Motivation and IT Project Success

By Richard Scroggins

Capella University, United States

Introduction- The goal of this literature review is to Compare and contrast the types of quantitative research approaches used to conduct studies on the relationship between motivation and IT project success. Additionally, the secondary goal is to Examine and discuss the issues of sampling, validity, reliability, and bias within these contexts. Wester, Borders, Boul, and Horton (2013) define research as, "An activity conducted to increase knowledge by systematically collecting, analyzing, and interpreting data to answer carefully formulated questions about publicly observable phenomena." (p. 280). Research is a critical part of the scientific method that allows our society and species to understand the world around us. Research can be divided into multiple categories.

GJCST-H Classification: D.2.11 D.4.6

Strictly as per the compliance and regulations of:

Motivation and IT Project Success

Richard Scroggins

I. Introduction

The goal of this literature review is to Compare and contrast the types of quantitative research approaches used to conduct studies on the relationship between motivation and IT project success. Additionally, the secondary goal is to Examine and discuss the issues of sampling, validity, reliability, and bias within these contexts. Wester, Borders, Boul, and Horton (2013) define research as, "An activity conducted to increase knowledge by systematically collecting, analyzing, and interpreting data to answer carefully formulated questions about publicly observable phenomena." (p. 280). Research is a critical part of the scientific method that allows our society and species to understand the world around us. Research can be divided into multiple categories. The two predominant research categories are qualitative and quantitative. Simply making the choice between quantitative and qualitative research is a challenge that deadlocks many research projects. Students struggle with this very dilemma, often changing the direction of their research multiple times before settling on a solid direction.

Although there is value in the qualitative approach for some aspects of IT research, challenges with this type of research are often presented by limiting the ability to provide solid numbers that are typically needed to justify a project. Ann (1998) makes the case for the limitation of the qualitative approach when applied to data that needs to be quantified. According to Ann (1998), "Both forms of qualitative work look for details about preferences, motivations, and actions that are not easily made numeric." (p. 162). Beyond the initial challenge quantitative research presents challenges that are specific. Quantitative research can be defined as the investigation of some phenomena through the use of statistical, mathematical, or numeric data and applying some computational, observational, or mathematical techniques to show a fundamental connection. This process typically follows the scientific method and involves some hypothesis to which a defining relational question will be evaluated and proven or disproven. The overall research design for quantitative research typically includes models, theories, hypotheses, instruments, methods, controls, variables, collection, and analysis.

Author: Capella University. e-mail: mr_scroggins@yahoo.com

II. Types of Quantitative Research Approaches

Determining the purpose of the research and creating a purpose statement is the primary challenge of performing quantitative research. Two examples of potential research methods for this type of study are exploratory research and descriptive research. Exploratory research would be useful to explore the topic and identify new insights, while descriptive research relies more on an existing body of scholarly work and statistical data. Exploratory research would better fit the goals of a study that is exploring questions that pertain to the impact of perceived IT project success. Exploratory research is research that explores something new. While typically used when a problem has not been clearly defined, exploratory research can be combined with a review of existing literature to satisfy all aspects of the research. In the case of the perception of IT project success, especially in the direct area of virtualization technology, exploration is needed, as the perceptions of success are not clearly known. Mansourian (2008) writes, "One of the most important and extensive stages of this study was the period of data collection and analysis. In this stage, the researcher sought to find the answer of the primary research questions through a systematic data collection and inductive analysis which ended up with reasonable answers to the primary questions." (p. 273). Questioning is exploring and that is the root of scientific study. By exploring and answering questions, you contribute knowledge, whether it is for all mankind, or just for a small population. Exploratory research suggests an area where a question needs to be answered through exploration. Exploratory research is often associated with qualitative research, as there is a qualitative nature to any answer given to any question posed or answered by a human. This is relative to our basic nature, but the statistical data collected can still be quantified and is thus appropriate for quantitative research. Quantitative research is narrow and specific, and is able to reduce a complex question to a single number or set of numbers.

From the purpose of the research comes the research purpose statement, which is central to the research. The purpose statement describes the controlling idea of the study. Although research purpose and purpose statements are common to both quantitative and qualitative research, they are very specific to each type of research. In quantitative research, the purpose statement includes variables that

1

can be independent, dependent, mediating, moderating or control variables. Identifying variables is a very important process that is unique to quantitative research.

III. Additional Elements of Conducting Quantitative Research

Choosing an instrument for the collection of data is another challenge of conducting quantitative research. There are many instruments to evaluate and choose from and often they are proprietary or must be modified for the specific research purposes. Examples of potential instruments that relate to a study on the impact of perceived IT project success on future IT project decision making include the use of direct interviews, observations, or surveys. Direct interviews present a challenge in arranging and facilitating the large number of interviews needed to collect enough data for an accurate quantitative study and are more frequently associated with qualitative research. Observations, while very useful in most hard scientific research, are difficult to facilitate in this type of study. Directly observing project and IT managers would present logistical difficulties. An ideal option for a qualitative study of this manner is the use of an online survey tool.

Due to the maturing nature of technology and survey services such as Survey Monkey, online surveys have become increasing prevalent. Sproull and Kiesler (1986) looked at patterns by comparing paper and electronic questionnaires and found that respondents made fewer errors and submitted supplementary content along with their answers on the electronic submissions. Surveys have the ability to reach more participants with greater simplicity and at a lower expense. Surveys also provide quantifiable answers that can be analyzed using statistical testing. Like any quantitative instrument, the objectives of the instrument must be defined and the method of data analysis must be accounted for prior to creating or submitting the survey.

Analyzing the data is a fundamental challenge to quantitative research. Rabhi, Yao, and Guabtni (2012) write, "Data analysis is an important part of the scientific process." (p. 489). Although collected data is analyzed in both qualitative and quantitative research, quantitative research uniquely analyzes the data mathematically. One way to mitigate the challenge of analyzing data within a quantitative study is to take advantage of technology. The use of software programs like SPSS allow for the importing and manipulation of data. Statistical tests like T-tests or ANOVA tests can be run from within the program and the statistical output is given in report format. Bhunia (2013) writes, "SPSS consists of an integrated series of computer programs that facilitate the user to understand data from questionnaire surveys and other sources, to maneuver

them in diverse traditions and to generate an extensive choice of statistical analyses and reports, together with documentation." (p. 154). The most important aspect of data analysis is ensuring that the question posed by the research is answered. In other words, the results of the analysis must support the goal of the research and ensure that the hypothesis is either proved to an acceptable margin or disproved. Before analysis is done, levels of measurement must be determined. Levels of measurement are categorized as nominal, ordinal, interval, and ratio. These levels of measurement have a direct influence on the types of analysis that is done. An initial step in analyzing the data is to simply tabulate the results using frequency and percent distributions. This will provide an overview that can be used for more detailed analysis. The analysis must also be data driven. There are several data analysis techniques that can be used to interpret the data, some include: histograms, T-tests, F-tests, ANOVA tests, cross tabulation, correlation, linear regression, or text analytics. Regardless of the methods employed, ultimately, the data must be interpreted, conclusions must be drawn, and the research question must be answered. It must be ensured that no bias is present as well.

IV. Synthesizing an Appropriate Quantitative Research Strategy

Beyond the above identified challenges, the process of synthesizing these challenges into one quantitative research strategy is a prodigious challenge. Evaluating the core question of the study allows this synthesizing process to begin. The core question is, what is the impact of perceived IT project success on future IT project decision making among IT managers? Data collection through the use of a survey will produce data that can be correlated based on age and gender. Correlations based on age will provide insights as to how different generations of IT managers perceive and define success within completed IT projects. Correlations based on gender will provide insights as to how IT managers of different genders perceive and define success within completed IT projects. Looking at age and gender together will provide deeper insights into how men and women of different generation define success within completed virtualization technology projects. While studying the effects of gender and age on new technology implementation Elizabeth, Al-Gahtani, & Hubona (2007) wrote, "Demographic variables (e.g. gender and age) that have been reported to be significant moderators of the influences of attitude, subjective norm and perceived behavioral control on behavioral intention" (p. 352). Correlating the data analysis by age and gender contributes to a larger impact on the IT managers; which are the target audience of the study. Beyond this primary audience

this data correlation strategy will likewise provide a greater contribution to the field in general and advance the stream of research.

In determining the elements needed to synthesize an appropriate quantitative research strategy, a research problem must be defined through a research statement. The research statement is very important to the overall strategy. The exam question describes a study on the impact of perceived IT project success on future IT project decision making. This problem is significant because IT managers are hesitant to engage in new technology projects unless there is a clear motivation, or there is a perception that project will be successful. It therefore becomes a valid action to research a solution to this significant problem through the mechanism of an exploratory online survey, where the perceptions of past project success can be computed and analyzed mathematically. Once this is completed, it can be presented to the target audience and community at large. In order to achieve the best results for this scenario, a statistically valid random sample is appropriate. This will include a random selection of IT managers in the United States who have completed a past IT project. In addition to information directly related to the perception of the past success of IT projects, some additional demographic data will be collected. Most important of this additional data is the age and gender of each survey participant. Correlating the resultant data based on age and gender will benefit the study by providing a more rich and substantive result.

One important aspect of this research is the intended audience, that of IT Managers. IT managers are also the participants of the study on the impact of perceived IT project success on future IT project decision making. The initial plan might be to sample a smaller geographic area. This, however, may prove too narrow for the sample results needed. In this case, the survey would be expanded to a larger geographic area. It is very important to the research that these participants be IT managers directly involved in past IT projects. The role of the IT manager has changed dramatically over the last few decades. Businesses and functional groups grow more and more dependent on the IT department and the IT manager for not just technology, but also strategic business direction and process design. The modern IT department is transforming into the role of a corporate brain trust in many companies thus giving the modern IT manger much more control over the direction of corporate spending and strategy, and make this research more directly relevant to the entire corporation and long term performance. Therefore, this research has a greater potential impact on the field and potentially a wider audience. Kharuddin, Ashhari, and Nassir (2010) write, "Prior researchers have shown that information system adoption did increased firms' performances and operations efficiency." (p. 28). Understanding your audience and the impact that the research has is a separate challenge and needs to be addressed, as it impacts decisions regarding the research strategy. One potential alternative to a quantitative research study might be a qualitative research study on the perception of IT project success. However, given the technical aspects of the subject and the reliance on hard data that IT managers demand, the audience drives the research to a quantitative study.

In creating or determining an appropriate quantitative research strategy for a study on the impact of perceived IT project success on future IT project decision making, the next critical element is a valid theoretical framework. This framework is made up of concepts and theories or statements that are a combination of preconceptions and what is drawn from the research. The theoretical framework is what will connect this research to the existing research and advance the stream of knowledge. A core theoretical element to a study on the impact of perceived IT project success on future IT project decision making is that there may be a significant relationship between the perceptions of IT managers who have performed past projects and the effect that this has on future IT project decision making. This can be evaluated many ways. How does the perception of one IT Manager effect the decision of another? What percentage of success is enough to make a new IT manager comfortable with a project? There are many potential questions from this research. When the data is correlated on age and gender, these questions have much more depth and potential meaning for the research and primary audience. Evaluating these questions allows for a deeper ability to evaluate the phenomena associated with the larger or more general question. The process of developing the full theoretical framework unfolds throughout the entire research process and comes from several aspects of the research. The research problem is the first building block of the theoretical framework. The research variables are another key to the overall theoretical framework. The literature review will also contribute greatly to the theoretical framework and will provide the answers to the research question. The purpose of the theoretical framework and these elements are to allow the specific data to be analyzed and interpreted from the specific viewpoint of the researcher.

V. Issues Associated with Research Elements

Sampling, or the sampling plan, is a critical piece of the overall research strategy. Sampling is the process of selecting participants for your research. The plan for this study is to use a random sample of survey participants. A random sample is a basic type of

probability sample. In order to draw a random sample, a population of interest is needed first. In the case of a study on the impact of perceived IT project success on future IT project decision making, the population of interest is IT managers within the United States. From this population of interest, a subset will be randomly selected through the use of an online survey tool. One issue with sampling is choosing the correct sampling plan for the study. A purposive sample was initially considered for this study, but the risk of bias was a concern. A random sample through the use of an online survey tool lowers the risk of bias. This also lowers the level of effort verses the use of a purposive sampling plan. The research strategy includes the plan to use the software program GPower to calculate the appropriate sample size for this study. GPower is an analysis program that performs analysis for many statistical tests such as T-tests or ANOVAS. This is very important to this study, as correlations will be tested and analyzed. In other words, the power represents the probability that the null hypothesis is correctly rejected. This is significant to sampling, because sampling size is a major factor in determining sampling error in any test result. Therefore, making sure that the sample size is large enough is critical to ensuring a large enough power rating for any statistical test that will be applied to the sample date collected. Given the correlation of the sample data in this study based on age and gender, multiple statistical tests will likely be required.

Reliability and validity are both important concepts in measuring and analyzing statistical data. They are, however slightly different. Reliability can be understood as consistency, where validity can be understood as accuracy. This is similar in concept to an archer or rifleman shooting at a target. Many shots placed in a small group would represent high consistency or reliability. This does not mean that those shots are placed near the bull's eye but only that they are near each other. Accuracy, opposed to this describes shots that are close to the bull's eye, but not necessarily close to any other shots. In terms of statistical analysis, validity is the concept that a test is measuring what it is designed to measure where reliability measures that a test shows results that are consistent. In order for a test to be considered proper, it must be both valid and reliable. Reliability does not imply validity, and conversely validity does not imply reliability, both must be independently established. Brown and Ki (2013) write:

"Similar to other disciplines, including psychology and marketing, as future studies are conducted to measure these constructs, the gap between the need for better, more valid measures and the lack of these measures must be addressed to enhance empirical research. Reliable and valid scales should be adapted or created to measure these constructs as precisely as possible. Such measurement

of constructs is an important component of all scientific research." (Brown & Ki, 2013, p. 363).

As stated, these concepts are important to scientific research in general. There are several types of statistical validity, but for this research, the most important is construct validity. Stated another way, in developing a complete and appropriate quantitative research strategy for a study on the impact of perceived IT project success on future IT project decision making, the determination must be made as to whether the tests do in fact measure what the theory says that they will. Although these tests have not been designed at this point in the process, construct validity can be applied through the process to make sure that as the tests are created that they do measure what they are designed to measure. This is another reason to look at a complete research strategy when considering or designing the research study.

Reliability, as stated above, is a measure of consistency. Tiku, Azarian, and Pecht (2007) write, "Reliability is the ability of a product or system to perform as intended" (p. 547). Unlike validity, a verification of reliability does not imply that a test is measuring what is intended. Reliability is simply a measure that a test is providing consistent results. If validity is a measure of accuracy, then reliability is a measure of precision. One challenge of scientific research is error. Establishing reliability in a test should help to reduce errors. This is because consistency should show any errors to be outside of the concentrated group. This should produce an observable measurement of errors in the statistical data.

Bias is another important factor in research. As stated above, bias consideration was a factor in selecting a random sampling method. Bias can occur when a researcher, consciously or unconsciously affects an experiment. By choosing a purposive sample, for example, bias could have entered the research by choosing survey subjects that the researcher already knew to harbor certain opinions on the subject. This is why much of the research done in the scientific community is blind to some degree. In the case of a random survey sample from an online survey tool, the researcher will not have any direct interaction with any test subject, so this will yield a blind result. This should eliminate bias from the study participant selection process. Beyond the initial sampling, there are many forms of researcher bias and areas where bias can occur. During the research phase the researcher can introduce bias by only selecting articles in the research that support one point of view. Bias can also be present when the data is analyzed and interpreted. Bias prevention or reduction is important in all scientific research. One area that can be concentrated on to reduce bias in the later stages of research is that of variable selection, or in choosing which variables to control (Soh, Harrington, & Zaslavsky, 2008).

Due to its complex nature ethics presents another challenge when executing research. Outside of research, ethics is often contrasted with legality. What is ethical is not always legal, and what is legal is not always ethical. However, this construct is very dependent on the individual's point of view or world view. The ethics of research are not as dependent on personal viewpoint, but they can still be complex, because research ethics can extend beyond the scope of a single research project. This gatekeeper role is played by many scientific institutions, whether at the university or national level. Beyond the external viewpoint, ethics, similar to bias, is important to research. One important ethical consideration is consent. In this particular research study, all survey participants must give their consent to participate in the study. This is very important for legal and ethical reasons. Beyond that it is important that the researcher follow the rules of ethics and use the data in an appropriate way. The researcher also has an ethical obligation to protect the privacy of the research participant within the study. Topic or research area does not negate the responsibility of the researcher to conduct the study in an ethical manner. In any case the researcher has an ethical responsibility to protect the identity of the participants. If comments that were made during the study were exposed, the participant could face a reprimand from their company. Regardless of the topic being researched, ethics plays a vital role in performing a valid study.

VI. CONCLUSION

Properly identifying all aspects of a quantitative research study can be challenging. All of the factors and challenges revealed by the research must be considered completely. To create an appropriate quantitative research strategy for a study on the relationship between motivation and IT project success, these challenges must be addressed directly. Determining the purpose of the research, creating a purpose statement, properly defining the target audience of the research, choosing an instrument for the collection of the data, and analyzing the resulting data must be considered. Additionally, challenges within the research itself such as validity of the information, reliability of the source, the biases possessed by the researcher and participants and the ethics all of aspects of the study must be evaluated. This research is important and valuable to the target audience, which needs to be properly defined. The completed quantitative research strategy for a study on the relationship between motivation and IT project success should allow stakeholders to make more informed and scientifically based decisions in relation to future IT projects.

REFERENCES RÉFÉRENCES REFERENCIAS

1. Ann, C. L. (1998). Bridging positivist and interpretivist approaches to qualitative methods. *Policy Studies Journal, 26*(1), 162-180. Retrieved fromhttp://search.proquest.com.library.capella. edu/docview/210560612?accountid=27965
2. Bhunia, A. (2013). Statistical methods for practice and research (A guide to data analysis using SPSS). *South Asian Journal of Management, 20*(1), 154-157. Retrieved from http://search.proquest. com.library. capella.edu/docview/1370705490?accountid=2796 5
3. Brown, K. A., & Ki, E. (2013). Developing a valid and reliable measure of organizational crisis responsibility. *Journalism and Mass Communication Quarterly, 90*(2), 363-384. Retrieved from http://search.proquest.com.library.capella.edu/docvi ew/1445173142?accountid=27965
4. Elizabeth, W. B., Al-Gahtani, S., & Hubona, G. S. (2007). The effects of gender and age on new technology implementation in a developing country. *Information Technology & People, 20*(4), 352-375. doi:http://dx.doi.org/10.1108/09593840710839798
5. Kharuddin, S., Ashhari, Z. M., & Nassir, A. M. (2010). Information system and firms' performance: The case of malaysian small medium enterprises. *International Business Research, 3*(4), 28-35. Retrieved from http://search.proquest.com.library. capella.edu/docview/822629352?accountid=27965
6. Mansourian, Y. (2008). Exploratory nature of, and uncertainty tolerance in, qualitative research. *New Library World, 109*(5), 273-286. doi:http://dx. doi.org/10.1108/03074800810873614
7. Rabhi, F. A., Yao, L., & Guabtni, A. (2012). ADAGE: A framework for supporting user-driven ad-hoc data analysis processes. *Computing.Archives for Informatics and Numerical Computation, 94*(6), 489-519. doi:http://dx.doi.org/10.1007/s00607-012- 019 3-0
8. Soh, C., Harrington, D. P., & Zaslavsky, A. M. (2008). Reducing bias in parameter estimates from stepwise regression in proportional hazards regression with right-censored data. *Lifetime Data Analysis, 14*(1), 65-85. doi:http://dx.doi.org/10.1007/s10985-007-9078-5
9. Sproull, L., & Kiesler, S. (1986). REDUCING SOCIAL CONTEXT CUES: ELECTRONIC MAIL IN ORGANIZATIONAL COMMUNICATION. *Management Science (1986-1998), 32*(11), 1492. Retrieved from http://search.proquest.com.library.capella. Edu /docview/205876410?accountid=27965
10. Tiku, S., Azarian, M., & Pecht, M. (2007). Using a reliability capability maturity model to benchmark electronics companies*. The International Journal of electronics companies*. The International Journal of

Quality & Reliability Management, 24(5), 547-563. doi:http://dx.doi.org/10.1108/02656710710748394

11. Wester, K. L., Borders, L. D., Boul, S., & Horton, E. (2013). Research quality: Critique of quantitative articles in the journal of counseling & development. *Journal of Counseling and Development : JCD, 91*(3), 280-290. Retrieved from http://search. proquest .com.library.capella.edu/docview/ 1398 803509?accountid=27965