The Intention to Re-Adopt Collaboration and Communication Technologies by Project Teams

Emergent Research Forum Paper

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Abstract

The adoption of technology is a subject of perennial interest in information systems. Post-adoption continuance has recently been an area that has attracted interest. However the adoption of technologies within projects is an understudied area. This paper proposes to examine the reasons for technology adoption in projects where there is some experience with the technology from previous projects. Technology Continuance Theory (TCT) (Liao, Palvia, & Chen, 2009) is adopted in this research as a theoretical lens. The main purpose of this research is to explore if Collaboration and Communication Technologies (CCT) acceptance and use are consistent with the TCT. The participants of this study are Information Systems professionals. It is expected that the TCT will provide an adequate explanation for intention to adopt CCTs in projects where the technology has been used before.

Keywords

Post Adoption Continuance, Technology Continuance Theory, Post Adoption Continuance, Projects, Collaboration and Communication Technologies.

Introduction

The study of the adoption and subsequent use of Information Technologies has been a perennial topic for research. Long streams of research related to intention to use technology have been undertaken lead by Davis (1989) and punctuated by Venkatesh, Morris, Davis and Davis (2003) and others. IT use has also gotten attention recently as illustrated by Burton-Jones and Gallivan (2007) and Burton-Jones and Straub (2006). Recently the idea of the continuance of IT Use has gotten some attention led by Jasperson, Carter and Zmud (2005) and extension by Liao, Palvia and Chen (2009).

However the adoption and re-adoption of technology across temporary organizations or projects is a subject that has had no study to this point of which we are aware. Projects differ from permanent organizations in that the organization is formed at the start of the project and is dissolved at the end of the project. Thus the social structures found in the organization cease to exist and new ones are created within the context of the newly created project. Therefore existing studies of IT technology continuance use might be not applicable when intention to use is considered across projects because the existing social structure cease and are reformed for one project to another.

What do transfer are the experiences of project team members from past projects. These experiences might have an impact on the IT adoption and use behavior in the new projects. If a project team member
has a good or poor experience with a technology in a prior project, this might have an impact on their willingness or intention to use that technology in a new project.

The object of this study is to investigate if prior experiences with technology in a project affect the adoption of that technology within a subsequent project and if extent theories of IT usage continuance are applicable in a project environment. In order to investigate this area, we investigate whether the Technology Continuance Theory (TCT) proposed by Liao, Palvia and Chen (2009) has explanatory power in the adoption of technology within projects. To examine this theory, we performed a field survey of a number of practicing project managers with the object of testing this theory within the context of adoption of technology in subsequent projects.

**Literature Review**

To guide our preliminary investigation, we have selected Technology Continuance Theory (TCT) as developed in Liao, Palvai and Chen (2009) (figure 1). We selected this model as being a one which integrates a number of different theories (see below) and thus provides a reasonably complete model while yet being relatively parsimonious in expression. TCT is the result of an integration of the Technology Acceptance Model (TAM) (Davis 1989), the Expectation Confirmation Model (ECM) (Bhattacherjee 2001) and the Cognitive Model for antecedents and consequences of satisfaction (Oliver 1980). This theory integrates the constructs of those models to show how these different models can be combined to describe how a decision to continue an IS is formed. It thus contains constructs from all three models (TAM, ECM and COG). In their theory, they propose that when technology is adopted, it is adopted based on a certain set of expectations as to the functionality and applicability of the technology. As it is used, the usage either confirms or disconfirms those expectations resulting in changes in the perceptions of perceived usefulness and satisfaction with the product in use. These changes result in a change in attitude toward the technology and a change in the intention to continue to use the product. Thus we can see a closed loop effect where there can be a vicious or virtuous cycle in which the technology either increases in use or decreases in use over time.

When this occurs in a continuous organization, the adoption process operates within a relatively stable set of social structures. However in a project organization, there is not this stability of structures. At the end

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**Figure 1: Technology Continuance Theory Model (Figure 10 from Liao, et. al (2009))**
of a project, the structures created for that project are in many cases dissolved. At the start of a project a new set of structures is created through the interaction of project stakeholders. Thus social structures do not necessarily transfer from project to project rather what transfers is the stakeholders’ experiences with technology. We recognize that some team members may move together to new projects and that other projects in the same organization might have many commonalities. However, we argue that each project is different and even with many of the same stakeholders, it is a different situation and the structures and culture will be different if only subtly. Therefore we argue that participants bring their collective opinions with them which would affect the decision made to adopt CCTs for the new project.

Given these differences, the object of this study is to explore how stakeholders’ previous experience with technology influences their intention to adopt the technology on their next project. To do so we will examine Liao, et al (2009) model to determine if it can explain how project stakeholders’ experiences with technology influence their intention to adopt the technology again.

**Research methodology**

To examine this question, we subjected Liao, et al (2009)’s model to a survey of project management practitioners (experienced project managers and project participants) in the field. We explored their intention to adopt collaboration and communication technologies (CCTs) on their next projects based on their past experiences with them.

CCTs are appropriate for this study because many collaboration and communication technologies (CCTs) are used including e-mail, desktop videoconferencing (e.g. Adobe Connect or NetMeeting), document sharing (e.g. Google Docs or SharePoint), interactive whiteboards, presence technologies, SMS, and unified communications (UC) systems in a project management environment. Increasingly, social media such as blogs, Twitter and Facebook are being used to facilitate collaboration and among project team members (Schaffner 2010). Hence, research on CCTs adoption in projects will find a ready source of appropriate subjects for this research.

Additionally, CCTs have a wide use in studies of the adoption and use of technologies. It has been explored by Dennis et al. (2003) in terms of collaborative meetings. More recently, Brown et al. (2010) have used an extension of TAM (the unified theory of acceptance and use of technology – UTAUT) to predict collaboration technology use. TAM suggests intention and use of technology are driven by the perceived ease of use and usefulness of technology. Generally speaking, ease of use and usefulness are more strongly related to intentions to use than actual use (Venkatesh et al. 2003) among individuals who are familiar with the technology. TAM may be a less useful explanation for technology adoption intention and use when potential adopters have relatively little or no familiarity with the capabilities of a particular information technology. Since there are many CCTs used in organizations, uncertainty about particular collaboration technologies beyond one’s immediate experience is a likely inhibitor of adoption. Further, TAM is relatively silent about user perceptions of the value of the technology post-adoption. Since there are many CCTs to choose from, a member’s remorse may be a widespread post-adoption reaction, especially among members of project teams who perceive little improvement in team performance as the result of using a particular CTT.

This research will also include other individual and group characteristics that have been previously shown to impact project team performance (Chong ; Goodman 1986; Jackson et al. 1992; Stevens and Campion 1994). Specifically, this research focuses on team member experience (more, less), gender (female, male), and age (younger, older), and team collaboration mode (virtual, co-located).

**Proposed Research Model**

For this study, we propose to retest the various paths of the Liao, et al (2009) model in the context of project related work in order to determine if it applies within the project management environment.
Hypotheses

The main research question of this study is to examine if the experience with CCTs determines adoption and usage of same CCTs again. To answer these questions, we will retest the hypotheses of the model proposed by Liao, et al. to determine if these antecedents lead to re-adoption of the technology in subsequent projects.

H1: The attitude will positively influence intention to re-select the technology
H2: Perceived usefulness will positively influence intention to re-select the technology
H3: Perceive usefulness will positively influence attitude
H4: Perceived ease of use will positively influence attitude
H5: Perceived ease of use will positively influence perceived usefulness
H6: Satisfaction will positively influence continuance intention
H7: Perceived usefulness will positively influence satisfaction
H8: Confirmation will positively influence satisfaction
H9: Confirmation will positively influence perceived usefulness
H10: Satisfaction will positively influence attitude

Methodology and Survey Instrument

An online survey is being used to collect data from IT practitioners, most of whom are alumni of an Information Systems program at a large regional university in the Southeast (USA). The survey instrument was create using Qualtrics Survey Software, which is supported by the university. The survey instrument includes three components: Major recent projects, perceptions of CCTs adopted and used when working with these projects using the Likert scale (1-5) and demographics. A pilot work enhanced the survey before submitted to the participants.
The Recent Projects component requests respondents to address the characteristics of a recently completed major IT project and the respondent’s role on the project team. In this section, respondents were asked to address several open-ended items including:

- List and briefly describe the project’s goals/intended outcomes.
- List and briefly describe the “client” for the project.
- Provide a brief description of the project team’s composition (size and major roles and responsibilities of team members).
- The respondent’s role on the project team.
- Whether project team members were co-located or distributed across locations (partially virtual or fully virtual).
- The project’s duration from start to finish.
- Project monitoring/management tools used to track project progress.
- The primary and other collaboration and communication technologies by the project.
- The contribution of collaboration and communication technologies’ to project success.

The Perceptions of Collaboration and Communication Technologies section included 20 Likert Scale items measuring respondent attitudes to CCT ease of use, usefulness, satisfaction with CCT experience, general attitude toward CCTs, and intention to use CCTs in the future. Numerous items in this section were used in the Brown et al. (2010) investigation. Responses to these items will provide the most direct tests of the research questions and hypotheses.

The Demographics section of the survey asks respondents to identify their gender, year that undergraduate degree was completed, graduate degrees or certificates, completed, and number of projects on which the respondent served as project manager or leader.

Subjects

For this study, it is desired to have subjects with actual experience using collaborative technologies in projects. Therefore, it was determined to recruit subjects from the professional project management and participant ranks. Subjects are being recruited from the alumni of the information systems program of a large university in the southeastern portion of the US. Additional subjects are being recruited from the membership of Project Management International. The subjects are being recruited by both email contacts and by appeal at chapter meetings.

E-mail addresses of IS program alumni are primarily being identified via contact information in LinkedIn profiles. The IS program has been successful in developing an alumni LinkedIn group that has more than 900 members. While e-mail contact information is not provided in each LinkedIn profile in this group, it is available for a sizable majority of the members of this LinkedIn group. Numerous alumni who are not members of this group have LinkedIn connections with one or more of the investigators and these connections can be used to solicit additional subjects should the need arise. Leveraging both the LinkedIn group and personal connections enables the investigators to personalize their solicitations for help with the survey and to reach out to IT professionals who are not program alumni.

The IS program also has a Facebook group with nearly 500 members, many of which are younger program alumni. This is another source of subjects that will be tapped if insufficient responses are received from the other sources.

Analysis Methodology

The results of the survey will be analyzed using Partial Least Squares (PLS) to test the hypotheses. PLS is appropriate when the goal is, as it is here, to test hypotheses rather than the goodness of fit of a model. PLS also tests the measurement model along with the structural model.

Answers provided in the Recent Projects section of the survey will be content analyzed. We will analyze the content of this section to provide further explanation of the results of the quantitative analysis. We may use LSI to determine common concepts being spoken of. This will allow us to assess some of the rationale of the respondents in answering the quantitative section of the survey.
Some Preliminary Results

To date, most respondents have been male. Considerable variation in graduation year has been reported ranging from 1995 to 2012. Most respondents have not earned a graduate degree, but some have, most commonly a MBA. Most respondents have served as project managers; several have been PM for 15 or more projects.

Responses to the Recent Projects section suggest that most recently completed projects involved partially virtual or fully virtual project teams. Most project teams are quite sizable, with an average reported size of approximately 15. Most projects were completed in less than 10 months, but some last much longer. MS Project is the most frequently mentioned PM tool, but a variety of others are also mentioned. MS Lync is the most frequently mentioned CCT; Sharepoint and Google Hangout are also frequently identified. CCT’s are almost universally described as being critical to project success.

The results to date suggest that we will have some very interesting findings to share at AMCIS 2015.

Expected Benefits of this Study

When this study is complete, we anticipate providing benefits to both practitioners and researchers. We will have a survey of the most used CCTs within the field of IT project management with the perspectives of project participants as to the affordances that they provide. This will be of value to both project participants and CCT providers. It will provide direction to the providers as to what project participants see as most valuable and where there are deficiencies. This will provide them guidance as to how to develop their products. The second contribution is that it will provide project participants with a perspective on what those who have used the tool consider the strengths and weakness of the tools.

For the researcher, it will provide an initial theoretical examination of the TCT as theoretical lens for looking how intention to use CCTs is developed in a project environment. We hope to determine if the TCT successfully translates into the realm of temporary organizations or if modifications are required. This will be the beginning of an interesting line of research into the use of technology in projects. Some of the limitations of this study include holding that the project structures are broken down at the end of the project. This is true in terms of some projects, however, some teams continue wholly or partially into new projects. While, as described above, each project is different, the effects of common stakeholders and organizational environments on the selection process deserve further study. It also does not consider mandated use of different tools with organizations that also deserves further study. Finally, we also did not list all the possible CCT technologies in our list. There are other technologies that might be considered.

REFERENCES


