# THE IMPACT OF MANAGER PHILOSOPHY ON KNOWLEDGE MANAGEMENT SYSTEMS

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#### SUMMARY

This paper analyses how information about managers and technology can be used to provide those managers with a system that is congruent with their needs. In particular, using McGregor's Theories X and Y philosophies, managerial needs are elicited and then contemporary knowledge management technologies, including intelligent agents, and the way they are implemented, are analysed to determine how they meet those manager needs. Different knowledge management technologies are found to be important to manifesting the requirements of particular management philosophies. For example, 'Theory X' appears consistent with use of intelligent agents to 'monitor' behaviour. This leads to the concept of 'technology congruence', where the choice of the technology ultimately is tied to which view of the world the manager employs. Copyright © 2010 John Wiley & Sons, Ltd.

**Keywords:** knowledge management; Theory X; Theory Y; technology congruence with management philosophy

#### 1. INTRODUCTION

Management theorists have initiated and tested a number of efforts that suggest the importance of different philosophies of management. This paper uses a set of views that have been found to be quite robust, McGregor's Theory X and Theory Y (McGregor 1960, 1966), to analyse congruence between a management's philosophy and the technology that they choose, and the way that the technology is implemented, called 'technology congruence'.

Theory X and Theory Y suggest that managers make different assumptions about workers (e.g. 'knowledge workers'). This paper argues that those different assumptions translate into different technologies and different implementations of those technologies. For example, Theory X assumes that managers take responsibility for the work, while Theory Y assumes workers take responsibility. As a result, for example, technologies generally consistent with Theory X would include executive information systems, intelligent agents to monitor worker behaviour, use of expert systems to replace people, push technology to get information out to users and other technologies generally consistent with Theory Y would include use of collaboration systems, pull technology, blogs and wikis, and communities of interest, since they assume that workers provide important input to other workers.

In addition, the way that the same technology is implemented is likely to be different if management has a Theory X or Theory Y philosophy. For example, implementation of workflow software can be

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based on business rules gathered from either management or workers. A Theory X manager would have management provide the rules and the rules are likely to be rigid, while a Theory Y manager would likely heavily involve the workers and be flexible to worker's needs.

This discussion suggests that choice of a technology may be more than a classic matching a set of technical requirement needs to a technology choice's capabilities. Instead, technology choice and implementation can reflect a specific management view and philosophy. As a result, managers and developers need to think about which view they endorse and try to choose a technology and implementation of that technology that is consistent with their views. Ultimately, technology requirements are not independent of management philosophies.

#### 1.1. Case Study

Johnson *et al.* (2001) analysed two companies that took two radically different approaches to knowledge management, ultimately influencing the companies' innovation capabilities. The case chronicles knowledge management system development by Daimler and Chrysler through their merger in 2000.

Daimler implemented a project called 'Sokrates', where consultants from Arthur D. Little were asked by management to generate a database of 'lessons learned' about new vehicle development programmes. Unfortunately, Daimler found that when consultants (hired by top management) filled databases with their own ideas, it was less helpful than when actual workers/practitioners were able to fill the databases. Having consultants fill databases rather than workers is consistent with Theory X.

In contrast, Chrysler developed 'Tech Clubs', where workers exchanged information about best practices in 'communities of interest'. In addition, Chrysler devised the 'engineering book of knowledge' (EBOK) to capture and share knowledge generated in the Tech Clubs. Engineers were responsible for writing, editing, revising and reviewing knowledge contributions. It was thought that EBOK helped Chrysler foster its innovation capabilities. Chrysler's approach was consistent with Theory Y.

The different management philosophies resulted in different tools and implementation of those tools. Further, both the types of tool used and the way that tools are implemented influence the quality of the knowledge management system. Since management ultimately is responsible for both tools and their implementation, these issues are important choice variables that are likely influenced by management philosophy and approach. Unfortunately, there has been limited research examining these issues, particularly in knowledge management.

### **1.2.** Purposes of this Paper

This paper suggests that managers will choose and implement technologies that are consistent with their management philosophy. As a result, the purposes of this paper are fourfold:

- 1. Investigate how management philosophy (Theory X or Theory Y) can influence technology choices in knowledge management system design.
- 2. Extend Theories X and Y to include collaboration.
- 3. Determine which technologies appear to best meet the needs of different management philosophies.
- 4. Analyse how implementation of those technologies might differ for different management philosophies.

As a matter of feasibility, this paper limits technology scope to technologies that could be categorized as contemporary knowledge management technologies, such as expert systems, executive

information systems, collaboration systems, wikis and blogs, intelligent agents, push-pull technology, lessons learned and workflow.

#### 1.3. This Paper

This paper proceeds in the following manner. Section 1 has provided a problem statement, brief summary of the findings and a short discussion of previous research in decision-support systems and user cognitive processes. Section 2 summarizes McGregor's Theory X and Theory Y. Section 3 summarizes some of the technologies that are couched under the label of knowledge management. Section 4 analyses the choice of technologies under Theories X and Y, and further discusses the notion of 'technology congruence'. Section 5 investigates differences in implementation associated with Theories X and Y management philosophies, referred to as 'technology implementation congruence'. Section 6 analyses interaction differences associated with technology choice congruence and 'technology implementation congruence'. Section 7 analyses issues that relate to worker and system congruence and how that congruence could influence success and acceptance. Section 8 analyses some situation where philosophy could change. Section 9 analyses the potential impact of a technology life cycle on the issues investigated in this paper. Section 10 investigates some potential extensions of the concepts discussed here. Section 11 briefly summarizes the paper.

#### 2. MCGREGOR'S THEORY X AND THEORY Y

Douglas McGregor (1960, 1966) argued that managers make one of two different sets of assumptions about workers, with his Theory X and Theory Y. Each of Theory X and Theory Y provide alternative ends of a management spectrum. Although most management philosophies are likely somewhere between the two extremes, the end points provide important insights into management's behaviour and their use or potential use of technology, particularly in a knowledge management setting.

### 2.1. Theory X

Theory X makes the following assumptions (McGregor, 1966: 5–6):

- 1. Management is responsible for organizing the elements of productive enterprise—money, materials, equipment, people—in the interest of economic ends.
- 2. With respect to people, ... (managing) is a process of directing their efforts, motivating them, controlling their actions, modifying their behaviour to fit the needs of the organization.
- 3. Without this active intervention by management, people would be passive—even resistant to organizational needs. They must, therefore, be persuaded, rewarded, punished and controlled—their activities must be directed. This is management's task—managing subordinate managers or workers ....
- 4. The average man ... works as little as possible.
- 5. He lacks ambition, dislikes responsibility, prefers to be led.
- 6. He is inherently self-centred, indifferent to organizational needs.
- 7. He is by nature resistant to change.
- 8. He is gullible, not very bright, the ready dupe of the charlatan and the demagogue.

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### 2.2. Theory Y

Alternatively, as noted by McGregor (1966: 15), in Theory Y:

- 1. People are not by nature passive or resistant to organizational needs. They have become so as a result of experience in organizations.
- 2. The motivation, the potential for development, the capacity for assuming responsibility, the readiness to direct behaviour toward organizational goals are all present in people. Management does not put them there. It is the responsibility of management to make it possible for people to recognize and develop these human characteristics for themselves.
- 3. The essential task for management is to arrange organizational conditions and methods of operation so that people can achieve their goals best by directing their own efforts toward organization objectives.

### 2.3. Collaboration under Theories X and Y

Generally, neither Theory X nor Theory Y explicitly considers collaboration or the lack of it. However, a knowledge management system based on Theory X generally would not use worker collaboration tools, since management would assume that the workers would not be bright enough to want to have them share what they know. Management would assume that workers would not take the initiative to share what they know. Further, Theory X probably would assume that what the workers would want to share would not be consistent with organizational goals. As a result, a 'Theory X manager' would assume little or no benefit from worker collaboration, and thus have no need for collaboration tools. A Theory X manager likely would think that worker-driven collaboration would be a waste of worker time and resources.

However, with Theory Y, worker collaboration could fall into 'conditions and methods of operation'. Theory Y managers likely would think that collaboration could permit goal achievement and that collaboration is consistent with the notion that workers have knowledge to share. As a result, facilitating and growing worker collaboration generally is consistent with Theory Y.

### 3. KNOWLEDGE MANAGEMENT TECHNOLOGIES

Knowledge management is concerned with managing knowledge resources in an organization. Knowledge management is heavily based on what technology is available. For example, as noted by Michael Turillo, a former Chief Knowledge Officer with a large professional services firm (Hildebrand, 1999), 'Knowledge management cannot be done without technology'.

Broadly conceived, knowledge management has evolved to include a number of tools, such as those discussed in this section. This section lays out some of the relevant technologies and relates those technologies to Theories X and Y. We are somewhat limited in our ability to couch technologies as either X or Y, because the way that they ultimately are implemented may affect one or the other approach. However, this section does argue that technologies can facilitate Theory X over Theory Y, and conversely. Accordingly, technologies are labelled 'Theory X (Y) technologies', if they generally are consistent with Theory X (Y).

### 3.1. Expert Systems

The basic concept behind expert systems is that expertise from a human expert is packaged as a computer program. As a result, after development of the system, the need for human experts is limited or at least leveraged. If implemented as planned, people do not need to have the knowledge of the expert because that knowledge is embedded in a program. For example, Rose (1988) reported that Southern California Edison (SCE) had an expert whose troubleshooting had helped keep a dam safe. However, SCE was afraid their expert would retire or quit, and they worried that he might 'get hit by a bus'. As a result, SCE planned on using an expert system to try to 'clone' one of their engineers, ultimately creating a computer program that captured his expertise.

From at least one perspective, expert systems are a Theory X technology. If I have little confidence in my workers being able to obtain the expertise, or would prefer an alternative, then I would work to capture the knowledge and embed it in a system so that they could use it to do their job or I can replace them. In addition, by having the expert system available, I would be in a position to better monitor their performance, since it would be possible to reconcile system recommendations and actual activities. This perspective provides at least one argument as to why expert systems have not made the inroads into management decision making that they were once expected to make (O'Leary, 2009).

### 3.2. Executive Information Systems

Executive information systems are information systems generally designed to meet the needs of executives, thus the name: executives are set apart from other workers. Studies of such systems have focused largely on the impact on executive decision making (Leidner and Elam, 1993). Although those other than the 'executives' potentially could use information on the system, these systems are limited to access by executives. As a result, this technology is roughly categorized as a Theory X technology.

### 3.3. Push versus Pull

Information can be either pushed out to employees or we can wait for them to pull it to themselves (e.g. Franklin and Zdonik, 1998). Push places control in the hands of the providers, while pull leaves control in the hands of the users. Theory X managers would push the information out to their employees, controlling what they saw and when they saw it. On the other hand, Theory Y managers would allow their employees to decide what information to pull to themselves, letting the employees decide what they wanted and when they would prefer to get that information. As a result, push is consistent with Theory X and pull is consistent with Theory Y.

#### 3.4. Browsing

Browsing provides employees an opportunity to find information of direct or indirect, current or future use (Choo *et al.*, 1999). However, browsing generally is unstructured, but may include a range of behaviours, such as chaining, monitoring, extracting and others. As a result, browsing is more likely to be accepted by managers oriented toward Theory Y, rather than Theory X managers. A Theory X manager compelled to allow browsing likely would work to limit the browsing opportunities to current and direct use, by controlling the sites and links available (e.g. through portals, as discussed below). On the other hand, a Theory Y manager would assume that workers would use browsing to facilitate current and future job requirements.

## 3.5. Portals

Portals direct users to relevant information that can be accessed through their browsers. Portals can direct users to important sources of information (Dias, 2001). That information can be customized for particular jobs or individuals. The implementation of the technology would be influenced by whether the managers are Theory X or Theory Y. Theory X managers are likely to see portals as a way to limit and guide users to what they think are the appropriate resources. In particular, Theory X managers are likely to have management play a strong role in choosing key information sources and limiting access to information resources. Theory Y managers are likely to see portals as just an opening to a world of other resources. Further, Theory Y managers are likely to have users help develop the information linkages, and allow greater flexibility in what is accessed.

## 3.6. Workflow Management Systems

Workflow management systems provide the ability to control and automate workflow (Georgakopoulos *et al.*, 1995). Workflow systems also provide the ability to send reminders of deadlines, schedule work and monitor work. Theory X managers are likely to see and emphasize the monitoring, scheduling and reminding functions. Theory X managers also are likely to emphasize automation of such workflows, subject to limited human intervention, whereas Theory Y managers may emphasize the ad hoc and be more open to human intervention. Theory X managers would provide the rules, while Theory Y managers would have most of the knowledge in the system solicited from the workers. Theory X managers are likely to see workflow systems as leveraging their control over the workers. Theory Y managers are likely to see workflow management systems as providing the ability to automate clerical work, allowing staff to perform other activities. Theory Y managers might also provide workflow management systems as a tool to assist workers response to unexpected events.

### 3.7. Lessons Learned

Lessons learned knowledge management systems captured 'things gone right' (TGR) and 'things gone wrong' (TGW) (O'Leary, 2002). 'Best practices' on how to perform or not perform processes are captured for reuse. As seen in the case in Section 1 above, the implementation of lessons learned can be influenced by whether a Theory X or Y is used. A Theory X manager would have managers or consultants generate the artefacts, whereas a Theory Y manager would have the workers generate and manage the artefacts. Further, at the extreme, we might see that a Theory X manager emphasizes the TGW, while a Theory Y manager emphasizes TGR.

### 3.8. Intelligent Agents

Intelligent agents have been discussed as playing a number of roles in enterprises and virtual enterprises (e.g. Brown *et al.*, 1995; O'Leary *et al.*, 1997). Intelligent agents could be developed for either Theory X or Theory Y use, but those uses could be quite different based on their goals for the agents. Theory X managers likely might use intelligent agents to monitor worker's behaviour, providing managers with reports as to deviations from expectations. On the other hand, Theory Y managers would allow individual workers to use intelligent agents to meet the worker's needs. For example, workers might be allowed to parameterize intelligent agents to support worker information needs.

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#### 3.9. Communities of Interest

Communities of interest are virtual organizations where users ask and answer each other's questions (e.g. MacCormick and Vopel, 2002). Communities of interest are consistent with Theory Y, because they assume that participants can help each other and that participants are in a position to ask and answer the appropriate questions. Communities of interest assume that participants have knowledge enough to make the communities work. On the other hand, Theory X managers would likely make sure that management played a role in answering questions. In addition, the management role might even be apparent to participants. Potentially, such management participation in communities of interest could negatively influence worker participation.

#### 3.10. Help Desk

Help desks are like communities of interest, in that users may ask questions. However, with help desks, answering of questions is a job responsibility. In many ways, help desk technology is a Theory X technology, since it assumes that workers must be told the answers to their questions by personnel whose job it is to answer those questions. A Theory Y approach to the same problem might employ Web 2.0 technologies to access knowledge available from a range of communities of interest.

### 3.11. Collaboration Systems

Collaboration systems provide users with the ability to work together, even though they may be separated by time and distance. For example, consultants may be interested in generating a proposal for a client, but they are located in different cities in different time zones. A collaboration system would facilitate worker-to-worker collaboration across time and place. As a result, collaboration systems generally are consistent with Theory Y views of the world, as discussed above. Collaboration tools may include wikis and blogs where users can rapidly deploy the information that they need.

### 4. THEORY X AND THEORY Y TECHNOLOGIES

This section examines each of the properties of Theory X (1-8) and Theory Y (1-3) and matches them to some of the knowledge management technologies given in Section 3.

#### 4.1. Theory X Technologies

What knowledge management system would meet the needs of Theory X managers? Since management is responsible for organizing the elements of the enterprise in the interest of economic ends, under a Theory X view of the world, management would be given access to models, knowledge and information, but there would be no need to diffuse access of such a system to the workers. As a result, the corresponding system might be labelled an 'executive information system', designed to meet a broad base of needs, but only for those at the executive level.

Under Theory X, management would be directing the employees' efforts, motivating them controlling them and modifying their behaviour; systems would need to be developed to facilitate those functions. Systems could be used to manifest this activity in a number of ways. Workflow systems can be used to direct, schedule and monitor employee activities. Portals would be structured to provide directed access to limited information. Intelligent agents would be used to monitor behaviour across some key performance indicators. Selected information could be 'pushed' out to the employees to try to motivate them or modify their behaviour.

In Theory X, management needs to intervene actively, by persuading, rewarding and punishing, and controlling worker activities. Push technology provides a forum to facilitate persuasion by providing limited and focused information. Intelligent agents and workflow systems provide tools to control worker activities. For example, intelligent agents could be used to provide an environment that is more tightly controlled, by monitoring worker activity along any of a number of dimensions.

Since Theory X assumes that workers do not like working, intelligent agents could be used as a basis to monitor their behaviour to ensure that there is constant feedback to management about how little employees are working and how little they are doing. Using workflow, management can see where bottlenecks are and who is at the bottleneck, and then direct the work as appropriate.

Theory X assumes that people prefer to be led and lack ambition. As a result, a Theory X knowledge management system can implement a 'push' environment where workers are sent the information that they need when they need it. A push approach would be used since it would be assumed that otherwise workers would not actively pursue necessary information. Further, management, not the workers, would need to set up a portal of intranet and web links for users, since users would not take the initiative to generate their own. The workflow system would be used to direct employees.

Since Theory X assumes that people are self-centred and unaware of organizational needs and constraints, intelligent agents would be used to monitor their behaviour to ensure that it stays within organizational constraints. Agents would be developed to monitor web resources to make sure that employees do not visit inappropriate sites and take up too much bandwidth with such visits. Also, intelligent agents could be used to monitor e-mail messages to ensure that no noncompany business is being conducted. Workflow systems would be used to take into account organizational needs and constraints in the flow of information.

Since Theory X assumes that people are resistant to change, managers need to monitor and push workers until they accept the change. Intelligent agents and workflow programs could be used to help accomplish much of this activity. Push technology could be used to provide information about needed change and why change is necessary.

Finally, since Theory X assumes that people do not make good decisions, Theory X managers would build expert and other systems to make the decisions for the workers, wherever possible. Further, those managers would build workflow systems to track the flow of work and indicate to management when and where there are problems, and report that information back to management so that management could do something about the issues. Since Theory X assumes that people are not very bright, Theory X managers would use expert systems to replace workers and intelligent agents to monitor their actions to ensure that workers do not spend company resources inappropriately.

#### 4.2. Theory Y Technologies

Theory Y probably would employ multiple facilitating technologies, including pull technology, browsing, communities of interest and collaboration tools.

Under Theory Y, workers are assumed to have potential for development. As a result, they would be given the opportunity to choose the information that they think is important through pull, rather than having it pushed at them by some other managerial source. Similarly, since they can direct behaviour to organizational goals, they can be permitted to browse company knowledge resources in order to find answers to problems. Further, since under Theory Y, workers are treated as individuals, each with their own goals, systems would be built to take into account individuals, e.g. by allowing individuals to use intelligent agents to facilitate customization. In addition, communities of interest would be an important tool to facilitate individuals' ability to achieve their own and company goals. Communities of interests would allow investigation of a wide range of topics, including those directly and indirectly related to company goals.

Further, as noted by McGregor (1966: 17) 'Theory Y depends on self control and self direction'. As a result, Theory Y can employ technologies that facilitate self-control and -direction, e.g, browsing and pull-based technology, allowing individuals to choose their own information and information sources.

Assuming Theory Y, workers would take the initiative to share what they know. Further, collaboration is consistent with the notion that workers have knowledge to share. In addition, what workers would want to share would be consistent with organizational goals. As a result, collaboration could permit goal achievement.

#### 4.3. Technology Congruence with Theory

The disparity of technology needs for Theory X managers as opposed to Theory Y managers suggests that there can be 'technology congruence' between the knowledge management technology used and the types of assumption that managers make about the workers. In particular, we will say that there is technology congruence when technology and management philosophy are congruent.

The existence of congruence can be critical to the successful implementation of either view. If the management philosophy is Theory X (Y) and the technology is Theory X (Y), then the two are congruent. If there is congruence, then a manager is more likely to buy in to the technology and accept it. If the manager employs a Theory X view, but the company tries to implement a collaboration system or pull-based browsing technology for information distribution, then there would not be a technology congruence, and the success of the efforts may be influenced. Similarly, if the manager employs a Theory Y view, but they are asked to implement a range of technologies to monitor their employees, then the technologies would not be consistent with the manager's view. This discussion is summarized in Figure 1.

In general, for those situations where the choice is incongruent, managers will try to push the choice into the congruent quadrants, while maintaining their philosophy. Transitioning from technology



Figure 1. Management philosophy and technology choice

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congruent with Theory X and Theory Y will occur differently in quadrants 1 and 4. In quadrant 1, a Theory Y manager will have Theory X technology. As seen earlier, this is likely to be technology aimed at facilitating monitoring of the workers. Since Theory Y puts greater trust and reliance on the workers, a Theory Y manager likely would limit their use of this technology or change the implementation of this technology. Then the Theory Y manager would begin to try to use other technologies, congruent with Theory Y, into the organization. Unfortunately, although, the technology could fall into disuse, the disuse or the reason for the disuse might not be communicated to the information technology department.

In quadrant 4, a Theory X manager will have Theory Y technology. In that setting, since management thinks that the workers are not very bright and dislike responsibility, top management would take a stronger role. For example, in communities of interest, top management could be the focus of supplying knowledge, in contrast to the workers. Alternatively, management could end support for the Theory Y types of technology. In addition, the Theory X manager would begin to try to layer Theory X congruent technology into the organization.

#### 4.4. Requirements Analysis under Theory X and Theory Y

Typically, requirements analysis is used to capture the set of needs of a company in its choice of software. This discussion suggests that the nature of the requirements for some software is likely to change based on whether management is pursuing a Theory X or Theory Y approach. We would expect that requirements analysis would include features that would facilitate either of the potential philosophies based on whether the manager's philosophy was more Theory X or Theory Y.

### 5. IMPLEMENTATION DIFFERENCES

Given any particular technology, a Theory X (Y) manager will try to implement that technology in accordance with a Theory X (Y) view of the world (Figure 2). In that setting, we will say that the 'implementation is congruent' with the respective managerial philosophy. Congruence occurs in quadrants 2 and 3. Congruence between manager philosophy and implementation can lead to buy-in from the manager.



Figure 2. Manager philosophy versus technology implementation

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However, in some cases, the way that software is implemented is not up to the manager's discretion or they have insufficient knowledge or resources to execute their position. In that setting, the implementation of technology will not be in concert with their managerial philosophy, occurring in quadrants 1 and 4. In general, for those situations where the implementation is incongruent, managers will try to push the implementation into the congruent quadrants, while maintaining their philosophy. These efforts could include an effort to redo the implementation because it does not meet the manager's needs. Accordingly, so-called requirements may be inappropriate.

In quadrant 4, a Theory X manager is faced with a technology implementation that is consistent with Theory Y. As an example, consider the case of workflow technology, being implemented to accommodate a Theory Y philosophy. From a Theory X perspective, the implementation is likely to be too flexible and may not have all of the rules that management thinks should be in there. In addition, the Theory X manager might see the implementation as not employing sufficient monitoring or scheduling capabilities. As a result, the Theory X manager would argue for implementation of additional capabilities.

In quadrant 1, a Theory Y manager is faced with an implementation that is consistent with Theory X. As an example, if the workflow technology was being implemented to accommodate a Theory X philosophy, then the Theory Y manager might try to expand the capabilities of the software, e.g. by building in additional flexibility, and gathering more knowledge from the workers. The Theory Y manager might focus less on monitoring and scheduling, and might not even use those capabilities, in spite of the fact that they were implemented.

#### 6. CHOICE AND IMPLEMENTATION: INTERACTION DIFFERENCES

For a Theory X or Theory Y manager, congruence or incongruence with management philosophy can occur at either the choice or implementation stage. To fully implement a Theory X (Y) approach, technology and implementation of that technology, consistent with Theory X (Y), will lead to systems consistent with the managerial philosophy. In those situations, management acceptance of the technology is likely to be the highest, generating management buy-in to the technology.

However, in some settings, for various reasons, such as lack of understanding of the technology, lack of control over the choice of the technology, legacy technology in place, Theory X managers are given Theory Y technology for implementation or Theory Y managers are given Theory X technology for implementation. In each of those settings, we would anticipate that those managers would attempt to implement the technology in a manner that was congruent with their philosophy. This discussion is summarized in Figure 3.

Consider quadrant 1. As an example, consider the case of implementing executive information systems, characterized above as a Theory X technology. If it was implemented from a Theory Y perspective, a broader base of users would be allowed access to the system. However, if the access was very broad then it would no longer be an executive information system. As a result, it would move away from quadrant 1, in this case toward quadrant 2.

Consider quadrant 4. As an example, consider the case of implementing communities of interest technology, characterized above as a Theory Y technology. If it was implemented from a Theory X perspective then we might find management planning on answering the questions or having specific personnel answer questions. Effectively, this could change the technology from a communities of interest perspective to a help desk setting. Accordingly that would move away from the incongruent implementation and technology.



Figure 3. Technology implementation versus technology choice



Figure 4. Workers' preferences versus system

The extent of congruence or incongruence could influence the success of the technology implementation in the organization, depending on other variables such as worker acceptance, where congruent technology and implementation are likely to generate a higher probability of success, and incongruent technology is less likely to result in a successful implementation.

## 7. WORKER AND SYSTEM CONGRUENCE

So far our discussion has centred on managers, with limited consideration of the worker's preferences, and how they fit with the capabilities of the system. In this section we assume that workers have a preference for being managed under Theory X or Y. For example, management consultants (O'Leary, 2008), faculty and other so-called knowledge workers generally expect to be managed under a Theory Y approach.

The same notions of congruence, discussed above, can be used to assess worker issues, as seen in Figure 4. If the system (technology and implementation) and the worker preferences are the same, then there is congruence in quadrants 2 and 3. However, if worker preferences are different than the

system capabilities, then there is incongruence, as seen in quadrants 1 and 4. The extent of congruence or incongruence would influence the acceptance of the systems by workers, with greatest acceptance where there is congruence. As a result, the extent of congruence or incongruence could influence the success of the system: the greater the congruence, the more likely the success of the system, all other things equal.

### 8. WHAT ABOUT CHANGING PHILOSOPHY?

In both Sections 4 and 5, it was assumed managers would not change their philosophy: If they started with a Theory X (Y) view of the world then they would stay as Theory X (Y). As a result, the manager would work to have both technology and implementation congruence. Similarly, in Section 7 it was assumed that workers did not change their preferences for being managed under Theory X or Theory Y. If they started with a preference for Theory X (Y) then they would continue to have that preference.

#### 8.1. Managers

Managers might shift their management philosophy. A Theory X manager that inherits Theory Y technology and implementation may be provided evidence that the workers do have valuable knowledge as evidenced in communities of interest or through the use of collaboration mechanisms. On the other hand, a Theory Y manager that inherits Theory X technology and implementation may be provided with substantial advantages associated with monitoring workers using intelligent agents or other technologies.

Further, if the manager takes a cost–benefit perspective that person may find that changing the technology to accommodate their managerial philosophy may be too costly. In such a situation, it might be less costly to change philosophy than knowledge management systems.

In addition, although a manager may have a preference for a certain management philosophy, and technology to facilitate that philosophy, the workers that are managed may not have the same set of preferences. Accordingly, the manager may need to consider the alternative philosophy.

### 8.2. Workers

Similarly, although workers may have a preference for being managed under a particular approach, it may be very costly to have that management style and technology changed to accommodate their preferences. Further, workers may find that, for the particular situation that they are in, the preferred approach may be inappropriate. For example, in time-constrained situations, collaboration, browsing and pull technology may be inappropriate.

### 9. IMPACT OF LIFE CYCLE ON DETERMINING FIT

The location of where a technology is in its life cycle can have an impact on its choice and implementation, consistent with this discussion of technology congruence with management philosophy. There are a number of approaches to study life cycle. Fenn (2007) discusses one of the better known technology life cycles, as seen in Figure 5. In Gartner's so-called hype cycle, a technology can go through five primary phases, including:

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Figure 5. Hype cycle

- 'technology trigger', where some event that includes the technology captures the public's interest;
- 'peak of inflated expectations', where overenthusiasm for the technology generates unreal expectations for what can be accomplished with the technology;
- 'trough of disillusionment', where the technology does not live up to its hype and, as a result, interest in the technology may decrease;
- 'slope of enlightenment', where organizations begin to use and truly understand how to use the technology;
- 'plateau of productivity', where a number of organizations embrace and use the technology.

At the technology trigger there is unlikely to be sufficient information or awareness about a technology to know whether it would fit the particular Theory X or Y needs of a manager. However, the peak of inflated expectations could be the basis for adoption of a technology by either a Theory X or Theory Y manager, depending on the set of expectations brought forward. Similarly, the trough of disillusionment could be the basis for not using a technology, e.g. as being inconsistent with either Theory X or Theory Y. However, the evidence available during these last two phases is limited and not likely to be completely insightful in terms of understanding how well the technology meets or does not meet management philosophy needs.

However, the slope of enlightenment and the plateau of productivity provide opportunities for real information either to support or not support the choice of a technology or the way in which a technology could be implemented. In addition, at those two points, the basic nature (Theory X or Y) can more accurately be assessed, because a number of firms have adopted and are using the technology. Further, by those points in time, the extent to which firms are implementing the technology in either a Theory X or Y manner will be more readily available. Accordingly, managers can do site visits to determine how well the technology will work, or at least seek comprehensive information from other sources,

in contrast to earlier stages where the primary information quality was limited to hype or lack of living up to hype.

#### 10. EXTENSIONS

This paper has developed the concept of congruence between technology and management philosophy, while focusing on Theory X and Theory Y. This discussion is not limited to Theory X and Theory Y philosophies, but instead could be extended to any philosophies. The key notion is the extent to which the technology facilitates, enables or is congruent with the particular management philosophy.

Further, this paper focused on two aspects of the life cycle: choice and implementation. We can also extend this discussion to other parts of the life cycle, including such concerns as software configuration.

In addition, this paper has concentrated on management and workers. However, the notions of congruence can be more tightly refined to other agents, such as business partners or particular subgroups, such as top management or middle management.

Future research might be aimed at an empirical analysis of the notion of technology congruence presented in this paper. For example, in the case of requirements analysis, requirements from different settings could be investigated to determine the extent to which they reflect either Theory X or Theory Y. Similarly, firms could be analysed to determine the extent to which they implement technologies, either consistent with Theory X or Theory Y, and the extent to which the portfolio of technologies that they have implemented is consistent with one or the other approach.

Finally, this paper has focused on knowledge management technologies. We could also extend the discussion to other types of enterprise technology, such as enterprise resource planning systems, customer relationship management systems, human resource management systems, etc.

#### 11. SUMMARY

This paper has investigated developing knowledge management systems that are congruent with managers' views of their employees, and workers' preferences for being managed. McGregor's Theory X and Theory Y were used to examine assumptions made of workers as a basis of making sure that the system met the needs of management.

Given the requirements of different managerial expectations, different knowledge management technologies were found to be consistent with different management views. For example, generally push was consistent with Theory X and collaborations systems were consistent with Theory Y. In addition, the way that those technologies were implemented also was seen as either congruent or not congruent with management needs.

Accordingly, both managers and developers need to be careful with choice of technologies and the view that is implemented within those technologies. If the organization wants to implement a Theory X or Y view of the work, then both technology and implementation consistent with that theory should be chosen. Technology is not independent of a management's view of the world.

Similarly, technology can be either congruent or incongruent with the workers' preferences on how they are managed. Do they prefer Theory X or Theory Y management? Ultimately, developing congruence between technology, a management's preferences to manage and workers' preferences on

how to be managed is likely to lead to the greatest acceptance of the technology and the higher likelihood of success of the implementation.

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