

Technology Change Management in the Department of Higher Education, State of Madhya Pradesh, India

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Abstract:

The main purpose of this study is to provide a rationale for the process of change and how change is implemented in reference to technology change management (TCM) in Department of Higher Education in State of Madhya Pradesh (i.e. a State of the Republic of India). This study evaluates the steps taken by the department to bring technology change in the field of higher education. This case study based on the primary data collected from 10 government colleges of Indore Division, information has been collected from the colleges through structured questionnaire and the data further been validated through personal interview of the employees. After analyzing the collected data some inferences and suggestions have been drawn to tackle technology change management in the higher education sector. A major finding shows that TCM has been implemented forcibly, but TCM has brought excellence into the department.

Key Words: e-governance, higher education, human resource management, technology change management, Madhya Pradesh (India).

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Introduction

E-governance has evolved as a model of governance in information-age. E-Governance (Gartner 2000) is the application of information and communication technologies (ICT) in the processes of government interactions with citizens and business as well as in internal operations with the objective to ensure the highest standard of services by providing instant access to selected information, and interfaces for communicating with various government functionaries, wherever and whenever they need it. The term e-government or also known as 'digital government' refers as to how government utilizes IT, ICT and other telecommunication technologies, to enhance the efficiency and effectiveness in the public sector. The stakeholders in e-governance are government, investors, employees, vendors, intermediaries and citizens. Various environment variables that exert an impact upon implementation of e-governance are Social, Political, Legal and Economic. This also includes internal aspects which cover IT applications to increase efficiency and effectiveness of internal functions, internal communications and internetworking (Ray and Dash 2005). E-governance is the process of service delivery and information dissemination to citizens using electronic means. It provides the following benefits over the conventional system:

- Increased efficiency in various governmental processes,
- Transparency and anticorruption in all transactions
- Empowerment of citizens and encouragement to participate in governance (Jeong 2006).

The broad vision of the state (GOMP 2007) for the IT sector is to improve the life of the common man by leveraging the strengths of e-governance, attract investment in the sector so that educated youth can contribute to the development of the state, create a pool of highly skilled professionals who are at par with the best in the country, and transform a resource based economy to a knowledge based economy. Foreseeing the opportunity of growth in the IT sector, the Madhya Pradesh government developed its IT policy in 1999. The policy ushered the state into the 21st century. The IT policy is targeted to achieve objectives including E-Governance that will attract IT projects industries and IT education. All essential daily public services of every section (e.g. agriculture, competition forms, news, education (all levels), weather, public complaint, information and other services are available through the internet. Madhya Pradesh is now on the path of an information highway.

The development agenda of Madhya Pradesh identified the education sector as a thrust area for social and economic development. For the purpose of e-governance the education roadmap includes School Education, Technical Education & Manpower Planning, Higher Education, Medical Education and Science and Technology departments. Considering the various functions of these departments and their interaction with the Government (GOMP 2006) , the major stakeholders are:

- Government of India
- Department of Education sector employees, their implementation agencies and institutions
- Multilateral and bilateral donor agencies
- Private education institutions
- Citizens
- NGOs
- Other government departments.

The Department of Higher Education is the governing body for higher education in Madhya Pradesh. This Department is responsible for overall development of higher education in Madhya Pradesh. This department looks after planning, budgeting, and infrastructural development of higher education in Madhya Pradesh. College and university education apart from engineering, medical, agriculture and veterinary fall under the purview of this department.

The average literacy rate of Madhya Pradesh as per the 2011 (GOI 2011) census is 70.6%. The male literacy rate in the state is at 80.5% as compared to the female, which is only 60%. The development in higher education in the state of Madhya Pradesh is moving at a greater pace. Earlier system of higher education was of the ancient forms but today colleges are moving towards securing more and more jobs in the industry, civic and academic fields. With the increase in demand for higher education in the industrial and academic sectors, there is a corresponding increase in institutes of higher education. About nineteen universities offer regular courses, professional and vocational courses through a large number colleges and institutes in the State of Madhya Pradesh.

Literature Review

Banamati and Lederer (1998) conducted a study on change management in IT environments. They stated that IT is changing rapidly and simultaneously, challenging IT management. To meet these challenges, several organizations created an official group of IT professionals to evaluate emerging IT so that they could cope with changes. This study was conducted through structured interviews, which were mailed to IT organizations to identify categories of coping mechanisms to handle changing IT. Five such categories emerged: education and training, internal procedures, vendor support, consultant support, and endurance. The research found that organizations with a group dedicated to investigating emerging IT cope more extensively, but not more successfully, than those without one. Thus the research contributes not only by providing an understanding of how organizations cope with rapid IT change, but also it suggests the need to achieve more from the group charged with emerging IT.

Lick (1999) expressed that the impact of globalization on culture and educational system is a major concern. He further stated that some people saw it as a threat for traditional institutions such as the family and the school. Another argument saw benefits in overturning traditional and developing modern attitudes. This paper also analyzed the positive and negative impacts of globalization on education for developing countries. Effective education systems are the foundation of opportunities to lead a decent life. Ensuring that children have an adequate access to education will be an essential public sector function for all countries, at all income levels. The paper argues that education is a core element of society and the foundation of democratic choice. The large difference in opportunities in education between different countries is global inequality. People can only contribute and benefit from globalization only if they are endowed with knowledge, skills, and values and with the capabilities and rights needed to pursue their basic livelihoods. The study also suggests that the primary issue facing higher education is the need to initiate, implement, and manage meaningful and planned change. It also offers an expanded view of strategic planning, contrasting the traditional teaching paradigm with a learning paradigm. Lick stressed that change management requires understanding that learning must precede change.

Sinha (2006) conducted a study on the status of e-governance in India. He articulates that the progress has been slow and uneven. While intentions and hype have been expressed, often prematurely, the ground result is not commensurate with the expectations. There are some fundamental reasons for this. The book presents a systematic description of the initiatives taken towards e-governance by the Central Government and some selected state governments and analyses the factors that hamper its growth. The scenarios in some ICT-advanced countries in the world have also been presented. The book is expected to provide information and stimulate technologists, planners and students of e-governance in general. The study is very important in view of the e-governance implementation programme in India and expressed that the e-governance was started very late and implemented in random manner.

da Silva and Wetzel (2007) investigate the social process of sense making in changing organizations, and tried to observe how participants interpret related events and construct their notion of time. This notion of time then interacts with the dynamics of the lives of individuals and contributes to the adaptation to the new reality they are facing. Results indicate that individuals establish a reference to central events in their attempt to make sense out of changes and in their effort to adapt to the new situation. The basic aim of this research paper was to find out how individual faces the changes in an organization and their efforts to adapt changes.

Stevenson and Thody (2009) make no claim as to how to 'do' change management, but rather they seeks to address weaknesses in the change management literature by providing a broader and more complex analysis of the processes of change. They focus on 'change' as a process both located in national policy contexts, and one rooted in individual institutions, and several papers in the e-book are concerned with how each of these is interdependent with the other. The major issue in this e-book is the change process should be at a grass root level to achieve the goals of change.

In *Immunity to Change*, authors Kegan and Lahey (2009) show how our individual beliefs along with the collective mind-sets of an organization can be combined to create a natural but powerful immunity to change. Kegan and Lahey (2009) have given us the keys and suggest that this mechanism can be used to unlock our potential and to move forward. They argued that by pinpointing and uprooting our own immunities to change, we can carry organizations forward with us as we move to achieve the goals of change. This is a persuasive and practical book, filled with readymade propositions and also delivers the tools we need to overcome the forces of inertia and transform our life and our work. This study shows that self-inertia is the most important factor in change. Somehow in the normal course of events we do not want to come out from the shell and this study helps to break or unlock that inertia to change.

Martini (2010) suggests that successful implementing and managing of change is necessary for each adult educational organization. He further argued during the change process, leading and guiding the staff is a key and the most significant factor. The study finds the significance of certain values and of organizational climate and above all the significance of leadership style which a leader will adjust to the staff and to the circumstances. Its originality/value is in providing information on the important relationship between culture, leadership styles and leader's behaviour as preconditions for successful implementing and managing of strategic change. The significant issues dealt in this study are the importance of leadership and its qualities in TCM (technology change management).

The following important points became apparent from the above review of literature. First, training is the most important aspect to cope up with rapid IT change. The most important issues arising are the need to initiate, implement, and manage meaningful and planned change. The e-governance in India was not implemented in timely or systematic manner. The individual initially resists changing but adopt to a new situation after a reasonable period of time. Change should be implemented at the grassroots level to achieve success. Self-inertia is the most important factor in a change process. Finally, the process of TCM depends on leadership skills and qualities.

Rationale for the Study

The main purpose of this study is to provide a rationale for the process of change and how change is being implemented in reference to TCM. This study is under taken to evaluate the steps taken by the Higher Education Department to bring technology change in the field of higher education in reference to administration and management. Change management is a structured approach to transitioning individuals, teams, and organizations from a current state to a desired future state. Several changes take place in organizations, such as strategic changes, technological changes, structural changes, and changing the attitudes and behaviors of personnel, and the technological change is the most versatile change. Every government department is under the state of change and most effective change is the technological change, and higher education needs a change to streamline all the activities. Department of Higher Education is adopting several technological steps to make its role more meaningful.

Since 2007 e-governance was initiated and established with the resources available in the department. This study was undertaken to analyze the efforts of Department of Higher education towards technological change management, and effectiveness. The study was an attempt to investigate the presence of technology as a tool of change management. To fulfill the objectives of the study, a qualitative case study method was employed.

Objectives of the Study

Main objectives:

- To recognize why and how the technology change process was started (drivers of the change).
- To examine the best practice processes adapted for technology change implementation.
- How TCM is implemented for good governance or e-governance.
- How the transition is streamlined in TCM along with a proper consideration of all associated stakeholders of the TCM process.
- What are the resistance factors?
- The evaluation of TCM and impact of change.
- How this change motivated, trained and capacitated government employees to undertake the revised roles and responsibilities associated with their job responsibilities.

Research Methodology

The effectiveness of case study is emphasized as “a case study design will be employed to gain an in depth understanding of the situation and meaning for those involved” (Merriam 1989). The interest is in process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation. There are three types of case study - research exploratory, descriptive, and explanatory (Yin 1998). While considering all the types of research I felt that exploratory research was more appropriate for this research, because exploratory research was selected just to understand a background of change, and to explore its future aspects. This case study research method was selected to analyze insight of the TCM in the Department of Higher Education.

Data Collection

This study has been conducted with an attempt to identify the initiatives taken by the Department of Higher Education towards TCM. The discussion and findings of this research is concentrated on the status of information technology application in department of higher education and its implementation since 2007. Primary information was collected through questionnaires and unstructured interviews. Only government colleges of Indore city were used to collect the data. Secondary information was taken from published books, journal, magazines as well as online sources discussing TCM. Data collected through Likert scales was analyzed by using non-parametric tests (e.g. chi-square test).

Questionnaires were collected from following Colleges of Indore District: Govt. Holkar Science College; Govt. Old P.G. Girls College; Govt. New P.G. Girls College; Govt. Arts & Commerce College; Govt. Sanskrit College; Govt. Law College; Govt. New Science College; Govt. P.G. College, Mhow, Dist.; Govt. College, Depalpur, Dist.; and Govt. College, Sanver, Dist.. In total ten (10) Principals were consulted along with the questionnaire. The questionnaire mainly covers the following aspects of change management:

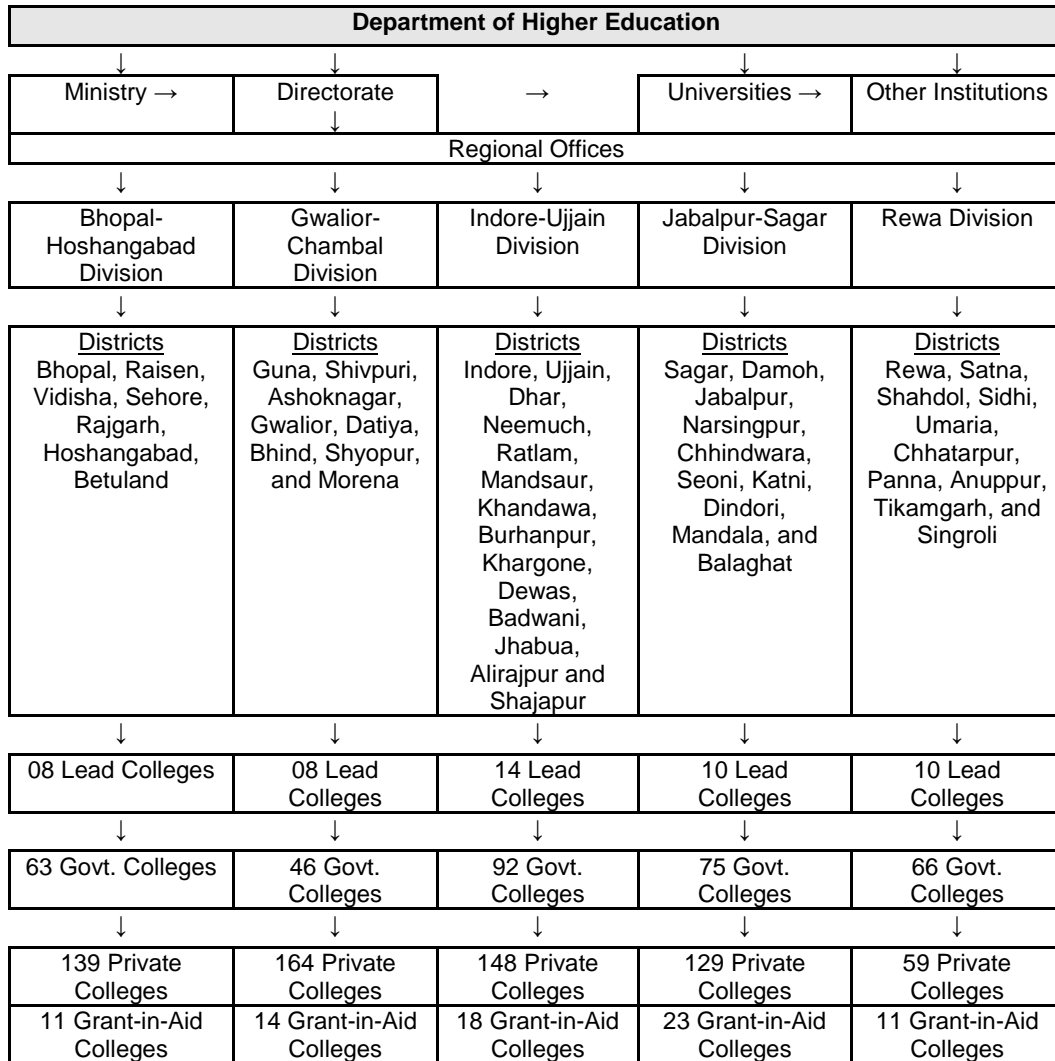
- Why change process has been started
- How change process has been Started
- What were the drives of change
- Processes adapted for implementation of technology change
- How TCM was implemented for e-governance
- How transition was streamlined
- Consideration of all associated stakeholders
- What are resistance factors
- Evaluation
- Motivation
- Training
- New responsibilities

Background

The first part of the analysis provides the background based on three years of annual reports of the Department of Higher Education. The IT policy adopted by the Department of Higher Education (DHE 2011) had the objective “To have fast information for efficient and time bound execution of policies of the Department with an aim to cater facilities available at this Department to each and every course of the state for implementation of Benefits of Higher

Education.” The target group of this policy is “All Employees of Higher Education Department of State and Students pursuing their studies at under graduate & post graduate level in state government colleges”. The main concern for adopting an IT policy was to increase the ‘gross enrolment ration’ (GER).

Table 1. Organizational Setup of Department of Higher Education



Source: Government of Madhya Pradesh, Department of Higher Education. Administrative Report 2011-2012 (GOMP, DHE 2012).

The government set a target of 21% GER by the end of the Twelfth Plan (2017) with an interim target of 15% by the end of the Eleventh Plan 2012. This seems a highly ambitious aim considering the present GER of 12.4%, when the world average is 27 per cent (World Bank, 2012). The organizational setup of the Department of Higher Education is based on the bureaucratic organizational structure (see Table 1).

The purview of the departments is very large and caters several types of institutes see Table 2).

Table 2. Higher Education institutions under the Department

S. No.	Types of Institutes	Number of Institutes
1.	Government Colleges	342
2.	Aided Private Colleges	77
3.	Private Colleges	636
4.	Universities	07
5.	Other Universities	06
6.	Private Universities	09
7.	Other Institutes	05
	Total Institutes	1082

The breakdown of 14,244 strong workforce in the Department can be visualized in Table 3.

Table 3. Workforce levels

No.	Cadre	Number
	Administrative Cadre / Directorate	
1.	Commissioner	01
2.	Additional Director	08
3.	Joint Director	07
4.	Public Relation Officer	01
5.	Officer on Special Duty	04
6.	Deputy Director	02
7.	Chief Auditor	01
8.	Assistant Director	12
9	Class III	229
10.	Steno	18
11.	Class IV	81
	Principals/Teaching Staff/ Class III & Class IV (Collegiate Staff)	
12.	Principals	355
13.	Professors	779
14.	Assistant Professors	6414
15.	Registrar	31
16.	Sports Officer	269
17.	Librarians	306
18.	Class III	2633
19	Class IV	3093

The state government contributes a significance amount to strengthen the level of higher education in the state. The budget for the year 2009-2010 (GOMP, DHE 2010), 2010-11 (GOMP, DHE 2011) and 2011-12 (GOMP, DHE 2012) are seen in Table 4.

Table 4. Higher Education Budget 2009 to 2012.

S. No.	Particulars	2009-10	2010-11	2011-12
1.	Budget			
	a. Main Budget	48465.62	52955.43	89847.34
	b. Supplementary Budget	4475.00	28250.88	442.58
2.	Schedule Tribe Sub-Plan	1237.37	1250.00	1235.00
3.	Schedule Caste Sub Plan	970.14	2160.00	865.00
	Total	55148.13	84616.31	91947.34

(Amounts given in Lakhs;
1 Lakh = 100,000)

A special budget allocation was made for IT in the colleges and their offices.

Initiatives towards TCM

- a. The State Government launched Tele-Samadhan (Redressal of Grievance through Telephone) Plan for the general public. Through this the general public can lodge their problems, complaints, or grievances.
- b. The department is providing broadband connections to 190 colleges of the state. This was launched in collaboration with Ministry of Human Resources Development, New Delhi under the National Mission of Educational Programme.
- c. To implement e-governance in the department, a number of indigenous software was developed for their day to day functioning and for a database of the workforce.
- d. The following software was developed by the department:-
 - **College Informatics:** This software includes Information about Gazetted Employees, Non-Employees, Infrastructural Information, Information about Availability, Information Technology Facility, Janbhagidari Samiti (Public Participation Committee).
 - **Budget Proposal and Monitoring Software:** The aim to monitor the expenditure of budget and Mudra (Money) and to generate the budget in electronic form.
 - **Scholarship Software:** monitors scholarship schemes:-
 - **Student Strength:** includes students' information class, caste wise and etc.
 - **Guest Faculty:** At present the department is not appointing permanent teaching staff, as per UGC recommendations the department is appointing guest lecturers. The department has developed software for making merit list and appointing guest lecturers in all government colleges.
 - **Online Admission:** Previously the department was monitoring admissions in all the colleges through website. This year i.e. 2012-13 the department has initiated online admission process, by which any student from any corner of the world can seek the admission in any college of Madhya Pradesh.
 - **Human Resource Development Module.** A complete database of employees of the Department to assist decisions regarding transfer, promotion etc.
- e. To improve communication the department coordinated with NIC and generated email addresses of all government colleges and all officers.
- f. The department instructed the Principals to develop their websites. At present 296 websites have been developed.
- g. To increase email effectiveness the department issued strict instructions for the proper use of email.
- h. A total 3400 users are visiting higher education website every day.
- i. Department is now using facilities of IT for HR development such as recruitment, promotion and gradation.
- j. Transfer and posting orders of employees are not being sent through conventional mean of communication, these are being uploaded on the website
- k. The department has decided to give ten internet connections to each college; it was introduced for fast communication and overall monitoring of the colleges..
- l. Apart from software development and implementation of IT, the department is imparting training to the clerical and teaching staff on IT at Prashasan (Administration) Academy, Bhopal.
- m. The Department of Higher Education was awarded "South Asia Award 2009" for excellent work in the area of e-governance.

- n. Moreover Department of Information Technology, Government of Madhya Pradesh has been honored for best application software developed by the Department of Higher Education i.e. E-Samvad (Electronic Communication).
- o. The department has dual responsibility towards HRD, first to educate students to develop useful human resources and secondly by adopting IT develop their own human resources to fulfill first responsibility.
- p. The department encourages the use of seminars and workshops on IT related subjects. State level workshops were organized by the Govt. M.H. College on Effectiveness of Computer Application for the teachers.
- q. The academic staff colleges of all universities are running refresher courses in computer applications for the teaching staff of colleges and universities.
- r. The colleges are being granted additional funds for purchasing IT infrastructure for teaching and official purposes.
- s. A separate cell for development of software and collection of information has been created at all levels of the organization.
- t. The department communicates directly and regularly with the Additional Directors (Regional Directors), Principles, and the other staff via video conferencing.

Results Part I

This section is based on the data collected from the 10 government colleges of Indore District through questionnaire designed in Likert scale to test the hypotheses which have been formulate to recognize ground realities of objectives. The views and opinions collected through questionnaires were analyzed and presented under each hypothesis.

H1: *There is no significant reason to initiate change process.*

Why Change Process	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Improve Performance	10 (100%)				
Win Over Stakeholders		3 (30%)	3 (30%)	3 (30%)	1 (10%)
Create a Road Map		6 (60%)	4 (40%)		
Take a Comprehensive Approach		4 (40%)		3 (30%)	3 (30%)
Be a Leader, Not a Bureaucrat		5 (50%)	5 (50%)		

The table value of χ^2 for 16 degree of freedom at 0.5 percent level of significance is 26.296. The calculated χ^2 is greater than the tabulated value of χ^2 at the 0.5% of degree of freedom expressed that no significant reason is involved in initiation of change process in the Higher Education Department.

H2: *There is no specific driver responsible for change*

Drivers of Change	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
External Environment	9 (90%)	1 (10%)			
Internal Environment	3 (30%)	3 (30%)	3 (30%)		1 (10%)
Systems	4 (40%)	1 (10%)	1 (10%)	1 (10%)	3 (30%)
Behavioral Theory	5 (50%)	2 (20%)	2 (20%)		1 (10%)
Organization Structure	3 (30%)	3 (30%)	3 (30%)		1 (10%)
Inadequate Performance	6 (60%)	1 (10%)	1 (10%)	1 (10%)	1 (10%)
Change in strategic Objectives	2 (20%)	2 (20%)	2 (20%)	2 (20%)	2 (20%)
New technology	10 (100%)				

The table value of X^2 for 28 degree of freedom at 0.5 percent level of significance is 41.337. The calculated value of X^2 is less than this tabled value, hence the hypothesis is accepted. This shows that all drivers are responsible for technology change in Higher Education Department.

H3: There is no meticulous factor is responsible to bring change

Factors	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Availability and Familiarity with Technology	9 (90%)	1 (10%)			
Policies for Technology Change	9 (90%)	1 (10%)			
Increase Level of Technology Literacy	6 (60%)	2 (20%)	2 (20%)		
Availability of Skilled Staff	4 (40%)	4 (40%)	2 (20%)		
Work Environment and Ethics	6 (60%)	1 (10%)	1 (10%)	1 (10%)	1 (10%)
Availability of Technical Support	9 (90%)	1 (10%)			
Social, Cultural and Political Factor	4 (40%)	2 (20%)	2 (20%)	1 (10%)	1 (10%)

The table value of X^2 for 24 degree of freedom at 0.5 percent level of significance is 36.415. The calculated value of X^2 is less than tabled value hence the hypothesis is accepted; all factors are certainly contain some weightage and deviate between higher and lower scales of the series express that no particular factor is responsible to bring the change in the department.

H4: There is no significant skill can be implemented to bring change.

Implementation of Change Process	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Soft Skills					
Leadership	9 (90%)	1 (10%)			
Internal Communication	4 (40%)	4 (40%)	2 (20%)		
Conflict Management				5 (50%)	5 (50%)
Hard Skills					
Strategic planning	8 (80%)	1 (10%)	1 (10%)		
Project management	8 (80%)	1 (10%)	1 (10%)		
Organizational alignment	4 (40%)	2 (20%)	2 (20%)	2 (20%)	

The table value of X^2 for 20 degree of freedom at 0.5 percent level of significance is 31.410. The calculated value of X^2 is higher than table value hence hypothesis is rejected.

H5: There is no unambiguous factor responsible for streamlining of transition

Streamlining of Transition	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The Request Backlog	4 (40%)	2 (20%)	2 (20%)	1 (10%)	1 (10%)
Changing Program Objects	5 (50%)	2 (20%)	1 (10%)	1 (10%)	1 (10%)
Promotion and Testing	9 (90%)	1 (10%)			
Deploying Changes	9 (90%)		1 (10%)		

The table value of X^2 for 28 degree of freedom at 0.5 percent level of significance is 41.337. The calculated value of X^2 is less than this table value hence hypothesis is accepted.

H6: There is no definite stakeholder is responsible to bring change process

Stakeholders	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Government of India	9 (90%)	1 (10%)			
State Government	9 (90%)	1(10%)			
Employees	7 (70%)	1(10%)	1(10%)	1(10%)	
Agencies			2 (20%)	3 (30%)	5 (50%)
Private Education Institutions	2 (20%)	2 (20%)	2 (20%)	2 (20%)	2 (20%)
Citizens	2 (20%)	2 (20%)	2 (20%)	2 (20%)	2 (20%)
NGOs			3 (30%)	3 (30%)	4 (40%)
Other Government Departments			5 (50%)	3 (30%)	2 (20%)

The table value of X^2 for 28 degree of freedom at 0.5 percent level of significance is 41.337. The calculated value of X^2 is less than table value hence hypothesis is accepted.

H7: There is a no specific reason of resistance towards change.

Resistance Factors	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Belief that the Change Initiative is a Temporary Fad	5 (50%)	1 (10%)	2 (20%)	1 (10%)	1 (10%)
Belief that Fellow Employees or Managers are Incompetent	4 (40%)	2 (20%)	2 (20%)	1 (10%)	1 (10%)
Loss of Authority or Control	5 (50%)	2 (20%)	2 (20%)	1 (10%)	1 (10%)
Lack of Faith in their Ability to Learn New Skills	7 (70%)	1 (10%)	1 (10%)	1 (10%)	
Feeling of Change Overload	10 (100%)				
Lack of Trust	7 (70%)		1 (10%)	1 (10%)	1 (10%)
Loss of Job Security	7 (70%)		1 (10%)	1 (10%)	1 (10%)
Loss of Family or Personal Time	7 (70%)	1 (10%)		1 (10%)	1 (10%)
Feeling that the Organization is not Entitled to the Extra Effort	9 (90%)		1 (10%)		

The table value of X^2 for 32 degree of freedom at 0.5 percent level of significance is 16.89. The calculated value of X^2 is less than this table value hence hypothesis is accepted.

H8: Change cannot be evaluated only with one issue.

Evaluation	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Relevance	8 (80%)	2 (20%)			
Effectiveness	8 (80%)	2 (20%)			
Impact	7 (70%)	1 (10%)	1 (10%)	1 (10%)	
Sustainability	9 (90%)		1 (10%)		
Efficient	9 (90%)		1 (10%)		
Cost Effectiveness	10 (100%)				

The table value of X^2 for 20 degree of freedom at 0.5 percent level of significance is 31.410. The calculated value of X^2 is less than this table value hence hypothesis is accepted.

H9: There is no fastidious motivational factor involved in change

Motivational Factors	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Physiological needs	6 (60%)	1 (10%)	1 (10%)	1 (10%)	1 (10%)
Safety needs	4 (40%)	4 (40%)	1 (10%)	1 (10%)	
Belonging needs	4 (40%)	2 (20%)	2 (20%)	1 (10%)	1 (10%)
Esteem needs	8 (80%)	2 (20%)			
Self actualization needs	10 (100%)				

The table value of X^2 for 16 degree of freedom at 0.5 percent level of significance is 26.296. The calculated value of X^2 is less than this table value hence hypothesis is accepted.

H10: There is no specific training is required for change.

Training	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Self Training	5 (50%)	2 (20%)	1 (10%)	1 (10%)	1 (10%)
In House Training	7 (70%)	1 (10%)	1 (10%)	1 (10%)	
Structured Training	9 (90%)	1 (10%)			

The table value of X^2 for 8 degree of freedom at 0.5 percent level of significance is 15.507. The calculated value of X^2 is less than this table value hence hypothesis is accepted.

H11: Is change add any particular responsibility

New Responsibilities	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Complete the process	10 (100%)				
Change Management process is being followed correctly	10 (100%)				
Maintains goals and objectives	10 (100%)				
Provides a fully functional Change Management process	7 (70%)	2 (20%)	1 (10%)		
resources have the required skill sets	6 (60%)	1 (10%)	1 (10%)	1 (10%)	1 (10%)
Maintains Continuous Process Improvement on a regular basis	7 (70%)	1 (10%)	1 (10%)	1 (10%)	

The table value of X^2 for 20 degree of freedom at 0.5 percent level of significance is 31.410. The calculated value of X^2 is less than this table value hence hypothesis is accepted.

- With the various factors (e.g. improve performance, win over stakeholders, create a road map, take a comprehensive approach, and be a leader not a bureaucrat) as to why this change process was initiated most of the respondents felt that it was just to improve performance of the department.
- Most of the respondents felt that this change process was established under a 'sense of urgency'.
- There were several drivers of change - external environment, internal environment, systems, behavioral theory, organization structure, inadequate performance, change in strategic objectives, and new technology. The respondents sensed that out of these drivers 'new technology' was the most effective driver.

- The Department of Higher Education adapted several processes to implement technology change and the respondents strongly agreed with the process. 'Availability and familiarity with technology' and 'policies for technology change' were the most effective methods which were adapted to implement change.
- There are two types of processes to implement change processes (i.e. soft skills and hard skills) and the department used a mixed kind of process to implement the change process.
- It was felt that to bring technology change in to the Department of Higher Education the influence of the Central and State Government policies were more important than the other stakeholders.
- The findings indicate that 'feeling of change overload' was the most important resistance factor. Other resistance factors (e.g. lack of faith in their ability to learn new skills, lack of trust, and loss of family or personal time) reported moderate levels of resistance.
- The all factors for evaluating technology change process showed equal value, but it was observed that the change process in the Department Of Higher Education can be evaluated on the basis of cost effectiveness rather than other factors like 'sustainability' and 'efficient'.
- It was strongly felt that 'structured training' was best for the technology change process.
- It was also felt that implementation of TCM in the department faced the challenge of new responsibilities. In these responsibilities it was observed that 'complete the process', 'change management process is being followed,' and 'maintains goals and objectives' were perceived to be the main responsibilities.

Results Part 2

To achieve the objectives of the study 65 employees were interviewed, which included a total of 31 clerical and semiskilled staff and 34 skilled and teaching staff of the government colleges. Most of the respondents who were interviewed were permanent staff of the department. Almost 92% of the respondents feel that this technology change was essential and was a requirement of time. Out of the 65 interviewees, 40% were technologically literate, fourteen (14) employees had undergone training, which was organized by the department and only six (6) employees did not have any exposure to technology. Sixty percent of employees felt that this change process was as per requirement of time, and to remain in competition. Almost 95% of the respondents felt that this change was not a planned change but a kind of forced change. This belief could have lead to the confusion illustrated by almost 50% of the respondents believing that this change process was well planned and systematically applied, but remaining 50% believing that the process was not well planned and not systematically applied. Further, 85% of the respondents thought that this process was started without consulting them and their views were not invited prior initiating this IT based change process. Yet, almost 90% of the respondents expressed that they had been actively involved in the change process and its implementation.

Forty-five percent of the respondents felt that this change process is good for development of the higher education in Madhya Pradesh and this will certainly raise the GER. 60% employees thought that the department was implementing the change smoothly with 'training' and remaining employees think that 'resources allocation' was taken as a measure to implement change smoothly.

The interviewees were asked that what new challenges they faced after implementing the change process and most felt that they have more workload in comparison to the previous work environment. A total of 65% of the respondents felt that the main challenge of this change was overwork. They also felt that their added responsibility was not being paid through added remuneration or increment. The remaining 35% of the respondents felt that they were not overburdened.

Most of the employees expressed that this process will lead to a better communication model, because after adopting this change process, communication has become easy and fast, leading to quick decision. Almost 93% employees feel that change management is making its impact on improvement of the systems and work culture.

Inference

The background illustrates that the Department of Higher Education followed a bureaucratic organizational structure and follows the instructions of the state government. It controlled about 1360 colleges i.e. making policies and monitoring of policies at state level and had a workforce of 14244. The department provided a reasonable budget for developing IT infrastructure in the colleges with the motive of implementing TCM and also provided grants to the colleges to purchase IT Infrastructure. It also provided information technology software for training the workforce on regular basis. The department developed a number of indigenous software for day to day functioning of the department and created database of every sphere of working environment including recently launched online human resources development software. .

In recognition of their initiatives the Department of Higher Education was honored with several prestigious awards in the field of Excellence for e-governance initiatives in Madhya Pradesh as well in India.

- 2008:** '*Certificate of Appreciation*' for the Best Application Software developed in Madhya Pradesh i.e. '*eSamvad*' (means electronic communication)
- 2009:** The Manthan Award with '*Certificate of Recognition*' under the category of *eGovernance* to project '*eSamvad*'
- 2010:** '*Certificate*' under the category for the *Best Application Software developed in Madhya Pradesh*.
- 2011:** '*Certificate*' under the Category of the *Best Website of Madhya Pradesh*.

The analysis of the questionnaires the question regarding why the change process started, reveals that, the perceived reason for the change process was 'improve performance' which triggered the change process and performance over and above the other triggers. There were several drivers of change process and the most effective driver of change was the external environment, because every part of human activity is under a state of change. Education could be reasonably argued that education is a substantial part of human activities and this change was a requirement of time. Most of the respondents felt that out of all the stakeholders the 'Government of India' and the 'State Government' were the primary stakeholders and these both stakeholders were responsible for the consolidation of the technology change process.

Implementing process change requires a powerful combination of 'soft' skills and 'hard' skills'. 'Leadership' is a soft skill and 'strategic planning' and 'project management' are hard

skills, and the Department Of Higher Education integrated both the skills in implementing change process. The analysis expressed that the stakeholders especially teachers and employees were eager to be empowered in change process. Respondents felt that most effective motivational factors are 'self actualization needs' and 'proper recognition' of their work. This states that workforce felt motivated when they realized their own maximum potential and their importance at work place is recognized/commended by the top management. In this case the work should be recognized by the higher authorities/officials of the Department of Higher Education.

The respondents feel that there are three types of training schemes namely 'self training', 'in house training' and the 'structured training' was being followed by the department, but they felt that 'structured training', which was conducted by the department, was far better than the other training schemes. Several resistance factors exist in the present state of technology change management, which means that the workforce of the department did not accepted the change straightforwardly.

Out of the six evaluation criterion respondents felt that the cost effectiveness criteria was the most effective evaluation criteria, because is the Department was implementing the change process without investing their hard public money in developing all technological processes on their own.

It is true that after implementing the change process the top level officials as well as workforce of the Department were shouldering new responsibilities along with the responsibilities they were facing before implementing the change process.

The e-governance project in Madhya Pradesh was not implemented in timely or systematic manner, which concurs with the findings of Sinha (2006).

Suggestions and Recommendations

As a result of the study regarding TCM at government colleges of Indore city and during the personal interactions with the workforce, the following suggestions would be beneficial, if implemented.

- There is an intense need to have someone listen to the employee's work related and personal problems. This task can only be accomplished by an effective HR team.
- It was observed that the efforts of the workforce are not properly recognized.
- The Department has deployed TCM process in a hasty manner, a clear policy should be developed and a team to implement and monitor the change management process in the department should be formed.
- Present age belongs to IT and it is good to have TCM in the Department, but in government departments it is very tough to implement TCM so it is better to first change the mindset of the workforce and then implement the change management concept.
- Though the Department is providing training, in my opinion, the training should contain purpose based modules which are specifically designed to meet the requirements of higher education.

- In today's technological and fast moving world employees have to keep pace with the competition in the outer world. For this an effective training program is a must to update the employees.
- Meetings with top management and the workforce in every quarter is suggested. By increasing the frequency of meetings timely solutions to all the problems of the workers may result.
- All HR policies should be in writing, recorded and approved from top management. In making these policies due participation of workers should be sought.
- The most important issues are the need to initiate, implement, and manage meaningful and planned change, thus these steps should be taken in a systematic manner.
- The resistance to change must be handled with a soft hand because in normal course of change resistance can be reduced in a reasonable period of time.
- Change should be implemented at grassroots level to achieve success.
- The process of TCM completely depends on leadership skills and qualities. Through leadership the workforce can feel the urgency of TCM. Groups can be built to observe TCM; proper communication process can be implemented; and this can involve all stakeholders' attitude in the TCM process.

Conclusion

The key to implementing change and continuous improvement is the effective exchange of information between people and process, a combination of organization and work force towards a shared objective. Vaughn (2012) expressed that change management can effectively be implemented by engaging employees, effective leadership and improve organization system characteristics. Further, by encouraging the right leadership and employee behaviors will give your change program a higher chance of succeeding. The study shows that the Department of High Education is implementing TCM by stimulating leadership in the right direction and engaging employees in the change process, this can be visualized by perusing the achievements of the department.

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