Beyond Intent: Technology Adoption and Appropriation by University Staff

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ABSTRACT
In this paper, we propose a model for understanding adoption and appropriation of technology. We describe a university-wide system that is designed for faculty and students, but which has been adopted by staff, followed by a survey study and some preliminary results.

Categories and Subject Descriptors
H.4.0 [**General**]

General Terms
Management, Measurement, Experimentation, Theory.

Keywords
Adoption, Appropriation, Courseware

1. INTRODUCTION
This paper reports on a work in progress investigating how a learning management system (LMS) designed for faculty and students that has been adopted by university staff. LMS log data show that university staff are using the "project site" capability of this system, which leads us to ask a series of research questions: Which staff are using the system? What do they use it for? Why do they choose to use it (or not)? Do staff use it in standard or innovative ways? We draw on the literature on technology adoption and appropriation to propose a model to frame our thinking about adoption and use of this particular system and other technologies.

2. BACKGROUND AND FRAMEWORK
Researchers have been interested in technology adoption and diffusion issues in organizations to predict a technology's success. If the new technology or tool is not incorporated into the existing workflow in meaningful ways, it is more likely to fail. For example, the success of a groupware application can be tied to its successful adoption by collaborators in an organization or work group [4]. One issue with adoption studies is that they tend to consider technology as static entities, that is, the technologies do not change in terms of their role and purpose. They are inserted into a group or organization (which is also usually static) and the technologies are used out of the box without modification with placid compliance to the designers' intentions. Researchers have shown that once it is released, technology is not static; it is often reconfigured and redefined by its users. Several researchers have used different terms to talk about this, but the term I will use for this is 'appropriation,' after DeSanctis and Pool [2] and Orlikowski [5].

There are very few models of appropriation presented in the literature and fewer that consider the re-design process. As one of main contributions, we present a model of technology appropriation adapted from Carroll [1]. We treat appropriation as one of four outcomes of evaluation that also includes disappropriation (abandonment), non-adoption, and simple adoption. This model avoids a flaw of adoption studies, where outcomes are only either adoption or non-adoption. It allows us to think of appropriation as a qualitatively different outcome than adoption. This particular treatment of adoption and appropriation distinguishes between adoption and appropriation as discrete outcomes for the sake of simplicity, though in actuality, they are the extremes out possible outcomes. We acknowledge that flawless adoption and complete appropriation rarely occur and that most adoption outcomes lie somewhere in the middle.

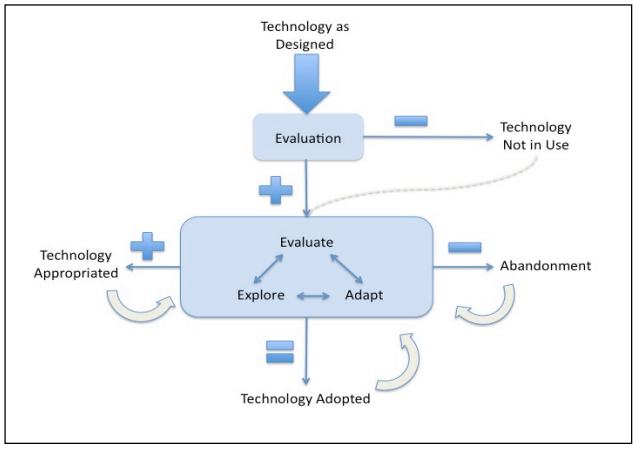

Figure 1: Model of Adoption and Appropriation

3. PROJECT SITES

To evaluate our model of appropriation, we are analyzing data collected as part of a university-wide study of LMD use. The LMS used on our campus include the ability to create project sites as part of the larger suite of courseware tools designed for faculty and students. This system, based on the Sakai architecture (see www.skaiproject.org), supports coursework and learning like similar systems such as Blackboard, Moodle, and ANGEL. Course sites are designed to support 'blended learning' [3] where the tools are used to supplement traditional face-to-face classroom interaction. Only course instructors can create these sites that are then automatically populated by the student lists provided by the registrar's office. Project sites include the same set of tools as course sites and act, look, and feel the same as course sites and are accessible from the same interface and menu as course sites. Unlike course sites, however, anyone on the campus can create a project sites including students, faculty, and staff.

For the purpose of design intent, is important to note that the only difference between course sites and project site is the label and who can create the site; the tools available on both type of sites are virtually are the same. This suggests that, for project sites, the design intent is to support the same kinds of course-related activities that students and faculty are engaged in. That students and faculty use project sites is not surprising since they already spend time in the course sites and become very familiar with the tool set. However, preliminary analysis of the site creation activity shows a surprising number of staff are setting up sites, surpassing even faculty site creation although not student's (see Table 1). Although it might be assumed that staff are setting up these sites for faculty or students, Further investigation reveals that staff members are creating sites primarily for themselves for administrative purposes (see Table 2).

Table 1: Project Site Creation

	2008-2009
Staff	23%
Faculty	18%
Students	59%

Table 2: Reported Site Purpose (as specified at creation)

	Learning	Research	Admin	Personal	Group	Other
Staff	14%	15%	54%	2%	3%	12%
Fac	32%	38%	24%	3%	4%	8%
Stud	29%	19%	2%	5%	38%	7%

4. METHODS

We administered an online survey at the University of Michigan over a three week period during the summer of 2009. We used a branched–survey design, where the answers to specific questions directed the respondents to different sections of the survey. The first part, which everyone completed, asked about general IT use. The last question in this section asked users to tell us about their use of Project Sites. From here, there were five branches: 1) those who have never used Project Sites, 2) those who have logged on once, 3) those who have logged in a few times, 4) those who were past users but currently did not use Project sites, and 5) those who are current project site users. Current users were then asked questions about their activity with the tool.

We invited 29,370 staff members to complete the survey. Of these, 4,672 staff members responded, for a response rate of nearly 16%.

5. PRELIMINARY RESULTS

Our branching question identified the extent to which the survey respondents were familiar with project sites. For respondents who had never used project sites, we asked them whether or not they had ever heard of this system. This allowed us to differentiate the differences between respondents who chose not to ever try the system from those who simply didn't know project sites exist. The results are shown in Table 3. The results suggest that about an equal number of staff who try project sites reject it (27%) as those who make use of it, whether in ongoing activities or for short durations (28%).

We asked our users to respond to the value of Project Sites for certain kinds of job activities on a 5-point Likert scale (1=Strongly Disagree and 5=Strongly Agree). Results shown on Table 4. The results suggest that communication, distance work, and providing a single access point for information were the biggest benefits.

We also asked all participants who had used the system at least once but were not currently users to react to various possible reasons why they discontinued their use. Ratings are on a 5-point Likert scale (1=Strongly Disagree and 5=Strongly Agree). Table 5 shows that the primary reason staff with only one login never used Project Sites was because they were "just looking." For those staff who had some limited experience with Project Site, the top reason for discontinuing use was because the specific project ended. For all respondents who were not current users, the fact that they had no co-workers using the system or that it had little connection to their job were the next most prevalent reasons for discontinuing use.

Table 3: Experience with Project Sites

Never used / Never heard of system	15%	690
Never used / Heard of system	30%	1389
One Login	7%	317
Few Logins	20%	898
Past User	10%	442
Current User	18%	840

Table 4: Mean Value-ratings for Project Site Features

Scheduling	2.98	1.031
Communication	3.87	.943
Posting Audio/Visual Materials	3.56	.928
Posting Group Materials	3.66	.947
Single Access Point	4.53	.679
Creating Groups	3.82	.904
Tracking Progress	3.47	.932
Distance Work	3.98	.862

Table 5: Top Three Reasons for ending Project Site Use

Activity	Reason	Mean	S.D.
One Login	Just looking	3.57	1.067
	No co-workers using	3.52	1.032
	Little connection to job	3.37	.898
Few Logins	Project Ended	3.56	1.048
	No co-workers using	3.37	1.056
	Little connection to job	3.17	.997
Past User	Project Ended	3.73	1.186
	No co-workers using	3.24	1.225
	Little connection to job	2.85	1.086

6. DISCUSSION

Thus far, the results have confirmed appropriation by some staff. Preliminary findings show that many university staff have adapted project sites to their work. Of those who try the tool, it seems that the biggest reason for non-adoption and abandonment is the lack of a project that requires it. This suggests that although these people have abandoned the tool, that they might be willing to use it again if they had a new project that required its use. Our analysis also suggests that there are two main uses for the tool—for enabling remote work and for a single location for various group materials.

Future analyses of our data will look to model which university staff have become users of the technology, as well as the extent to which these staff have adopted or appropriated the system. We will investigate questions addressing whether staff adapt project sites more broadly into their work than just for specific projects and show evidence of how these users have appropriated the technology to their work.

7. REFERENCES

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