How have disruptive technologies forced Information Technology Managers to change their management practices of Information Technology Professionals in the last 3 years in US market?

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Author Note

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Chapter 1: Introduction

The question, how have disruptive technologies forced information technology managers to change their management practices of information technology professionals in the last 3 years, is an important one. This question has personal relevance to me as an information technology manager. I have come to learn that IT professionals are a unique breed of individuals in the workplace. They run the gamut of personality and individuality. What makes them unique, specifically in terms of managing them, is the strains put on them by the larger business in their profession. I have come to believe strongly that managers are not prepared adequately, to appropriately manage IT professionals, when given standard management training. I firmly believe that specialized management skills are required to more successfully manage information technology professionals and these skills can be developed and taught. It is my desire to share what I have learned on my journey through the lens of IT professional and manager of IT professionals with those that could benefit from it. It is also my desire to ensure this topic has visibility and weight in the professional management training and education community with an outcome of specialized training for would be managers of IT professionals. There is unmistakable evidence that the relevance of this research to the organization and manager exists.

A look at the research describing the satisfaction of the Information Technology (IT) professional and the link to organizational success and managerial success demonstrates the need for engaged and content IT professionals. As stated by Lo (2015), IT professional turnover is a very damaging occurrence, no matter the industry. Lo hints that turnover in IT professionals is so damaging because so many learned aspects or inside knowledge is lost when IT professionals are retained for prolonged periods of time and able to also properly transition their knowledge to others in their specialty. According to Tong, Tak and Wong (2014) the satisfaction and retention
of IT professionals directly impacts the information technology organization’s success within the larger organization's success. The retention, motivation and satisfaction IT professionals are therefore critical to the success of the business. Research by Agarwal and Ferratt (2002) indicate that information technology managers and supervisors must then be specially trained to ensure satisfaction, motivation, engagement and retention of IT professionals. Agarwal et al. (2002) state, “We strongly believe the imbalance is a recurrent problem managers will have to contend with as technologies change at a relentless pace and as the opportunities for utilizing IT in organizational work continue to expand” (Agarwal et al., 2002, 73). This statement by Agarwal et al. made a decade before major trends in emergent technologies and prior to the introduction of disruptive technologies to the global IT landscape, holds more weight in the recent IT job market. The identification of the rapid pace of technology then plays a significant role in the career of any IT professional, and therefore the IT manager supporting that professional. As Burrow and Beradinelli (2003) stated, “It is not enough to demonstrate learning or even transferred and sustained learning on the job” (Burrow et al., 2003, 12). This also suggests that it is critical to train at level three and four to create organizational and personal success for IT professionals. It is then important to also understand what specific and unique training might be required for IT managers and supervisors to enable their success in the management of IT professionals due to the rapid changes in technology, especially given the rapid rate of growth in the last three years.

**Purpose of Proposed Research**

The purpose of the research is to demonstrate and identify the need for specialized training for managers who are responsible for training, coaching and managing information technology professionals. The intended audience for the research are human resource
professionals, trainers, educators and others who can build and convey specialized training, specific to the unique aspects of managing information technology professionals. The outcome of the research could be to identify the unique aspects of that management for the purposes of further study, analysis and research. The research could also provide special materials to human resource trainers and educators specialized in training IT managers and supervisors.

**Research question and hypotheses.**

The main question, how have disruptive technologies forced information technology managers to change their management practices of information technology professionals in the last 3 years is built on several hypotheses. These are the following.

1. Information technology professionals require management practices/approaches that are not described in current management training material.

2. Management of information technology professionals is directly influenced by the introduction of disruptive technologies in the global information technology community.

3. Disruptive technologies introduced in the global information technology community have a different impact on information technology professionals than introductions of other new technologies and technology trends.

**Limitations of this study.**

While many of the skills required to manage IT professionals successfully are no different than managing other disciplines, according to Kappleman, Jones, Johnson, McLean and Boonme (2016) they may require a fine tuning or adjustment specific to the challenges of management presented by the IT landscape. This research will focus on the relational aspects unique to managing IT professionals as it relates to the disruptive technology advances that IT
professionals must understand. The research will describe the unique facets of employment in the information technology discipline that relate to the potential need for specialized management approaches, related to supervising or managing IT professionals. This research will not cover all unique aspects of working in IT or all specialized training required for managers who will manage IT professionals. This research will cover what is explicitly unique to IT professionals in their roles independent of any specific field. This review will not include information about standard management practices, generally used in all organizational disciplines or their adaptations to IT professionals. This document is organized to demonstrate the unique challenges IT professionals face in their roles. This document discusses the implications that these unique variables portray to managers of IT professionals. A limitation of this research will also include an personal bias. Finally, this will cover a summary including potential areas of additional research and focus.

Definitions and terms.

IT abbreviation for information technology.

IT professional is defined as a specialized knowledge worker with a focus specific discipline or area of expertise. For example, and for the purposes of this document a person acting as first level technical support at a call center is not considered an information technology professional. Information technology professional for the purposes of this document includes, developers, engineers, architects and other especially skilled roles in the functional area of information technology.

Disruptive technology is defined as a globally recognized and impacting technology. Some examples of this are artificial intelligence, autonomous vehicle technology, cloud computing, etc. These are technologies that reshape the landscape based on their potential.
Disruptive technologies are different from technology trends or advancements, new/emergent technologies in information technology fields.

Manager of information technology professionals are defined as the individual directly responsible for the output of the IT professional and the impact of that knowledge tower to the overall organization.
Chapter 2: Review of the literature

Information technology professionals face certain unique challenges that can be correlated to the need for specialized or refined management approaches for IT managers and supervisors. According to Majors, Davis, Germano and Fletcher (2007) in the article Managing Human Resources in Information Technology: Best Practices of High Performing Supervisors, some of these unique challenges come in the form of specialized stress mechanisms for IT professionals. These stress creators are often comprised of on the job requirements, for example, on call requirements of IT professionals where they are expected to be available twenty-four hours a day, seven days a week, including holidays and personal events. This on call mentality unique to IT professionals can create the feeling or sense that the business success is more important than their lives or happiness. This stress factor and some additional factors detailed below, if not properly managed, can lead to discontent, lower engagement and possibly even retention challenges for the organization. While considering sources of stress for IT professionals, Niederman, Ferrat and Trauth (2016) suggests that stress sources unique to the IT discipline also include the requirement to stay educated on the latest technologies and expertise in their area of responsibilities. When coupled with the potential time commitments of being on call and other personal time commitments this task of staying on top of technology changes, trends, and emerging technological advances could be overwhelming and demoralizing to the IT professional, the results include discontent, lower engagement or retention challenges, if not properly managed. The addition of global disruptive technologies which may be more complex or introduce completely foreign methods as replacements to the tried and true methods can add a level of complexity and sense of starting over, being overwhelmed by too much technology learning curve or feelings of inability to cope or master that innovative technology for the IT
professional. Finally, an additional potential source of unique job-related stress according to Robin (2016), comes from the possibility of job loss due to outsourcing. This potential creates fear for IT professionals that if they do not master the technological changes at a rapid pace, their jobs could be in jeopardy to providers that claim to have expertise in new, disruptive or emerging technology trends. While the larger community agrees that a little fear is a good motivator, the constant threat or substantial amounts of fear could result in lack of motivation, disengagement and retention challenges, if properly managed.

In addition to the unique stresses created by their industry, Luftman, Lyytinen and Zyi (2015) indicate that IT professionals also have a special relationship to the business, in their many faceted cross-functional relationships. According to Luftman et al. (2008), this unique ask of the IT professional to learn about all areas of the business, act as partners, liaisons and provide solutions unique to that functional area based on their understanding and relationship with that specific functional area makes the type of individual required to fill the role very special. In most cases IT professionals do not natively have the skills required to build these cross functional relationships or develop the function by function learning required to provide complete solutions. It is not common to teach these skills in the college classroom to IT professionals in many curricula as the focus is on the technology and the need to master those skills required to develop, support, engineer or architect that technology. This often puts the IT manager responsible for the IT professional as the sole source of providing this education. However, these are skills that most individuals entering the work force or adapting their career seldom have obtained and are not always fostered inside management training programs. Many management training programs only focus on one or limited aspects of cross functional relationships and inter-organizational learning dependencies. This need to understand many aspects of the business and
provide collaboration, guidance and partnership fundamentally changes how IT professionals must be approached from a management style according to Luftman et al. (2008). IT professionals would need the proper coaching, training and management guidance to develop the cross-functional relationships as well as specialized help in learning the many functional aspects of the business. This alternate material learning pattern could potentially clash with technological learnings that the IT professional maybe required to do at the same time to stay current with the trends or changes in their respective IT field. In addition to the unique aspects related to the IT organization, Burton, Wu and Prybutok (2010) suggest that IT professionals are impacted uniquely by their organizational social networks and research performed by Pittenger (2015) suggest that IT professionals have a higher demand or need for advanced emotional intelligence than the average organizational employee. What the research that Burton et al. (2014) demonstrates is that IT professionals are more successful based on their inter-organizational social network, not just inside of IT, but in the larger business. As Tong et al. (2014) indicated, success in IT is heavily predicated on how social networks for the IT professional shares information, both about the business and about emergent technologies. Indicating that IT professionals, not only need to have high emotional intelligence to create social circles inside the organization that can educate them on the business practices, but also develop social circles with other information technology professionals, both within and external to their organization, to ensure they are learning about trends, technology and its impact to businesses. This unique relational status in the organization and outside of it forces IT employees to have to behave differently than many other disciplines inside the operational organization. It creates a potentially difficult landscape for individuals who maybe technical experts in an area or discipline, expecting to only work on that isolated topic of expertise as they are required also to
communicate cross-functionally. This means their IT manager maybe the only source of coaching that can help them grow in emotional intelligence and in social networking but only if the IT manager is prepared and trained to do so. According to the research by Dinger, Thatcher, Treadway, Stephina and Brelan (2015), many individuals have never been asked to behave in this manner before and many organizations do not have training or guidance for individuals, manager or professional in the arena of coaching social networking and growing peer knowledge groups for professional success. This creates a knowledge gap, even in high performing managers, who have never been introduced to this practice. This lack of knowledge and need to work to grow social networks for success, coupled with the rapid advances in technology, especially disruptive technologies and the fact that according to Dinger et. al. (2015) having a good social network in technology helps the IT professional more rapidly educate themselves on the technological advances could create an immediate gap for the IT professional, unless properly managed.

**Implications to Information Technology Managers**

Due to the unique aspects presented both by and to IT managers in the capacity for which they are employed, the logical conclusions drawn are that they wish to be more successful in their roles and will add unique disciplines to their management practices as they pertain to the management of IT professionals. One example of these practices presented by Luftman and Kempaiah (2008) in their research *Key Issues for IT Executives*, include coaching on emotional intelligence, with the specific goal of external communication abilities to stakeholders and business partners for describing technology. According to Luftman et al., managers of IT professionals need this skill first to coach it. This skill set could be foundational in answering the needs presented by both Dinger et al. (2015) and Tong et al. (2014) research on social network
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building and emotional intelligence. Besides the coaching on social aspects, according to Niederman et al. (2016) IT managers will also need to adopt practices specific to the teaching and encouragement of learning and the practice of learning new, emergent technologies, amidst the daily grind of operational business for IT professionals. The skill sets of teaching balance between learning, training and self-development in technology is not currently a skill set actively taught to managers through management training programs. Adding to the challenges of training, according to Gallivan (2004), IT managers of IT professionals will have to adapt, and train based on a sliding scale of growth from the professional as they migrate through their personal career. Gallivan’s (2004) research indicates that IT professionals change and develop, much like any other functional area as their career progresses. This however creates a unique situation for IT professionals as their career changes due to the rapid pace of technology and especially introductions of disruptive technologies. It can be more difficult for more advanced IT professionals in their career to lean, train and adopt at the same speed as professionals at different ages in their career. It is therefore in the hands of the IT manager to ensure a proper scale of training and education is introduced at every level of the IT professional’s they are responsible for. Finally, IT managers, supervisors and leaders of the IT organization will have to focus on identifying, understanding and adopting emergent and disruptive technologies themselves, so they can be adapted and implemented by the IT professionals they are responsible for. For IT managers that come from other disciplines and are not technically trained or used to keeping up with the self-education of the rapid pace of technology changes, this could be a difficult task without proper training to do so.
Summary.

In conclusion there is limited research and understanding of the ongoing impacts of disruptive technologies, recent technology trends and specific management practices and skills for managers responsible for introducing these technologies. The research available indicates that there is a conclusive need for specialized training for IT managers to better prepare them for managing the IT professionals they are responsible for in the adoption and learning related to these technologies. Other areas of focus for future research could include attempts to directly correlate and understand the impact that the speed at which disruptive technologies are developed and deployed have on IT professional’s engagement and retention in their current role. Also, future research could focus on the additional stress that is caused to IT professionals due to the introduction of disruptive technologies in their field. Future research could also look at the emotional impact and performance impact of disruptive technologies to the IT professional as related to motivation. Finally, research in correlating the impact of training needs and on the job stresses like on call duty, outsourcing and knowledge building for IT professionals versus the time commitments required to support the business might be conducted. These potential future research topics could then be provided to managers via specialized training to help them better support the IT professionals they are responsible for. Management of IT professionals is a specialized skill and should be trained for accordingly. This training should be comprised of researched and vetted curriculum for documented outcomes.

Management of IT professionals is not an easy task due to the dynamic nature of the role assigned to the professional and the unique challenges they face in the organization. Successful or highly functioning IT organizations within the business are now more critical than ever to the overall success of the business. Contributing to the IT organization’s success is retention and job
satisfaction of the IT professionals who comprise that organization. The need for IT managers to be as skilled and prepared as possible to supervise and properly support these human assets are more critical in business success than ever before. There are many challenges for IT managers to overcome and prepare for to be successful in the endeavor of IT management. These specialty management disciplines include coaching emotional intelligence and verbal technical communications, teaching socialization and networking inside and external to the organization for proper knowledge sharing. Managers of IT professionals will need to learn to provide proper incentives for motivating professionals both with training and education as well as with proper down time and mental rest practices. In short management of IT professionals is not as simple as managing other disciplines and requires specific training, education, insights and disciplinary focuses to achieve success as an IT manager in the organization.
Chapter 3: Research Methodology

Research Design and Plan

An approach of mixed methods of investigation could be used in researching the main question, how have disruptive technologies forced information technology managers to change their management practices of information technology professionals in the last three years and these hypotheses.

4. Information technology professionals require management practices/approaches that are not described in current management training material.

5. Management of information technology professionals is directly influenced by the introduction of disruptive technologies in the global information technology community.

6. Disruptive technologies introduced in the global information technology community have a different impact on information technology professionals than introductions of other emergent technologies and technology trends.

In performing this research using mixed methods, there are merits and drawbacks to both the quantitative and qualitative methods. For example, while utilizing the quantitative method in performing this research, the merits as it applies to this topic are in the identification of the target groups and analysis of existing data sets to both correlate and to identify new potential data sets. There are drawbacks to this format of research as it pertains to the desire to identify behaviors’ and seek open ended feedback both from managers and professionals. Quantitative research would not be able to address the third hypothesis of this research. This kind of raw information cannot be obtained through quantitative methods. Likewise, using qualitative research will have the benefit of identifying trends with both managers and professionals through interviews and
surveys, asking for feedback in an open-ended way. Using the qualitative method will specifically answer or help to prove or disprove all three of the hypothesis presented. There is a possibility in this research that the identification of diverse types of IT professionals or IT professional roles and the impact they experience due to disruptive technologies must also be discovered. For example, it is possible that unique management skills for managers, relating to impact of disruptive technologies are only required for IT professionals working in certain types of roles. This a need for quantitative data that qualitative cannot supply.

**Research data collection methods.**

Looking at the benefits and drawbacks of both qualitative and quantitative methods and their practical application they are represented in the following research methods framework. Utilizing both quantitative and qualitative methods for research, the starting point is with quantitative research. To understand and define the market over the last three years in the United States, a quantitative approach is required. This approach will focus on identifying and analyzing several factors to establish the remaining basis of the research groups. First is empirically identifying high and low performing Information Technology managers. This could be performed first by collecting the Information Technology turnover rate of a sampling of 3000 U.S. companies in different market segments and sizes inside those segments, taking specifically the turnover of information technology professionals in the last three years. Next, one would have to identify organizations in that 3000 where IT managers also turned over. Next, a grading scale utilizing turnover by manager, where the scale of least turn over to most turn over by single manager, could be used to identify and place managers with the most turn-over. Using this grading scale, one could identify the top performing IT managers. Using the same scale, one could identify underperforming IT managers who remained at the same organization but had the
highest turnover during the three-year tenure. These provide different sample sets for both open and closed ended interviews and survey questions. Still using quantitative methods, a closed poll of all IT professionals that turned over during that three-year period from the 3000 companies would be conducted. This poll would focus only on the reason for turnover from a formatted, standardized sample set of questions and answers. The poll for turnover would ask close ended question: reason for departure? A drop-down list would allow selection of answer, like “position eliminated.” (see appendix for full survey examples)

After collecting the responses an evaluation of the responses by ranked manager would be in order. This would require matching employees, reason response and manager rating to determine if highest ranked managers lost employees for either seeking more technical challenge, less technical challenge or in ability to keep pace with the technical changes.

Introduction of qualitative methods would follow. The qualitative portion would be surveying managers in all grades to attempt to identify trends among managers that could add to the research. This could be accomplished with surveys conducted online, given that it might be impractical to interview all the potential managers. The managers’ survey could look like the following question type.

- Are there any unique management practices you demonstrate because you are managing information technology professionals?
  - Free form answer box

Continuing with qualitative methods, a similar survey of IT professionals in all grades could be conducted to determine management practices that were ineffective as well as management practices that were helpful in dealing with disruptive technologies. There are likely many other potential avenues that could be utilized to collect and formulate the data required to begin to prove or disprove the hypotheses that are associated with this research.
In summary, utilizing quantitative and qualitative research would provide the most access to the types of data required to research the question and hypotheses presented for management practices of IT managers and the changes they make in managing IT Professionals due to the impact of disruptive technologies.

**Justification of data collection methods.**

This research, being founded on mixed-methods approach to data collection could be justified in this way. Quantitative research is justified in its need for building hard facts and figures around employment of IT professionals, their management history and the control groups they might participate in. Qualitative research is justified in bringing in trends, behavioral feedback, and identifying potential practices that work or do not work for the purposes of proving hypotheses and directing future research. They are both critical to the success of the potential research for this specific topic.

**Ethical issues and sources of bias in this research.**

While this research will utilize mixed-methods, the qualitative data collection will likely focus a great deal on human subjects, specifically behaviors, motivations and impact of technologies in daily job routine. There are specific issues that arise when conducting research involving human subjects. These issues can be classified in several categories. Generally, these categories are risk to human subjects, maintaining privacy and confidentiality of the subjects involved in the research and ensuring the research methods meet the ethical guidelines, rules and regulations of local and federal organizations. Some specific examples, related to the research topic above might include ensuring employees who speak unfavorably of a manager or manager’s practices during interviews cannot be subject to retaliatory actions from the manager. Another example is ensuring that interviewees personal information, like company tenure and performance or past
performance depending on the scope of the research are not made publicly available. Another specific issue that could arise while dealing with human subjects in this research is ensuring that persons participating are not able to be identified from any published data. This is important because it could lead to discrimination in the job market and could apply to any of the members of research. One last potential issue that could arise from this research is the inability to find/have a diverse enough research group to ensure the research was applicable on a broader scale. This might include not having enough candidates by race and sex.

The research on management practices will likely not raise many direct ethical issues. However, it may bring to light indirect ethical issues, such as discrimination by managers due to race, sex or other background topics not related to the specific research but that might be revealed as a part of it. Another potential ethical issue that could arise is that respondents may try to paint themselves in a more flattering light if the research is not phrased in a specific way. This could create false context for the outcome of the research.

The issues of research involving human subjects and ethical challenges could be mitigated with multiple potential solutions. One such solution to ensure confidentiality and to ensure compliance with research standards would be to strip identifying data from the survey responses and store that separately on encrypted media, accessible by the research team. Formulation of a specific set of questions designed to focus only on the specific qualitative information desired in the surveys is another way to ensure that potential secondary ethical issues do not arise. The research team would also have to ensure that the potential participant groups included a large enough population of ethnicities, genders, etc. to ensure that the results were indicative of the larger population.
If this project were for publication, the approach of requesting expedited IRB review would be used. This approach would be appropriate based on similar studies of management practices performed in the past, the minimal risk to participants, and because all participants would be an adult. In addition, all participants would be given consent and confidentiality agreements. Based on these premises an expedited review should be possible.

When performing research, the possibility of influence of bias should be mitigated. After two decades in the same field, moving through multiple industries it would be hard for any person to fully objectively reflect on their field. As such, over the years I have also drawn conclusions about various roles and responsibilities inside the IT organization that have become truths to me. For example, one can teach a network person telecom, but one cannot teach a telecom person to work on networks. This personal example does not mean it is absolutely a truth. It is an example of the bias one could bring to this type of research. This is the risk to researching in one’s field. There will be many conclusions that will have to be unlearned to be an objective researcher. Other firsthand experiences, like the example above could also influence data collection. For example, if the research only ever ask managers of IT professionals in the infrastructure tower to respond to surveys, and never ask managers of software developers to participate, it is possible the research has excluded a large population of potentially different IT professionals. A single researcher might be likely to do this, if they have only worked in one vertical in their career. This leads to the question of how I, as an objective researcher, will deal with conflicts that arise based on my personal values and styles of management. How will I be able to objectively formulate the research to ensure my bias are not leading or otherwise influencing the research? One mitigation solution is to ensure a diverse research team, who can review from other possibilities the research criteria and methods. Ask for input outside the ITO,
for example from Human Resource trainers who have trained thousands of managers in all disciplines for their input and feedback on the direction of the research and data collection methods. Another potential way to avoid conflicts with my values and personal bias, is to ensure when the data is collected that it is also reviewed by peers, who do not hold the same values that I do. It would also seem that individuals with values opposed to my own should be primary members of the research team, to help ensure that the research is well rounded and truly unbiased. I would treat these colleagues with respect and professionalism, regarding their values, even if in direct opposition to my own. Externally the questions and survey answers would have to be treated in an analogous way to ensure external biases are not able to influence the data collected. For example, respondents may try to paint themselves in a more flattering light if the data collection methods are not phrased in a specific way.
Chapter 4: Results and Discussion

Expectations of Discovery, Including Reasoning Behind Expectations

Through the course of the proposed research and data collection via mixed-methods the expectation is to find specific successful behaviors and management behavior gaps that are not currently provided by management training and are specific only to individuals wishing to manage IT professionals in IT organizations. An expectation is that there are unique skills that successful IT managers have that can be both replicated and incorporated into training. There is also an expectation that there may be skills that cannot be taught but are truly required for successful management of IT professionals due to their unique skill sets and dispositions. IT professionals as a collective group have changed over the last decade, just as the field has changed and adapted. This leaves the expectation that unknown new skill requirements which are not yet identified in current research will be discovered.

I expect these results partly based on the experience of working as an IT professional for many kinds of managers over the years. I also have these expectations based on insights I have learned as an IT manager of IT professionals. Because I have had to learn and adopt new ideas that I was not aware of to be successful, it would stand to reason that there are more and that some can be taught.

Next steps if expectations are not met.

If during the research it comes to light that the expectations stated will not be met the logical course of action would be to close this specific research approach. It would also be a next step to introduce or pursue other research topics either discovered through this research or already highlighted as potential additional research areas of focus in this document. A goal would be to ensure no topic is missed or potential area of research overlooked as it pertains to the
larger topic. A recommendation of future research on the same topic would also be made, the reasoning behind this recommendation being that disruptive technologies are just emerging in the market place and globally the impacts may not be fully understood for years to come.
References


Niederman, Fred; Ferratt, Thomas W.; and Trauth, Eileen M., (2016). On the co-


Appendix A

**SAMPLE Informed Consent document**

A research study investigating IT management practices

**Introduction**

You are invited to participate in a research study focusing on management practices of IT professionals. If you are interested in participating in the study, please take as much time as is needed to discuss this study with your family, friends or anyone else you wish to. The decision to participate is entirely up to you. In this research study we are evaluating and comparing various IT management practices and their impact to IT professionals.

**What is involved in the study?**

Should you decide to participate in this study you will be asked to answer questions in a survey format. The surveys should not take more than 15 minutes of your time and there would not be more than a total of 5 surveys involved in your participation.

The researchers involved may stop this study at any time or remove you as a participant from the study if they deem your participation is not in your best interest. You can be removed from the study for other reasons and this can be performed without your consent.

You can also choose to stop your participation in this research study at any time without any loss of benefits.
Risks

Potential risks associated with this study are minimal. While the following risks have been evaluated there may also be risks that cannot be predicted.

Potential risks of participating in this research study include minimal psychological harm, potential harm to employability, and possible social harm.

What are the benefits to participating in this study?

It is possible that the following benefits can be attained from participating in this research study.

- Free access to the published research upon completion
- Wider understanding of the management practices of IT professionals

It is also possible that there are no direct benefits to you in participating in this research. Others, including you might benefit from the information gathered from this research in the future.

Confidentiality statement

The research team will take all possible measures to ensure your information remains private and confidential. These steps may include replacing names or other identifiable details with alphanumeric indicators. It may include scrubbing the data of personally identifiable data. Your confidentiality may be protected by requiring surveys to be taken with at least 128 bit encryption electronic surveys. Personal details may be kept separated on physical print and electronic media stored in separate locations, under lock, accessible by only certain members of the research team.

Incentives for participation
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There are not currently any incentives given for participation in this study. However, your participation could mean a more positive impact on the larger IT community.

**Your rights as a study member?**

Any participation in this study is voluntary. You have the right to stop participation at any time for any reason. If you choose to leave the study no penalties or loss of benefits to which you are entitled will occur.

**For questions or concerns please contact us:**

At any time you can call 1-800-myresearch or email MYRESEARCHPROJECT@CALEB.ORG for questions about the study, your participation, unexpected discomforts or if you feel your participation has put you in any jeopardy or harm.

_____________________________
Signature of Participant

_____________________________
Date

_____________________________
Signature of Principal Researcher
Appendix B

Data Collection examples

Survey examples:

Reason for departure from organization A

Select only one answer:

- Position eliminated
- Seeking different position for compensation
- Seeking different position with more technical challenge
- Seeking different position with less technical challenge
- Let go from position
- Unable to keep up with the rapid changes in technology.
- Unfavorable company culture

Survey of management methods:

Survey questions:

1. Are there any unique management practices you demonstrate because you are managing information technology professionals?
   a. Free form answer box
2. Have you had to make any changes to your management approach due to the impact of disruptive technologies on your staff?
   a. Yes, or no drop down:
   b. Follow up question on yes:
      i. Describe the changes you have made based on the impact of these technologies.
         1. Free form box
3. What have you learned from managing IT professionals that you were not taught in management classes/training/school?
   a. Free Form box
4. If you could impart only one thing to new IT managers working with IT professionals to help them be the best manager possible, what would that one thing be?
   a. Free form box
   b. Follow up question

5. What would that one thing be if it was specific to managing IT professionals as the introduction of disruptive technologies becomes necessary?