Business Intelligence: A catalyst for change management (Case Study of Loral International Schools Organization)

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Abstract— *Today's business management is faced with a lot of challenges due to the prevailing business environment. The globalization faced with new market penetration, accessing resources more economically, fast information processing and sharing with relevant stakeholders are more than enough reasons to force business managers to seek a CHANGE for a better and technological approach to handle management of business operations. The evolution of business intelligence(BI) therefore becomes the preferred business tool to drive its processes in an attempt to meet up with the target of a better-cheaper-faster business results. This research work is aimed at outlining the basic concept of business intelligence / change management, functions of business intelligence in an enterprise, how to transform from a nominal business to a business intelligence(BI) environment and its impact analysis. Loral international Schools Organization is a case study of planned implementation of business intelligence using System Application Products(SAP).*

Keywords— Benchmarking, business intelligence, SAP, data mining, change management and impact analysis.

I. THE PURPOSE

The school management team of Loral International Schools Organizations has approved the project submitted to it to carry out a world-class integrated and automated processing for both academic, financial and every other information of the entire school system using the technology of Enterprise Resource Planning(ERP) – being a component of business intelligence. This will eradicate the manual processing that wasted time, limited a full integration of different modules/section of the school and also was not providing the school management with a real-time information for easy and fast decision making. The implementation of this project will replace the above listed limitations while providing the school with a system having a full automated and integrated facilities for students, parents, suppliers, management and teachers for interactivity at their various levels such as online writing of examination, result automation, online checking of results, e-PTA newsletter/minutes, online tuition/fees payments, etc.

II. THE SCOPE

The process of change in this research applies to the application of business intelligence in Loral International Schools organization. Beginning from the Crèche level up to the University Foundation level of its educational system. The change management scope here is about a radical change from the use of manual system to Enterprise Resource Planning (ERP) system in the entire template of Loral school's information processing. The software selection is System Application Product (SAP). This proposed system will provide a full integration of all the six units (the Preparatory, the Crèche, the Nursery, the Primary, the Secondary and the University Foundation College) of the institution only. This is possible because SAP is all about customization and parameterization of functionalities to suit the needs of the client (Dilip S., 2010).

III. OVERVIEW OF THE PROCESS

The change process will involve the implementation of Enterprise Resources Planning in all pupils' and student's data(personal and academics), all financial transactions of school(student's tuitions, loans, salaries and other financial deals in the school) to procurements of buses, desks, books and other expenses of the school at different levels(Prep, Creche, Nursery, Primary, Secondary and University Foundation College). Majority of scholars in Loral International Schools Organization start from Preparatory school to the Foundation School. Therefore, their transcripts(cumulated academic records) can easily be followed up and computed easily whenever needed as a result of the advantage of system integration.

IV. RESEARCH QUESTION

How would the organizational capacity to carry out a successful change from the current state of the school system to a new system be assessed in other to meet the desired specification and standard?

V. INTRODUCTION

The complexities and challenges faced by business managers today has led to the decision to choose a better tool in business operation called – Business Intelligence. This is a high technology-based tool that requires ability to get an automated access to a large volume of data, interpret it, process it, analyze it and share it amongst all stakeholders for their individual usage within a fast period of time with a high level of precision(Wikipadia,2014). For this to be achieved, there is a need for an effective connectivity, cooperation, and alliance amongst all identified organizational functions for a proper communication with the aims of planning and decision making. This kind of business environment can be termed AN INTEGRATED BUSINESS ENVIRONMENT.

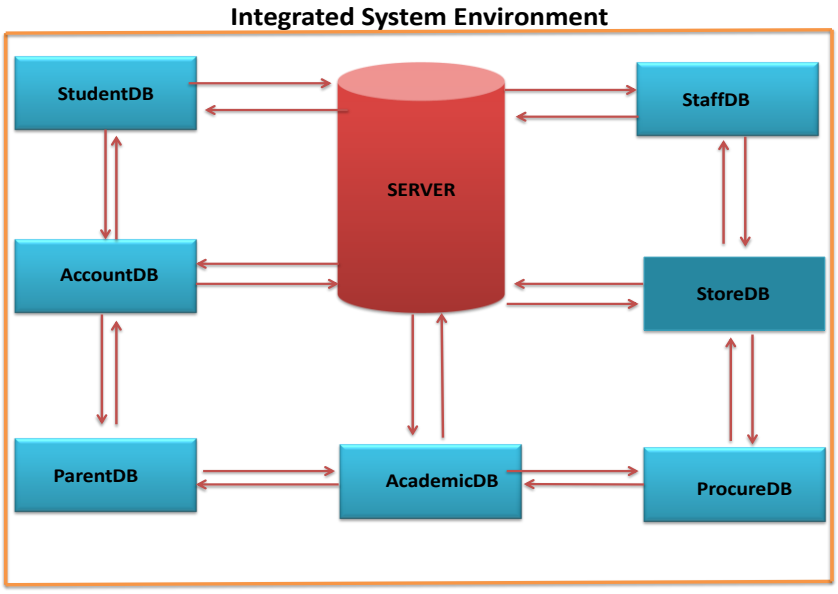

FIG.1 DIAGRAM SHOWING CENTRAL SERVER AND UNIT DATABASE OF THE SYSTEM.

But, in a non-integrated business environment where these processes are absent is termed a standalone business environment. The link between a stand-alone business environment and an integrated business environment is a Change.

The step taken by any management to effect a change from a stand-alone business to an integrated business is called a change management. Globalization has actually brought up the need for a better business technology.

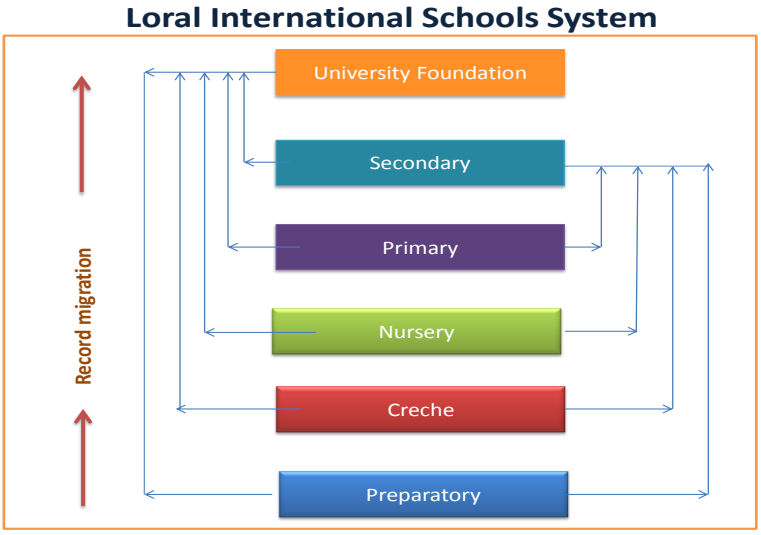

FIG.2 DIAGRAM SHOWING THE INTEGRATION PATH IN LORAL SCHOOL SYSTEM.

New technologies and changing market demands globally have necessitated new business models to cope with these challenges. For such a business to survive and remain in business will require that, it adopts a drastic or a radical change in its management approach. Such a business needs to move away from managing just a specific function of its processes to a vast integrated method of business management with the help of business intelligence.

Researches around the world show that, new and much more new technologies are expected in future. Also, the consumer expectations keep changing in the market. Therefore companies and organizations that hope to remain in business must ensure that they keep abreast with research findings and be ready to effect whatever recommended research results that come out. The fact is, the rate of change experienced in today's global market is faster than what it used to be in recent past. Correspondingly, mangers of business must stay afloat with the wind of change that comes as a result of changes in the global market.

For Loral International schools organizations, it is the time to move away from the era of paper and biro to the age of business intelligence. This is to meet up with the recent quality of pupils/students/parents and the prevailing standard of educational system required to adopt the global best practice and also to maintain itself as the pace setter in the industry. In the past, most educational institutions have been deploying ordinary database applications like Oracle, Sybase, MySQL, mSQL, etc as their backend to support an interactive interface (frontend) to manage educational data, institution's finances and other administrative information. But, the implementation of business intelligence (BI) in this research will unveil a new chapter of a real-time educational institution management in this 21st century.

VI. EXPLANATION OF CONCEPTS

What is business intelligence ? Business intelligence can be defined as a set of techniques and tools for the transformation of raw data into meaningful and useful information for the purpose of business analysis(Wikipedia, 2014). It can handle large amount of unstructured data to help identify, develop and create a new strategic business opportunity.

The system is a key factor in strategic planning process of the enterprise. It allows for a gathering, storing, accessing and analyzing corporate data and provides a concise result for decision making(Wikipedia, 2014).

Business intelligence is possible with business intelligence software that provides the procedures for gathering, storing, processing and analysis the raw data into processed information.

This underlines the ability to handle a volume of data. Organizations such as multi-nationals having their branches across nations and continents will naturally deal with a vast volume of data. It will require a dependable storage ability of the software and of course processing will require a trusted application. The accurate distribution of the processed results to different stakeholders will require a strong distributive network channels. Examples of such software include Microsoft Excel, Microsoft Access, Oracle database and SAP (Wikipedia, 2014).

Business intelligence software is a computer application designed with the purpose of extracting vital and useful from the pool of organization's raw data while presenting processed information which are needed by managers to make decisions on them. The general feature of this software is the ability to implement an integration across the various functionalities of the company thereby presenting a user-friendly platform for users across the system.

A typical example of business intelligence software is Enterprise Resource Planning(ERP). The application that provides an integrated platform for ERP. The vendors are : Systems Applications and Products(SAP), Oracle Database and Microsoft. A specific example of the application is SAP BusinessObjects platform solutions. SAP has several modules, each of which represents a business process. The basic features of business intelligence offered by SAP include : a real-time business platform, an increased level of autonomy, easy information accessibility, flexibility of data formatting and representation, scalability of the infrastructure, etc.

VII. THE CONCEPTS OF CHANGE MANAGEMENT

Change management is a systematic management approach adopted to introduce new processes both from the perspective of the organization and that of an individual employee within that organization(Whatis.com, 2008). Change is the only constant factor that nature has provided. One can only dislike change, but it is inevitable and indispensable. If it is accepted that change has come to stay, then one has to prepare to move with the change. In today's fast changing environment, change management skills are paramount if we are to stay on course as a business.

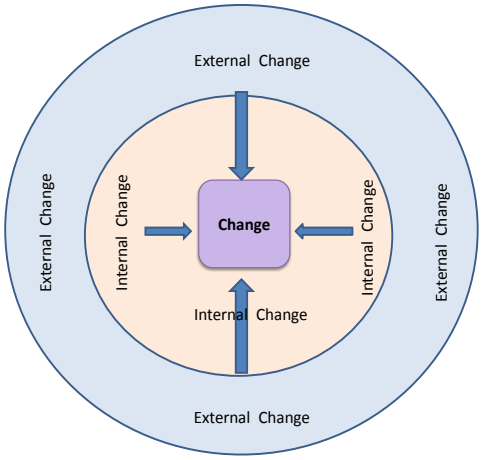

FIG. 3 DIAGRAM SHOWING THE DIRECTION OF CHANGE IN MANAGEMENT

Change, just like a wind that blows. It comes in different directions. Basically, change comes from two basic directions – Internal (This is a kind of change that has internal factors like process, strategy, technology and organizational adjustment) and External (this is the kind of change that has to do with factors like legislation, merger and / or acquisition).

VIII. COMMON FUNCTIONS OF BUSINESS INTELLIGENCE IN AN ENTERPRISE

Reporting: Business reporting is one of the functions of business intelligence. The vast amount of processed information would be too cumbersome for easy assimilation. Most processed information could be too conflicting without a function of improved reporting usability, embedded features, optimized characteristic to give managers of information a clear insight into the various contents of business modules.

Online Processing: Online processing function is one of the powerful features of business intelligence. The online processing involves the process of gathering input information, processing this input, updating and distributing them to stakeholders in a formatted mode. This function makes use of a remote processing which allow the applications for a high throughput and update-intensive in database management. These applications are used concurrently by hundreds of users. The key goals of online processing is to provide – speed, availability, concurrency and easy recovery of lost data. These are aimed at making fast-cheaper-accurate business results(Thamhain, H. J. 2005). Some of these systems include – financial transactions, sales, order entries. They require a robust database that optimizes data in other to facilitate the processing of such large volumes of data on real-time.

Data mining: Data mining can be defined as the practice of automatically searching or accessing a vast storage or a pool of data to discover patterns and trends that go beyond simple analysis(Oracle, 2008). Data in its original form is unstructured. The data mining applications provide that tool required for analyzing data. This allows users from various access points or locations to reach the data pool with the aim of analyzing it for their respective purposes. This is a function in business intelligence that helps mangers to improve in their decision making process and to quickly identify inefficient business process which of course requires a change or changes. Data mining requires a common analytical methodology that spans domains, business objectives and information sources(Oracle, 2008). The method, for instance can take three stages –

Explore(as a result of the volume of data generated within the system, exploring the whole pool of such data or information is critical to data mining process. It will require designing query forms and searches to capture those data attributes which are really needed).

Understand(it is vital to have a clear understanding of the pool of data generated in the process of data collection. A good knowledge of this will enhance a better way of mining the data. For instance, it will be better to understand the data generated from customers and those that come from the shareholders. How to set these two kinds of data will help to take the next step of analysis).

Analyze(this is the stage at which different structured and unstructured information are combined in other to identify the trends, patterns and relationships inherent in the data which can be used to make a better business decisions). In data mining, the following questions should be answered – where are the data ? how do I understand the data so collected ? what am I looking out for in the data ? who need the data and for what ? (Oracle, 2008).

The answer to all above questions is simply turning high velocity data into value.

Event Processing :The event processing is a function of business intelligence that gives an integrated platform where data are filtered, correlated and processed at real-time to meet business requirements which enable enterprises meet up with their targeted expectations. Its high performance and low latencies makes the tool a more preferred data management infrastructure (Wikipedia, 2014).

Business performance management : This, otherwise called corporate performance management(c.p.m.) can be defined as a set of management and analytic process that helps the monitoring of an organization's performance to achieve one or more targeted goals. Business performance management has three key activities such as –setting or selecting goals, consolidating measurement information that has to do with the progress of the organization in line with the set goals and interventions often made in light with information with a view to improving the performance recorded(Wikipedia, 2014).

Benchmarking: A measurement of the quality of an organization's policies, products, programs, strategies, etc., and their comparison with standard measurement or similar measurements of its peers(Webfinance, 2014).This is the process of comparing a company's business processes (internal processes) with the performance metrics to industry best practices from other firms. Specific indices or indicators such as quality, cost and time are often used. This applies majorly in strategic management where firms evaluate various aspects of their processes in the life time of the business operation. The results would consequently assist managers to develop plans and procedures on how to make necessary arrangement to meet the specific best practice. Depending on the policy of the management, benchmarking could be done as a continuous process or a one-off event exercise(Webfinance, 2014). But whatever may be the case, this function of business intelligence goes a long way to make business managers take a fast decision which enhances an enterprise meet up with the prevailing market demands.

Predictive Analysis: This is a branch of data mining that deals with the prediction of future probabilities and trends of the business in question. It describes a range of analytic and statistical techniques used for developing models that may be used to predict future events of the business (Whatis.com, 2014). The followings are a few advantages of predictive analysis. These are – provides a quantitative base to recognize, practice and assess the trend of business. Helps to identify the type of market (customer) and how to reach, interact and satisfy them. Assist managers to handle the present challenges and how to prepare for the future. Enables business processes to improve on their decision-making process and to attain the ability to automate, optimize and direct key decisions as per demands to reach business set goals or targets (Whatis.com, 2014).

IX. EFFECTS AND CHALLENGES OF BUSINESS INTELLIGENCE IN AN ENTERPRISE

A well implemented business intelligence strategy in a company gives the following benefits:

1. **Provides a clear insight into the company's progress:** Due to a reliable prediction based on a reliable analytical and statistical computation, a clear and a dependable insight of the present and future progress of business can be at the reach of the manager. This will also inform the later on a right decision to take both in a short and a long run terms. This simply implies that vital business decisions are not taking based on trial and error basis.

2. **It reduces labour cost in the long run:** A labour cost in running business is drastically reduced with a well-integrated business intelligence system. The cost such as mails dispatch to stakeholders, duplication of similar equipment at various branches of the organization which is faced out by a single server with only terminals at various branches as a result of cloud enhanced processing.

3. **Reduces information bottlenecks:** Information bottlenecks such as the delay in communicating relevant data and information to students, parents or customers as a result of real-time processing and accesses to these information.

4. **It makes data actionable:** A lot of data in the pool of organization's database can actually be accessed and utilized by various stakeholders. There is no room for inactive data since the survey or forms administered to capture these data were based on their needs.

5. **It offers information for a fast and a better business decision:** The free and fast accessibility to information due to an integrated platform assist managers to make both a fast and a better business decisions required to move the development of the organization forward.

6. **It aligns business operations close to the set objectives:** Benchmarking as a key function of business intelligence guides the business performance management that enables business operators to pursue its objectives closed to the set goals and objectives. The success of any business process is measured in its alignment between its set targets and the actual achievements.

7. **Indicates a clear insight about the future of the business:** good business management is the one that has a clear insight of today's progress and the tomorrow's continuity. With business intelligence, using a reliable predictive analytic tool, the future of the business is guaranteed.

X. CHALLENGES

1. **Changing business models and organizational processes:** The act of moving away from the old to a new system actually encompasses a lot of factors and constraints. These factors include among others - the mission, vision, business imperatives, the political implications, cultural influence, the model, the technological and people requirements. The complexity of project venture: Implementing of a kind of project like a business intelligence model is a complex one. This is a high tech venture that requires the relevant technical personnel with the appropriate skill-set. Project implementation and monitoring demand proportional skills in other to arrive at desired objectives and targets(Thamhain, H. J. 2005). For SAP project, there are needs for both functional and technical consultants. Then users must be conversant with the complexities involved in running the system.
2. **The cost of embarking on project implementation:** Embarking on a business intelligence project is a cost effective one. The nature of the technology calls for the cost. This is a high-tech that requires engagement of high profile personnel or professionals. This goes along with a high value in hiring them. Most high tech project requires multi disciplines. This implies that it will cost more to hire such classes of professionals to initiate the projects and to complete them as scheduled.
3. **The man power development**: Electronic based project and implementation demands a new skill set. The man power need has and shall continue to experience challenges as a result of a huge deployment of business intelligence system by most multinational organizations. Sourcing for or training the needed skill set to fit into appropriate jobs is a challenge.
4. **Managing impact of re-engineering process:** Whenever there is a change, there is a corresponding reaction. Man naturally resists a change. The result of this change usually brings different feelings and reactions with regard to the people in the job. The management of these feelings is critical if industrial peace must be maintained.

XI. METHODOLOGY

The Simple Random Sampling was used in this experiment to ensure an unbiased result. The questionnaire was administered as a survey using a simple random sampling(s.r.s.) to both – the Junior Category and the Senior Category of staff. Two surveys were conducted. The first survey captured members of staff (Junior and Senior) while the second survey captured 100 members of staff (Junior and Senior). Five questions were used in the survey to capture the input from the staff believed to have a proper knowledge of the organization in this study. Most of the senior staff members belong to the management team. They are believed to have a good insight of both the finance, the time, the support and the managerial capacities of the company to carry out the change project. 'Nothing is more frustrating than believing in the change but then not having the time, money, help, or support needed to effect it'(John K.,1995).

A SAMPLE OF QUESTIONAIRE

TABLE 1. SHOWING THE SAMPLE OF QUESTIONNAIRE USED IN THE SURVEY

SEX ☐ STAFF STATUS (SENIOR ☐ JUNIOR ☐)

S /N	QUESTION	CAPACITY YES	CAPACITY NO	CAPACITY NO IDEA
1				
2				
3				
4				
5				

First Survey: Out of 50 members of staff selected at random to respond to the survey questions, the following result was obtained:

TABLE 2

SAMPLE SURVEY ONE										
TOTAL NO	THERE IS A CAPACITY(YES)					THERE IS NO CAPACITY(NO)				
	JUNIOR STAFF		SENIOR STAFF		TOTAL	JUNIOR STAFF		SENIOR STAFF		TOTAL
	M	F	M	F		M	F	M	F	
50	20	12	8	4	32	7	3	5	3	18

n = (the simple random sample size of the those in the survey) = 50

$\hat{p}$ = (proportion of individuals within the sample whose choice were YES) =

= 32/50

= 0.64

The measure of margin of error associated with p using 95% of confidence =

$$= \frac{1}{\sqrt{n}}$$

$$= \frac{1}{\sqrt{50}}$$

= .14 or 14%

Second Survey: Out of 100 members of staff selected randomly to respond to the survey questions, the following result was obtained:

TABLE 3

SAMPLE SURVEY TWO										
TOTAL NO	THERE IS A CAPACITY(YES)					THERE IS NO CAPACITY(NO)				
	JUNIOR STAFF		SENIOR STAFF		TOTAL	JUNIOR STAFF		SENIOR STAFF		TOTAL
	M	F	M	F		M	F	M	F	
100	35	13	20	10	78	9	4	6	3	22

n = (the simple random sample size of the those in the survey) = 100

$\hat{p}$ = (proportion of individuals within the sample whose choice were YES) =

= 78/100

= 0.78

The measure of margin of error associated with p using 95% of confidence =

$$= \frac{1}{\sqrt{n}}$$

$$= \frac{1}{\sqrt{100}}$$

= .10 or 10%

NOTE: The larger the size of the sample used, the more closed to the truth of the result (error reduction).
This shows that a good number of staff both from the junior and the senior categories have indicated the positive capacity of the organization to embark on the project. This may be connected with the fact that the change was well communicated across the entire strata of the employee and of course the expected benefits they stand to share from its successful implementation. A good change communication leads to a change in employee's behavior and facilitate a new behavioral pattern in line with the desired change. (Sevda Y.,2013).

XII. PURPOSE FOR CHANGE

Reasons for a change: Develop a statement that identifies what made you think that the company needs this change(Cher der R., 2010).The tabular comparison on reasons for change is shown below:

TABLE 4. SHOWING DIFFERENCES BETWEEN OLD AND NEW SYSTEM

Old System	New System
Standalone	Integrated
Offline	Online
Non Real-time	Real-time
Slow	Fast
Prone to error	Accuracy
Commercially not viable	Commercially viable
Not cost effective in long run	Cost effective in long run
Customer satisfaction low	Customer satisfaction high
Low profit turn over	High profit turn over
Organization's rating is low	Organization's rating is high

XIII. IMPACT ANALYSIS OF BUSINESS INTELLIGENCE AS IN CHANGE PROCESS.

Determine who will be involved in what activities (Instructor Guide,2010)

Whenever there is a change in any existing system. The questions that will naturally arise include:

What happens to whom? The impact of change in case of business intelligence is a drastic change. Most times it affects workers from the top to the bottom (from the executives to ordinary data entry officers.)If the chief executive of the business organization lacks the basic skill set, then the change must affect him/her.

What is the nature of effects? The nature of effect usually ranges from loss of job to demotion from the present positions downward. The change may bring new people which are big threat to workers at various levels (Wikipadia,2014).

What is the cost of the effect? The cost of effect differs depending largely on how many years each worker has put in and at what level. The cost of impact on an executive officer will definitely be different from that of a data entry officer.

How are these effects managed or handled? How these effects are managed for each category of workers depend largely on a well analyzed impact and the strategy to handle at various levels. The option of training is a more compromising one. The other option could be to lay off with a good pay off. But what happens to shareholders and customers all through the period of change is a tactical management strategy to carry all along.

In this case study. The option of training for all categories of teachers and administrative staff of Loral Schools Organization was chosen. This option was well communicated and it assisted the management to have a support to consider the proposal for implementation.

XIV. CONCLUSION

The change project by the Loral International Schools organization is believed to be a monumental change that would affect the finance, the political will and cooperation of the entire stakeholders of the institution. The research was focused on the change capacity assessment by Loral Schools organization to implement the change. The positive response by staff shows a good communication of the planned change to them despite the pending effects. Their responses provided an impetus for the commencement of the project which is believed to be beneficial to them. Implementation of business Intelligence is a new project in school environment within the domain of this research. And this is believed to set a standard for all other schools to follow.

REFERENCES

[1] Cher de R., (2014). Change Management. Administration & Introduction.

[2] Ekaterina N.(2012). Strategically restructuring as a way of Change Management Economic & Management. Saint Petersburg.

[3] Wikipadia:www.wikipadia.com. Downloaded on the 2nd October, 2014 Source: www.wikipadia.com

[4] Tatiana E. A.(2008). Can organizational change be planned and controlled? Evidence from Russian companies. Saint Petersburg. Russia. International Journal of Human Resources.

[5] Linda A. & Dean A.(2009).Awake at the Wheel: Moving Beyond Change Management to Conscious Change Leadership.

[6] Sevda, Y. & Sigrid, B.(2013). Culture-Specific Objectives of Change Communication: An Intercultural Perspective. Journal of management and change.

[7] Oracle, 2008. Data Mining Concepts 11g Release 1(11.1) : www.docs.oracle.com/.../process.htm

[8] John, K.(1995). leading change: why transformation efforts fail. Harvard Business Review, March-April 1995.

[9] Whatis.com, 2014. Downloaded on the 4th October, 2014. Source: www.searchdatamangement.techtarget.com :

[10] Instructor Guide Resources, 2010. Steps in the Impact Analysis and Implementation Planning Process. The Change Leader's Roadmap.

[11] Webfinance, 2014. BusinessDictionary.com. Download on 4th October, 2014 Source: www.businessdictionary.com/definition

[12] Whatis.com, 2014. Downloaded on the 4th October, 2014 Source: www.searchcio.techtarget.com/definition....

[13] Thamhain, H. J.2005. Managing Technology. John Wiley and Sons, ISBN: 0-471-41551-0.

[14] Dilip S., 2010. SAP Sales and Distribution-Complaints Returns Management Overview. Think Tree technologies Inc.