
Understanding IT Change Management Challenges at a Financial Firm

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Abstract

This research presents an ethnographic study of information technology (IT) change management process for the production environment at a financial firm. Ethnography study has a long tradition as means of understanding the everyday aspects of work settings. The ethnographic study was conducted for six months and researchers observer weekly change control meeting. The goal of the research study was to find the improvement areas in change management process. The results suggest that user resistance to change, lack of ownership, failure to educate and communicate the importance of change management, and power dynamics within IT department are main reasons for the failure of the change management controls initiative. The findings are grounded in the data and supported by the literature.

Keywords: Change management, Change Control, Ethnography, power dynamics

1. INTRODUCTION

Businesses today have huge dependency on reliability, availability and integrity of its information technology infrastructure to meet its goals and objectives. Despite advances in infrastructure robustness, occasional hardware, software and database downtime is unavoidable (Martinez, 2009). A failure of critical system in production environment could lead to two types of losses: loss of application service and loss of data. The potential loss of data and application services due to a system outage could have significant legal and financial implications for organizations. A case in point being the incident system unavailability at Virgin Blue in 2010 resulting is huge loss for the organization. In

September 2010, Virgin Blue's airline's check-in and online booking systems went down due to hardware failures and subsequent outage of the airline's internet booking, reservations, check-in and boarding systems became inevitable. The outage severely interrupted the Virgin Blue business for a period of 11 days, affecting around 50,000 passengers and 400 flights. The company is estimated to have lost around \$20 million in profits during this period of system unavailability for business (Bushell-Embling, 2010). The reliance on IT systems to support business critical applications has increased. A single incident of system downtime event can potentially impact the profitability or possibly the viability of an enterprise (Preimesberger, 2011).

Formal change management involves careful planning, peer review, post-change testing and user acceptance of any changes to the production environment (Halprin, 1998). It is surprising that organizations spend significant resources towards development and maintenance of change management processes intended to maximize the availability of the existing production environment but still do not get the expected results.

This research study utilizes the ethnography methodology to understand the phenomenon of implementing a change management process in production environment of an organization. The production environment referred as an IT system or discrete part of an IT system (made up of hardware and system software) which is used to run software that is in live use, and sometimes to build software releases for live use (knowledgetransfer.net, 2014). The change management process is fairly new to the organization and is evolving with time. The key goals of the IT department in this organization manage and reduce number of unplanned changes in a production environment. Management realizes that success of such a change management initiative depends more on team dynamics than technical issues such as implementation of the hardware and software technology. The goal of the research study is to find the improvement areas in change management process and understand the factors that cause the unplanned changes in an organization.

Following this introduction, Section two describes research settings and situation. Section three describes research question. Section four discusses the concept of information technology change management. Section five defines research methodology ethnography. Section six describes the weekly meeting in which ethnography study was conducted. Section seven describes ethnography field notes and observations and analysis of the observation. The final section is the conclusion.

2. LITERATURE REVIEW

Change management is the process responsible for identifying, controlling, and tracking all of the elements of the IT environment (Microsoft.com, 2014). The goal of the change management process is to introduce change into the IT environment quickly, with minimal disruption. Change management process includes a method for quickly implementing urgent changes required to quickly restore IT services. Change

management should be a core and constant part of IT operations. Change management involves the following activities:

- a. A change is requested
- b. The impacts of making changes are assessed
- c. The change is authorized
- d. The change is handed over to change implementer for implementation
- e. The change is verified

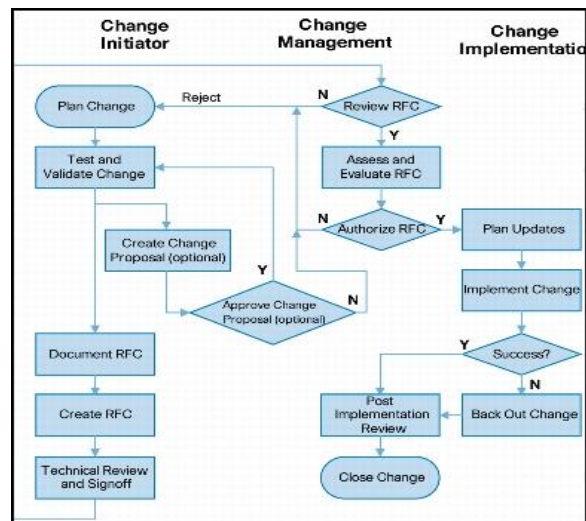


Figure 1: IT Change management process (Source: cisco.com, 2014)

For example, Cisco has a formal change management process defined in the organization (Figure 1). At Cisco, a change initiator initiates a request for plan change, document and create change artifact. Change artifact goes through the approval process. The change management team reviews, assesses and evaluates change artifact and provide authorization for a change. Change implementer implements the change and based on result of change success either forward the change artifact to change management for post implementation review or back out changes or forward to change management for the review. Change management finally closes the change artifact.

Research in change management domain offers several insights into the process. Resistance to change is ongoing problem at individual and organizational level. The relationship between individual and organizational resistance to change is important. An organization is a complex system of relationship between people,

technologies, and work processes. From the interaction between people, technologies and processes, organizational behavior, culture and performance emerges (Lorenzi & Riley, 2000). Changes in systems could vary in its impact and scope. Watzalwick et. al. (1974) in (Lorenzi & Riley, 2000) selected theory of groups and the theory of logical types from the field of mathematical logic and proposed an explanation for change types. These are:

First-order change is a variation in the way processes and procedures have been done in a given system, leaving the system itself relatively unchanged. Some examples are creating new reports, creating new ways to collect the same data. Second-order change occurs when the system itself is changed. Some examples are introducing new system in production environment and upgrading existing system for additional functionality.

Financial impact of IT system outage includes human resource, regulatory and compliance, remedial and reputation impact (Martinez, 2009). The average cost of unplanned data center outages 41 data centers across varying industry segments and found out that unplanned changes in production environment has negative financial impact on organization (emersonnetworkpower.com,2011).

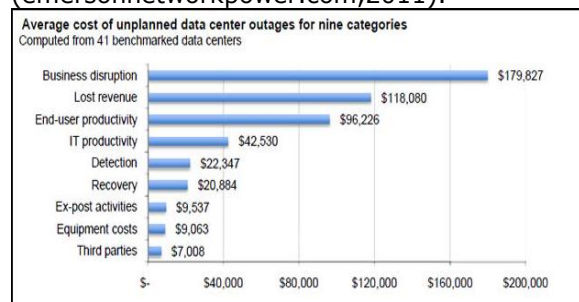


Figure 2: Average cost of unplanned data center outage in various industry (Source: evolven.com, 2014)

Organizational relationships among people, content (meaning) and processes depend a great deal on information flows within organization (Skovira, 2004). IT change management process involves people, technologies and processes. The success of IT change management depends on organizational culture and behavior of its people. In order to make informed decision in the role of change approver, correct information is required to assess the impact of the proposed change on

production environment. Information flow from source to destination depends on policies ensuring responsibilities and authority of people involved. Employees are situationalized in an organization as per their hierarchical level in the organization and develop mental models, perspectives, resulting from their frames in use. These frames are their department, their roles, their educational, their professional background and their longevity in the organizational (Skovira, 2004). Resistance of change could occur due to several reasons such as lack of communication, non-supportive culture, level of complexity, lack of training and lack of leadership support (Lorenzi & Riley, 2000).

3. METHODOLOGY

Research Context

Figure 3 is to illustrate the actors involved in the weekly change control meeting at the research site. The researcher was engaged approximately 26 weeks of fieldwork in a financial institution located at mid-Atlantic region in USA. To conduct the ethnography study, conditional verbal approval from IT manager at this financial institution was granted. To put writing in a context, I would name this financial institution as "First Financial Firm" (FFF). FFF participates in regular internal and external audit to compliance with government regulation. By federal law, FFF is required to ensure the availability of critical financial services during the defined business hours (ffiec.gov, 2012).

To improve and enhance system availability and reduce production system outages, Chief information officer (CIO) of the organization, introduced a new IT matrix. IT matrix is home grown change measurement tool. It records all the changes of production environment and systematically performs root cause analysis of organization system outage due to change in production environment. The changes in production environment are categorized either planned changes or unplanned changes. Planned changes are change control requests that have entered into the change control system, reviewed by the Projects, Priorities, Assessment, Coordination team and approved by IT manager. For this purpose of this study, this team would be referred to as Change control (CC) team.

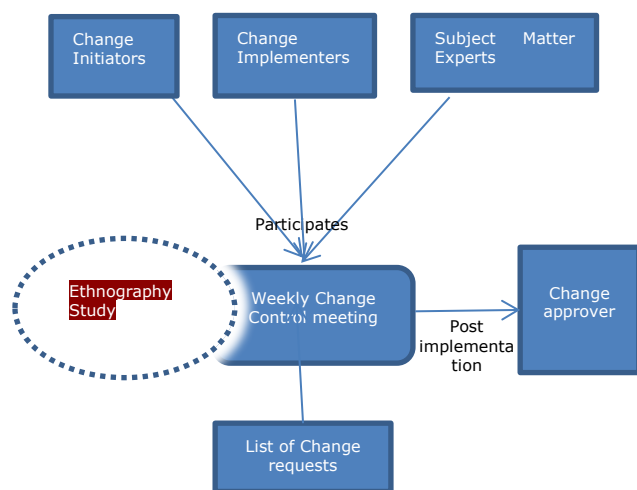


Figure 3: Weekly change control meeting structure

Unplanned changes are the change control requests that have been entered into the change control systems and approved by IT manager. The implementation of unplanned changes occurs outside of the change control cycle. The change control cycle is currently a period of one week. It starts as result of weekly Thursday CC meeting and continues until the next weekly CC meeting. The CC team consists of CIO, IT directors, IT managers, Project Managers, System Engineers, Database Administrators, System Analysts and IT Risk and Compliance analyst. The success and failure of CC team is measure by IT matrix output. IT matrix result is defined in color code. The implementation of planned changes above 93% consider as GREEN status. The implementation of planned changes between 85% and 92% consider as YELLOW status and below 85% consider as RED status.

So far CC team never has achieved the GREEN status. In any given month, the number of unplanned changes is always more than the number of planned changes. Unplanned changes lead to unplanned system outages which is then the responsibility of IT to resolve. Unplanned changes are essentially an important business issue.

Ethnography

Ethnography research is an in-depth research method. In ethnography, the researcher is at research site for a long time – an ethnographer obtains a deep understanding of the people, the organization and the broader context within which they work. It is a method well suited to provide information systems researchers with

rich insights into the human, social and organization aspects of information systems (Myers, 1999). Ethnography of Information Systems is concerned with leaning the use of use of ethnographic method and techniques in order to describe and analyze systems of meanings, contextualizing information or informational situations, and grounding informing actions and objects (Skovira, 2012).

Ethnography facilitates the learning about the cultures and structures of organization from the inside out. It provides researchers with a way to examine the cultural knowledge, behaviors, and artifacts that participants share and use to interpret their experiences in a group. Researchers have acknowledged the value of linking micro-level, interactional processes with macro-level structures for a better understanding of social and cultural practices. Ethnography provides researchers with the kind of data necessary to make this link (Schwartzman, 1993). In this methodology, researchers as ethnographer adopts the role of cultural broker, attempting to understand and sometimes mediate conflicts between groups with different interests and cultures in organization system.

Several schools or types of ethnography exist. Sanday (1979) divides ethnography into holistic, semiotic and behavioristic schools of thoughts. Semiotic ethnography can be categorized into thick description and ethno science. Each school of thought approaches ethnography differently. However, spending a significant amount of time in field is common among all different approaches of ethnography (Myers, 1999). The ethnographers associated with holistic school of thought assume that one has to become like a blank slate in order to fully understand local social and cultural practices. Empathy and identification with the social grouping being observed is needed.

Clifford Geertz, the foremost exponent of the thick description semiotic school of thought, says that it is possible to describe and analyze another culture without having to empathize with the people. "The ethnographer, once the writing of the story begins, no longer is merely a participant and observer, but a commentator and analyst who, using some formal theoretical framing, analyzes and interprets what is going on in terms of theoretical framing which creates a thick or deep understanding of the described affairs encapsulated by a cultural matrix" (Skovira, 2012).

Ethnoscience or cognitive anthropology school of thought assumes that "culture is composed of psychological structures by means of which individuals or groups of individual guide their behavior" (Geertz, Clifford, 1973, pp. 11). Critical ethnography is another approach of doing ethnography. Critical ethnography sees ethnographic research as emergent process, involving a dialogue between the ethnographer and the people in research setting (Myers, 1999).

Ethnography is an observational technique that uses a naturalistic perspective. That is it seek to understand settings as they naturally occurs, rather than in artificial or experimental conditions, from the point of view of the people who inhabit those settings, and usually involves quite lengthy periods of time at study (research) site. It is ability of ethnographer to describe a social setting as it is perceived by those (informants) involved in that settings (Hughes et al., 1995).

Ethnography reports can be presented as is a descriptive story and an analytic story; perhaps written in alternating interweaved style i.e. description based on observation inscribed in filed notes followed by explanations or interpretations (Skovira, 2012).

4. DATA COLLECTION

Ethnographic fieldwork process starts with: First, process of seeking permission and approval for research in organization. Second, seek to understand cultural context, behavior and artifacts participants share and use it to interpret their experiences. Third, to perform content analysis using grid format to identify the range and type of organizational participation and interaction that characterizes an organization. Fourth, observe and interview informants in this study. Informants are the people who participate in ethnography study. Spradely argues that initial ethnographic data should be gathered by listening and observing the idea behind observing process "is to not to discover answers but to find which questions to ask" (Schwartzman, 1993).

The researcher of this study is an employee of FFF and a member of CC team. A verbal agreement was reached with the manager and the researcher about observing the meeting as a participant. The weekly CC meeting occurs on every Thursday and is chaired by IT manager. It is required that all members (IT Director, IT managers, compliance manager, business

Continuity planning manager and project managers) attend this meeting weekly. Other participants of this meeting are database administrators, system engineers, system analysts and security analysts. The CIO sometimes joins this meeting as well. This meeting duration is about 60 minutes. The weekly agenda of the meeting is to discuss and analyze the impact of change (planned or unplanned) in production environment and conduct post-implementation review of successfully implemented changes or back out changes last week. Table 1 provides the mapping of change management roles and responsibilities as per job role of the participants at FFF. Following is the job descriptions of each participant (onetonline.org, 2013):

Compliance Managers (CM): Plan, direct, or coordinate activities of an organization to ensure compliance with ethical or regulatory standards.

IT Managers: Plan, direct, or coordinate activities in such fields as electronic data processing, information systems, systems analysis, and computer programming

System Analysts: Analyze science, engineering, business, and other data processing problems to implement and improve computer systems. Analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities, workflow, and scheduling limitations. May analyze or recommend commercially available software.

System Engineers (SE): Design and develop solutions to complex applications problems, system administration issues, or network concerns. Perform systems management and integration functions.

Database Administrators (DBA): Administer, test, and implement computer databases, applying knowledge of database management systems. Coordinate changes to computer databases. May plan, coordinate, and implement security measures to safeguard computer databases.

Information Security Analysts (SA): Plan, implement, upgrade, or monitor security measures for the protection of computer networks and information. May ensure appropriate security controls are in place that will safeguard digital files and vital electronic infrastructure. They are also required to respond to computer security breaches and viruses.

IT Project Managers: Plan, initiate, and manage information technology (IT) projects. Lead and guide the work of technical staff. Serve as liaison between business and technical aspects of projects. Plan project stages and assess business implications for each stage. Monitor progress to assure deadlines, standards, and cost targets are met.

IT Directors: Coordinate activities of IT departments and Plan, initiate, and manage information technology (IT) projects.

Business Continuity Planner manager: Develop, maintain, or implement business continuity and disaster recovery strategies and solutions, including risk assessments, business impact analyses, strategy selection, and documentation of business continuity and disaster recovery procedures. Plan, conduct, and debrief regular mock-disaster exercises to test the adequacy of existing plans and strategies, updating procedures and plans regularly. Act as a coordinator for continuity efforts after a disruption event.

Chief Information Officer (CIO): Determine and formulate policies and provide overall direction of companies or private and public sector organizations within guidelines set up by a board of directors or similar governing body. Plan, direct, or coordinate operational activities at the highest level of management with the help of subordinate executives and staff managers.

Change management role	Job role at FFF
Change initiators	System Engineers, Project Managers, System Analysts, DBA & IT managers
Change implementers	System Engineers, DBA
Subject matter experts	Project Managers, System Engineers / Analysts, DBA
Change approvers	IT Managers, IT Director and CIO

Table 1: Change management roles and responsibilities as per job role

Ethnography Field notes

As a general rule ethnographers should write up their field notes on a regular basis. These notes can include observations, impressions, feelings,

hunches and question which emerge. Figure 4 is the photograph of field notes taken during ethnography study of CC meeting at FFF. Field notes were taken during the CC meeting and later in same evening details write-up was done about the meeting. CC weekly meeting starts on Thursday in afternoon.



Figure 4: Field notes taken during ethnography study at FFF

5. DISCUSSION

Emergent themes

Ethnography study has a long tradition as means of understanding the everyday aspects of work settings (John et al., 1994). However, its use in the analyzing the change management process is relatively underutilized. In this paper, the dominant themes that have emerged as factors for unplanned changes in production environment at FFF are:

Resistance to change

In every CC meeting session, the following comments were noted either project managers or system analysts and at times from IT managers. One thing is important to note that CC meeting chair is also one of the IT Manager. The comments such as:

“Why is this unplanned change?”, “Can’t it be planned”, “Things do not get done on time”, “My customer needs this change ASAP”, “This was not told to us”.

There was lot of finger pointing and blame game during these meetings. As the comments suggest, there was palpable frustration within project managers and system analyst community and within certain selective managers. There were several groups involved to see through the CC process but no formal ownership of the change management process was given to any particular group.

The resistance in the mind of the users was a direct result of the confusion due to lack of communication from the managers. As the responsibility and accountability was not clearly articulated and communicated, even after establishing the new change management process, users of this process are hesitant to identify with the benefits of this new process. This reflects the lack of leadership at the top level. The top management did not prepare the staff for new process and failed to communicate effectively the importance of this process to the end users. Streit & Pizka (2011) argue that the more established a routine is, the stronger will be the reluctance to change it in an organization. More so the resistance is particularly strong from people who have worked at the same company, in the same project or with the same technology for a long time. Resistance to change has consistently been cited as one of the factors in failure of system implementations (Kwahk & Kim, 2008). Resistance to changes can be viewed as a generalized opposition to change engendered by the expected adverse consequences of change (Ray et al, 2011). It is the tendency of individuals to resist changes and find it aversive across contexts or various types of changes (Oreg, 2003). The users' perception of management of change effectiveness exerts a strong effect on readiness for change and on the end-user satisfaction (Ray et al, 2011).

Power dynamics within IT department

The strictly hierarchical structure in the organization is reflected in the seating arrangement of the team in this meeting. These meetings regularly occur in a training room where the seating arrangement is similar to a typical classroom. The leaders sit together in one row (facing others) and other participants such as system analysts, system engineers, security analysts, database administrators sit in last 3-4 rows facing the meeting chair. IT Director and CIO generally sit in first 2 rows facing other participants. In this setup Meeting chairperson never sees IT Director face-to-face. The vertical top down management approach is efficient but not always effective, and it depends on employees' willingness to follow directives from the bosses above (Bolman & Deal, 2009). In FFF, organization command and control flows from top to down. That's what is reflected in participants seating place during CC meeting at training room.

Generally meeting chair reviews the list of proposed changes in a production environment for next week. First "Planned changes" gets reviewed followed by "Unplanned changes" and in last post-implementation review of the last week implemented or back out changes in production environment are discussed. This review is helpful in identifying the range and type of organizational participation and interaction that characterizes an organization research using a grid format.

Change initiator in this role submits a new change request in "change system" database and may follow-up with subject matter experts in case of any question related to the proposed change. Change implementer may follow-up with change initiator, if he or she finds out any discrepancy in change request.

Change implementers, implements changes in production environment, co-ordinate with subject matter experts to ensure that changes made in production environment are correct and have been validated. Change implementer updates Change approver in change post-implementation review process. Subject matter experts works with Change imitators to open a change request in a change system. They work with Change implementers on validating the production environment after the changes have been made. Subject matter experts provide their input in CC meeting and analyze overall impact on FFF's production environment and its business. Change approver approves or disapprove change request and perform post-implementation change review process.

The power dynamics between IT managers is apparent from the fact that they continuously disapprove the change requests made by the other team. This causes conflict between IT managers and project managers of IT departments. The power struggle can be understood by review the IT department organization chart below Figure 5. Three IT managers and two IT directors are basically at the same hierarchical level reporting directly to the CIO. The competitiveness that these managers and directors display is results in not so effective implementation of change controls in the IT process and production environment.

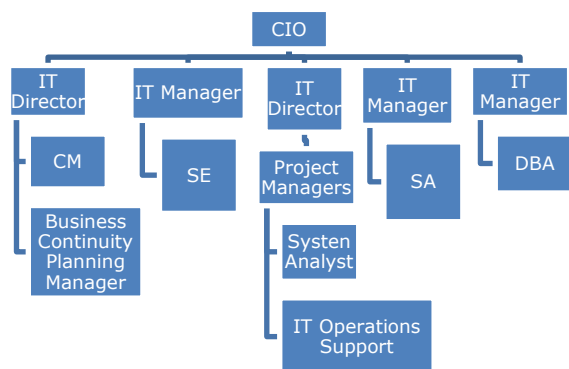


Figure 5: Organization chart of IT department at FFF

The politics of information is the use of information to obtain and maintain power in organization. A deep rule of power symbolized in information use is about “getting others to do what he or she wants them to do, as well as to avoid being forced by others to do” (Skovira, 2008). The “fear” of being portrayed as less efficient guides the behavior of these managers. Fear is a strong stimulus for human behavior, and handling stakeholders’ fears is one of the main topics in change management (Streit & Pizka, 2011). Fears are not necessarily rational and legitimate, but might also stem, for instance, from missing knowledge.

Failure to educate and communicate the importance of change management process

As per participants seating arrangement during the change control meeting, FFF can categorize under structural frame of Bolman & Deal model. Structural frame draws from sociology and management science. Vertical coordination rests on top-down command and control. It is efficient but not always effective, and it depends on employees’ willingness to follow directives from above (Bolman & Deal, 2009). In FFF, organization command and control flows from top to down. That’s what is reflected in participants seating place at meeting room.

The meeting participant’s comments such as “Why do we need to go through this process”, “What we gain by going through this exercise” indicate that staff does not understand the

purpose and importance of the change management process. The staff finds the change management process as a red tape and obstacles in addressing their customer needs quickly.

Management needs to work on changing the existing mind-set of employees and creating the motivation to change. The actions to create the readiness for change include providing mechanism for changing circumstances, stimulating dissatisfaction against the status quo and creating an appealing vision of the future state (Aziz & Yusofb, 2012). Management requires to be involved in the change implementation process by forming a powerful change team (that will organize and manage the change process), establishing a sense of urgency, creating a vision and communicating the vision to the members (Aziz & Yusofb, 2012).

Our recommendations are that organizations should be aware of the above dimensions (power dynamics, resistance to change and lack of education and communication) during change management process. This awareness would help organizations to proactively address and prepare policies and procedures accordingly.

6. CONCLUSION

This paper presents an ethnography study of change control (CC) process at FFF. The CIO of the organization started a new change management controls process to reduce unplanned changes into production environment of the bank and reduce the possibilities of introducing error and compromising integrity of the data. The main theme that is reducing the efficiency of this CC process is the resistance of people in IT department to change and the power and politics situation between the teams in the organization. The themes identified in this study are grounded in the extant literature.

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