in the process, Better understanding of the problems, Interpretation of progress towards the goal and Monitoring and reporting accomplished results and change.

Customer satisfaction has become one of the key issues for companies in their efforts to improve quality in the competitive marketplace. It can be seen as either a goal of or a measurement tool in the development of construction quality. The objective of this paper is to examine and deepen the understanding of customer satisfaction factors in the construction projects. The following sections discuss these efforts with a literature review

NEED OF STUDY

The main objective of this study is to identify the factors of customer satisfaction in construction. Customer satisfaction is one of the critical success factors for construction and all companies. Improving quality and customer satisfaction has received extensive attention. Customers want all utility and service and quality from the beginning till the end of the project. It should present a good appearance. Customer need good climate and its effect, customer needs their requirements. Customer also reflected on cost.

II. LITERATURE REVIEW

The literature review is carried out to identify factor of customer satisfaction in construction firms. This is the various research review regarding factors of customer service satisfaction in construction works.

Mana N. Shah, Vireet Raitani, Aditya Oza and Kunal Gupta(2017) "Customer Satisfaction Study Of The Mumbai Metro Service". In this study they investigated about the service quality of the metro service based on the performance leading to customer satisfaction. The survey was conducted and analyzed with SPSS tool. This survey is based on Gap 5 SERVQUAL model and identified the level of satisfaction with their parameters.

Poojia Rashid and Muhd Za'imi Abd Majid (2014) "Critical Criteria on Client and Customer Satisfaction for the Issue of Performance Measurement". The outcome of this paper is to establish the client and customer satisfaction criteria as the two key stakeholders in construction project for the issue of performance measurement based on the reviewed data. The methodology of this study is based on comprehensive literature review of performance measurements for client and customer whereby the data were analyzed, using the metrics which the additive number of each customer and client-satisfaction criteria are occurring in previous study. From the metric analysis, the common factors for customer and client satisfaction were ranked. From the analysis of this paper, it can be concluded that expectation and perception are the two common critical satisfaction criteria for client and customer that must be considered where the satisfaction is required.

Zeljko M. Torbica and Robert C. Stroh(2001) "Customer Satisfaction in Home Building". This study examines the home builder's performance measured by the home buyer's satisfaction. In this paper 16 home builders are participated and 300 valuable inputs are used & model for the customer satisfaction is evaluated.

Natalia Yano and(2015) "Assessment of Satisfaction with the Quality of Education: Customer Satisfaction Index". In this paper, monitoring the opinions of consumers of educational services is an effective tool for management decisions to optimize the educational policy in feedback mode. Consecutive improvement of public assessment measurement tools provides a more accurate and reliable feedback from consumers of educational services.

Risk Management-An Analytical Study

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Abstract: In finance, risk is the probability that an investment's actual return will be different than expected. This includes the possibility of losing some or all of the original investment. A fundamental idea in finance is the relationship between risk and return. The greater the potential return one might seek, the greater the risk that one generally assumes.

Risk management is an activity which integrates recognition of risk, risk assessment, developing strategies to manage it, and mitigation of risk using managerial resources. Some traditional risk managements are focused on risks stemming from physical or legal causes (e.g. natural disasters or fires, accidents, death). Financial risk management, on the other hand, focuses on risks that can be managed using traded financial instruments. Objective of risk management is to reduce different risks related to a pre-selected domain to an acceptable. It may refer to numerous types of threats caused by environment, technology, humans, organizations and politics. The paper describes the different steps in the risk management process which methods are used in the different steps, and provides some examples for risk and safety management.

The financial risk should be minimized by analyzing the capital structure of the company. If the debt equity ratio is higher, the investor should have a sense of caution. Along with the capital structure analysis, he should also take into account of the interest payment. In a boom period, the investor can select a highly levered company but not in a recession.

Keywords: Financial risk management, Investment, Management, Return, Risk

I. INTRODUCTION:

Risk

Risk is the potential of losing something of value, weighed against the potential to gain something of value. Values (such as physical health, social status, emotional well being or financial wealth) can be gained or lost when taking risk resulting from a given action, activity and/or inaction, foreseen or unforeseen. Risk can also be defined as the intentional interaction with uncertainty.

Financial Risk

In finance, risk is the probability that an investment's actual return will be different than expected. This includes the possibility of losing some or all of the original investment. A fundamental idea in finance is the relationship between risk and return. The greater the potential return one might seek, the greater the risk that one generally assumes. A free market reflects this principle in the pricing of an instrument: strong demand for a safer instrument drives its price higher (and its return proportionately lower), while weak demand for a riskier instrument drives its price lower (and its potential return thereby higher). For example, a zero-risk investment, such as a U.S. Treasury security, has a low rate of return, while a stock in a start-up has the potential to make an investor very wealthy, but also the potential to lose one's entire investment. Certainty types of risk are easier to quantify than others. To the extent that risk is quantifiable, it is generally calculated as the standard deviation on an investment's average return.

The possibility that shareholders will lose money when they invest in a company that has debt, if the company's cash flow proves inadequate to meet its financial obligations. When a company uses debt financing, its creditors will be repaid before its shareholders if the company becomes insolvent. Financial risk also refers to the possibility of a corporation or government defaulting on its bonds, which would cause those bondholders to lose money.

II. FINANCIAL RISK MANAGEMENT: A SELECTIVE HISTORY

No discussion of financial risk management is complete without a brief look at financial market history. Although this history is by no means complete, it illustrates events and highlights of the past several hundred years.

Early Markets

Financial derivatives and markets are often considered to be modern developments, but in many cases they are not. The earliest trading involved commodities, since they are very important to human existence. Long

The Study on Factors Affecting Employee Engagement

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Abstract- The Objective of the project was to study the factors affecting Employee Engagement in HDFC bank. The study included understanding the concept, studying the employee engagement policies being followed by the organization, analysing them, taking viewpoints of employees and analysing the feedbacks received and giving recommendations for improvement. Basically Employee Engagement refers to the intellectual and emotional attachment of an employee with the Organization. The organization must work to develop and nurture engagement, which requires a two-way relationship between employer and employee's. There are lot of factors that affect employee engagement. The main theme of the study revolves around those variables. The independent variables considered in this study are work environment, image of the organisation, incentives and pay, supervisor and co-worker relationship, training and development, decision making and policies and procedures. This study is quantitative in nature and data was collected from 82 employees of the organization through the Survey Questionnaire method. The statistical tool used was SPSS software. After studying and analysing the Employee Engagement at HDFC, some improvements are suggested to make the workforce engaged to the maximum level possible.

Keywords: Employee Engagement, work environment, image of the organisation, supervisor and co-worker relation, training and development, decision making

I. INTRODUCTION

In recent times, due to rapid globalization, Indian organisations have realized that their talent is the key to their growth, and the Human Resource is the strategic resource that any enterprise truly needs. As a result, the Human Resource function has made the transition from "behind-the-scenes" support to become a strategic partner in the business. Human Resource has tried to progress from being transactional to strategic where the head of the Human Resource function is now a vital part of the senior management team. Every organization knows the importance of engaging and motivating its people to perform and this has gained more prominence with time. But what is less commonly recognized is that employees want to be engaged in work where they feel that they are contributing in a positive way to something larger than themselves. Over the years, one of the toughest challenges confronting the business leaders of many organizations has been to ensure that when their employees check in everyday, they not only do it physically but also mentally and emotionally. In short, they need to ensure that their employees are truly engaged.

Employee engagement has emerged as a critical driver of business today. It practically affects the employee morale, productivity and reasons for retaining in the company. Organizations are using their engaged employees as a tool of strategic competence. A highly engaged employee will consistently outperform and set new standards. Engaged employees contribute to the foundation line of any business and their engagement is echoed in their services to clients and customers. By so doing, engaged employees are helping to generate more patronage and customers loyalty, which in turn, gives organization a huge profitability.

II. LITERATURE REVIEW

Pooja Koldi and Shubhami Zodge (2016) carried out work on "A study on Employee Engagement of Staff level employees working in Manufacturing Industries". They found that the leadership of senior management engages employees, the majority of employees feel compensation program is well organized for them, Employees feel that suggestions are considered and also queries are looked into.

Brenda Beryl Achieng Otieno, Esther Wangithi Waiganjo & Agnes Njeru (2015) carried out work on "Effect of Employee Engagement on Organization Performance in Kenya's Horticultural Sector". Results indicated if the organization wants to have engaged employees then their personality profile must be given due weightage at the time of recruitment and selection.

Y Anuradha Mahalingam, Kennedy D. Gunawardana Kennedy D (2017) carried out work on "Employee Engagement and Perceived Financial Performance: A Serene Insight". They found that there is no empirical evidence on the relationship between employee engagement and financial performance in the Sri Lankan context.

Anitha J (2017) carried out work on "Determinants of employee engagement and their impact on employee performance". In her work she found that the linkage between engagement and performance is consistent with engagement models, theory, and research.

Karninder Ghuman (2016) carried out work on "A Prognostic Examination of Functional and Emotional Employee Engagement Drivers and their Impact on

Employee Performance" and their study revealed that the feeling of engagement comes the most from effective leadership,

Physico-Chemical Characteristics Of The Coastal Water Off Devi Estuary, Orissa And Evaluation Of Its Seasonal Changes Using Chemometric Techniques

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Abstract

Devi estuary is one of the major tributaries of the Mahanadi riverine system in Orissa. Modernization and industrialization in its neighbourhood in the north in the recent past have greatly influenced many tributaries of the Mahanadi and the adjacent coastal environments. To trace the influence of this modernization activity further down south off Devi estuary and to understand the quality of the Devi estuarine water reaching the coastal region, investigations on physico-chemical parameters (temperature, pH, salinity, dissolved oxygen), including dissolved nutrients ($PO_4\text{-P}$, $NO_3\text{-N}$, $NO_2\text{-N}$, $SiO_2\text{-Si}$) were carried out in the water off the mouth of the Devi estuary, during different months of the summer and winter seasons in 2006-07. The multivariate statistics and principal component analysis applied to the datasets, indicated three factors each during the summer and winter seasons influencing the water to the extent of 77 and 80% respectively. Principal axis factoring and alpha factoring have been used to observe the mode of association of parameters and their interrelationships, for evaluating water quality during the summer and winter seasons. The results indicated the addition of phosphates and silicates to the coastal water by the Devi estuary from natural sources during both the seasons. The anthropogenic nitrogenous species, as a fallout from modernization activities in the north, are more clearly observed off the mouth of the Devi estuary during the winter season. The study indicated that the Devi estuary adds sufficiently well-oxygenated, nutrient-rich water to the coastal region.

Keywords: Coastal environment, multivariate statistics, physico-chemical parameters, principal component analysis, seasonality.

1. INTRODUCTION:

RIVERS are the main inland water resources for domestic, industrial and irrigation purposes and often carry large municipal sewage, industrial waste water discharges and seasonal run-off from agricultural land to the coastal region. It is for this reason that the river water is mostly enriched in nutrients compared to other environments¹. The spatial heterogeneity within the river, however, is due to existing local environmental conditions such as light, temperature, water discharge and flow velocity that change with time, and differences in the local channel form². Contrary to this, the coastal environments are highly economical, important and are significantly involved in the transport of terrestrial organic matter and associated nutrient elements to the sea for their biogeochemical cycling. The balance in the concentrations of bio-geogenic elements in coastal water reflects the healthy status of water, while their excess supply as observed in the continental shelf and upwelling areas has been found to trigger high primary productivity^{3,4}. The complex dynamism in physico-chemical characteristics of coastal waters is related to riverine flow, upwelling, atmospheric deposition, vertical mixing and other anthropogenic sources.

The coastal Bay of Bengal is a unique marine environment in the tropical belt with marked continental influence due to the drainage by a large number of rivers. One such riverine system is the Mahanadi river in Orissa, which is the third largest river in India. The three major urban settlements such as Cuttack, Sambalpur and Paradeep along the banks of this river have resulted in a large amount of untreated domestic waste and effluents from fertilizer, paper, textile distilleries and many other industries in Orissa⁵. The Mahanadi river divides into many branches and one of its main branches is the Devi river, which meets the Bay of Bengal at Nuagarh. Due to various anthropogenic influences in the Mahanadi river basin, large amounts of contaminants arising from nutrients and other parameters have been observed in many of its tributaries and the adjacent coastal region¹. Apart from this, the naturally occurring cyclones along the Orissa coast, which give rise to severe floods, also affect the water quality and productivity of the waters off the Orissa coast. There is hardly any information available on the water quality characteristics of the Devi river compared to other estuaries along the east coast. It is important to know the additions to the coastal water from the Devi estuary because it is well-known place for the congregation of Olive ridley turtles during their arribada. In view of this, physico-chemical studies were carried out at selected locations in the coastal region off the mouth of the Devi estuary (Figure 1) in the summer and winter seasons of 2006-07 to assess the water quality of the region and to understand its input to the coastal water. The present study also aims to find out the seasonal variations in physico-chemical parameters of the coastal water off the mouth of the Devi estuary and the anthropogenic influence.

Status Of Ground Water Quality Over The Years In Cuttack City, Odisha, India

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ABSTRACT

A study was carried out to assess the quality of ground water in Cuttack city. It was found that most of the parameters were below permissible limit. Kalyani nagar area and Khapuria industrial area were found to be more polluted. The ground water of the study area was safe with respect to TC, FC as none of the locations were above the WHO limit in any seasons. From correlation coefficient it has been observed that TH, Conductivity, Cl⁻, TDS have strong correlation with each other. Iron is negatively correlated with TH and F is negatively correlated with pH.

Key words: Ground water, Pollution, Physico-chemical parameters

1. INTRODUCTION

Pollution of ground water has been reported for a number of cities throughout the world. Dependence on ground water resources for municipal supply is growing due to paucity and pollution of surface water bodies. Cuttack, the erstwhile state capital of Odisha and is a traditional Indian town organically developed over the time. The huge population of this area use ground water for drinking and other purposes. A number of dug and tube wells have been constructed to meet the short supply of municipality. So it is essential to have a study of ground water quality as it is being polluted. MSW (Municipality Solid Waste) is heterogeneous in nature and contains paper, plastic, reg. metal, glass pieces, ash, composite matter, dead animals, discarded chemicals, paints, hazardous hospital waste and agricultural residues. Presently most of the MSW in Cuttack city is being disposed unscientifically like other cities of India. Generally MSW is collected and deposited in sanitary landfills. During land filling of solid waste continuous pressure results in the quizzing of a contaminated liquid as leachate which contains dissolved, suspended and microbial contaminants from solid waste. The leachate has high organic contents, soluble salts and other constituents capable of polluting ground water. This polluted ground water is unfit for drinking and causes jaundice, nausea, asthma and infertility.

The quality of ground water of this area still remains largely uncharted and a possibility of severe contamination looms large. Keeping this in view a systematic study on the groundwater quality was carried out over a period of two years from January 2009 to December 2010, which include various Physico-Chemical and microbiological parameters.

Description of study area

Cuttack having latitude of 20°29' to 20°26'N and longitude of 85°48' to 85°56' E. River Mahanadi and its major distributaries Kharajodi surrounds the city in north and south boundaries and the city is situated on a doab land. Low lying areas are available centrally. The ground height of the study area varies from 19 to 20 m on the north. The soil beneath the city is composed of unconsolidated alluvium in alternating sequence of sand, silt, and clay, the depth of which continues up to 120m and is placed above Gondwanaland sedimentary rock of Archean crystallines (Mahallik, 1992). The depth of water table changes with monsoon, going down to 4-6 m during pre monsoon and rises to 0 to 3m during monsoon and post monsoon period, (CGWD,1995). Within a depth of 90 meters besides the water tables two confined aquifers could be identified which are lined by impervious clay minerals. The first confined aquifer lies at a depth of 30 meters with thickness varying from 15 to 40 meters separated from the second confined aquifer by a clay bed of 15 to 20 meters thickness. There is a possibility of third confined aquifer below the clay layer overlying the Gondwana basement (Mahallik, 1992)

II. EXPERIMENTAL SECTION

To have a thorough idea regarding ground water quality of Cuttack seven different locations were chosen. The locations were chosen keeping in mind that all the areas of Cuttack can be covered properly. The detailed locations of sampling points are described in table-01. From each location a particular tube well was chosen and grab sampling was done quarterly from that particular tube well. The samples were collected in plastic and glass bottles as per requirement. Using these samples different physical, chemical and microbiological parameters such as pH, turbidity, conductivity, total hardness, chloride, total dissolved solids, iron, fluoride, TC, FC were studied. All chemical reagents used were of analytical reagent grade. After sample collection and under

Studies on Ground Water Pollution due to Iron Content in Bhubaneswar, Odisha, India

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Abstract

A study has been carried out in Bhubaneswar city, Odisha, India, to ascertain the causes for the origin and distribution of iron content in the ground waters. Ground water samples were collected quarterly for two consecutive years and analyzed for iron content. The iron content ranges from 0.32 to 7.7 mg/l. A comparison of ground water data with rock and soil chemistry suggests that the concentration of iron in the ground water is derived from the rock and soils due to geogenic processes. This concentration is taken as a natural occurrence of iron in the groundwater of the study area for assessing the causes for its next higher content. Relatively higher concentration of iron is observed in some samples where the wells are located nearby municipality waste waters indicating the impact of anthropogenic activities on the ground water system. These activities mask the concentration of iron caused by geogenic origin. Hence, both the geogenic and anthropogenic activities degrade the ground water quality. Drinking water standards indicate that the iron content in all the ground water samples exceeds the permissible limit (0.3 mg/l) recommended for drinking purpose causing the health disorders. Necessity of close monitoring of ground water quality for assessing the impact of geogenic and anthropogenic sources with reference to land use and land cover activities is emphasized on the present study area to protect the ground water resources from the pollution.

Keywords: Ground Water Pollution, Iron Content etc.

1. INTRODUCTION

Urban growth and rapid increase in population have induced tremendous pressure on natural resources. A common factor to most urbanization is that it results in impermeabilisation of a significant proportion of land surface and contamination of ground water. On the other hand concern about the degradation of water quality is now widespread among the public as the water is of utmost physiological importance in the human body. About 80% of the diseases of the world population and more than one-third of the deaths in the developing countries are due to contamination of water (WHO 1984; Earth summit 1992). Trace elements are essential for human health. However excess concentration of these elements cause health disorder. Man can control some undesirable chemical constituents in water before it enters into ground water. But once the water enters ground man's control over the chemical quality of percolation water is very limited (Johnson 1979). Hence the understanding of the processes that controls the water quality is needed before one can speak about water quality and improvement (Hem 1991; Rao et al 2006).

II. LITERATURE WORK

Groundwater composition in a region depends on the natural (such as wet and dry deposition of atmospheric salts, evaporation, soil/rock-water interaction) and anthropogenic processes, which can alter or modify the natural system of hydrological cycle (SudhaRao 2002 2006). Zuane (1990) has stated that the type and extent of chemical contamination of the ground water is largely dependent on the geochemistry of the soil through which the water flow prior to reaching the aquifers. Romie and Romie (2003) have pointed out that iron in the ground waters is mainly derived from geogenic (pedogenic) process in the urban area. Rajmohan and Elango (2005) have stated that the distribution of iron content in the ground water is due to lithogenic and non lithogenic sources in Palar and Cheyyar river basin, Tamilnadu, India. Ramesh et al (1995) have explained the unequal distribution of major and trace elements in the ground water because of anthropogenic activities such as sewage waste, industrial effluents etc. and improper management of natural resources in Madras City, Tamilnadu, India. Raju (2006) describes the iron contamination in the ground waters caused by dissolution of rocks and ferruginous minerals, iron related smelting processes and seepage of domestic sewage effluents in Tirumala-Tirupathi environs, Andhra Pradesh, India. Eswari and Ramani (2000) have estimated the seasonal variation of iron in the waters of Chennai, Tamilnadu, India.

Most of the population in Bhubaneswar, a rapidly growing urban area in east India depends upon the ground water resources for drinking purposes due to scarcity of surface water supply. Hence the present paper deals with the causes for the origin and distribution of iron content in the ground waters as the iron plays a significant role on human health among the trace elements. A deficiency of iron causes anemic, while an excess of iron develops undesirable taste and gastrointestinal irritation. Moreover, it stains the cloths, teeth, gum and utensils, promotes the growth of bacteria and reduces the water life. Abnormal content of iron leads to cancer (Micozzi).

The capital city of Odisha- Bhubaneswar is located between 20°12'N and 20°25'N latitude and 85°44'E to 85°55'E longitude on the western edge of coastal plain across the main axis of Eastern Ghats in Khurda district of Odisha. The city has witnessed a dramatic change in growth of population. The city designed for a population of 40,000 in 1954 with an area of 16847a has grown to many 837737 (2011) which is expected to increase to 16,87,087 by 2031. The present city

Development of Energy Storage Systems for Power Network Reliability: A Review

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Abstract: Electricity plays a crucial role in the well-being of humans and is a determining factor of the economic development of a country. Electricity issues have encouraged researchers to focus on improving power availability and quality along with reliability. This pursuit has increasingly raised the intention to integrate renewable energy (RE) into power systems to curb the problem of energy deficiency. However, intermittency in the sources of RE supply coupled with fluctuating changes in demand with respect to time has induced high risk in maintaining system reliability in terms of providing adequate supply to consumers. Whilst an energy storage system (ESS) is not another source of electricity, it is proven to be effective and viable in solving the aforementioned issues. Thus, this paper comprehensively reviews the development of ESS technologies and discusses the benefits and real-life applications of these technologies. The concept of reliability in power systems is also explored to provide an improved understanding of this study. Lastly, notable studies that have addressed the reliability impact of ESSs on power systems are discussed. This review paper therefore is expected to provide a critical analysis of ESS developments, as well as recognize their research gaps and areas of reliability studies in modern RE-integrated power networks.

Keywords: energy storage system; power system reliability; renewable energy; smart grid

1. Introduction

Sustainable Development is currently a crucial issue globally. The most common and simplest definition of sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [1]. There are many factors that can contribute to achieving sustainable development. One of them is to be able to supply energy sources that are fully sustainable [2]. A secure supply is a necessity; however, it also must comply with other considerations to achieve sustainable development. Energy is expected to be readily available all the time, at reasonable costs, and without causing negative societal impacts [3].

Conventional energy sources based on oil, coal, and natural gas have contributed the most towards the development we have achieved today. However, excessive use of these sources is causing depletion of these reserves, as well as damaging the environment and humans' health [4]. These so-called "dirty sources" are facing increasing pressure from environmental advocates, becoming targets of Kyoto Protocol greenhouse gas reduction. The challenges in meeting energy demand whilst limiting greenhouse gases have prompted the idea of integrating renewable energy (RE) sources into power systems. RE has been recognised in tackling issues such as energy access and energy security.

Many initiatives have been undertaken especially in developing countries to improve accessibility, with the help of stand-alone RE generation to meet the demand of rural communities in a cheaper and cleaner way [5]. Energy security, on the other hand, refers to secured supply of energy without compromising any disruptions. Since the majority of power generation comes from fossil fuel, energy security is harmed by price volatility [6]. Local RE options can mitigate this problem by diversifying supply options and reducing dependency on imported energy [7].

Whilst RE sources are offering such great benefits, these inexhaustible sources are also characterised by fluctuating generated power output. Therefore, high penetration of RE sources into power grids may risk power system stability due to their intermittency in nature. Power oscillations due to intermittency may also cause rapid voltage fluctuations, which can damage the equipment [7]. Energy storage systems (ESSs) can contribute to improving system reliability whilst optimally maintaining sensible operational costs in the aforementioned cases. ESSs can mitigate power variations and functions as storage for flexible dispatch of RE.

Following the definition obtained from [8,9], ESSs enable the method of converting electrical energy from power generation into a form that can be stored for utilising the energy when needed. Therefore, the ESS will dispatch its stored energy during low energy production of RE, and will help store excess energy when power production is high. Apart from supporting this type of generation, ESSs can also mitigate some issues in the conventional generation sector, such as peak shaving and energy arbitrage [10,11]. In other words, an ESS is a flexible power electronic device that supports the grid in providing a constant supply whilst satisfying power quality and reliability [12,13].

In the electrical industry, power outage is the main concern because consumers are expecting a continuous and steady supply throughout the year. This steady supply is termed as "reliability", which is further defined as the capability of a power system to provide adequate output to consumers, as discussed in [14]. Approaches to measuring the reliability of a power system are available at different levels, namely, generation, composite generation, and distribution. Reliability evaluation provides utility in decision-making and future planning for the best optimisation solution.

Calculating Voltage Magnitudes And Voltage Phase Angles Of Real-Electrical-Networks Using Artificial-Intelligence Techniques-

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ABSTRACT

[REDACTED]

Keywords:

[REDACTED]

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1. INTRODUCTION

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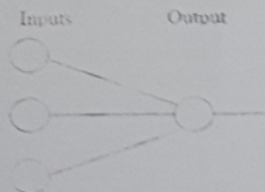
2. BIBLIOGRAPHIC STUDIES

Power flow study

[REDACTED]

Artificial neural networks

[REDACTED]



[REDACTED]

Artificial neural network structure

[REDACTED]

The feed forward neural network

[REDACTED]

Adaptive neuro-fuzzy inference system

[REDACTED]

Adaptive neuro-fuzzy inference systems structure

[REDACTED]

ANFIS's learning process

[REDACTED]

Conclusion

CONCRETE FOR SUSTAINABLE CONSTRUCTION

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Abstract

Modern concrete consists of a family of materials and designed concrete mixes are used for different engineering applications under service loading and environmental conditions. Its success is due to many reasons including versatility, adaptability, formability and economy. However, sustainability of concrete construction industry is of concern, considering: use of natural materials, energy and manpower, emission of carbon dioxide; and durability failure in concrete structures. Since waste materials and by-products from other industries can be used in the production of concrete mixes, concrete industry is beneficial to the environment. This paper discusses the environmental impacts of concrete production and usage and addresses the approaches to minimize these negative environmental impacts. The roles of concrete specifications and initiatives in Singapore towards achieving sustainable concrete construction are discussed. Finally, current research trends are briefly highlighted.

1. INTRODUCTION

From ancient times, buildings and civil engineering structures shaped our nations and projected their prosperity. Construction industry provides built infrastructure needed for socio-economic development which has positive impact on the quality of life. It provides employment opportunities to millions of workers around the world. Several countries, including Australia and Singapore, had continued with their infrastructure construction projects during the uncertain financial climate and produced positive economical growth. China and India, the most populous nations of the world, are showing outstanding economic growth and spending substantial capital in developing their infrastructures. The growth rate for the construction industry in India is expected to exceed the overall GDP growth in the next few years.

Concrete, a proven building material over hundreds of years, continues to enjoy the status as the most popular and cost-effective construction material. It can be economically produced to meet the performance requirements from locally available component materials. Research and development efforts on concrete technology over the last decades have resulted in improved quality of concrete produced. The existing concrete technology knowledge is allowing the concrete plants to produce high-performance economical concrete mixes with respect to its workability, stability, strength, stiffness and durability. It can be pumped to greater length and heights. The modern concrete is a high-tech complex material consisting of a family of materials, having many types of binder materials, aggregates, admixtures, fibres and others.

This paper discusses the environmental impacts of concrete production and usage and addresses the approaches to minimize these negative environmental impacts. The roles of concrete specifications and initiatives in Singapore towards achieving sustainable concrete construction are discussed. Finally, current research trends are briefly highlighted.

2. SUSTAINABLE CONSTRUCTION

The concept of sustainable construction can be defined as an approach to construction which promotes to attain goals associated with the process oriented "pillars" (Hill and Bowen, 1977).

- Economic sustainability: increasing profitability through efficient use of materials, energy and labour.
- Environmental sustainability: minimizing environmental impact by effective use of natural resources, minimizing waste and utilizing recycled materials.
- Social sustainability: meeting the peoples' needs at all stages of construction, providing high customer satisfaction and working closely with clients, suppliers, employees and local communities.
- Technical sustainability: responding the availability of materials, technology, education and training, and manpower to enable construction and maintaining the built infrastructure.

Therefore, sustainable construction had several objectives: (a) promoting resource-efficient building designs with prolonged service life and minimum maintenance; (b) minimizing environmental impact by minimizing the use of energy and natural resources; and (c) reducing the manpower requirement.

3. CONCRETE SUSTAINABILITY AND BINDERS

Portland cement, the most remarkable binding material in concrete, is invented by Joseph Aspdin in 1824. The popularity of concrete as a material for the construction of civil engineering structures, is mainly due to its ease of production, mouldability and low maintenance. It is easily produced from locally available ingredients, namely cement, aggregates and water, with minimum effort and experience. Over a period of time, through the research and

Assessment of Sustainable Product Development Tools and Methods

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Abstract Systematic consideration of environmental aspects within the early stages of product development (PD) can be considered highly significant in order for the overall environmental performance of the product to be improved. Many methods and tools have been developed aiming to enable this consideration and provide the properties that need to be considered and improved. This article provides an overview of some well-known and more applicable tools and methods that have been developed and are available today. The identified tools are generally classified in two groups: Guidelines and Analytical tools. The limitations and barriers of current tools are assessed and categorized and two areas for future work are proposed in order to address current limitations in the existing literature.

Keywords: Sustainability, Product development, Product life cycle, Triple bottom line (TBL), Sustainable product development, Environmental impacts.

1. INTRODUCTION

These days, people recognize that besides profits, there are other elements in the long-term success of companies and economies that are important to consider. Issues such as the future of generations to come and the future of the planet are gaining more significance. These concerns are measured as the triple bottom line (TBL), which stands for people, profit and the planet [1, 2, 3].

The growth of industrial products is dramatic and should be considered in the implementation of TBL. Product development (PD), as the first step of creating a product, has a great influence on its sustainability as by the end of the PD process, the sustainability attributes of the product are largely fixed. Early decisions in PD can have a significant or even dominant impact on the sustainability of product realization [4]. Therefore, adding sustainability to PD is increasingly becoming an important issue for companies [5]. Considering the environmental aspects of a product, PD becomes sustainable PD. Sustainable PD focuses on reducing or eliminating environmental impacts over a product life cycle by incorporating environmental considerations into product design. In many cases when environmental aspects are integrated into PD, it leads to synergies with other business interests such as image improvement, new market opportunities and very often, cost reductions. Indeed, many organizations have faced economic benefits when environmental considerations were considered in the design process [6, 2]. Numbers of methods and tools have been developed to assist in integrating environmental aspects into the PD process.

This research assesses current tools and methods for sustainable product development in order to discover barriers and limitations of them. Sustainable PD is defined and the importance of life cycle thinking is highlighted. The ways to improve current tools and methods are considered and appropriate solutions are checked to be recommended as future works. The major reasons for poor application of current tools are recognized and two ways for development are introduced. The literature review on which we report here is based on 160 articles in the field of sustainable design, sustainable product design, sustainable PD and sustainable tools and methods for PD. Publications were selected through searching various journals from the engineering, management, and policy studies disciplines. It should be mentioned that the number of publications that exist is large and consequently it was not possible to analyze all articles or books. Thus a screening process of the available material was needed in order to select the publications that should be considered for the study.

Leadership: A Comprehensive Review of Literature, Research and Theoretical Framework

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Abstract

This paper provides a comprehensive literature review on the research and theoretical framework of leadership. The author illuminates the historical foundation of leadership theories and then clarifies modern leadership approaches. After a brief introduction on leadership and its definition, the paper mentions the trait theories, summarizes the still predominant behavioral approaches, gives insights about the contingency theories and finally touches the latest contemporary leadership theories. The overall aim of the paper is to give a brief understanding of how effective leadership can be achieved throughout the organization by exploring many different theories of leadership, and to present leadership as a basic way of achieving individual and organizational goals. The paper is hoped to be an important resource for the academics and researchers who would like to study on the leadership field.

Keywords: Behavioral Approach, Contemporary Theories, Contingency Theories, Leadership, Servant Leadership, Trait Theories, Transactional Leadership, Transformational Leadership

1. INTRODUCTION

In order to attain organizational effectiveness, organizations have shifted away from the use of hierarchical structures and individualized jobs, and implemented team-based work structures. This implementation has increased the importance of individual initiative and cooperation (Le Pine, Erez, & Johnson, 2002). Therefore, in today's complex business world, one of the major concerns of organizations is motivating employees for initiative and cooperation in order to attain effective organizational functioning (Le Pine et al., 2002).

The concept of leadership has evolved and developed due to numerous organizational and environmental changes (Alonderiene & Majauskaite, 2016). Several studies have been carried out to assess the effect of leadership on the performance of organizations and how organizational variables such as culture, employee effectiveness, satisfaction, performance, retention, and motivation are influenced by various leadership styles (Shaw & Newton, 2014; Siddique, Aslam, Khan, & Fatima, 2011; Yang, 2014; Yang & Islam, 2012).

The literature is very rich with theories about leadership in general. It has been a major topic of research in psychology, which has spawned thousands of empirical and conceptual studies (Zaccaro & Klimoski, 2001). According to Yukl's (1989) study, most leadership researches suggest that leadership is an important determinant of organizational effectiveness. Leaders can significantly affect individual, group, and organizational performance (Ilies, Nahrgang, & Morgeson, 2007). Effective leaders influence individuals and groups so that they are willing to perform beyond the minimum levels required by the organization (Ilies et al., 2007; Podsakoff, MacKenzie, Moorman, & Fetter, 1990).

This paper aims to give a brief and clear understanding of leadership and theories of leadership in order to form the most effective leadership type.

2. DEFINITION OF LEADERSHIP

Leadership is mostly defined as the process of influencing a group toward the achievement of goals and directing the organization to make it more cohesive and coherent (Bass, 1997). A leader carries out such a process by applying his/her leadership qualities, such as values, beliefs, character, knowledge, skills, ethics, experience, and culture. Leaders inspire people, move them to action and change the world. Leadership is a social process that is highly complex.

Business Ethics and Crisis Management: Circumstances for a Second Chance

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Abstract: Discourse regarding ethics and corporate responsibility arose in the last years linked with an increasing number of accounting fraud scandals. The recent financial crisis has had a lasting negative influence on corporate profits. Companies have had to satisfy the interests of several stakeholders, such as its employees, banks, customers and the community, and at the same time successfully manage the consequences of the crisis. An empirical qualitative study which was conducted in Austria in 2008 is presented in this paper aimed at investigating business ethics and crisis-management. The stakeholder theory will be used as a reference framework. This paper concludes with lessons that can be learned and political recommendations and policies put forth to grant failed businesses a second chance.

Keywords: corporate responsibility, corporate restructuring, enterprise crisis, bankruptcy

1. INTRODUCTION

In the past 50 years, an increasing number of fraud cases and accounting scandals is linked to fierce discourse with respect to ethics and corporate accountability. Business ethics has likewise become a current research subject in science (Homan/Lütge, 2005; VHB, 2008). Discussions concerning corporate responsibility can be examined from different standpoints such as theological, philosophical or economical perspectives, and moreover it is examined in diverse cultural contexts, for instance in the USA and Europe.

Business ethics and social responsibility of companies are both issues of great significance; especially linked to global competition (Enderle, 2005) in combination with increased instability of companies (Kantner, 2009). The recent financial crisis has had a lasting negative impact on corporate profits. Companies must satisfy the interests of several stakeholders, such as employees, banks, customers and the community, and at the same time strive to successfully contend with the consequences of the crisis.

The European community is concurrently working to provide legal conditions for corporate restructuring for failed or at-risk corporations with the aim of sustaining these improvements for all corporations and business people confronted with crisis management (European Commission, 2003, 2007).

The purpose of this article is to define ethical principles of corporate restructuring and concentrate on the stakeholder's interests to ensure that only conscientious entrepreneurs can be afforded a second chance. These concepts are presented in the following thesis:

- Entrepreneurs are in need of external consulting services during the restructuring of their company. Their personal state of affairs is more important than the interests of the external stakeholders. If the entrepreneur's morality wanes, fraudulent behavior may result.
- The legal structure has to be made more flexible and the authorities must gain more influence to relax the preconditions determined for facilitating a "second chance".

2. STAKEHOLDER THEORY AS A REFERENCE FRAMEWORK

Evolution of the Stakeholder Theory

The stakeholder theory is based both on the behavioral theory, and the theory of coalition (Cyert/March, 1964). According to these concepts, the company is a coalition of different organizational entities and the company is seen as a coalition of diverse people with wide-ranging interests who the company depends on to exist. The main task of the company is to persuade the coalition partners to support the cooperation. A coalition is a group characterized by a clash of parties with different goals and trade-offs. Freeman (1984) developed the theory of coalition into a comprehensive concept of strategy in stakeholder management. In this original sense, the stakeholder theory is a management theory model which

Effective Employee Engagement and Organizational Success: A Case Study

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Abstract

Employee engagement as an "engine" in talent management drive draws its resilience from the effectiveness of various environmental factors from within and outside an organization. Strategic employee engagement initiatives support organizational branding and reputation among employees. This paper explores the strengths and weaknesses of employee engagement strategies implemented by a telecommunications organization in Ghana. Quantitative research approach was adopted with 137 completed responses. The findings reveal that the engagement strategies deployed by the organization has achieved level of satisfactory. However there are areas of improvement that can be established to integrate the talent management with overall organizational corporate strategies.

Keywords: employee engagement, talent management, organizational success, corporate strategies, environmental factors

1. INTRODUCTION

The last two decades have witnessed the phase of transition from 'satisfied' employees to 'committed' employees (Carter et al, 2007; Buckingham and Coffman, 1999) who are not predisposed to attrition, rather immersed in the goal and success of their organization and often serve as the force behind organizational success.

Though to most executives the concept of success is infused with brand equity, percentage of market share, and more critically increase in revenue. Yet, the true impetus behind all these attributes of business success comes from the employees. They are the success catalysts that make the competitive firms and their absence could create a vacuum through which history making organizations sink into obscurity. For instance, Tower Watson studied 100 firms over a period of one year and this was what they found: organizations with high employee engagement had 19 percent increase in operating income and about 28 percent earnings per share (EPS) growth. Conversely, those with low employee engagement levels experienced more than 32 percent drop in operating income and 11 percent decline in EPS (McConnell, 2011). Additionally, Well Fargo Company found in a research study to ascertain internal drivers to business outcomes a correlation between high employee engagement scores and business productivity. This leads to chain of positive effects that gets customer satisfaction involved in the equation (Tett, and Meyer, 1993)). However, much more intriguing findings on the subject is the recent extensive study conducted by Harvard Business Review (HBR) which indicated that employee engagement is becoming the center of attraction among senior executive thereby describing 2010 as year of employees. Based on the data gathered all over the world from top firms, HBR realized that 70% of people are of the opinion that effective employee engagement is critical to the success of every organization. The HBR among other things discovered that a highly engaged workforce inevitably result

Antecedents and Consequences of Organizational Commitment

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Abstract

Despite the increasing attention of organizational commitment in the management literature, most studies predominantly focus on full-time workers in traditional work settings. The results of this study highlight important directions for implementing strategies to increase casual academic's organizational commitment. Organizational commitment is important because it is known association with other important organizational variables such as turnover, absenteeism and work effort. This study provides the first step in better understanding the factors that affect the organizational commitment.

Keywords : Organizational commitment, turnover, absenteeism , work effort

1. INTRODUCTION

Corporate collapses of past decade have affected all stakeholders through a loss of public confidence, loss of jobs and loss of shareholders' funds. We have seen poor business decisions, extravagant business acquisitions, lack of attention to detail, exorbitant directors fees, lack of board scrutiny and inadequate disclosure. Internationally improved corporate governance is increasingly being seen as the answer to these problems as 'every one of the mechanisms set up to provide checks and balances failed at the same time' (Monks and Minow, 2004:1). Internationally, legislative control has been strengthened with the Sarbanes-Oxley Act 2002 (USA) and the Corporations Act 2006 (UK), alongside voluntary guidelines such as the Australian Stock Exchange (ASX) Corporate Governance Council's Principles of Good Corporate Governance and Best Practice Recommendation (Australia), in an endeavour to reduce risk to shareholders, employees, communities, government, suppliers and customers. Notwithstanding that many factors contribute to organizational success alongside effective governance, human resource (HR) is a key factor. As Young (2002 (cited in Duffley and Brookmire, 2005:39) observed that an organization must have strengths in four areas: financial capital, technological capital, human capital, and sociospiritual capital to be healthy and productive, and added that in Enron's case despite their Code of Ethics, the human resource, that is, its leaders lacked ethical leadership and personal integrity causing an ethical deficit. But even so, the incorporation of human resources into governance structures is problematic (Young and Ahyil, 2007a). Its position varies due to the different paradigms that decision makers such as boards of directors and management operate from. For instance those who do not place a high emphasis on human resources within governance often view HR from a functional and transactional approach through the lens of cost and policies; others view labour from an employment relationship or industrial relations' perspective often through an adversarial lens; others see human resources practices as simply a function of the legal and regulatory environment; and others, more broadly, see labour as a key stakeholder and thus integrate employees into organizational purpose, strategy and decision-making structures. Evidence of such approaches can be seen when looking at the variety of definitions of Governance, each emphasizing different components and each with different objectives. For instance, Monks and Minow (2004:2) focus on structure in defining governance as, 'the structure that is intended to make sure the right questions get asked and that checks and balances are in place to make sure that the answers reflect what is best for the creation of long-term, sustainable value. When that structure gets subverted it becomes too easy to succumb to the temptation to engage in self-dealing'. Healy (2003:10), in prioritising shareholders, defines governance as 'the corporate values and control mechanisms which ensure that the business is behaviour in the interests of its shareholders'. In contrast, Gospel and Pendleton (2003:560) refer to three main sets of factors in Corporate,

2. ORGANIZATIONAL COMMITMENT

Intense international competition fuelled by globalization has prompted a number of changes in the way work is organized and the way people are deployed. One significant area of workplace change is the increased use of flexible employment practices, particularly the increased use of temporary/casual workers in organizations. Improved efficiency and productivity were the anticipated outcomes of implementing flexible employment practices (Hartman and Bambacas, 2000). A number of researchers, however, have raised concerns about the level of employee loyalty and commitment that can be expected in an environment of less secure and shorter term employment contracts (e.g. McClurg, 1999; Hartman and Bambacas, 2000; Gallagher and Sverke, 2005). Organizational commitment in this context remains important because of its potential effect on employees' identification with the organization's goals, the desire to contribute, particularly in the area of work, has been analysed from several perspectives (Martin and J. C. Wright, 1984; Morrow, 1983; Mowday et al., 1982). It has served as both a dependent

The In-Situ Synthesis Of Tic In Cu Melts Based On Ti-C-Si System And Its Mechanism

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Abstract:

Introduction of carbon into metal melts, especially those with limited carbon solubility, for composites preparation by casting method is very difficult due to the poor wettability between carbon and melts. In this work, carbon in various forms has been effectively introduced into Cu melts and TiC has been in-situ synthesized based on Ti-C-Si system, and its mechanism has been investigated. It is found that, after the addition of TiC mixture into Cu melts, carbon can be wetted by Cu through TiC reaction. However, because of the TiC interconnected network formation, the mixture tends to become the block which cannot be dispersed into the melts. Using Ti-C-Si instead of TiC system is an effective way to wet carbon and in-situ synthesize TiC while prevent the formation of TiC network. It is considered that Si changes the reaction pathway of the system. The Ti₃Si₂ which is prior to be formed in Ti-C-Si system can prevent the following formed TiC from interconnecting and its subsequently dissolution due to TiC formation can further help the products to distribute more uniformly in Cu melts.

1. INTRODUCTION

Carbon in different forms, including the elemental carbon and carbides, has been widely used in metal matrix composites fabrication [1-11]. For instance, grey cast iron which has been used for many years is actually a kind of graphite-containing composite [3]. Due to its high thermal conductivity and hardness, diamond has been used to pre-pare metal matrix composites applied in thermal management applications, such as microelectronics, optoelectronics and power electronics, etc. [4,5]. CNTs and graphene have been used to prepare metal matrix composites, which exhibit both excellent mechanical properties and good electrical as well as thermal conductivity [6-8]. Carbides, such as TiC, SiC and B₄C, are also commonly used to prepare various metal matrix composites [9-11].

Accordingly, many methods have been developed for preparing the elemental carbon or carbides reinforced metal matrix composites (CRMMCs), i.e. self-propagating high temperature synthesis (SHS), powder metallurgy technique, spraying process, spark plasma sintering, pressurized liquid-metal infiltration, pressureless infiltration, and so forth [12-16]. Apart from the methods mentioned above, casting is promising due to the processing conditions have extensive choices and suitable for many materials [17-19]. However, in general, it is difficult to apply casting method to prepare CRMMCs, especially those with limited carbon solubility, such as Cu, Al and Mg. The root cause is that the elemental carbon and carbides usually show poor wettability [20-25], which severely hinders their effective introduction into the melts. For example, previous works have confirmed that the molten Cu does not wet the carbon as the contact angle is approximately 140° [20,21]; it has been reported that the wettability between carbon and liquid Al is also poor at temperature close to the Al melting point [24,25]. Accordingly, extra treatments, such as violent stirring and pre-treatment of the carbon sources, are usually required to introduce carbon into metal melts during casting processes, and even if the carbon are finally added, because of the poor wettability, the C-containing reinforced phases are difficult to uniformly disperse and tend to agglomerate, or form an unsatisfactory bond with the matrix, which will seriously deteriorate the mechanical properties [26-32].

It can be seen that the key point for introducing carbon into the melts to prepare CRMMCs with uniform distribution of reinforced phases and strong interfaces is to improve the wettability. Reactive wetting which is realized by the reaction between some elements in the system and the reinforced phase is very effective and has been investigated extensively [33-40]. The beneficial effects of reactive wettability have been considered to be two reasons: the reduction of interface energy caused by the negative free energy of the reaction, and the formation of a reaction product at the interface [40-42]. Although it is debatable which one is dominant or both of them work, in practice, the effectiveness of reactive wetting has been verified in a variety of systems, including the metal-carbon systems, such as Cu-Ti-C, Cu-Cr-C, Al-Ti-C, Al-Si-C and so on [43-48]. Therefore, it is reasonable that the reactive wetting can be used to introduce carbon into metal melts and then realize the

A Brief Review On Inorganic Nanoparticles

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ABSTRACT

For the past few years, there has been significant research in the area of nanotechnology using nanoparticles. In the field of modern material science, inorganic nanoparticles are emerging as novel drug delivery system due to their unique physical properties that make them size dependent optical, magnetic, electronic, and catalytic properties. These nanoparticles possess high stability, large surface area, tunable compositions, abundant physicochemical multifunctionality and specific biological behaviors. Biocompatible inorganic material-based nano systems provide a novel choice to surmount effectively the intrinsic drawbacks of traditional organic materials in biomedical applications, especially in overcoming the multidrug resistance. The aim of this article is to review the types, synthesis methods and characterization techniques related to inorganic nanoparticles.

Keywords: Carbon nanotube, Characterization, Fullerene, Gold, Iron, Silica, Silver, Synthesis, Quantum dot

1. INTRODUCTION

Size is the fundamental defining characteristic of all nanomaterials. While size is an easy concept to understand, it is more difficult to apply because there are no natural, physical or chemical boundaries that delineate the "nanoscale." By convention, 1-100 nm is the size range most commonly used in reference to nanomaterials, but there is no bright line that clearly demarks the nanoscale from a chemical or biological perspective [1]. Pharmaceutically important inorganic nanoparticles are discussed in this review.

Metallic inorganic nanoparticles

Metallic nanoparticles have fascinated scientists for over a century and are now heavily utilized in biomedical sciences and engineering. Today these materials can be synthesized and modified with various chemical functional groups which allow them to be conjugated with antibodies, ligands, and drugs of interest and thus opening a wide range of potential applications in biotechnology, magnetic separation, preconcentration of target analytes, targeted drug delivery, and vehicles for gene and drug delivery and more importantly diagnostic imaging. Moreover, various imaging modalities have been developed over the period of time such as magnetic resonance imaging, computed tomography, positron emission tomography, ultrasound, surface-enhanced Raman spectroscopy and optical imaging as an aid to image various disease states. These imaging modalities differ in both techniques and instrumentation and more importantly require a contrast agent with unique physicochemical properties. This led to the invention of various nanoparticulate contrast agents such as magnetic nanoparticles (Fe₃O₄), gold, and silver nanoparticles for their application in these imaging modalities. In addition, to use various imaging technologies in tandem newer multifunctional nanoshells and nanocages have been developed [2]. Over the years, nanoparticles such as gold, silver and magnetic nanoparticles (iron oxide), have been continuously used and modified to enable their use as a diagnostic and therapeutic agent [3].

Gold nanoparticles (GNPs)

GNPs occur in various size ranges from 2-100 nm; however 20-50 nm particle size ranges showed the most efficient cellular uptake. Specific cell toxicity has been shown by 40-50 nm particles. These 40-50 nm particles diffuse into tumors and easily recover it. In contrast, larger particles, i.e., 80-100 nm does not diffuse into the tumor and stay near the blood vessels [4, 5]. The size can be controlled during their synthesis and functionalization with different groups. The size of the conjugated nanoparticles depends on the thiol/gold ratio [6]. When the amount of thiol is high, then the particle size will be small [7]. The GNPs have following advantages, it has unique physical and chemical properties which enhance the efficiency of drugs, drug loading, biocompatible, easily reach to the targeted site with blood flow, non-cytotoxic to the normal cells, and can be synthesized by various methods [8-10]. The gold nanorods, gold nanoshells, gold nanocages and gold nanospheres, are various types of GNPs [11].

Physical, chemical, and biological methods can be employed for the synthesis of GNPs. The physical methods are mainly used to produce nanowires [12]. Chemical methods use various chemical agents to reduce metallic ions to nanoparticles. This has some certain drawbacks as there will be the use of toxic chemicals and generation of hazardous by-products [13]. In the recent past, aspects applications of nanoparticles increased tremendously only when the biological approach for nanoparticle synthesis came into focus. These methods are listed in (table 1) [14-16].

Experimental Investigations On Cavity Edm And Wire Edm During Machining Of H-11 Steel

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Abstract:

Electric discharge machining has been utilized for machining hard to machine substances that are not being synthesis by customary mass-produced techniques. This thermal metal removal process machine the work piece by high temperature spark erosion of material. Two different techniques falling under this category like cavity EDM and WEDM remove the material from electric conducting materials. In present investigations the cavity EDM and WEDM have been used to machine the holes of 10mm diameter on H-11 steel at different operative variable like current, voltage, On-time, Off-time. In Taguchi L-9 experimental design has been used for experimentation and the output response in terms of MRR, Tool wear ratio, Wire wear ratio and surface roughness have been recorded at different process parameters levels as per experimental design. Parametric optimization of Input variables has been made by using Regression analysis and to depict the relation between the significant parameters. The regression analysis shows that current influences the tool wear and MRR in cavity EDM as compared to voltage, on-time has significantly affected the tool wear, surface roughness and MRR and off-time has significantly affected the tool wear only. On the other hand current has significantly affected the performance of WEDM in terms of wire wear ratio, MRR and surface roughness. The regression analysis confirms that the on-time has significant contribution on wire wear ratio as well as the off-time has significantly affected the surface roughness of the work material. The significance of voltage on the performance of cavity EDM and wire EDM has been reported less as compared to other parameters. The experimental result shows that the cavity EDM is consuming almost 5-7 times more current than WEDM but the MRR is 3-4 times less than WEDM. The machining time of cavity EDM is 3-4 more time than WEDM and there has been improved surface roughness of wire EDM machining as compared to cavity EDM.

Keywords: Cavity EDM, Wire EDM, Material removal rate, Surface roughness, Tool wear ratio, Wire wear ratio, On-Time, Off-Time, Regression analysis.

1. INTRODUCTION

1.1 Cavity Electric Discharge Machining

Cavity Electrical Discharge Machining (EDM) is an inside and out seen machining process for making geometrically perplexing or hard material parts that is not really hard to appliance by customary synthesis procedure. It has been for the most part used to create design, aviation, vehicle factory and careful segments. One of the essential clarifications behind utilizing it that it is likewise suitable for synthesis breakable substance, as there is fundamentally no connection between the apparatus and work piece.

There are distinctive periods of electrical releases happens through EDM. At first, the anode pass near the work piece, when the propagating comes through between the two planes, the insulator separates and particles are produced. Solid electric liquid small after by the EDM releases well make where the partition between the two planes is slightest. A regularly expansion number of particles are created, which will decrease the ensuring stuff of the insulator through a limited passage at the end where most heavy electric field produced. Right now the voltage achieves its high point, while the current is still nil. A release passage starts to form between the terminal and the work piece. The voltage keeps on diminishing during current keeps on expanding. This will enable the warmth to grow rapidly, causing a segment of the anode, cathode, and insulating substance to vaporize.

The vaporized substance and part of the medium have achieved the greatest and a couple of substances have been liquefied and evacuated, the discharge can be set up by the constraint of the condensation. At the point when the voltage and current way to end with nothing, the electrode part and base it to fall, in this way enabling the liquid substance to be removed from the work piece plane. The ones the improvements in the area of EDM have advanced because of the difficulties being looked by the various assembling materials. The improvement of modern substance that is hard and difficult to machine such as tool steel, ceramic, carbon composite, Invar alloy, nitralloy, nemonics and so forth can assembled effortlessly with the assistance of EDM. Different device terminal utilized in EDM are copper, brass, tungsten, steel, copper tungsten, and copper chromium alloy, etc.

1.2 Wire EDM

Wire electrical discharge machining process has been developed as a vital irregular thermo electrical synthesis method to machine the substances which are a conveyor of power. The component of substance evacuation is similar to the fundamental EDM operation. The discharge apparatus and galvanic sparkles, which have been layout and supervised with the assistance

Problem of Poverty in India

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ABSTRACT

Here used to say that "poverty is a social phenomenon". Mahatma Gandhi thought that poverty was the worst crime to be committed by any civil society. Poverty in India has two facets, one, social and another socio-economic. Those who are poor socially are generally poor educationally and economically. Poverty in India is mostly counted in absolute terms. According to Damien and Rafi, poverty in India is visible to the naked eye of anyone who tries to understand it. According to them a poor cannot afford even to send his children to the government funded school where primary education provided free of any fees. He also could not afford to get his children treated in a primary health care centre run by the government. Incidence of poverty in India has been highlighted by several economist a few of them consist of Prof. Amartya Sen, and Jeanedreze, Suresh Tendulkar, N.C. Saxena to quote a few. According to them around 25 percent populations still live in abject poverty. Even the government of India has conceded that around 20 crore people in India live in a state of abject poverty with no access to portable drinking water, sanitation, and two square meals.

Keywords: Poverty, Socio-economic, Government, Population, Social phenomenon

1. INTRODUCTION

One of the realities of our rapidly developing and increasingly progressive world is that poverty continues to be widespread and rampant, and the vulnerable population seems to have grown ever more vulnerable. Jürgen Narsis considers that those who are poor remain poor simply because at the mental and physical level they suffer from the pangs of poverty, which he calls secondary poverty. The recent studies done by Thomas Piketty and Lucas in their essay from British Raj to Billionaire Raj, they argue that the gap between the rich and poor in 2013-2014 was the most glaring one as it had been in 1921-1922.^[1] In India, despite several attempts by the government to lift the poor out of the poverty drag, still there are millions who don't have access to the basic amenities of life.

The incidence of poor and the downtrodden in India is a matter of serious concerns for both policy makers and scholars. It is because of its widespread implications. In absolute numbers, India accounts for largest number of poor persons amounting to nearly 300 million persons with a huge percentage of them being forced to live in abject poverty due to socio-economic vulnerability.^[2] While measuring their plight on the basis of Sen coefficient and multi-dimensional index, it appears that majority of people living urban and rural areas still struggle to eke out their living. While defining poverty, economists rely upon subsistence level data which is axiomatic and widely accepted across the world.

2. INDIA'S POVERTY MEASURES: A CHRONOLOGY

Poverty lines determined during the British Raj were flawed an initio simply because most of such lines were dependent upon a contextual sense of adequacy. In 1979, subsistence needs were systematically linked to nutritional needs and household spending patterns. Calorie norms of 2,400 per capita per day for rural India and 2,100 for urban India were adopted, and the expenditure equivalents of these norms were identified through the empirical studies with the NSS survey of 1973-1974.^[4] The studies during 1970s conducted by M.S. Ahluwalia, et al. have become the new poverty lines for both rural and urban areas in India. Most of these studies measured per capita consumption expenditure or household expenses generally a period of one month or one year, was the most standard choice for calculating poverty in India. Implicitly, subsistence was defined as the bundle consumed by households at these calorie levels.

Poverty alleviation has been on the national policy agenda for more than seventy years. During the national movement, Congress was also working hard to spell out a future plan for adopting the strategy of planned development after India got independence. Accordingly, in 1938, the Indian National Congress set up a National Planning Commission (NPC) headed by Jawaharlal Nehru, which made a declaration that the social objective of the government should be "to ensure an adequate standard of living for the general masses, in which would be included the eradicating poverty of the people". The importance of reduction in poverty and provision of other basic needs has been emphasized in all the five-year plans since independence particularly since the Fifth Five-Year Plan. The government concerned had adopted a two-pronged strategy, one, promoting economic growth and the other, legislation for alleviating poverty.^[5]

Unorganised Workers: A Core Strength of Indian Labour Force: An Analysis

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ABSTRACT

The Indian economy is characterised by the existence of a vast majority of informal or unorganised labour employment. As per a survey carried out by the National Sample Survey Organisation (NSSO) in 2009-10, the total employment in the country was of 46.5 crore comprising around 2.8 crore in the organised and the remaining 43.7 crore workers in the unorganised sector. Out of these workers in the unorganised sector, there are 24.6 crore were employed in agricultural sector, about 4.4 crore in construction work and remaining in manufacturing etc. The Indian Economic system is characterized by the existence of a vast majority of informal or unorganised labour employment. As per the Economic Survey 2007-08, 93% of India's workforce include the self-employed and employed in unorganized sector. The Ministry of Labour, Government of India, has categorized the unorganised labour force under four groups in terms of Occupation, nature of employment, especially distressed, women and service categories.

Keywords: Unorganised Employment, Informal Economy, Unorganized Sector, Underprivileged Sections

1. INTRODUCTION

The unorganised or informal sector constitutes a pivotal part of the Indian economy. More than 90 per cent of unorganised employees in the country are accounted for by the informal economy. A high proportion of economically underprivileged sections of society are concentrated in the informal economy. The growth of the Indian economy during the past two decades are accompanied by interlinkages between formal and informal economy. There has been new dynamics of the informal economy in terms of employment and growth needs special attention to informal economy. Sustaining high levels of growth and inclusive growth needs special attention to informal economy. Improving domestic demand of those engaged in informal economy, and the need of the sector in terms of credit, skills, technology, marketing and infrastructure. The term "unorganised worker" has been defined under the Unorganised Workers' Social Security Act, 2008. An unorganised worker is a self-employed worker or a wage worker in the unorganised sector and includes a worker in the unorganised sector who is not covered by any of the Acts mentioned i.e. The Employee's Compensation Act, 1923, The Industrial Disputes Act, 1947, The Employees' State Insurance Act, 1948, The Payment of Bonus Act, 1965, The Industrial Disputes Act, 1947, The Employees' State Insurance Act, 1948, The Minimum Wages Act, 1948, The Maternity Benefit Act, 1961 and the Unorganised Workers' Social Security Act, 2008.

As per a survey carried out by the National Sample Survey Organisation in the year 2009-10, the total employment in the country was of the order of 46.5 crore. Out of this, about 2.8 crore were employed in the organised sector and the balance 43.7 crore in the unorganised sector. Out of 43.7 crore workers in the unorganised sector, 24.6 crore were employed in agriculture sector, 4.4 crore in construction, and remaining were engaged in manufacturing activities, trade and transport, communication & services. A large number of unorganised workers are home based and are engaged in occupations such as beedi rolling, agricultural machinery repairing, tailoring, and embroidery work.

The unorganised sector suffers from cycles of excessive seasonality of employment, lack of a formal contract, employment insecurity and absence of social security protection. Several legislations such as the Employees' Compensation Act, 1923, The Industrial Disputes Act, 1947, The Employees' State Insurance Act, 1948, The Minimum Wages Act, 1948, the Maternity Benefit Act, 1961, The Unorganised Workers' Social Security Act, 2008, Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996; and the Building and Other Construction Workers' Welfare Fund Act, 1996 etc. are directly or indirectly applicable to the workers in the unorganised sector. The Ministry of Labour, Government of India has approved the merger of Social Security Schemes viz., Employees' State Insurance (ESI), Employees' Compensation Act (ECA), Employees' State Insurance (ESI) and Janashree Bima Yojana (JBY). The merged scheme is renamed as Employees' State Insurance (ESI).

Experimental Investigation of The Mortar By Incorporating Jarosite With River Sand

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ABSTRACT:

This paper was presented for an experimental investigation of the physical property of Cement Mortar with incorporating jarosite as the partial replacement in mortar. Jarosite is a waste material that was generated from the hydrological process. Which contains a significant amount of iron, zinc, lead, manganese etc. shows cementitious properties. Where jarosite partially replaced in different proportions of 10, 20, 30% by weight of river sand in 1:3 mixes of Mortar. This study was done for the evaluation of compressive strength of the jarosite mortar at the ages of 3, 7, 28 days. From this mortar study, it was found that the compressive strength of mortar was increased significantly and results showed that jarosite has been replaced up to 20% in Mortar.

Keywords: Compressive strength, Jarosite, Mortar, Replacement.

1. INTRODUCTION:

In the fastest growing countries like India, the construction industry has rapidly increased their demand for construction materials. This necessity has soon created a scarcity of the construction materials like River sand. Now to overcome this problem some industrial waste material can be used as in place of river sand i.e. Fly ash, Bottom Ash, Fibers, agricultural wastes, etc. These waste materials can be utilized in mortar mixes also which helps in the prevention of the natural resources of construction. Whereas replacement of mortar increases day by day as the binding material. Nowadays mortar can also use in the construction of blocks, bricks, etc., which also require a large amount of fine aggregate and Cement.

Jarosite is a waste material, which was obtained from the hydrometallurgical process and contains a significant quantity of iron, zinc, sulphur, lead, cadmium, manganese etc. Due to the presence of toxic substances, this waste is very hazardous in nature and possess serious problem for their disposal. However, due to weathering/bacterial action, there is a release of toxic elements in the soluble form, which ultimately contaminate the soil, groundwater and aquatic life due to improper management of such hazardous wastes. The properties of jarosites showed the cementitious behavior in their properties by which it has been utilizing in the construction work. If the utilization of jarosite in construction work can overcome the disposal problem of this hazardous material.

This present study was done for the utilization of the jarosite in the mortar as a partial replacement in 1:3 of Cement Mortar. Jarosite was partially replaced in the mortar in different proportions of 10, 20 and 30% with River sand. Mix design of this mortar study as prepared as per IS 4116: 1980 code, which helps in recycling of waste materials in concrete. The main aim of this study was to analyze the effect of jarosite in compressive strength of the mortar.

2. EXPERIMENTAL PROGRAM:

In this experimental program OPC 43 grade of cement has been utilized for this mortar study as confirming from IS 8112:2017. Whereas the specific gravity of the cement was observed to be 3.15. River sand was collected from the locality where gravity of the gravity of river sand was found to 2.67. Waste material jarosite was collected from the nearest hydrometallurgical plant.

Experimental Investigation On Geopolymer Concrete

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Abstract

Cement is the second most consumed product in the world. It contributes nearly 7% of the global carbon dioxide emission. Efforts are underway throughout the world for the development of eco-friendly construction materials, which will minimize the utility of fast deteriorating natural resources and also to reduce the emission of greenhouse gases. In this regard, Geopolymer concrete (GPC) is becoming an excellent type of eco-friendly concrete alternative to Ordinary Portland Cement (OPC) concrete. Inclusion of Class-F fly ash can have a significant effect on the setting and strength development of geopolymer binders when cured in elevated temperatures. This paper evaluates the strength properties of fly ash based geopolymer concrete.

Key words: Geopolymer concrete, Conventional Concrete, sodium hydroxide, sodium silicate, oven curing, open air curing

1. Introduction

Concrete is the world's most versatile, durable and reliable construction material. Next to water, concrete is the most used material, which required large quantities of Portland Cement. It is estimated that the production of cement will increase from 2.2 billion tonnes in 2010 to 3.3 billion tonnes in 2020. Ordinary Portland Cement production is the major generator of carbon dioxide second only to automobiles industries, which polluted the atmosphere. Production of one tonne of cement requires about 2 tonnes of raw materials of shale and limestone, and also releases large amount of carbon dioxide (CO₂) to the atmosphere that significantly contributes to Greenhouse gas emissions. The amount of Carbon dioxide released during the manufacturing process of OPC is 1 ton for every ton of OPC produced. As the demand for concrete increases, it also increases the demand for Portland cements. Thus the environmental problems caused by cement production can be reduced by finding a substitute conventional concrete material. Geopolymer concrete is a new construction material with significant potential. This type of concrete is produced without Portland cement as a binder. Joseph Davidovits is a French material scientist known for the invention of geopolymer concrete. It is made of silica (SiO₂) and alumina (Al₂O₃) available in the specially processed clay (metakaolin) to get inorganic polymeric system of aluminosilicates. Unlike ordinary Portland cement (OPC), geopolymers do not need calcium-silicate-hydrate (C-S-H) gel for matrix formation and strength, but rather the polycondensation of silica and alumina precursors to achieve required strength level. Two main constituents of geopolymers are geopolymer source materials (GSMs) and alkaline activator liquids. The GSMs should be aluminosilicate-based materials like fly ash (FA) and aluminium (Al) and thus, by-product materials such as fly ash, silica fume, slag, rice-husk ash, red mud, etc. can form GSMs. Because the chemical reaction that takes place in this case is a polymerization process, Davidovits coined the term "Geopolymer" to represent these binders. The beam column joint is the crucial zone in a reinforced concrete moment resisting frame. It is subjected to large forces during severe ground shaking and its behaviour has a significant influence on the response of the structure. The assumption of joint being rigid fails to consider the effects of high shear forces developed within the joint. In case of failure is always brittle in nature which is not an acceptable structural performance especially in seismic resistant structures. In analysis of reinforced concrete moment resisting frames the joints are generally assumed as rigid. In Indian practice, the joint is usually neglected for specific design with attention being restricted to provision of sufficient anchorage for beam longitudinal reinforcement. This may be acceptable when the frame is not subjected to earthquake loads. There have been many catastrophic failures reported in the past earthquakes. The poor design practice of beam column joints is compounded by the high demand for steel.

In the design of flexural members (beams and columns) in the event of mobilizing their inelastic capacities to dissipate seismic energy, unsafe design of beam column joint region jeopardizes the entire structure, even if other structural members conform to the design requirements.

Necessity

Construction is one of the fast growing fields worldwide. As per the present world statistics, every year around 260,00,00,000 Tons of cement and concrete is required. This quantity will be increased by 25% within a span of another 10 years. Since the limestone is the main source material for the production of cement, an acute shortage of limestone may come after 25 to 50 years. More over while producing one ton of cement, approximately one ton of carbon dioxide will be emitted to the atmosphere, which is a major threat for the environment. In addition to this, a large quantity of energy is also required for the production of cement. Hence it is now essential to find an alternative material. The cement production generated carbon di oxide, which pollutes the atmosphere. By producing Geopolymer Concrete all the above mentioned issues shall be solved by rearranging them. Waste Fly Ash from Thermal

The Effects of Nano Bentonite and Fatty Arbocel on Improving the Behavior of Warm Mixture Asphalt against Moisture Damage and Rutting

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Abstract

The use of warm mix asphalt (WMA) technology has increased dramatically in recent years to protect the environment and to reduce energy consumption. Despite numerous advantages, WMAs are less commonly used as a pavement material because of their low performance in comparison to HMAs. One of the main reasons for the low performance is their high moisture sensitivity. In recent decades, bitumen modifiers have been used to improve the performance of asphalt mixtures. One of the additives that has recently been used to modify the characteristics of bitumen, is bentonite. The grade of asphalt cement used in this study is PG 64-22 and the Bitumen was modified with 1, 3, 5 and 7% nano bentonite. Also, 0.3% fatty Arbocel has been used for the preparation of WMA. Indirect tensile strength (ITS) test and Nicholson stripping test are used to determine moisture susceptibility and dynamic creep test and LCPC are also used to evaluate the rutting potential. The results indicate that, increasing the percentage of nano bentonite and applying 0.3% of fatty Arbocel improve the performance of mixture against moisture damage. Also it was found that increasing the mixture hardness increases the permanent displacement and rutting potential of WMAs. So, it is suggested that the consumption of these additives increases WMA's lifetime and decreases its maintenance cost.

Keywords: Warm Mix Asphalt; Dynamic Creep Modules; Rutting; ITS.

1. Introduction

Possible failures in WMAs are divided into four major groups: 1. Permanent deformation or rutting, 2. Fatigue or load associated cracking, 3. Low temperature or thermal cracking, 4. Moisture damages. WMA is an emerging technology. In line with the concern about global warming and energy consumption in asphalt industry. In WMA production, the mixing and compaction temperature are reduced from 10 to 38 °C compared to the HMA (Hot mix asphalt) that is produced and compacted at temperatures of 145 to 150 °C [1]. Production of temperature reduction results in reduced fuel consumption and manufacturing costs. It also reduces the amount of greenhouse gas emissions in asphalt production process [2]. Modified bitumen is one solution for improving the pavement performance [3]. Clay modified bitumen had been used since 100 years ago. As soon as the clay particle-page reaches inside the bitumen, it creates strong inter-plate properties inside polymer concrete which improve bitumen performance against cracking and deformation in high temperature [4]. Research shows that adding clay to bitumen increases bitumen softening point and decreases its elasticity which increases the resistance of hot mix asphalt against thermal cracking [5]. Adding nano clay and nano lime to the hot mix asphalt mixture increases the durability of the mixture against freeze -thaw cycles [6]. The use of nano-clay also improves surface free energy and fatigue resistance of HMAs [7]. Adding cement and nano clay together, have been used to improve the initial strength and cracking resistance, and reduce moisture susceptibility of asphalt concrete [8]. Bentonite is a type of clay with high plastic and colloidal properties; it mainly consists of silicate and alumina [9]. Studies on HMA containing nanoclay modified bitumen show that nanoclay improves the performance of HMA against moisture damages and rutting [10]. Bentonite improves the rheologic characteristics of asphalt concrete by just using [11].

Researches on HMA containing bentonite modified bitumen indicate that these types of mixtures have higher shear strength and longer life span than conventional HMAs [12]. Bentonite improves the rheological properties of bitumen at low temperature which increases the resistance of hot asphalt mixtures against thermal cracks [13]. Semi-hot additive bentonite (SHAB) and bentonite have no significant effect on the amount indirect tensile strength and moisture sensitivity of HMA [14]. However, bentonite improves the moisture sensitivity of WMAs, but its effect on failure of mixture has not been reported. Some studies have found to increase the hardness and modulus of WMAs and decreases their permanent displacement [15]. Some studies have proved that the addition of Evotherm and paraffin wax was not effective against moisture damage [16]. Also, based on research findings, the use of rubber enhanced resistance against permanent deformation of WMAs, but could not affect fatigue resistance [17]. Warm mix asphalts containing styrene-butadiene copolymer with epoxy resin were found to have a good behavior against rutting damage [18]. A considerable number of studies have been done on nanoclay modified polymers. Variables that have a great impact on the final properties of the polymer are the type of used clay, the components of the polymer used, and how the clay is dispersed in the polymer. These studies can improve the resistance of fracture and the performance of WMAs

Development Of Geopolymer Concrete For The Protection Of Environment: A Greener Alternative To Cement

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Abstract

There has been rapid usage of concrete for infrastructure development in present scenario all around the world. Consumption of cement in making concrete has proven to be posing a potential threat to our environment in terms of massive carbon footprint into the environment causing global warming. Sustainable development in the construction industry has been a major area of research in the present decade and geopolymer concrete is one such development towards sustainability. Geopolymer concrete is concrete without cement but better than OPC based concrete in all aspects. According to various researches, limestone reserves are on the verge of extinction and climate change due to Carbon emissions have been an important environmental issue around the world. This review paper presents the environmental issues by empirical data/surveys related to emissions of CO₂ gases specific to cement industry conducted by eminent scientific researchers and several environmental research bodies and online non-government organizations. The literature in this paper focuses on experiments conducted around the world in the field of production of geopolymer concrete as a green-building material stressing the importance of using eco-friendly construction material for sustainable development.

Keywords - Geopolymer Concrete, carbon footprint, global warming, green-building material, eco-friendly construction, sustainable development

1. INTRODUCTION

Global warming has become a colossal threat since the Industrialization and urbanization era. Cement industries gained popularity and evolved to be the second most utilized material just after water. The trend of production of cement has seen a perceptive progression. From consuming approximately 1100 million Metric Tonnes in 1990 to 3270 million Metric Tonnes in 2010 there has been a steep rise in Consumption of cement [1]. This number is expected to grow further up to 4830 million Metric Tonnes in 2030 [1]. Production of cement is both an energy and resource intensive process. The production of 1 tonne of ordinary Portland cement nearly produces an equivalent amount of CO₂ [2,13] and also consumes huge amount of lime stone which is a non-renewable natural resource and moreover the concrete making process uses enormous amount of water. Energy associated with the production of cement is nearly 4 GJ per Metric Ton [18]. The rapid industrialization has other side effects as well. The industrial waste disposal is a very severe problem which poses a considerable threat to environment. The industrial wastes like Fly Ash, Slags, Rice Husk Ash, Silica fumes, Tailings etc. pose a huge threat when released into the environment. Steps have been taken to utilize these materials however complete utilization of these wastes have still not been possible. Fly Ash is mainly generated by the power plants in the process of combustion of coal in a boiler to form steam. Slag is a waste produced by the steel industry and mainly consists of iron oxides, calcium and silicon dioxides. Rice husk ash is an amorphous silica rich byproduct of rice husk incineration. Similarly silica fumes have very fine particles with the average particle size being 1µm.

[24]. It is produced as a byproduct of ferro-silicon industries. Tailings are the waste of mining industry: the leftover materials after extraction of valuable minerals. All of these materials accumulate in the environment and over time can pose a huge threat to the flora and fauna. Some of these materials are used in construction industries but the amount of waste is not sufficient to consume all of the material generated. There has been a significant rise in the consumption of cement from 30.99 Metric tons per capita in 1960 to 4.970 Metric tons per capita in 2014 with a forecasted rise to 10.96 Metric tons in 2012 [3] (up till 2014) moreover

9.9 other types of CO₂ are emitted into the air in 2017, CO₂ constitutes about 76% of the total greenhouse gases [19]. While the most significant of CO₂ formation however; one of the biggest contributors to these emissions is the cement industry which is responsible for 7% of the total CO₂ emissions in the world [5, 20]. Cement formation is a very energy

Smart prepaid energy metering system to detect energy theft with facility for real time monitoring

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ABSTRACT

Electricity theft remains a huge loss incurred by electricity distribution companies. This theft arises majorly because of activities carried out by consumers such as energy-meter by-passing, energy-meter tampering etc. This research study of this approach for handling energy meter by-passing and tampering. The system design is based on the monitoring of the readings of two current sensors by a programmed microcontroller. While one of the current sensors monitors the current drawn by the user's load, the latter installed before the meter monitors current drawn by all loads. Any discrepancy between the values read, indicates theft. A momentary current spike is used to trigger the meter once it is tampered with. Furthermore, the user is provided with a remote access to the energy meter for recharging energy units and for monitoring energy consumption. It was observed that the system accurately measured load consumption and detect any attempt to by-pass or tamper with the energy meter. Lastly, all unscrupulous attempts were reported using GSM technology.

Keywords: Advanced meter infrastructure, Electricity theft, Energy management, Microcontroller, Smart-meter

1. INTRODUCTION

It is impossible for an electric power system to be 100% free from theft. In 1999, Transparency International reported that close to 15% of the generated power is lost as a result of electricity theft. For instance, between 1997 and 2009, in Bangladesh, the Bangladesh Power Development Board (BPDB), after generating about 100,000 MWh of electricity, could only account for 11,462 MWh of billed energy, reflecting a total loss of about 88% [1]. In developing countries like Nigeria, electricity theft remains one of the major problems faced by the power sector of which the government has little or no control over due to lack of the requisite technology. With the implementation of Automatic Metering Infrastructure (AMI) by utility companies, an estimation of Nigeria's grid has a total transmission and distribution (T&D) losses of about 40% would be randomly high when compared to United States whose T&D losses are at 7% [3, 4]. Electricity theft is a form of non-technical loss. According to [5], any form of interference done by consumers to tamper with the meter to adulterate its values is referred to as electricity theft. The Non-technical losses are categorized into three types. These activities include meter tampering, bypassing of meter, billing irregularities and tampering [1, 6, 7]. In response to the electricity theft and growth trend, the country needs to take appropriate measures not only to boost its power generation capacity but also to make residential sector more energy efficient and cost-effective.

Analog meters which are widely used in most parts of the nation, pose lots of challenges for monitoring the supply and distribution. In addition, with the analogue meters, operators must go to the consumer's premises to disconnect his power supply if he does not pay up his bills. Even in most cases, the operators are not allowed to do so that their supply will not be disconnected. Consumers also have been known to tamper with their energy meters in order to reduce or stop the meter from reading without the knowledge of the operators. With the old analogue meters, consumers have no way of disconnecting power in their houses when they travel and forget to disconnect or turn off their appliances. This leaves the meter running, thus generating charges for the energy consumer. Prepaid meters have provided a better way of monitoring power consumption by users. The motivation of this study is based on the fact that electricity theft as a result of meter tampering and energy meter tampering has constituted a major problem to electricity distribution companies and has also resulted in a huge loss of revenue to the Nigerian power sector.

This paper presents a monitoring system with energy meter theft and tampering detection systems that can accurately monitor and monitor the supply and distribution of power. In addition, it provides a remote energy management system for the consumer to disconnect or connect his load at free will. The rest of this paper is organized as follows. Section 2 reviews the previous researches related to energy theft detection and meter tampering that have been carried out earlier. Section 3 discusses the methodology for this study. The experimental results are presented in section 4. In section 5, recommendations for future research are given.

Physico-Chemical Analysis of Ground Water in Angul-Talcher Region of Orissa, India

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ABSTRACT: The study was carried out to assess the impacts of industrial and mining activities on the ground water quality in Angul-Talcher region of Orissa. The quality was assessed in terms of physico-chemical parameters. Ground water samples were collected from thirteen (13) open well at various locations in study area during pre and post monsoon season. The physico-chemical parameters such as pH, Electrical conductivity, TDS, Total hardness, Ca hardness, Mg hardness, Ca ion, Mg ion, Chloride, and COD were analyzed (APHA, 1998) to know the present status of the groundwater quality. Drinking water quality (IS: 10500) of pre-monsoon season was better than post monsoon season. Few water samples were slightly alkaline along with high dissolved solids. [The Journal of American Science, 2009;5(5):53-58]. (ISSN 1545-1003).

Key words: Ground water, physico-chemical parameters, water quality, drinking water standard

1. INTRODUCTION:

The safe portable water is absolutely essential for healthy living. Ground water is ultimate and most suitable fresh water resource for human consumption in both urban as well as rural areas. The importance of ground water for existence of human society cannot be overemphasized. There are several states in India where more than 90% population are dependent on groundwater for drinking and other purpose (Ramachandriah, 2004). Ground water is also frequently using as the alternative source for agricultural and industrial sector.

In India, there are over 20 million private wells in addition to the government tube wells (Datta, 2005). The wells are generally considered as the worst type of ground water sources in the term of physico-chemical contamination due to the lack of concrete plinth and surrounding drainage system (WHO, 1997). Over burden of the population pressure, unplanned urbanization, unrestricted exploration and dumping of the polluted water at inappropriate place enhance the infiltration of harmful compounds to the ground water (Pandey and Tiwari, 2009). There are various ways as ground water is contaminated such as use of fertilizer in farming (Altman and Parizek, 1995), seepage from effluent bearing water body (Adekunle, 2009). Most of the industries discharge their effluent without proper treatment into nearby open pits or pass them through unlined channels, resulting in the contamination of ground water (Jinwal and Dixit, 2008). The incidence of ground water pollution is highest in urban areas where large volumes of waste are concentrated and discharge into relatively small areas (Rao and Mamatha, 2004). The hydro-geochemical conditions are also responsible for causing significant variations in ground water quality (Mahanta et. al., 2004). The paper makes an attempt to carry out qualitative analysis of some physico-chemical parameters of ground water in study area.

2. STUDY AREA:

The Angul-Talcher area lies between latitudes 20° 37' N to 21° 10' N and longitudes 84° 53' E to 85° 28' E, and situated at an average height of 139 m above Mean Sea Level (MSL). Vast mineral deposits, availability of water and good infrastructure conducive for industrialization in the Brahmani river basin has resulted in heavy industrialization of the area. Many small, medium and large scale industries such as coal mines (Mahanadi Coalfields Limited), Super Talcher Thermal Power plant (Kaniha), Talcher Thermal Power Stations (Talcher), Nalco smelter and its captive power plant and other iron & steel industries are situated in the region. The ground water quality of the study area is adversely affected by the industrialization. Increased population and improper drainage system have potential to influence the ground water quality. Geographical location of study area is shown in the Figure 1.

Factors Affecting Employee Turnover And Sound Retention Strategies In Business Organization: A Conceptual View

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Abstract

"Employee turnover" as an expression is broadly used in business organization. Despite the fact that several studies have been performed on this topic, little research has been conducted on examining the causes and leading factors of turnover as well, as advising some feasible approaches, which can be applied by bosses to ensure that employees will continue in their respective organizations to enhance organizational effectiveness and productivity. The main purpose of this study is to determine the reasons and key factors in the perspectives of the relevant literature and identify to the intention of employee turnover. This conceptual paper also suggests various possible strategies on how to minimize the turnover and retain employees in the organizations. Hence, the paper has proposed a conceptual framework that shows the major variables in explaining the phenomenon of employee turnover and addressing sound retention strategies to handle these issues.

Keywords: employee, turnover, factors, causes, retain, leave, strategies, organization.

1. INTRODUCTION

In the era of globalization, it has been regarded to be a key issue to deal with employee turnover for any business organization. Chan et al. (2010) also state employee turnover as a serious issue, particularly in the area of human resource management. To fulfill the basic needs and provide a good working environment, good pay and other benefits in an economic approach is quite multifaceted and burdensome to an organization. Every business desires to increase the productivity and lessen turnover, thereby leading to be profitable. Employee turnover supervision is an obligation to attain organizational goals effectively. However, high turnover would bring devastation to the business in the form of both direct and indirect costs. Direct costs are referred to costs such as expenses on recruitment, selection, orientation, work-shop and training for the fresh employees. Indirect costs are indicated to spending on education, condensed self-confidence, stress on the existing worker and the collapse of social capital. Moreover, high employee turnover will put at risk on reaching the organizational goal. To combat the challenges in the cutthroat business world, management has considered employee turnover as a major concern and initiated some measures to retain them in the organizations.

However, due to the less attention, top management does not concentrate on this major issue. They are perhaps little capable of realizing the situations about how employee turnover has a detrimental effect on the productivity of the organization. Therefore, it is more significant to conduct the research on employee turnover to help business organizations by identifying their problems, analyzing the information and recommending possible solutions in recent time.

The purpose of this research, therefore, is to find out the various causes and influential factors of employee turnover in business organization. This study also explores some sound retention strategies on how an organization can retain employees and minimize the rate of turnover. Based on previous studies, this research has been performed nationally and globally to uncover a variety of factors in relation with employee turnover affecting the industry for their productivity.

2. LITERATURE REVIEW

Employee turnover is delineated to a situation in which employees depart the organization for several reasons, and thus, negatively affect the organization in terms of overall expenditure and the abilities to distribute the minimum required services (Yankeelov et. al., 2008). When employees leave the organization, this may not only impact on organization but also on workforce itself. Due to its depressing impact, employee turnover has been considerable topic for scholars, academics and managers.

The reasons for individual turnover intention are age, gender, marriage, education levels and years of working in the organization (Liu and Wang, 2006). Previous studies found that the rate of female employee turnover is higher, as compared to male employees. It can be associated with women duty that women need to give birth and take care of the family. Therefore, this is a pressing issue that needs to be dealt with urgently. Though employees work in units or positions for a long period, they feel tired and tend to leave the jobs. According to Ma et al. (2003), "Employees with young, inexperienced and high education level tend to have low level of satisfaction about jobs and careers, and have lower commitment to the organization, these negative attitudes are associated with turnover intention". One of the key factors of turnover intention is Individual aptitude. When individuals have strong ability, or individuals are not core competent at their job and cannot progress them completely in the organization, they are prone to turnover intention (Chen and Li, 1998). For employees aged over 30, individual responsibility is also a factor to consider them leaving the organization. We can study this when the more responsibility (such as workers are the single father or mother, or their income is the main source, etc.) persons bear in the family, the lesser the possibility of their turnover (Zhang and Zhang, 2003)). In short, all these individual factors directly influence the turnover intention, or indirectly affect on them through the rule of other variables.

Interpretation Of Ground Water Quality Using Co-Relation And Regression Analysis Of Bhubaneswar City, Odisha, India

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ABSTRACT

The present study deals with assessment of the physico – chemical and microbiological parameters of Bhubaneswar city, India. Statistical regression analysis was carried out to study the correlation between various physico – chemical parameters. Comparison of estimated values with W.H.O standards revealed that water of study area is more or less safe for drinking purpose. Except iron all most all parameters are found below permissible limit in most of the locations. Regression analysis of these data points suggests that conductivity of water is an important parameter and it is significantly correlated with other parameters. Present study may be treated as one step a head towards the drinking water quality management.

Key words: Ground water, Co-relation, Physico – chemical parameters

1. INTRODUCTION

Water of good quality is required for living organisms. Ground water is highly valued because of certain properties not possessed by surface water. Water quality is based on the physical and chemical constituents due to weathering of parent rocks and anthropogenic activities. Ground water is the most important water resources. Unfortunately ground water is being polluted by various human activities. Ground water is always victim of negative impact of urbanization. The statistical regression analysis has been found to be highly useful tool for co-relating different parameters. Co-relation analysis measures the relationship between chosen independent and dependent variables. If the co-relation is near to +1 or -1 it shows the probability of linear relationship between the variables x and y. In this way the analysis attempts to establish the nature of the relationship between the variables and there by provides a mechanism for prediction of forecasting.

The co-relation coefficient is a helpful tool for promotion of research in water pollution problems. No attempts has yet been made to predict the ground water quality of the study area with precision using the co-relation co-efficient of different water quality parameters. Studies done from time to time indicate the favorable or unfavorable changes occurring in the ecosystem. This paper is an eye opener on water quality parameters using the co-relation co efficient and regression method in analyzing the ground water of Bhubaneswar city of India.

2. EXPERIMENTAL SECTION

Description of study area

The capital city of Odisha Bhubaneswar is located between 20°12'N and 20°25' N latitude and 85°44'E to 85°55'E longitude on the western fringe of coastal plain across the main axis of eastern Ghats in Khurda district of Odisha. Geologically Bhubaneswar region below to the Gondwana land mass, one of the oldest and most stable land mass in the world. The rock ranges from the Archean to the recent period. Major part of the area is covered with the quarterly alluvium and lateritic soil.

Methodology

27 ground water samples were collected from nine different locations (three from each location). The samples were collected in clean 2L polythene bottles without any air bubbles. The bottles were rinsed before sampling and tight sealed after collection. The temperatures were measured on the spot.

Analysis was carried out for various water quality parameters pH, Turbidity, Conductivity, TH(Total Hardness), Chloride, TDS(Total Dissolved Solid), Iron, Floride, TC(Total Coli form), FC(Fecal Coli form), as per standard procedures recommended by APHA(2000) 19th edition. The water quality parameter values are expressed in mg/l except pH and EC in μ s/cm. All chemicals/reagents used were of analytical reagent grade.

Co-efficient of Co-relation (r)

The mathematical models used to estimate water quality require two parameters to describe the realistic groundwater situation. Correlation analysis measures the closeness of the relationship between chosen independent and dependent variables. This analysis attempts to establish the nature of the relationship between the variables and there by provides a mechanism for prediction of forecasting. The relationship of water quality

Muscle Noise Cancellation from ECG Signal Using Self Correcting Leaky Normalized Least Mean Square Adaptive Filter under Varied Step Size and Leakage Coefficient

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ABSTRACT

The electrocardiogram (ECG) signal is exposed to many types of noise due to its sensitivity, especially those high-frequency noises, the most important of which is the electromyogram (EMG) noise whose spectrum overlaps with the spectrum of the ECG signal, which impedes the correct diagnosis of heart diseases. In this paper, a new adaptive filter for EMG noise removing from corrupted ECG signal is proposed; the filter is based on self correcting leaky normalized least mean square algorithm SC-LNLMS with varied step size and varied leakage coefficient, the corrupted signal passes through noise canceller filter based on leaky normalized least square algorithm using multiple stages and under adjusting both step size and leakage coefficient. Testing was performed using noise free ECG signals from the MIT-BIH Arrhythmia database and the noise from Noise Stress Test database (nstdb). The experimental results show that the proposed denoising filter achieves better output signal-to-noise ratio (SNR), improvement SNR and lower mean square error (MSE) when compared to other existing techniques. Besides preserving the original shape of the signal without causing distortions in the low-amplitude. Using the proposed denoising filter, the average output SNR varies from 16.53 to 28.56 dB, and the MSE less than 0.00000045.

Keywords:

ECG signal, EMG noise, noise canceller, step size, leakage coefficient, normalized least square, self correcting filter

1. INTRODUCTION

An electrocardiogram (ECG) displays the heart electrical activity recorded by the electrodes placed on the human body surface; and because of its importance in the detection of various heart diseases, it should be clear of all types of noise that affect its waves and intervals; and therefore lead to errors in the diagnosis, which sometimes leads to sudden death [1], such unwanted interference are electrode motion (EM), muscle noise (EMG noise) and baseline wander (BW) [2]. One of the most worrying, high frequency noises in the recording of ECG signals is the presence of EMG noise which is due to patient muscular activity; it behaves as a random wide band spectrum signal, seriously overlapping the ECG spectrum; mainly with the spectrum of the QRS complex where most energy of ECG signal is collected, and on the other hand low-amplitudes (P- and T-waves) are totally covered by EMG noise [1], thus removing noise from corrupted ECG signal is an absolute requirement for correct and accurate diagnosis.

Many denoising methods were proposed for EMG noise removal from ECG signal, Thakor NV, Zhu YS proposed a recurrent least mean square (LMS) filter structure for obtaining the impulse response of the normal QRS complex and then applied it for arrhythmia detection in ambulatory ECG recordings, they show the effectiveness of such recurrent filter in detecting cardiac arrhythmia by noise reduction. However, the filter does not work adequately when only a single lead is available or when EMG noise arises at all the electrodes [3]. By considering the ECG signal slope an approximation filtering using dynamically variable samples number and weighting coefficients was proposed by Christov and Daskalov, the method showed considerable reduction in the EMG noise and maintained the ECG signal amplitude. However, a small widening of some original QRS complexes was obtained [4]. Satheskumaran and Sabrigiriraj [5] proposed an adaptive filter based on step-size delayed LMS (VSS-DLMS) with pipeline architecture for ECG feature extraction improvement and noise removal, the estimation delayed error and the noisy signal both are used as two inputs to VSS-DLMS to update the filter tap coefficients, the method provided highly output SNR and low MSE and reduced calculation multiplicity. El B'charri et al. [6] investigated the dual-tree wavelet transform (DT-WT) using tuning threshold to reduce synthetic, realistic, and colored noises in ECG signals; the performance of the method is affected by varying the threshold value, wavelet function and decomposition level, the method achieved superior results over conventional DWT in removing all kinds of noises. However, wavelet is non-adaptive tool in denoising ECG signal because of its dependent on the selection of wavelet function and thresholding technique. Venkatesan et al. [7] proposed a delayed error normalized LMS (DENLMS) with pipelined architecture for noise removal from ECG signal; a comparison with error normalized mean square (NLMS) and delayed NLMS algorithms, the pipelined DENLMS showed an increase in operation speed and reduction in power consumption because of the aspect of latches. Kumar et al. proposed combination filter between empirical mode decomposition (EMD) with non-local mean (NLM) to denoise ECG signal; They collected information related to the input noise by calculating the differential standard deviation before passing it to the EMD filter with the aim of reducing noise, then the output obtained is passed through the NLM with aim of preserving ECG signal edges; the method showed superior results in term of mean square error (MSE), mean SNR improvement, and mean of percent root-mean-square difference (PRD). EMD is not ideal in denoising non-stationary signal unless it combined with another algorithm [8]. Pongponsri and Yu [9] proposed a combination between multi-resolution discrete wavelet transform (DWT) and the adaptive learning potentiality of artificial neural networks for noise removing from ECG signal, the obtained coefficients from thresholding technique in DWT step was used as input to the neural network in initial filtering. Then, the obtained filtered ECG signal after converted to time domain was used as input to neural network in final filtering; the neural network in the final filtering accomplishes the inverse DWT to the output. The combination showed satisfactory results to remove the noise with important improvement on SNR. Mohammad Zia-Ur-Rahman et al. proposed an adaptive noise canceller based on leaky NLMS algorithm for noise removal from ECG signal, by introducing new variable step size containing the leaky coefficient in the weight update function; the results showed that the performance of the LNLMS based algorithm outperforms LMS based algorithm either in quantitative and qualitative results [10]. Liu et al. [11] proposed a guided filter based on Butterworth high-pass filter for EMG and EM based noises removal from ECG signals; a prefiltering of ECG signals using Butterworth high-pass filter was used to remove BW, then removed

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Stabilization/Solidification of Waste Containing Heavy Metals and Hydrocarbons Using OPC and Land Trass Cement

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ABSTRACT

The stabilization/solidification process (S/S) is one of the alternative methods of treating B3 waste, especially heavy metal. The S/S uses cement as the solidification agent. The cement will bind heavy metal pollutants in a monolithic mass with a sturdy structure, thus inhibiting its movement. The presence of hydrocarbons affects the S/S strength. Therefore, it is necessary to add pozzolan material which can absorb hydrocarbon constituting the cement blocking component of pozzolan cement, i.e. Ordinary Portland Cement (OPC) combined with trass soil. This study aims to determine the maximum content of organic materials in the form of hydrocarbons can stabilize/solidify heavy metals contained in wastes containing hydrocarbons. This research is conducted in two steps. Stage I aims to obtain the optimum composition of the mixture. On the other hand, stage II is to determine the maximum content of hydrocarbons in percent weight that can stabilize/solidify organic wastes containing heavy metals - Cu, Cr, and Pb in artificial wastes. The composition of OPC and trass soil was varied at a ratio of 100: 0, 5:25, 50:50, 25:75 and 0: 100. The hydrocarbons used in step II were paraffin, added to the optimum composition of OPC and trass soil with a proportion of 2.5%, 5%, 5% and 10%. The S/S product quality test was performed, involving: compressive strength test, Toxicity Characteristic Leaching Procedure (TCLP) and paint filter test. Strength test was conducted using a compressive strength testing apparatus Toasters Universal Testing Machine Type RAT-200, MFG No. 20380 CAP 200 tf. TCLP test under US-EPA (method 1311). The method of analysis pertaining to heavy metal concentrations involved a colorimetric method for Cr (VI), neocuproine for Cu, and dithizone for Pb. The paint test refers to the US EPA 9095B method. The results showed that the optimum composition of OPC mixture: trass soil was 50:50, which is the composition used in stage II. The results of compressive strength test were 2770 tons/m². The TCLP test results for heavy metals Cu and Pb with hydrocarbon addition on Cu 10% and Pb 2.5% reached 0.076 and 0.076 mg/L, respectively. The result of the paint filter test indicates that there is no remaining free fluid.

Keywords: trass soil, heavy metal, ordinary Portland cement (OPC), stabilization/solidification

1. INTRODUCTION

Environmental pollution by hazardous toxic waste (B3) is a serious problem that has not been handled properly. The B3 wastes generally contain the heavy metals resulting from industrial activities. The industrial waste containing heavy metals may be inorganic waste that does not contain hydrocarbons, for example including electroplating, metallurgical, and smelting industrial wastes. The waste generated from the oil and gas industry can be liquid, solid/mud or gas. Large amounts of oil sludge is generated during tank cleaning, crude oil storage, maintenance of related facilities and processing activities prior to crude oil sales to sea terminals. Oil sludge contains aromatic hydrocarbons (benzene, toluene, ethyl benzene and xylene), poly-aromatic hydrocarbons and heavy metals (Ayotamuno et al., 2007).

Oil-borne waste is a water-in-oil emulsion residue (W/O) containing a hydrocarbon and heavy metal compound. The most commonly found compounds are petroleum hydrocarbons (PHC) compounds, ranging from 5% to 86.2%, and other organic compounds such as Polycyclic Aromatic Hydrocarbons (PAH), alkanes, and phenols. On the other hand, the content of heavy metals such as lead is 0.001-0.12 mg/kg, copper 32-120 mg/kg, and chromium - 27-80 mg/kg (Hu et al., 2013). Phenol and PAH compounds are flammable, so they are classified into hazardous and toxic waste of B3 waste (Silva et al., 2012). Oily mud contains organic and inorganic contaminants. The organic contaminants are in the form of heavy metals, such as zinc, lead, copper, nickel, chromium, and mercury. The organic contaminants consist of Total Petroleum Hydrocarbon (Al Futaisi et al., 2007). Many processing techniques are used for the processing of waste oil industry, especially oily sludge. The methods with oil sludge incineration have been introduced to replace the hoarding and bioremediation methods. However, the method has limited concerns that the combustion process can release toxic gases which evaporate into the environment. Inorganic vaporous (VOC) vapors are formed and released. Toxic heavy metals also cannot be removed during the combustion process and will accumulate as solid particles of combustion areas (Dominguez et al., 2005).

Petroleum wastes generated by businesses or activities of oil, gas and geothermal or other activities producing petroleum waste are hazardous and toxic waste. The waste has the potential to cause pollution and environmental damage. Therefore, it is necessary to manage it well. Technological alternatives have been developed for treating the B3 waste through the physical, chemical, biological or combinational mechanisms. The B3 waste treatment technology must be in accordance with the characteristics of waste. One of the methods of managing petroleum and soil waste contaminated by petroleum methods can be carried out by the biological treatment. However, the biological treatment has the requirements of Total Petroleum Hydrocarbon / TPH

An Experimental Study On Behaviour Of Concrete By Partial Replacement Of Cement Using GGBS In Addition With Sisal Fibre

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Abstract - Concrete is probably the most extensively used construction material in the world. The main ingredient in the conventional concrete is Portland cement. The amount of cement production emits approximately equal amount of carbon dioxide into the atmosphere. Cement production is consuming significant amount of natural resources. That has brought pressures to reduce cement consumption by the use of supplementary materials. Availability of mineral admixtures marked opening of a new era for designing concrete mix of higher and higher strength. GROUND GRANULATED BLAST FURNACE SLAG (GGBS) is a new mineral admixture, whose potential is not fully utilized. Moreover only limited studies have been carried out in India on the use of slag for the development of high strength in a concrete with addition of sisal fibres. The study focuses on the compressive strength performance of the concrete containing as a partial replacement of OPC different percentage of slag and addition of sisal fibre. The cement in concrete is replaced accordingly with the percentage of 10 %, 20%, and 30%, by weight of slag and 2% by weight of sisal fibre. Concrete cubes are tested at the age of 3, 14, and 28 days of curing. Finally, the strength performance of slag blended sisal fibre concrete is compared with the performance of conventional concrete. The ultimate compression strength and split tensile strength were obtained at 20% replacement of GGBS with 2% of sisal fibre. The flexural strength of the beam were calculated from the optimum value obtained from compression and split tensile strengths. The various comparison of test results were illustrated graphically.

Key Words:

Ground Granulated Blast Furnace Slag(GGBS),Sisal Fibre (SF),

1.INTRODUCTION

In the recent years, there is great development in the area of admixtures and now a day, the pozzolanic admixtures like fly ash, micro silica are commonly used to enhance performance characteristics of concrete. It is need of time to design and construct the structures which will have greater durability and strength and which have led to develop concept of high performance concrete. The major intension in developing high performance concrete is to have adequate resistance to aggressive environments and to make the structure impermeable. However, use of pozzolanic admixtures like micro silica adds to the cost of concrete which directly affects the cost of the project.

It is need to find out the substitute to micro silica without sacrificing the quality and performance of High performance concrete. One of the better alternatives to Micro silica is GGBS. Civil structures made of steel reinforced concrete normally suffer from corrosion of the steel by the salt, which results in the failure of those structures. Constant maintenance and repairing is needed to enhance the life cycle of those civil structures. There are many ways to minimize the failure of the concrete structures made of steel reinforce concrete. The custom approach is to adhesively bond fibre polymer composites onto the structure. This also helps to increase the toughness and tensile strength and improve the cracking and deformation characteristics of the resultant composite. But this method adds another layer, which is prone to degradation. These fibre polymer composites have been shown to suffer from degradation when exposed to marine environment due to surface blistering. As a result, the adhesive bond strength is reduced, which results in the de-lamination of the composite. The principal reason for incorporating fibres into a cement matrix is to increase the toughness and tensile strength, and improve the cracking deformation characteristics of the resultant composite. In order for fibre reinforced concrete (FRC) to be a viable construction material, it must be able to compete economically with existing reinforcing systems. As GGBS is good in resisting salt corrosion & chemical reactions it enhances the properties of Sisal fibre.

2.MATERIALS USED

Ground Granulated Blast Furnace Slag (GGBS)

Ground Granulated Blast Furnace slag is a bi product obtained from the manufacture of the pig iron. Ground Granulated Blast Furnace slag is manufactured in such a way that the waste slag float over during the manufacture of pig iron is poured directly into the cold water, the process is known as

Conversion of Waste Marble Powder into a Binding Material

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Abstract

In the marble industry, a lot of marble is wasted in the form of odd blocks of various sizes and slurry consisting of water and micro-fine particles. The slurry on drying converts into powder. Both slurry and powder have adverse effects on the environment. This research is focused on the gainful utilization of waste marble powder (WMP) by converting it into a valuable binding material. For this purpose, WMP and clay were collected, and their physical and chemical properties were determined. A mix of WMP and clay was prepared and burnt at a temperature around 1300 °C. The burnt mix was ground to powder form to get marble cement (MC). The MC was then used in mortar. The compressive and flexural strengths of mortar cubes and prisms were determined. Apart from this, X-ray diffraction (XRD) analysis, thermogravimetric analysis (TGA) and scanning electron microscopic (SEM) analysis were also carried out. The chemical composition showed that the MC has 52.5% di-calcium silicate (C₂S) and 3.5% tri-calcium silicate (C₃S). The compressive strength of MC mortar after 28 days curing is 6.03 MPa, which is higher than M1 mortar of building code of Pakistan (5 MPa). The compressive strength of MC mortar after one year is 20.67 MPa, which is only 17% less than OPC mortar.

Keywords: Marble Powder; Binding Material; Cement; Mortar; Mechanical Properties.

1. Introduction

Marble stone has been used for construction and decoration purposes since a very long time [1]. Its demand has increased exponentially in the last few years and is growing further. Pakistan is one of the largest marble producing countries in the world. It has around 300 billion tons of known reserves of marble, and the actual reserves can be much more [2]. In Pakistan, about one million ton of marble stone is quarried and processed in marble factories annually. During quarrying operations, blasting technique is mostly employed, which results in the wastage of approximately 50 percent of marble stone [3]. The waste generated in quarries is in the form of odd rocks of various sizes [4]. However, there is no proper way to dispose of the waste, and thus the waste remains scattered in the vicinity of the quarries.

The raw marble blocks of large sizes are taken from the quarries to the marble processing units to produce marble tiles and other valuable stones of different dimensions and shapes [5]. Pakistan has numerous marble processing units with a sheer variety of machinery and equipment employed for the processing of these stones. During the cutting and polishing of the raw marble blocks, waste is also produced as a by-product. The waste is in the form of odd blocks of different sizes, shapes, and slurry, which contains very fine marble particles. Approximately 20% of these blocks are reduced to the micro-fine particles, which varies with the processing technology [6].

The slurry is usually discarded in the vacant spaces nearby the factories. There is no systematic way to eliminate the slurry; thus, it results in vast mounds of wastes. Consequently, the slurry dries and converts into a fine powder.

During windy seasons, heavy winds can easily carry the fine marble particles and can cause various health issues such as lung cancer, skin and eye irritation [7]. Besides, the heap of slurry remains scattered all around the industrial sector and spoils the aesthetics of the entire area [8]. Moreover, upon mixing with water, the slurry causes water pollution [9]. In addition, it reduces the porosity and permeability of the topsoil, resulting in the waterlogging of the area [10]. The fine marble particles reduce the productiveness of soil by increasing its alkalinity. Further, there is a loss to flora and fauna, i.e., already grown trees and bushes are dried out due to deposition of micro marble particles on leaves of plants and vegetation [11].

In order to solve the aforementioned problems, different researchers have used waste marble slurry and powder in various construction materials. Sutcu et al. [12] and Saboya et al. [13] utilized waste marble powder in the production of fired clay bricks. The authors concluded that the weight of clay bricks reduces considerably, while its compressive strength reduces marginally. Gencel et al. [14] used waste marble in the production of concrete paving blocks. They observed that the increase in the amount of marble sludge, results in a decrease of compressive strength; however, this reduction lies within acceptable limits. Moreover, the addition of waste marble increased the durability and freeze-thaw resistance of the concrete blocks. Rehman et al. [5] incorporated marble slurry in the preparation of masonry bricks. Apart from slurry; cement, plaster of paris, sand, crushed stone and acrylic fibers were also used. They concluded that when waste marble slurry, sand and cement were used in a ratio of 80, 5 and 15 respectively, along with acrylic fibers; a maximum compressive strength of 8.94 MPa was achieved, which is satisfactory for the construction activities where high strength is not required. Moreover, these bricks are low cost as compared to the conventional bricks. Kabeer and Vyas [15] replaced sand in mortar with WMB in various percentages up to a maximum of 100 %. They reported a considerable enhancement in the properties of mortar such as compressive strength, flexural strength, modulus of elasticity and density, considerably improve upon the 20 % replacement of sand

The Awareness Of Integrated Project Delivery And Building Information Modelling - Facilitating Construction Projects

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Abstract

Construction projects are complex undertakings, which involve many different parties striving towards successful completion. Effective and efficient processes are based on collaboration with an integrated project delivery approach, the project team working together as a cohesive unit towards a common goal. However, the current procurement system adopted creates fragmentation of the design and construction teams, which results in projects being delivered late, constructability issues, final project cost exceeding the approved budget, and variation orders.

A self-administered questionnaire was distributed to various built environment professionals within the Eastern Cape construction industry to determine the current awareness with respect to Integrated Project Delivery (IPD) and Building Information Modelling (BIM).

The findings showed that these systems have many benefits, which can assist in mitigating the afore-mentioned issues. The respondents indicated that they were aware of IPD and BIM and the related benefits; however, there are barriers preventing the adoption of these systems, such as clients not identifying the advantages, clients being resistant to change, as well as a lack of the requisite-related knowledge and skills.

Conclusions include that collaboration within the construction industry is imperative toward the successful completion of projects and that further information with respect to IPD and BIM is required to raise awareness and promote the adoption of these models.

Keywords: Building information modelling, construction, integrated project delivery.

1. INTRODUCTION

The construction industry is characterised by practices and systems, which professionals have become accustomed to. However, these practices and systems have not always produced the best value for clients. All projects are different and have their own unique location, and due to fluctuating time and budget constraints, the final product constitutes an untested model, which has been subject to continuous design variations. The concept of right first time is therefore a challenge to an industry that has not standardised its products. The construction industry is also fragmented, with many inexperienced clients, and delivery courtesy of separate design and construction organisations [1].

“Integrated Project Delivery (IPD) is a project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to optimise project results, increase value to the owner, reduce waste, and maximise efficiency through all phases of design, fabrication, and construction” [2]. This would be the ideal situation and approach, to commencing with construction projects.

The fragmented industry constitutes the rationale for the study reported on, namely to evaluate the level of awareness of construction professionals with respect to the benefits of implementing an IPD approach and tools such as BIM. IPD and BIM could potentially resolve many fundamental issues the industry is currently dealing with.

Predictive Analytics for Roadway Maintenance: A Review of Current Models, Challenges, and Opportunities

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Abstract

With the pressing need to improve the poorly rated transportation infrastructure, asset managers leverage predictive maintenance strategies to lower the life cycle costs while maximizing or maintaining the performance of highways. Hence, the limitations of prediction models can highly impact prioritizing maintenance tasks and allocating budget. This study aims to investigate the potential of different predictive models in reaching an effective and efficient maintenance plan. This paper reviews the literature on predictive analytics for a set of highway assets. It also highlights the gaps and limitations of the current methodologies, such as subjective assumptions and simplifications applied in deterministic and probabilistic approaches. This article additionally discusses how these shortcomings impact the application and accuracy of the methods, and how advanced predictive analytics can mitigate the challenges. In this review, we discuss how advancements in technologies coupled with ever-increasing computing power are creating opportunities for a paradigm shift in predictive analytics. We also propose new research directions including the application of advanced machine learning to develop extensible and scalable prediction models and leveraging emerging sensing technologies for collecting, storing and analyzing the data. Finally, we addressed future directions of predictive analysis associated with the data-rich era that will potentially help transportation agencies to become information-rich.

Keywords: Roadway Maintenance; Predictive Maintenance; Asset Management; Roadway Asset; Deterioration Model.

1. Introduction

United States is globally ranked among the top two countries for its excellence in financial systems, business dynamism, and innovation capability by the global competitiveness report of world economic forum [1]. However, this report ranked the United States 11th for road quality. Maintenance, repair, and rehabilitation (MR&R) strategies, significantly influence the condition of our roadway infrastructure, which was scored D, consistent with WEF report, on 2017 infrastructure report card of American Society of Civil Engineers [2]. During past decades, the importance of transportation infrastructure maintenance has significantly grown due to its contribution to economic growth. Well-maintained transportation systems (a) better-connect geographical locations, (b) lower transportation and transaction costs—through decreased vehicle maintenance, reduced delays, and lowered fuel consumption, and (c) enhance the safety of transportation systems [1, 2].

Among major maintenance strategies—predictive, preventive, and reactive—categorized by AASHTO (2011), predictive approaches have gained much importance in recent years. It is due to their potential in enhancing several aspects of maintenance objectives to lower cost over the life span of highways, increase the highway performance, provide optimal long-term planning capability, and integrate risk management into asset maintenance planning [3, 4]. In addition, advanced sensing technologies with lower price points and higher computing power coupled with emerging prediction models pave the way for accurate condition prediction of highway assets.

To this end, not only increased investment is necessary to close the \$543 billion capital investment gap for highways and bridges maintenance [2], but also smart investment is critical to take the optimal advantage of allocated budgets. Several state and federal level legislations such as MAP-21 [5], and FAST Act [6] were signed into law to increase investment and provide guidelines to enhance asset management. For example, state DOTs are required by FHWA to establish a process for conducting a network level Life Cycle Planning (LCP) for the National Highway System (NHS) pavements and bridges. FHWA defines LCP as the process of cost estimation for managing assets over their life span with consideration for minimizing cost while maximizing or preserving the condition. Identification of deterioration models that support predictive maintenance is one of the required elements of the LCP process as stated by FHWA. Life cycle planning will support prioritizing the improvement of various assets with minimum possible costs to achieve maximum possible return on investments on the roadway infrastructure [7-9]. While the current focus of most state DOTs is on project-level life cycle cost analysis, planning towards a network-level analysis is required to increase the return on maintenance investment. That is why data-driven predictive analytics of multiple highway asset classes is critical to LCP planning.

To investigate the potential of different predictive techniques in tackling the challenge of efficient and effective MR&R planning, we reviewed prediction models in the literature for a range of highway assets. We reviewed several methodologies, from simple subjective assessments based on experts' opinions to parsimonious probabilistic and

Computerized Optical Plethysmography for Data Recording and Processing of Biomedical Signal

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Abstract— An optical device has been developed for recording and processing of biomedical signal using transmission mode of optical plethysmography technique. The data acquisition process is carried out based on detection of the near-infrared light absorbance in blood vessels of fingertip due to heart's pump activity. The microcontroller was used as main component to provide the operation of electronics module and communication to personal computer through Universal Serial Bus (USB) system. In addition, the USB port was also used as part of power supply device, so that requiring no the external power adaptor. The analogue signal of photosensor (photodiode) was fed to microcontroller for digitalization process and then was transferred to a software for storage, processing and display of the biomedical signal on the personal computer. Performance of the developed device was tested to record the biomedical signal data of three fingertips of healthy volunteers. The testing results have shown that the developed device could successfully perform recording, analysis, and storage of biomedical data. Further, the recorded biomedical signals were processed by the software for filtering (removal noise) and extraction of spectrum signal using Fast Fourier Transform (FFT) function in the developed software. The results of FFT spectrum have shown that the dominant peaks in range 1 - 1.5 Hz according to the normal frequency of human heartbeat. Therefore, this device can potentially be developed as a simple, low power, computerized and portable device for importance of biomedical research and clinical practices.

Keywords— Computerized, Optical Plethysmography, Processing and Recording Data, Biomedical Signal

I. INTRODUCTION

The Optical Plethysmography (OPG) is a non-invasive technique used to optically obtain the arterial blood volume changes in blood vessels close to the skin surface [1]. Currently, pulse oximeter is major application of OPG technique in medical devices.

Pulse oximeters are non-invasive instruments used extensively in hospitals and emergency rooms to acquire patient oxygen saturation (SpO₂) and heart rate (HR). The data of SpO₂ and HR are derived from a series of OPG signal measurement. The principle of measurement is based on the fact that spectra of oxy and deoxy-hemoglobin have different optical absorption at the wavelengths of 660 nm (red light) and 905 to 940 nm (near infrared light) [2]. The measurement based on optical detection has several advantages over other techniques such as the use inexpensive optical sensor (e.g., LED and photodiode), non-invasive, safe, and easy-to-use properties. Therefore, the design of pulse oximeter technology requires only a few opto-electronic component [3].

The modern probes in pulse oximeter utilize low cost semiconductor technology with LED and matched photodetector operating at the red and/or near infrared (NIR) wavelengths [3]. In generally, the probe is placed on a fingertips and can operate in transmittance mode. More recently, advances in opto-electronics and computer have significantly supported to the advancement of OPG instrumentation. Due to demand for low cost, simple, low power, easy-to-use and portable, the OPG technique has been object of an extensive research in the later decades [4]. Therefore, the development of computer based OPG devices for vascular analyzer and portable heart rate detector have been reported [5, 6]. In field signal processing, there are several reports of the developments of computer-based digital OPG signal processing and OPG pulse waveform analysis [9, 10].

Currently, many research groups have been focused on the analysis of the OPG pulse waveform obtained from a single pair of infrared LED and photodetector [6]. The analyzing OPG signal waveform can give a valuable physiological information such as blood oxygen saturation, heart rate, and blood flow [2]. Because the OPG pulse is synchronized to each heartbeat, the pulse waveform can be used to assessment of cardiovascular system [11]. Many studies verify the high correlation between the RR intervals obtained from ECG signals and peak-to-peak (PP) intervals obtained from OPG signals [12]. The studies on dysfunction of microcirculation in skin have been also done, since the OPG signal is largely obtained on skin surface [13]. Meanwhile, the analysis of OPG signal waveform can provide information related to the diabetes due to the change of glucose level in blood volume [14]. Future, the detection of diabetes mellitus diseases can be non invasively carried out. In the other hand, the several of research groups was successfully verify that modulation of OPG signal amplitude related to respiration patterns [15, 16]. Although the pulse oximetry is commercially available in the market, but the OPG signal waveform analyzer devices have not been widely produced [10]. In particular, the demand for low cost and low power devices are required by the developing world countries, where they have limited resources.

Therefore, in this paper an optical plethysmography or OPG device has been designed, developed, and tested for the data acquisition and the processing of OPG signal waveform. The demand of low power is provided by USB system, so that requiring no external power adaptor. Meanwhile, in order to low cost in designing of OPG device the programmed microcontroller has been used to acquire the data of OPG signal using its embedded analogue to digital converter (ADC). The data of OPG signal is gathered and stored by a computer program for advanced signal processing. The designed system is simple, portable, low power (due to the device is powered by USB), automated (computerized), and allows the user to do the data acquisition in a clinical setting or biomedical research laboratory.

A Review on Graphene as Fillers in Rubber Nano-Composites

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Abstract—Rubber Nano-composites is under research due to their unique properties. In rubbers/elastomers, fillers are used to gain specific improved properties for their final applications. For most of the operations, rubber has to be reinforced with certain kind of fillers such as carbon blacks, silica, and clay etc. Nanofiller-reinforced rubber exhibits high hardness, modulus, and anti-aging and gas barrier properties when compared with microfiller-reinforced rubber. Also rubber nanocomposites filled with graphene are in demand in the industrial application because of its distinctive electrical, thermal and mechanical properties. This article reviews about rubber nanocomposites, various nanofillers, advantages and challenges of rubber nanocomposites. Moreover, it summarizes the preparation techniques, innovative properties and potential applications of rubber/graphene nanocomposites.

Keywords—Rubber/Elastomers, Micro-Fillers, Nano-Composites, Graphene Filler, Rubber Graphite Nanocomposites

I. INTRODUCTION

Nanoscience and nanotechnology can be considered as a revolutionary science in the multidisciplinary area combining chemistry, physics, material science, electronics and biosciences [1]. Generally, the term 'nano' is enclosed between the range 1-100nm sizes. With respect to diversity in technological applications, nanotechnology offers innovation and flexibility not observed in any other field.

Elastomer is a crucial commercial polymer due to its unique physical and chemical properties. In rubber, long chained polymers are arranged in random motion having amorphous solid rubbery nature. In molecular state, the atoms are cross-linked at certain points in rubber. Thus between pairs of linking, each bond can rotate freely irrespective of neighbor. As a result, rubbers possess unique physical and chemical properties. As an engineered product, rubber at some point will be subjected to external load. Due to application of external loading on rubber, molecular chain breaks down and is aligned into direction of loading. Upon unloading, the molecular chain of rubber gets cross-linked in random manner again. Due to this phenomenon, rubber possesses unique properties such as low hardness, high elasticity and high elongation at yield point. Rubber is impermeable to water but swells to more than double its size in organic solvents. These useful properties of rubber cannot be obtained until and unless a curing agent is added to modify the chemical characteristics of rubber. This process is called Vulcanization. Therefore raw rubber is usually vulcanized for its applications in the real world.

II. RUBBER NANO-COMPOSITES

In recent years researchers have focused their interest on polymeric nanocomposites which serve as a profound substitution to traditional filled polymers. In nanocomposites the reinforcement has atleast one dimension in nanometer size range (1-100 nm) when compared with traditional filled polymer reinforcements. Generally rubber nanocomposites show advantageous mechanical properties, lower water sensitivity and lower permeability to gases [2]. Over the past few years, nanocomposites have been widely deliberated considering number of various nanoelements such as layered silicates, talc, silica, nanobiofillers and carbon nanotubes. Moreover, incorporation of these nanoelements to polymer matrix provides four different structures: (i) conventional, (ii) partially intercalated or exfoliated, (iii) fully intercalated or exfoliated and (iv) fully exfoliated and dispersed.

A. Types of Nanofillers

Various nanofillers that are widely used in rubber nanocomposites are enlisted below:

1. Layered Silicates
2. Nanotubes
3. Spherical Particles
4. Polyhedral Oligomeric Silsesquioxanes (POSS)
5. Bionanofillers

The addition of the filler usually results in the improvement of the stiffness and hardness, and also of the resistance to abrasion, tear, cutting and rupture. In addition, the physical performance of an elastomeric material strongly depends on a large number of parameters, such as volume fraction, as well as the shape, size and aspect ratio of the particles. Fillers are generally classified according to their average particle size. Particles larger than 1 micrometer do not have reinforcing capabilities (at best) or have a detrimental effect, and they generally increase viscosity by a mere hydrodynamic effect [3].

Of all the ingredients used to modify the properties of elastomers, filler occupy a main role because of their significant contribution to reinforcement and processability.

Micro and Nano Scaled Patterning on SU8 and PVP Polymer Substrates by Direct Laser Writing Lithography

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Abstract - Laser exposed direct writing technique is a methodology of optical lithography effectively established fabrication technology for miniature structuring of surface patterns. In this paper we fabricated micro-scaled and nano-scaled patterns on the substrate implemented by mask-less lithography process. Films deposition was carried out by spin coating process, patterns on surface of SU8-epoxy based negative photoresist, and sonicated PVP (polyvinylpyrrolidone) substrates carried out by (532nm, 150mW) diode pumped solid state (DPSS) type continuous wave green laser as main source, laser beam penetrates on SU8 substrate get ablated created a path with good depth and non-circled bumps was created in PVP substrate, characterized it by Olympus optical microscope under various magnification levels.

Index Terms: Surface modifications, direct writing, spin coating, curing, SU8, PVP, lines, dot and bump Patterning, Optical Microscope-(OM)

1. INTRODUCTION:

In past decades there was enormous and sophisticated development in micro and nanotechnology, one of the successive key factors is continuous improvement in lithography techniques are driving a force for innovative patterns formations in present industrial areas. So far lithography focused on micro and nano patterning's has been limited industrial applications [1]. Making micro and nano scale patterns on a polymer substrate is of great importance for both fundamental research and practical purpose. The advantage of polymer based substrate are mechanical flexibility, light weighted, enhanced durability with low cost [2]. Fine patterning on a polymer based substrate with good resolution can be regularly achieved with some sophisticated state of art facilities. However these facilities are not widely accessible mainly due to their high complexity to implement, these are treated as main problems (high complexity and low accessibility) faced by the conventional micro-nano fabrication techniques may be overcome by using recently developed lithographic approaches such as radiation lithography using optical equipments. Patterning are mainly focussed on obtaining a patterns with smaller and lateral dimensions via optical lithography for new fields miniaturized devices emerged [3].

Direct writing technique is already proven to be appropriate for printing patterns of different materials in solid phase metals (aluminium, titanium, and tungsten etc.) [4]. Also these techniques are implemented by the laser beam focusing through objective lens with and without using mask and make the patterns. Depends on laser power density, material property, Micro and nanometre scaled patterns are realized by focusing laser beam in bulk and semisolid materials [5]. However the main drawback of this technique is a 100 class clean room required for implement the laser direct writing lithography [6].

SU8 and PVP materials are used to fabricate the patterns on it. Polymer based microstructures are popular in industry, SU8 is supplied by (Microchem Inc), chemically amplified, high contrast, epoxy based negative photoresist [7]. For patterning on SU8 is the most commonly used to make the separation system, micro reactors, micro needles, valves, polymeric chain reaction (PCR) chips, cell growth substrate and other MEMS systems [8] it has very high optical transparency above ~400nm, ideally suited for patterning high aspect ratio with near vertical side walls structure in very thick and thin films. Negative tone photo resist is highly and chemically stable and resistant to most acids and other solvents [9-10]. The SU-8 photoresist is most suitable for making the micro and nano patterns fabrications because, having good mechanical properties such as excellent chemical resistance [11], biologically benign material with stability, optical transparency and very high absorption coefficient etc., [12-13]. We can define the micro patterns in SU8 by using different exposure methods [14].

Polyvinylpyrrolidone (PVP) is deposits as substrate also used for the micro and nano patterning's, PVP belongs to the conjugated polymers family, its having good stability and capability to dissolve in deionised water [15], excellent transparency, fine charge storage capacity and optical properties, it is water-soluble and physiologically inert polyamide polymer [16]. The first patterned PVP is obtained by micromolding in the capillaries techniques [17]. PVP improves the film formation and it can thermally be cross-linked yielding a composite with outstanding thermal stability and high mechanical strength and the low light scattering due to the amorphous structure make it an ideal polymer for composite materials in optical applications [18]. Among the many polymers the polyvinylpyrrolidone has good film-forming exhibits good optical quality (high transmission visible range) for various applications [19], also crossover many commercial and technical applications such as Pharmaceuticals, agricultural chemicals adhesive, beverages, cosmetics, detergents, textiles, lithography, photography, paper manufactures and processing, oil-well drilling, fuel cell batteries[20-21] also in ceramics and fibreglass and etc.,[22].

2. RESEARCH METHODOLOGY AND IMPLEMENTATIONS:

2.1. Process Flow: