Leadership of Global Information Technology Projects

Richard Scroggins[1]

[1] Capella University

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Abstract

Introduction-The goal of this literature review is to evaluate the cultural variables critical to successful leadership of a global information technology project. Also to analyze the fundamental challenges to today's IT projects. To properly evaluate variables critical to successful leadership, a thorough investigation must be made of the leader, which in most cases will be the CIO or IT Manager. Technology acceptance is the concept of how end users accept and therefore use technology and is a key cultural variable critical to success. The concept of technology acceptance is very important and applies to a wide scope of users including both personal and business end users, IT employees and managers, and business executives. Jiun-Sheng and Hsing-Chi (2011) write, "Consumers' adoption of new information technology has been a central concern to many researchers and practitioners owing to its importance in technology diffusion." (p. 424).

Index terms—

1 Introduction

he goal of this literature review is to evaluate the cultural variables critical to successful leadership of a global information technology project. Also to analyze the fundamental challenges to today's IT projects. To properly evaluate variables critical to successful leadership, a thorough investigation must be made of the leader, which in most cases will be the CIO or IT Manager. Technology acceptance is the concept of how end users accept and therefore use technology and is a key cultural variable critical to success. The concept of technology acceptance is very important and applies to a wide scope of users including both personal and business end users, IT employees and managers, and business executives. Jiun-Sheng and Hsing-Chi (2011) write, "Consumers' adoption of new information technology has been a central concern to many researchers and practitioners owing to its importance in technology diffusion." (p. 424). For the purposes of this research, the focus is on business acceptance, specifically IT managers. When presented with any new technology, many factors influence decisions made regarding the use or acceptance. This is no different than being presented anything new, whether food, tools, or toys. The human brain is very complex and any decision goes through many steps and is greatly influenced by the individual. Many of these individual influences include personal esthetic preference, culture, core values, etc. To account for these individual tastes and feeling, researchers look to behavior on a larger scale and seek to determine how technology is accepted by a larger group or population. This can be thought of as a technology acceptance model. There are many technology acceptance models that vary in how they look at human decision making. In order to select a technology acceptance model that best fits the purpose of this research several models need to be evaluated so that they can be compared and contrasted. The following models influence technology acceptance: the theory of planned behavior; the theory of reasoned action; diffusion of innovations; the technology acceptance model or TAM; the extended technology acceptance model; the unified theory of acceptance and use of technology; the task-technology fit model; the greenfield technology acceptance model; and the perceived characteristics of innovating model.

Author: Capella University. e-mail: mr_scroggins@yahoo.com Businesses rely on IT and the CIO role far more than they used to, and that is fine as long as proper boundaries are maintained. The IT department and

IT resources represent a large part of any modern business and are justified by large savings for the business in money and manpower. A few decades ago the IT department was seen as not needed at all, then as a necessary evil. Today, it is a foregone conclusion for any executive or business student that the IT department will play a large role in any company at least of medium size. So this is progress for sure, that allows the modern IT department and CIO to have a place of honor, purpose, and great responsibility. One role that is important of any CIO or IT Manager is that of leading and inspiring the IT department. Yes, the role of the CIO has expanded over the last few decades to one that provides more for the company overall, but the first duty should always be to the IT department. This may include providing leadership and direction, or maintaining a high level of moral. One way to keep moral high may be by providing newer equipment; most IT employees like to use and play with the latest toys and have good equipment for everyday use. Another way might be in providing occasional team building activities, like a weekly lunch or monthly activities that the department does together. Communications to the group and keeping everyone in the loop to company changes is also important. Treating everyone with respect and letting them know that they are doing a good job and contributing. Also, the CIO has to function as a buffer between upper management and IT department employees for many things, like programming or support issues, or corporate policies that effect the IT department. Basically, the CIO is in a position to look out, so to speak, for the people in their department, and their interests. This also includes managing the expectations of the upper management group.

Another major aspect of the CIO role that has changed over time due to legal and cultural changes is the contribution to IT and corporate policies. These policies can cover a broad range of topics, from the use of thumb drives and burners to the acceptable use of corporate computers. These policies will be different in each company based on their values and circumstances. An acceptable use policy is one that is very common in most companies and may govern II.

Role of the cio things like the ability to listen to music at work; this is one that might be a coordinating effort between the CIO and the HR Manager. This policy might be affected by the company's internet connection speed, which if slow might restrict the use of online music. Companies also might not want music stored on hard drives or servers for space or legal reasons. All these things and many more are factors that the modern CIO must evaluate when drafting or contributing to policies and this is an issue that can get very deep. Overall, the position of CIO is one that is far more improved and respected than it once was, to spite the complications that come with the job. I also believe that this trend will continue in the same direction in the future as the CIO role will take on more and more strategic importance in the company and corporation of tomorrow. I am currently at the IT Manager level, but once I am finished with my doctoral degree, the position of CIO is a reasonable goal for my future. I am looking forward to the challenges and opportunities that I may face if fate and determination lead me in that direction.

2 III.

3 Cultural Acceptance Models

The theory of planned behavior is a theory within the field of psychology that attempts to connect a link between beliefs and behaviors, including acceptance. Although this theory helps to explain behaviors such as acceptance, it is not directly focused on technology acceptance. This theory was proposed by Icek Ajzen and based in part on the theory of reasoned action. The theory of planned behavior states that attitude toward behavior, subjective norms, and perceived behavioral control shape behavior (Ajzen, 1991). Pickett, Ginsburg, Mendez, Lim, Blankenship, Foster, and Sheffield (2012) write, "Ajzen's Theory of Planned Behavior (TPB) maintains that an individual's behavior can be predicted based on attitudes, subjective norms, perceived behavioral control, and especially, intentions." (p. 339). Within this theory, social influence is recognized as a major factor in human behavior. In the modern world of social networking and smart phones, there is a tremendous level of social pressure to conform. Therefore despite the original intentions of this theory, it has direct relevance to modern technology acceptance. The heavy use of social media and smart phones has become what Ajzen (1991) referred to as a social norm. Although this theory provides a foundation for other theories and is relevant to some types of technology acceptance, it does not directly address technology acceptance in business. While there is some level of social pressure within IT, this theory is not specific enough to this industry to be the dominating theory of the research.

Another base theory that helps to establish some of the modern technology acceptance models is the theory of reasoned action. The theory of reasoned action is a model that seeks to predict behavior and attitude. The theory of reasoned action is a theory that heavily influenced the development of the theory of planned behavior discussed above. The theory of reasoned action was also created by Icek Ajzen along with Martin Fishbein. The main components of the theory of reasoned action are: behavioral intention, attitude, and subjective norm. Attitudes is described as the sum of beliefs about a particular behavior weighted by evaluations of these beliefs. Subjective norms look at the influence of people in one's social environment on his or her behavioral intentions. Behavioral intention is a function of both attitudes toward a behavior and subjective norms toward that behavior, which has been found to predict actual behavior (Ajzen & Fishbein, 1980). Nguyen (2011) writes, "Human behavior such as cooperation can be explained by the theory of reasoned action." (p. 61). Ajzen and Fishbein make reference to subjective norm, similar to Ajzen's reference to social norm. This concept of norm, or what is

normal, is a major contributing factor to the adoption or acceptance in general. This is equally relatable to technology, clothing, or behavior in general. Subjective norms continue to establish peer pressure as a potential causal factor in acceptance. Again, within the context of our modern world that has become both engrossed in and socially dependent on social media and technology, peer pressure is likely a major factor in the use of a particular technology and furthermore in the eventual or immediate acceptance of that or any technology. Like planned behavior, reasoned action helps to establish a basis for understanding behavior and acceptance, but is not focused sufficiently on technology. Therefore it is not relevant enough to the IT industry to use as the basis for technology acceptance research.

Diffusion of innovations is one of the first major technology acceptance theories or models, being first proposed by Rogers (1962). Diffusion of innovations evaluates new technology and how it is spread though a culture. "Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1962, p. 5). These certain channels in the modern world include the various protocols that make use of the internet. The speed of communication in modern social systems like social media extends and magnifies the significance of this theory. This theory relies heavily on human interaction and supposes that a technology must be widely adopted before it reaches a self-sustaining level. The diffusion of innovations theory suggests that four main factors effect acceptance: the innovation or actual technology, available communication channels, time, and the existence of a social system. The diffusion of innovations theory also provides four basic categories of technology adopters: innovators, early adopters, early majority, and late majority. Additionally the diffusion of innovations theory lists five stages of the technology

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Volume XV Issue I Version I Year ( ) H acceptance process: knowledge, persuasion, decision, implementation, and confirmation (Rogers, 1962). A question remains as to whether or not this social aspect that permeates the acceptance theories explored thus far extends to business environments, specifically in the IT industry. Despite the age of the theory, diffusion of innovation is still relevant theory utilized in our modern society. Kilmon and Fagan (2007) write, "A case study approach was taken using a component of diffusion of innovations theory as a framework for exploring the research questions." (p. 134). This suggests that the diffusion of innovations theory has potential as the technology acceptance model that would serve as a basis for the research framework for an IT industry related study. This theory is very robust in the description of the various elements of technology adoption and stands as a strong candidate for research on the IT industry.

One technology acceptance theory, simply called the technology acceptance model or TAM, models technology use and acceptance. The technology acceptance model identifies factors that influence decisions related to acceptance and use of technology. Two prominent factors noted are perceived usefulness and perceived ease of use (Davis, 1989). Davis (1989) defines perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance." (p. 319). Davis (1989) defines perceived ease of use as "the degree to which a person believes that using a particular system would be free from effort." (p. 319). The technology acceptance model is based on the theory of reasoned action, explored above. The technology acceptance model also identifies constraints, such as the limited freedom to act. Ease of use is an important concept introduced by the technology acceptance model and may be an important part of applying a technology acceptance model to the IT industry. Ease of use is important because many users have difficulty in learning to use new technology even when the features are very similar in use to the old technology that they are more comfortable with. The technology acceptance model is in very wide use and is very adaptable. Pasaoglu (2011) writes, "The technology acceptance model (TAM) is another theoretical model commonly used for predicting and explaining user behavior and IT usage." (p. 157). The technology acceptance model was one of the few early theories that looked at human behavior within the context of the technology explosion of the late 1970's and early 1980's. This is the same technology boom that gave rise to companies like Apple and Microsoft. This is a core technology acceptance model that many newer models are built on or adapted from. The technology acceptance model is still popular for direct adaptation and use in modern technology acceptance research. As such, this theory has high potential for use with research with the IT industry.

The unified theory of acceptance and use of technology is a technology acceptance model that seeks to explain a user's intentions and behavior. This theory was formulated by Venkatesh, Morris, Davis, and Davis (2003). The theory has four key elements: performance expectancy, effort expectancy, social influence, and facilitating conditions. The Unified theory of acceptance and use of technology also lists four variables that Venkatesh, Morris, Davis, and Davis (2003) call "direct determinant of use behavior." (p. 425). These determinants are: gender, age, experience, and voluntariness of use (Venkatesh, Morris, Davis, & Davis, 2003). This is the first theory that mentions age and gender. Variables like age and gender allow for correlation in the research analysis and produce stronger research results. The unified theory of acceptance and use of technology is based on several other theories, including: the theory of reasoned action, the theory of planned behavior, diffusion of innovations theory, and the technology acceptance model. This is a good example of how research extends the stream of knowledge and how each new theory build on those proposed before it. Venkatesh, Morris, Davis, and Davis (2003) write, "Information technology acceptance research has yielded many competing models, each with different sets of acceptance determinants." (p. 425). There are many different theories related to the acceptance of technology, many of which explore the same or similar themes like social pressure and communication. The

only drawback to this theory is that while is seeks to unify multiple theories, it relies on over forty variables, which will likely exceed the scope of a research study on the IT industry. The unified theory of acceptance and use of technology model would likely require much more time and detailed data than a simpler model like the diffusion of innovation model.

The extended technology acceptance model is based on the TAM, or technology acceptance model. It is sometimes referred to as TAM2. The extended technology acceptance model was developed by Venkatesh and Davis, who were principle contributors to the unified theory of acceptance and use of technology theory. The extended technology acceptance model is a theoretical extension of the TAM, or technology acceptance model that evaluated usefulness and usage intentions in terms of social influence (Venkatesh & Davis, 2000). On this point, Venkatesh and Davis write:

The extended model was strongly supported for all four organizations at all three points of measurement, accounting for 40%-60% of the variance in usefulness perceptions and 34%-52% of the variance in usage intentions. Both social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use) significantly influenced user acceptance. **??** The findings within their research suggest that this combination of factors, when combined, greatly expands the understanding of technology adoption behavior (Venkatesh & Davis, 2000). The extended technology acceptance model is a significant improvement over the technology acceptance model, without the complexity of the unified theory of acceptance and use of technology. The extended technology acceptance model has great potential to be used as the primary model for the research on IT project success.

Most of the theories or models discussed to this point have been very general in their target population, specifically normal technology user rather business or IT industry users. The Greenfeld technology acceptance model is specifically designed to evaluate technology acceptance within nonprofit organizations. It is important to evaluate the Greenfeld technology acceptance model for potential research use or adaptation for the general IT industry. This is because it is necessary to understanding the ability to adapt models. Greenfeld and Rohde (2011) write, "During the past decade there has been an increasing interest in research within Notfor-Profit (NFP) organizations. Research has indicated that there are a number of characteristics that make NFPs different from other organizations." (p. 26). The Greenfeld technology acceptance model was developed by Greenfeld and Rohde and based on the technology acceptance model or TAM. The Greenfeld technology acceptance model was developed because there was a concern that the technology acceptance model or TAM was not able to predict across all situations (Greenfeld & Rohde, 2011). This is a concern, as many of the contemporary technology acceptance models are based, at least in part, on the technology acceptance model. The Greenfeld technology acceptance model suggests that career choice is a variable the technology acceptance model does not account for. The career choice of an individual likely reveals something deeper about their psychology and may be a significant factor in their behavior, attitude, perceived usefulness, and perceived ease of use in relation to technology that effect their individual technology acceptance (Greenfeld & Rohde, 2011). This suggests that that this model might be used if the research study on the IT industry were limited to IT departments within the nonprofit sector. This may also suggest that a new and independent model is needed, possibly to be developed as part of this independent IT industry research project.

The task-technology fit model is a very simple model that is specific to the IT industry that does not directly address acceptance, but instead addresses utilization, as well as individual performance. This theory was developed by Goodhue and Thompson in 1995. Goodhue and Thompson identified four total variables: task characteristics, technology characteristics, performance impacts, and utilization. Additionally the task-technology fit theory proposes that there is a direct relationship between task characteristics and technology characteristics to performance impacts and utilization. Most importantly, the theory makes the argument that information system or technology and the intended technology benefits are achieved when the technology is well suited for the task. This is a simple concept, but likely a significant factor of variable in overall technology acceptance (Goodhue & Thompson, 1995). Goodhue and Thompson (1995) define tasktechnology fit (TTF) as "the extent to which a technology provides features and supports a fit with the requirements of the task." (p. 213). Describing the application of the task-technology fit theory, Forman (2014) writes, "From an organizational perspective, the more an organization perceives a technological fit, the more likely that technology will be utilized" (p.41). This is shows that the task-technology fit theory, despite being simple in design, exposes the same reliance on social systems and communication for the acceptance of technology that is detailed in many other technology acceptance models. However the task-technology fit theory is more compact in design and potentially more efficient as a model when inserted as part of a complete research strategy. Many research studies that employed the task-technology fit model as a core part of research strategy were discovered during the research. This suggests the theory is well suited to be adapted to many specific technologies within the IT industry. This is likely due to the simplicity and flexibility. However, a model with very few variables may not provide enough of a theoretical construct to meet the needs of research specific to the IT industry.

The perceived characteristics of innovating model, or PCI, developed by Moore and Benbaset in 1991 identifies elements that are fundamental to technology adoption. The perceived characteristics of innovating model identifies four factors that influence the adoption of innovation or technology: image, result demonstrability, visibility, and voluntariness (Moore & Benbasat, 1991). These factors vary from the previous models explored, but they are valid none the less. Image, one of the identified factors, is a used to market technology today

and it has a large effect of sales. A simple look at the marketing surrounding the many Apple products on the market make the power of image very evident. This also connects the concept of image to that of the social construct that many other technology acceptance models have focused on. The image that a technology has or presents is largely driven by social factors. Additionally, the perceived characteristics of innovating identifies two additional constructs: relative advantage and compatibility. There are potential problem with the model. The perceived characteristics of innovating model is industry specific as originally envisioned, similar to the Greenfeld technology

Volume XV Issue I Version I Year ( ) H acceptance model. In the case of the perceived characteristics of innovating model, it was developed to evaluate the adoption of innovation within government. Additionally, like the Greenfeld technology acceptance model, the perceived characteristics of innovating model could be used for IT industry research that was limited to a specific job sector. So, one potential option would be to use the model for a research study within government IT departments. However, the model could also be modified or adapted to apply to the whole IT industry or just private sector IT departments.

To this point, the research has encompassed several technology acceptance models or theories. Many have common themes, such as social pressure and communications. Outside of these structured technology acceptance models, one question remains as a gap in this research thus far. That question is, beyond the obvious factors that affect technology acceptance, what underlying or subconscious drivers are responsible. In researching an answer to this question, Maslow's hierarchy of needs was coming up often in the research. Maslow's hierarchy of needs, is a theory by Abraham Maslow introduced in 1943 in a paper called a theory of human motivation. In the theory of human motivation, Maslow (1943), describes his observations of the innate nature of humans. In the theory of human motivation, Maslow (1943), developed a hierarchy of needs that included the following, in order of the most basic to the most evolved: physiological, safety, belongingness or love, esteem, and selfactualization (Maslow, 1943). It is the needs of belongingness and esteem that best relate to the social aspect of technology acceptance. On this relationship, Cao, Jiang, Oh, Li, Liao, & Chen (2013) write, "In level three, we find needs of belonging and love that are also termed social needs, including love, be loved, and a sense of belonging." (p. 170). According to Maslow (1943), humans need a sense of belonging and acceptance as humans, and this comes from our social groups, whether large or small. (Maslow, 1943) This theory seems to be connected to acceptance to a degree that on that strength alone it should have a connection to this research on technology acceptance in the IT industry. Outside of the ability to feel socially connected and accepted by using certain technology, some technological device can also serve as a surrogate for human social networks. An additional aspect of technology acceptance in modern times may be the extent to which a technology serves as a social surrogate. Esteem is also a factor, as much of our modern identity is tied to what technology humans are able to possess. Technology can be a status symbol. Today, people usually carry their smart phone in such a way that the screen size is obvious to any observer, and this is part of that is part of modern identity within the western culture. This is true as well within the IT industry and Business in general. Businesses tend to provide technology as a benefit to certain positions within a company, and that can be a badge of rank. The simple providing of a laptop or cell phone as part of your benefit package within a company can elevate social status within the company.

6 IV.

7 Conclusion

Several different theories related to the acceptance of technology have been explored. Seminal articles were a core part of this effort. Some of which could be forcibly applied to the specific field or industry of Information Technology. Others, however, where specifically designed and conceived for this application. Some were very specific in scope or industry, and others very vague. One very common theme revealed was the social aspect of technology acceptance and how peerpressure and social acceptance drive technology acceptance. This research, while focused on business acceptance within the IT industry cannot ignore this strong relationship between technology acceptance and social systems. The diffusion of innovations theory, though not a new model, seems to be very relevant to the overall process of technology acceptance within the context of social media. Lane and Coleman (2012) write: "The advance of the use of social networking systems is rapid and compelling. People are continually connected to each other on their blackberries, i-phones, netbooks and computers. People are texting, talking, e-mailing and in general, communicating through electronic rather than face-to-face methods at an accelerating pace." **??**Lane & Coleman, 2012, p. 1) Social media accelerates or magnifies several of the factors identified by the diffusion of innovations model: communication channels, time, and a social system (Rogers, 1962). The model that best suits this research may be a modified diffusion of innovations model that directly accounts for social networking. Social networking is a technology that magnifies the effects of behavioral influences. Because many behavioral influences are present in a real time environment, the social network acts like a catalyst to the behavioral reaction. This is similar to the process of heat catalyzing a chemical reaction. Within the ecosystem of a social network time, communication, and social interaction frequency are increased well beyond what is normal or common. Social networking is relevant to the IT industry as it is to other industries. Many companies now have a social networking presence and monitor the lives and actions of employees. This

relationship is relevant to the study of behavior and to the workers within the IT industry. Knowing how social networking affects technology acceptance in the workplace needs to understood as part of any research effort.

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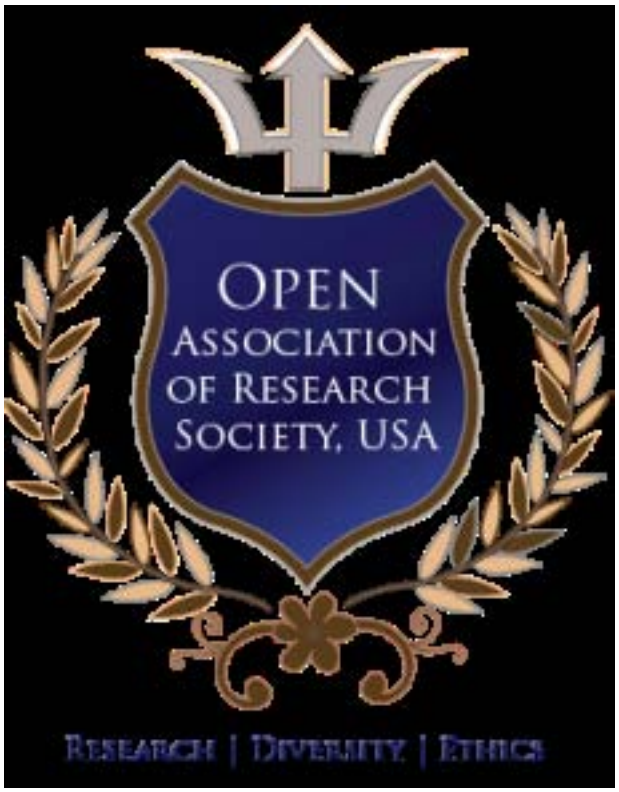

Figure 1:

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