Content Analysis of a Computer-Based Faculty Activity Repository

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ABSTRACT

The research presents an analysis of faculty opinions regarding the introduction of a new computer-based faculty activity repository (FAR) in a university setting. The qualitative study employs content analysis to better understand the phenomenon underlying these faculty opinions and to augment the findings from a quantitative study.

A web-based questionnaire was distributed to faculty of a medium-sized university in the western United States. A total of 154 faculty responded and 99 of the respondents provided written comments and opinions about the FAR. A content analysis was performed on these 99 comments.

Six themes and several subthemes regarding the FAR were identified in the content analysis. These six themes were productivity, usability, security, implementation, management and structure of the organization, and users' attitudes. These themes and subthemes were discussed in the specific context of using the FAR as well as the general context of a computer system's usability, development, management, and introduction in the organization. In addition, a model for future research is proposed based on these findings.

INTRODUCTION

The pace and extent of technological developments in recent decades have influenced society in many ways. These developments have produced increased dependence on information technology in organizations and society. For example, information technologies enable business and organizational processes by creating efficiencies in business practices (Lee, Chu, and Tseng, 2009). Typically, the intention of implementing such computer technology is to automate routine and repetitive tasks allowing an employee time for more analytical, decision-making focused tasks. Often, as a result of these applications, employees are expected to use computers and the Internet daily as an essential part of their work. Although there is an expectation for computer and Internet use to improve the productivity of employees, implementing a new technology does not automatically translate into improved employee productivity and perceptions of benefit.

Technology is successful at automating tasks only if it is appropriately used by the employee, if use is volitional. If system use is nonvolitional, employees may still have discretion regarding the extent or degree of innovative use of the system. Many factors influence employees' perceptions of successful acceptance of technology (Davis, 2001). Acceptance of technology impacts employees' degree of system use as well as perceptions of the technology's usefulness and performance impacts. For example, employees' belief that they can competently use technology to enhance their work performance, perceptions of ease of use and usefulness of the technology, and satisfaction with the technology can influence their inten-

tions to use the technology in the future (Stone and Henry, 1998).

A variety of technologies aimed at improving performance has been introduced to higher education. Some of these technologies are instructional (e.g., smart boards, projection displays, voting mechanisms) and others administrative in nature (e.g., accessing travel and grant forms, electronic document and grades submissions). One such administrative application of technology is a system providing for the development, storage, and retrieval of documents and reports related to faculty activities and accomplishments. Such a technology application introduced in a university environment is the focus of this research.

The specific technology application studied is a Faculty Activity Repository (FAR; actual commercial product name redacted). The FAR allows faculty to enter performance activities in a computer-based system that is a repository for these data. With appropriate permissions, administrators can combine entered data across faculty to produce predetermined reports such as department, college, and university research reports and class loads by the individual faculty, department, and college.

The project producing this research began as a quantitative effort to examine faculty acceptance of the FAR. The underlying theoretical model was the Technology Acceptance Model (TAM). TAM provides theoretical linkages regarding users' acceptance of technology based, in part, on their perceptions of the usefulness and ease of the technology's use. The data were collected using a questionnaire consisting of a series of close-ended questions designed to measure the constructs in the TAM. Also included on the questionnaire was an open-ended question to allow respondents to discuss their perceptions of the FAR. Based on the quantitative results, we found that perceived ease of use and usefulness of the FAR were key to the acceptance of the FAR. However, TAM does not provide a description of the issues or reasons why a system is not perceived to be easy to use or useful. Furthermore, over sixty percent of the questionnaire respondents answered the open-end question regarding the FAR. Many of these comments addressed usability and ease of use of the FAR. These comments gave rise to the qualitative study presented here which attempts to provide insights regarding the mechanisms un-

derlying respondents' perceived ease of use and usefulness of the FAR. Developing these insights regarding the FAR is the focus of the research presented here.

The research presented below uses the inductive approach of content analysis. The employed methodology is presented first followed by the content analysis findings. Using the research findings, we next present the research implications followed by potential directions for future, theoretically-based research. The manuscript ends with conclusions.

METHODOLOGY

Data were collected via a questionnaire regarding the faculty attitudes and perceptions of using the FAR. The questionnaire items were refined over a series of iterations and entered into an Internet-based survey tool called Websurveyor. Websurveyor distributed the URL and an invitation to complete the questionnaire by way of a faculty listserv at a medium-sized university in the western United States. We distributed the questionnaire in the spring semester after the initial implementation of the FAR and while faculty were expected to use the FAR to prepare their end-of-year performance reviews. A total of 866 people received the invitation email and 154 respondents fully completed the questionnaire producing a 17.78% response rate.

Twenty-seven percent of the respondents were female and 73% were male. Thirty-one percent of the respondents were in the 50 to 54 year-old age bracket with another 20% in the 55 to 59 year-old age group. By job classification, 86% of the respondents held tenure-track faculty positions. In terms of college affiliation, the largest group of respondents, 26%, were in the College of Letters and Social Sciences. Finally, 58% of the respondents reported receiving no training in the use of the FAR. All these demographics are displayed in Table 1.

Ninety-nine of the 154 respondents used an open-ended comment box on the questionnaire to provide detailed comments regarding the FAR. These comments presented an interesting opportunity to better understand the FAR and its implementation from the perspectives of these respondents. These comments were analyzed using the grounded theory approach (Charmaz, 2000; Glaser and Strauss, 1967; Locke, 2001;

TABLE 1		
THE DEMOGRAPHICS OF THE RESPONDENTS		
Gender		
Gender Category	**Frequency**	**Percentage**
Female	41	27%
Male	109	73%
Total	150	100%
Age		
Age Category	**Frequency**	**Percentage**
25-29 years	2	1%
30-34 years	5	3%
35-39 years	14	9%
40-44 years	19	13%
45-49 years	19	13%
50-54 years	46	31%
55-59 years	30	20%
60 years and older	15	10%
Total	150	100%
Job Classification		
Job Category	**Frequency**	**Percentage**
Tenure-Track Faculty	132	86%
Non-Tenure-Track Faculty	6	4%
Instructor	4	3%
Administrator	11	7%
Total	153	100%
College Affiliation		
College Affiliation Category	**Frequency**	**Percentage**
Agriculture and Life Sciences	25	16%
Business and Economics	16	10%
Education	10	6%
Engineering	17	11%
Law	2	1%
Letters, Arts, and Social Sciences	40	26%
Natural Resources	11	7%
Sciences	16	10%
Library	10	6%
Art and Architecture	5	3%
Other	2	1%
Total (not 100% due to rounding)	154	97%
Received Training in the use of FAR		
Category	**Frequency**	**Percentage**
No Training Received	86	58%
Training Received	64	42%
Total	150	100%

Strauss and Corbin, 1990). From the analysis, themes and subthemes in the respondent comments were identified and are discussed below.

Independent raters review the comments or observations identifying themes based on keywords or concepts. This is often called an open coding procedure (Strauss and Corbin, 1990). The raters then meet to agree upon common keywords or concepts. From these keywords and concepts the raters identify themes and subthemes within the comments and observations. Within the FAR context, themes and subthemes should provide insights into the reasons and issues surrounding the adoption and use of the FAR. Furthermore, these reasons and issues, and their interrelationships may provide directions for future, theory-driven research. This is referred to as a grounded theory approach (Glaser and Strauss, 1967).

The framework for grounded theory building focuses on the concepts derived from the open cod-

ing procedure. Encircled in these concepts or core categories are themes, subthemes, and properties which manifested in the contextual conditions, interactions, and consequences of developing, introducing, and using the FAR. The contextual conditions can be viewed from a macro or micro view. The interactions are correlated with the concepts and represent the phenomena signified by Strauss and Corbin (1990) as axial coding. Whether purposeful or routine, the interactions influence the shape of the concept. These interactions evolve over time as people interact, define, and then establish meaning based on the environment (Miller and Fredericks, 1999). Consequences result from the interactions in response to macro or micro conditions. These concepts do not occur in a linear manner but in a much more circuitous way. Therefore, this study sought to develop a grounded theory of the users' perceptions regarding implementation and use of the FAR through a process of open coding and theme development.

FINDINGS

We identified six categories or themes as well as a number of subthemes. The themes were productivity, usability, security, implementation, management and structure of organization, and users' attitudes. The research details for each theme, its properties and sub-themes are presented below.

PRODUCTIVITY

Business managers measure success of an employee by how productive he or she is at work. The productivity theme that emerged from the use of the FAR was defined as time spent and outcome from the time spent on a FAR task. In particular, the productivity theme focused more on the time spent on the FAR task and the time spent away from other, non-FAR tasks. Two subthemes further categorized the productivity theme as **time spent on a FAR task** and **time away from teaching and research**.

The **time spent on a FAR task** was repeated in the data in different ways. Responding faculty felt they spent an inordinate amount of time on the task of entering data in the FAR:

> I have used FAR and it is really not that difficult except it takes a bunch of time.

> FAR is designed to generate a measure-

ment of our productivity. In reality, however, is that FAR is so cumbersome to use, especially when it comes to entering publication information, that it reduces our productivity by sucking up our valuable time.

Additionally, faculty commented on how the FAR took longer to complete specific, required tasks:

> Using FAR increased the amount of time needed to prepare my annual report by several hours. I found some of the questions that were asked to be insulting and a real waste of time (and I was in favor of using a system such as this before I was confronted with FAR).

Others commented on the time on task and how it relates to use of the FAR in the future:

> I have no use for it and could spend my time being much more productive doing my real job if I wasn't wasting this time with something that I will never use.

> We were told we could cut and paste from our vita, but that would take more time than doing it from scratch. It's a waste of faculty time!

> The use of faculty time to input data into FAR is both onerous and unnecessary.

The amount of time initially spent completing tasks on a system will be longer because of the initial learning curve. Hopefully, the next time employees use the system the less time they should spend on the task. Interestingly, faculty did not recognize the future use of the FAR. Many faculty felt they would not use the FAR again; therefore, it wasted time inputting the data. It is possible that previous faculty experience with systems tainted their view of the FAR. If past systems were time consuming and then not used effectively, the attitude toward the FAR would be affected.

The second subtheme related to productivity was **time away from teaching and research**. Depending on the focus of the university or college, faculty time is divided appropriately by percentages of research and teaching time. Administrative tasks are not accounted for in the percentages and are considered to be added to the top of a

faculty's primary focus of research and teaching. The time spent doing administrative tasks meant that time used to be a productive researcher or effective teacher would be reduced.

> The diversion of time from serving students weakens performance of teaching, service, and education, and will ultimately weaken both the university's ability to receive university students and maintain accreditation.

> FAR seems yet one more thing in the way of time spent teaching. So far, the university's introduction to it has been insufficient to belay that idea.

> My job is to teach and perform research. There are always some extra tasks (committee service and such) that must get done too but they must be subordinate to my primary tasks of teaching and research. There is a disturbing amount of "task creep" increasing the number of new tasks faculty must perform to compete with their primary tasks. FAR is part of this trend.

> I would certainly rather spend my time becoming a better teacher or doing more research than populating a database using a cumbersome interface (i.e., cant just cut and paste). I can't believe the university feels this is the best use of my time.

This is an important theme to consider in different environments, not just in a university setting. If an employee is asked to take on additional tasks, does he or she determine the priority of the tasks or does a supervisor? Are there additional resources to help in performing the tasks (i.e., overtime pay or additional clerks)? Although administrative tasks may seem like "small stuff" they can eat away at the time during a day. For example, twenty years ago, faculty did not spend time sending or responding to emails of students. Now, composing and writing emails is a significant component of a faculty's day. Since many students use email instead of coming into office hours, the time spent on emails can be categorized as teaching. Email is also an effective collaborative tool for research. Entering data into the FAR did not fit into either teaching or research activities.

USABILITY

Another theme affecting the perception of FAR productivity was the usability of the FAR. The amount of effort expended to use a system determines the usability (Davis, 1989; Davis et al., 1989; Venkatesh and Davis, 1996). Closely tied to usability is the perceived usefulness of the system. These two constructs from the technology acceptance model influence the acceptance of technology (Davis, 1989; Venkatesh and Davis, 1996). If a system is easy to use, users will be more likely to perceive its usefulness. In the two examples provided below, time spent on the FAR was linked to how usable the system was.

> I spent more time figuring out which category data was to be entered in and editing than anything else. I did not find the system user friendly or adaptable for the various fields our faculty are involved in-especially research.

> The system is slow—it took too long to add a new co-author to a paper, to switch from one menu to another, to return to a menu after seeing that data was entered incorrectly. Every time I clicked something that would add a entry to the screen, I had to be careful and wait until the screen was refreshed and redrawn—slowly.

Many people mentioned the number of fields that have to be populated in the FAR and identified two issues: do all the fields have to be filled in and for what purpose? why can't the system be linked to the existing database to fill in the fields?

> there are so many fields to populate I found myself asking—is this something my administrators even care about—because finding the data will take too much time

Additionally, faculty respondents mentioned the formatting of the text and how inputting the data was difficult and inflexible. The vocabulary used for the categories and the organization of the menu and navigation can also influence how the data are entered *"When I enter professional development, for example, the items appear in an*

entirely different category." Some users couldn't figure out which category the data fit in *"We don't fit in all the pulldowns, so we end up picking other all the time and some reports and many screens don't make sense."* In certain disciplines, research information is displayed in a specific way. If the FAR doesn't allow data to be entered as expected in the discipline's format, the user must decide what does and doesn't get included. This can be problematic when accrediting committees look at a college's research history. Some information may not show as intended, or inappropriate information may be displayed.

> The main problem I still have is that I am unable to enter the names of authors on publications as they actually appear on the paper. Somewhere in the program it is decided how these names should be written and that cannot be changed as far as I can tell

Most respondents indicated that use of the FAR was problematic. Interestingly, many of these faculty commented that the idea behind the FAR was useful, but because of "bugs" in the FAR, the full usefulness was not realized.

SECURITY

The age of the Internet has allowed more data to be collected and stored about users, employees, and customers. Storing data is a security issue for many organizations. The U.S. Army has moved from storing data on portable USB thumb drives to storing them on network spaces to reduce the corruption of data from viruses on shared devices (Matthews, 2009). In the last few years several companies have accidently released the names, emails, or Social Security numbers of customers or employees (Andrews, 2009). Often, the greatest risk comes from inside the organization rather than from hackers trying to access the information (Swartz, 2007). How the data are stored and who has access to the data reflect an organization's integrity. We identified two important perspectives within the security theme: **the risk to stored data** and **privacy issues**.

Storing of data has become inexpensive due to lowering costs in hardware. With virtually unlimited storage space available, some data are being kept for long periods of time. Embedded in the storage issue is the type of data being collected.

> I do NOT believe that the THE UNIVERSITY is capable of protecting this sensitive information and do NOT want the THE UNIVERSITY to have it.

Additionally, once the data have been collected, the question is posed as to who has the rights to the information. Is the information stored at the university or in a third-party location? If the data are stored by a third-party, how secure are the data? If the company storing the data goes bankrupt, how are the data disposed (Spring, 2009)?

> having the university maintain personally identifiable information in an external company's servers and databases, and whether FAR is using a third-party commercial web hosting company

It is difficult to tell whether the user feels that a third-party or the university would put the data at greater risk. These are important to consider in the development of future systems. The specific types of data needed to make the FAR useful to the university are most likely the type of information about which users are concerned.

> I also think the possibility for misuse of the information or the mishandling of the information is easily foreseeable.

> First, the FAR system is asking questions that have no relevance, nor cannot be used, for employee review purposes. These include: Gender, Ethnicity, US Citizen or Permanent Resident, and Year of Birth. There should be an indication if these are optional or voluntary.

> has numerous flaws both technical and substantive, and is open to misuse, abuse and the input of fictional results, leading to likely legal challenges against the university if it is used for substantive purpose

Much of the data requested of the FAR system also exist in other university systems. Unfortunately, having no connection between these systems also leads to problems with data entry. Some questions may be phrased differently causing confusion and inaccuracies across the two systems leading to lack of data integrity. Certainly where and how the data are stored as well as the type of data collected greatly influences the use of the system.

IMPLEMENTATION

Implementing a system into an organization is as important as the development process. Many factors that make a system successful are perception-based from the user such as the flow of information between the developers and the users, trust and shared expectations, attitudes of the user, and value to the users (Ginzberg, 1981; Rai et al., 2009). Implementation in this context is defined as the method used to introduce the FAR to users and the assistance provided to aid in learning FAR and its use. Two subthemes further categorized the implementation theme as administrative support and training.

The implementation method for the FAR had meaningful impacts on users' perceptions of the FAR.

> My problem is not so much with the program itself, but with the implementation of it by administration; only when an uproar was raised by faculty did the admin back off on the rigid deadlines for completion of CV;

A key to successful implementation of a new system is the provision of quality training to use the system (Alvarez, 2003; Sykes et al., 2009). Adequate training provides the basis for successful initial experiences using the system, which impact positively user perceptions of the system. A common perspective was that no training was provided for the FAR or if there was training, it was not adequate.

> I received no specific training on how to use the resource merely an informational seminar on its benefits and adoption by the University.

> Training for faculty has been sporadic and limited to a few faculty on campus.

> Extremely poor training scheduled for off-campus people. If this is going to be used, they need people at the various off-campus locations to advise on how to run FAR.

> FAR isn't too bad once you get into one part of it and understand how it works. I think overall it will be a useful tool. Inadequate training was the most frustrating thing for me.

Beyond initially learning how to use the new system, on-going support for the system and its perceptions of availability are important in influencing users' perceptions regarding the system (Kim and Kankanhalli, 2009). Such support may take many forms: clerical help, a facility to answer users' questions, and resources to manage the continuing use of the system.

> If we are stuck with this program then let us give the information to a secretary to enter for us. Surely it isn't a good use of our time to spend gabillion hours doing what takes less than half the time to do in MSWord.

> Administrators in my college were very helpful, however, in getting staff to take my materials and enter them into FAR.

> One person per college should be in charge of managing FAR; faculty should not spend time inputting info into it.

Providing support to help use and add data to the FAR would probably modify faculty's perceptions. Training the user is a long term strategy for successful implementation and adoption of the system (Shuit, 2004).

MANAGEMENT AND STRUCTURE OF ORGANIZATION

The management and structure of the organization may greatly influence users' perceptions of a new system. As indicated by Goodhue and Thompson (1995), system effectiveness and user perceptions of it are influenced by the "fit" between the task to be performed, the technology used as well as the organization's and user's characteristics. Within this theme of management and organization structure, in the context of the FAR, there are two subthemes: the **top-down attitude of the university administration** and the **usefulness for administrators not faculty**.

The top-down attitude was expressed by users in terms of being told that they would be required to use the FAR with little or no encouragement regarding its benefits or importance. When users are a group of professionals accustomed to possessing significant job and work autonomy, such as university faculty, a top-down managerial attitude has particularly strong impacts on these users' perceptions of the FAR.

No reasons were given for encouraging FAR's use except "it will be done or no evaluation." Generally this is another top-down directive without discussion why it might be important.

FAR is a good example of a "top-down" approach to management of an administration that is completely out of touch with its workers and with good common sense, and administration that punishes productivity.

The "compelling" need for why introduction of FAR was never communicated, nor was there a real showing of benefits that FAR would provide. They simply said you WILL use FAR to enter your "performance" data.

Being convinced of the need for the new system as opposed to being told to use the system, it is important how a new system is "sold". This is particularly true when the targeted user groups are professionals accustomed to significant work autonomy. The usefulness of a new system impacts users' perceptions of the system (Guriting and Ndubisi, 2006; Page-Thomas, 2006;). These perceptions manifest themselves more clearly if the new system is volitional in its use as opposed to nonvolition (Stone and Henry, 1998). Regardless of the degree of volitional use, usefulness or outcome expectation does indeed impact these perceptions (Hasan, 2007; Venkatesh and Davis, 1996). In the case of the FAR, the perspective of usefulness is from that of the faculty member compared to the usefulness or benefit derived by the university administration.

Possibly useful for administrative tasks, but has no significant use in instruction.

This may be something that is beneficial for administrators to look at faculty statistics and compare to other universities, but it does not help faculty do the things they are hired to do (i.e., conduct research, teach, publish, and obtain grant funding).

This does nothing for faculty that I can see.

Bottom line in my opinion: Only the administration benefit since less time

is needed to compile data. No benefit to faculty, in fact the opposite, since we need to take time to input the data (which most of us already have done in our updated CV).

Users' evaluation of a system's usefulness, particularly in the context of compared to another groups' gain, significantly influences users' perceptions of the system. This is particularly acute when the reference group is viewed as a rival or having managerial authority with regard to the users.

USERS' ATTITUDES

Users' attitudes toward a new technology system greatly influence how they interact and use the system. Researchers have used various approaches to link users' attitudes to information technology use. Examples include the technology acceptance model in all of its versions and social cognitive theory (Davis et al., 1989; Sykes et al., 2009; Venkatesh and Davis, 1996). Regardless of the theoretical foundations, users' attitudes toward the new technology influence their willingness to use it as well as to experiment with the system beyond the minimum requirements for the users' work.

The introduction and use of the FAR produced feelings of frustration among the faculty. The influence of these faculty attitudes are difficult to separate from the productivity theme. These difficulties are illustrated below.

FAR is extremely frustrating to use.

FAR is one of the worst time sinks for the worker ever imagined. It requires hours upon hours entering tedious information in formats designed to make me frustrated at their user-surliness and slowness. The irony of the whole situation is that, the more productive a faculty member is, the more FAR punishes him or her with frustration and time waste.

...People are frustrated, morale has been lowered, and no one seems to know what the benefit is. Maybe someone should explain that to us.

This system is very confusing and frus-

trating - it is difficult to know where to put what and how to classify various segments. It would really help if we could get some training and if sections/areas were more clear in the instructions.

Those who used the FAR also expressed an attitude of being uncomfortable or fearful of using the FAR. This attitude appears based in the idea that the data provided in the FAR would be used to evaluate faculty performance. More specifically, this attitude is that the FAR is not sufficiently reliable to record and provide such important data to administrators and that the FAR does not allow faculty to provide all the needed data to actually represent their performance.

I feel uncomfortable having any decisions made about my career or any university decisions made in general based on this unreliable software product.

I frankly fear the misuse by administrators of data generated by such a system .... (Coming on the heels of (an administration led program review) fiasco of a couple years ago)... it's hardly surprising that many people would be apprehensive about something that reduces individual performances and program values to numbers.

I hate FAR. I do NOT believe that my contribution to THE UNIVERSITY and the students can be measured by numbers alone.

Attitudes toward a system influence how users perceive the value of a system and determine if they further adopt the system in the future. The majority of system users had a negative attitude toward the system. The previous themes of productivity, usability, security, implementation, and management and structure of the organization further exacerbate the negative attitudes. All of these themes and subthemes are summarized in Table 2.

THEORETICAL DEVELOPMENT

Many implications appear important to developing a theory based on the generalization of the faculty comments within the discussed themes and subthemes. First, users' adoption, acceptance, and use of a new technology application appear greatly influenced by the users' perceptions of its usefulness. This perceived usefulness, or what is sometimes called outcome expectancy, was indicated in the comments contained in the productivity theme with subthemes of "time spent on FAR task" and "time away from teaching and research" and the management and structure of organization subtheme of "useful

TABLE 2		
THEMES AND SUBTHEMES		
Theme	Definition	Subthemes
Productivity	Time spent and outcome from the time spent on a task	Time spent on a FAR task
		Time away from teaching & research
Usability	Amount of effort expended to use a system	
Security	Protection of stored data and maintenance of data integrity	Risk to stored data
		Privacy violation
Implementation	Introduction of the system to users and the assistance provided to aid learning	Administration support
		Training
Management and Structure of Organization	fit between the task to be performed, the technology used as well as the organization's and user's characteristics	Top-down attitude of university administration
		Useful for administrators not faculty
Users' Attitude	Interaction with and attitude toward new system	

for administrators not faculty." The technology acceptance model (Davis et al. 1989; Sykes et al. 2009; Venkatesh and Davis 1996) provides a structure in which to expand the theory. For this particular technology application the themes and subthemes appear in a negative context, and do illustrate the importance of perceived usefulness or outcome expectancy.

A second implication from the study is that security of a new technology application is a concern to users. From the respondents' comments regarding the FAR, users are concerned about the "risk to stored data" in the application and the potential for a "privacy violation." These security concerns appear to be important to the users' adoption, acceptance, and use of new technology. Such concerns may well be at least partially influenced by the increased networked world in which we live and work. Inclusion of security into the model addresses the ever increasing digitalization of data and how it is stored and who has access to it. This addition is also an important component to address in the acceptance of technology. There are also implications for the design of technology applications from these respondents' comments.

The usability of the technology application impacts respondents in terms of the quality of the "menu system and navigation." Usability or ease of system use appears to impact users' perceptions of a new technology application and its use. In addition to usability is how the conversion from the old technology to the corresponding new one is important to users. The conversion to a new technology depends on its implementation process and management support. In terms of implementation, "administrative support" for the new technology and the process to introduce the new technology as well as the "training" available to users are important to users and their perceptions of the new technology. From the respondents' comments, management and structure of the organization influences respondents' orientation to the new technology. This structure is expressed that the administration has a "top-down attitude" and that the new software application is "useful to administrators and not the faculty." Users' perceptions regarding senior managers' attitude toward the new technology and its conversions plays a key role. For example, if users' view management as forcing the new technology on them or that the new technology is geared to

benefit managers rather than users, users' perceptions of the technology will be impacted.

The final implication from the research is in regard to users' attitudes. Among the respondents, subthemes regarding their attitudes with respect to the new technology emerged. These subthemes are that the new system is "frustrating" and that respondents are "uncomfortable or fearful" regarding how the data entered into the FAR will be used. These attitudes have a variety of impacts on users, their use of the new technology, and their job performance.

The development of a model grounded in this research emerged from the comments, themes and subthemes. The interrelationships among the variables can be explored in a model such as the one illustrated in Figure 1 (The Model Considering Technology Implementation and User Perceptions). This model provides a direction for future research regarding the mechanisms or the "ways" in the acceptance and implementation of new technology applications.

The model proposes that respondent's attitudes towards the FAR are directly impacted by four variables: The top-down management of the technology, the FAR's impact on productivity, the usability of the FAR, and security concerns with the FAR. The attitude that FAR is useful for administrators but not faculty is proposed to impact the perceptions of both the top-down management of FAR and FAR's impact on productivity. Additionally, the FAR's usability is proposed to impact productivity. The perception of FAR's usability is impacted by help and support using the FAR and administrative support for the FAR. Based on this model, further testing is needed. Implementation methods, user attitudes before and after implementation, and data storage methods will need to be analyzed as well as different types of technologies.

CONCLUSIONS

The outcomes from this study should be considered for future development of technology applications, implementation of the technology, and the perception of usefulness. Its practical implications indicate the importance of making sure that users perceive and accept the usefulness of the new technology in the users' job function. In addition, users need to be convinced that the new technology has appropriate, effective secu-

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FIGURE 1
THE MODEL CONSIDERING TECHNOLOGY IMPLEMENTATION AND USER PERCEPTIONS

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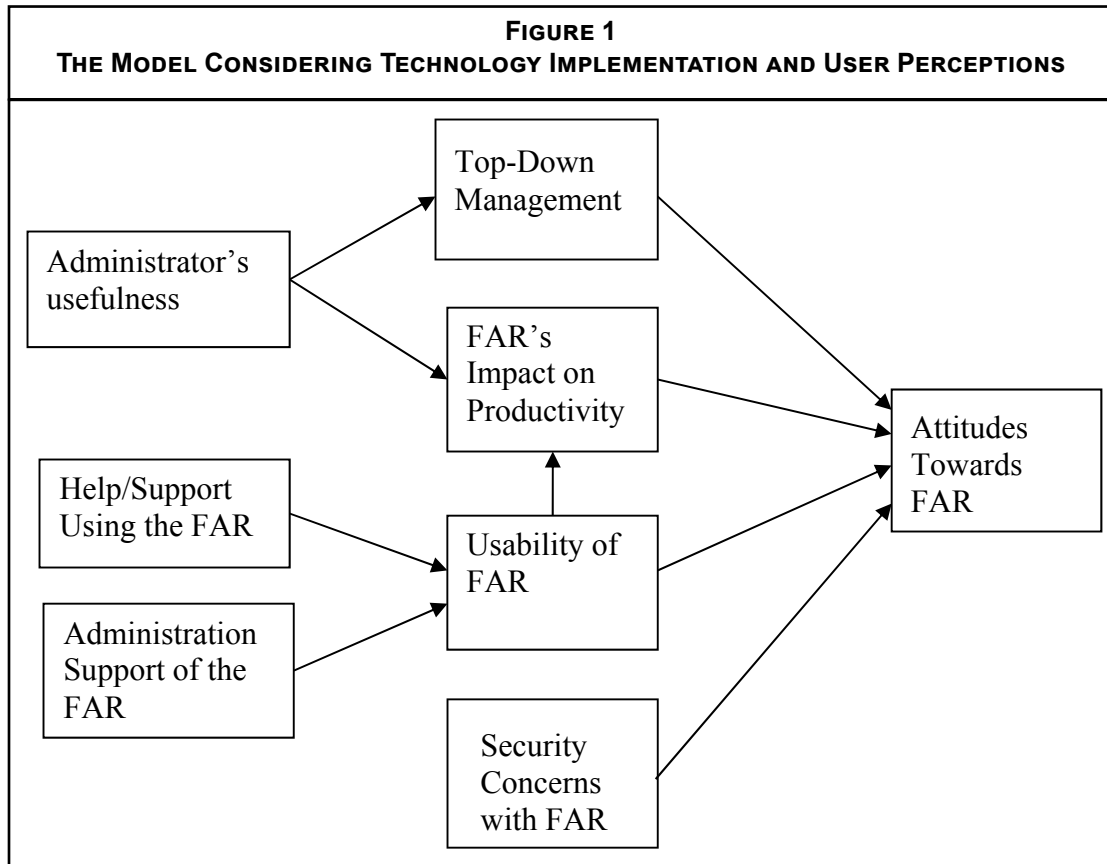
rity measures. Furthermore, managers in the organization can impact respondents' perceptions of a new technology in how the conversion to the new technology is handled. The conversion process would include the implementation process as well as management's approach to administering the conversion. Finally, the technology itself and the support provided users impact its acceptance and users' attitudes towards it.

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