User-is Partnership And Is Development Success

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USER-IS PARTNERSHIP AND IS DEVELOPMENT SUCCESS

by

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ABSTRACT

Since 1970, high project failure rate and low user satisfaction has elicited research on users and their role in the process. It is believed that users' physical participation or psychological involvement in the development process can improve user satisfaction and/or system quality. Previous research treats users as a source of requirements and hypothesizes satisfaction to increase when requirements are fulfilled. However, inconsistent conclusions lead to confusion.

Recently, a co-production concept has been proposed to understand consumer participation in product development process. In this reconceptualization, users, instead of requirement generator, should be part of the production.   In this study, based on co-production concept, we view users as one knowledge source and study how knowledge can be coordinated through the co-production process. After collecting data from 97 system users, most of the hypothesized relationships have been confirmed. IS-user co-production has a positive effect on expertise coordination and, in turn, improves teamwork outcomes. The only relationship that is not significant is between "bring expertise to bear" and "creativity." Implications for practitioner and suggestion for future research are provided.

Co-production was found to be a second-order construct comprised of multiple formative constructs. Higher levels of co-production behavior were expected and were found to produce better outcomes of collaborative efforts. For future study, this relationship is expected to hold true when pairs of information systems developers and information systems users who have worked together on the same information systems development project are surveyed at the end of their projects (or just before it ends or recently thereafter).

To the longsuffering.
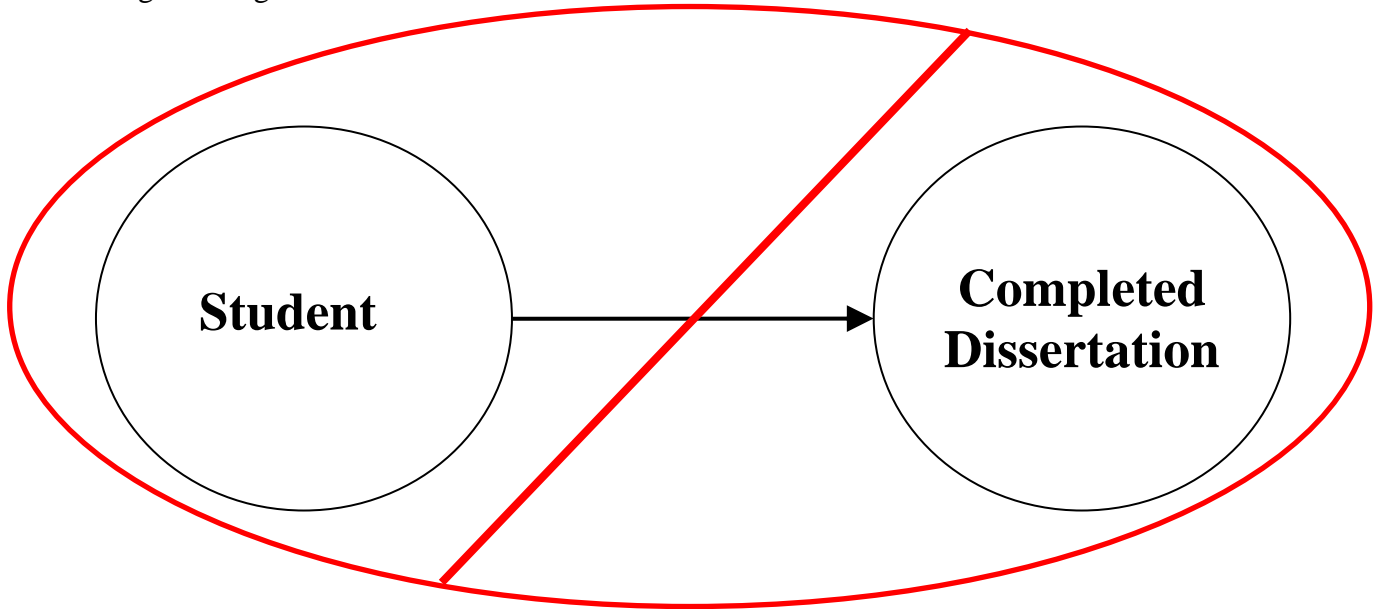
It has been demonstrated experimentally that the above model does not work when JT is the student.

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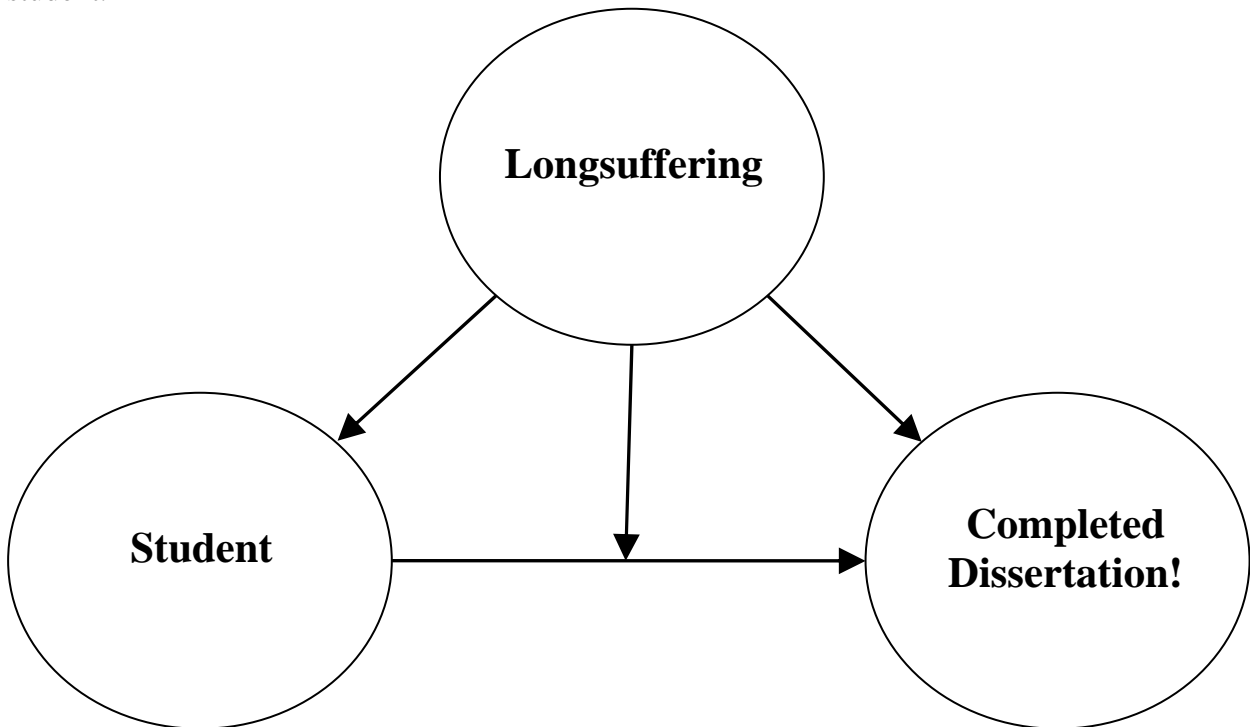
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1. INTRODUCTION

While approaching the end of the twentieth century, failure rates for information systems (IS) development projects are still alarmingly high (Glass 1998, 529). Studies continue to indicate that a majority of all IS projects end in failure (Ambler 1999). As a result, researchers have attempted to explain this lack of success in terms of various risk factors such as project size, objectives for interactive applications, user interface, newness of technology applications, user commitment, and IS developer experiences (Barki and Hartwick 2001; Baskerville and Stage 1996; Jiang and Klein 1999; Vonk et al. 1990). One prescription for successful implementation is to have user participation during the IS development process — a social behavioral perspective (Cooprider and Henderson 1990).

However, past user participation or involvement hasn't reached consistent conclusions. Some research concluded that user participation has a positive impact on final outcome but some find insignificant or even negative results. A couple researchers attempted to answer this phenomenon based on different perspectives. Among them contingency theory based perspective received most attention. It indicates that whether user participation is required is based on different contexts (McKeen, Guimaraes, and Wetherbe 1994).

More than simply participating in system developing process, a couple researchers emphasize the importance of building partnership between users and developers. Within projects, interaction quality and pre-project partnership is found to have a positive effect on teamwork process and final outcome. From this perspective, users should not be viewed as merely a source of requirements, but as partners with the developers. With adequate relationship between users and developers, much conflict can be avoided, and the conflict that inevitable ensues can be

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resolved amicably, teamwork climate can be improved and teamwork outcome should be improved (Jiang, Klein, and Discenza 2002; Jiang et al. 2002).

Recently, a co-production concept attracts researchers' attention in public policy, marketing and other arenas. Based on this concept, the final product or service involves joint efforts from both customers and developers. Moreover, customers should be viewed as part of the team instead of as only final consumers. For example, one recent study suggests that customers should be conceptualized as human resources of service organizations (Bettencourt et al. 2002; Mills and Morris 1986). Pinto and Rouhiainen (2001) also suggest that successful projects may require both product and client modification. The process of developing greater acceptance of IS projects involves a process of mutual adaptation between the project itself and the customer. Significant prework [aka pre project planning] is required from the project manager and team members as they evaluate the client and assess attitudes and needs. If the team determines that it is not feasible under current organizational or environmental conditions, they need to find a more supportive environment, prepare for failure or deescalate and fire the customer.

One of the major reasons why users should be involved is because they possess knowledge which developers don't have but is required for system development. However, the inclusion of users doesn't guarantee that knowledge or expertise transfer will occur. Instead, various activities are required for users and developers to join their expertise together to produce the final product. Those activities, include: communication, accommodation, advocacy, relationship commitment, problem solving, tolerance, project governance, and personal dedication; allare theorized to be necessary conditions for individuals to blend their unique

expertise. In a co-production context, users play an active role beyond just providing requirements, which yields better project performance.

The focus of this dissertation is to examine the impacts of user-IS co-production on project performance. More specially, this study examined the consequence of user-IS co-production behaviors – expertise coordination, and how expertise coordination leads to better project performance and creativity outcomes. The results of this study have several important contributions to the IS researchers. It provides new insight for the "user participation" literature by re-introducing the "customer co-production" into the IS research. Second, the study purports that co-production be viewed as a second-order construct.

In the following sections, this dissertation discusses the background and theory about user participation, partnership, and user-IS co-production. Hypotheses were developed according our research model and literature. In the next section, data collection procedure and measurement validation information are provided. After presenting analysis of the results, implications and conclusions are made.

<u>What distinguishes this paper from others?</u>

As stated elsewhere in the paper, co-production is a subset of user participation. It's user participation at a deeper level. It is at a level that defies substitutability. In a normal partnership, one partner can do the job of the other. For example, if two people are moving a pile of stones with a wheelbarrow, they can both do it together, but if one partner doesn't participate, the other one can still complete the job. With co-production, the relationship is more complex and interdependent.

For example, as much as a teacher would like to teach a student or a software developer would like to develop an information system, he/she requires collaboration with the student and user, respectively. This is different than user participation in and of itself that may or may not be linked to doing anything really productive. In other words, the user may be participating merely in a ceremonial, busy-work fashion and not doing anything really substantial or important.

Do organizations really do that? Yes. The Greater Orlando Area Realtors (GOAR) was implementing a new MLS system prior to Y2K. The developers GOAR hired brought in a group of about 30 to 40 Realtors to help them with the process of designing and developing the system. Most of the work that was done was frustratingly merely cosmetic—arranging the position of fields and how the forms are laid out and other matters of relatively little intrinsic value. The Realtors traveled substantial distances to meet on several occasions for extended periods of time, incurred substantial opportunity cost, and put forth great effort into something that seemed worthwhile. However, the final outcome was that their efforts were in vain. Therefore, their null hypothesis that their input was making a material contribution was incorrect.

One participant sensed the sham and articulated it publicly when he said, "This is like the Titanic sinking and we're here arranging the chairs on the deck." This is not "true participation" which involves the ability to make or influence design decisions (Markus and Mao 2004, 532). Feedback that is not utilized because of a lack of procedural justice tends to destroy trust.

For the purposes of this research paper, information systems development is conceptualized to include the initial implementation of the system but not maintenance. Due to the nature of the instrument, a reconceptualization to parse development and implementation into two separate components as suggested by (Markus and Mao 2004) is unlikely to make any material difference.

2. BACKGROUND AND HYPOTHESES

Research Question

"How can change agents employ participation practices to increase the chances of success in varied IS development contexts" (Markus and Mao 2004, 524)?

The traditional model of service delivery and the co-production model are clearly illustrated in Brudney and England's 1983 paper "Toward a Definition of the Co-production Concept."

The traditional model is shown below and is adapted from Brudney and England (1983).

Feedback
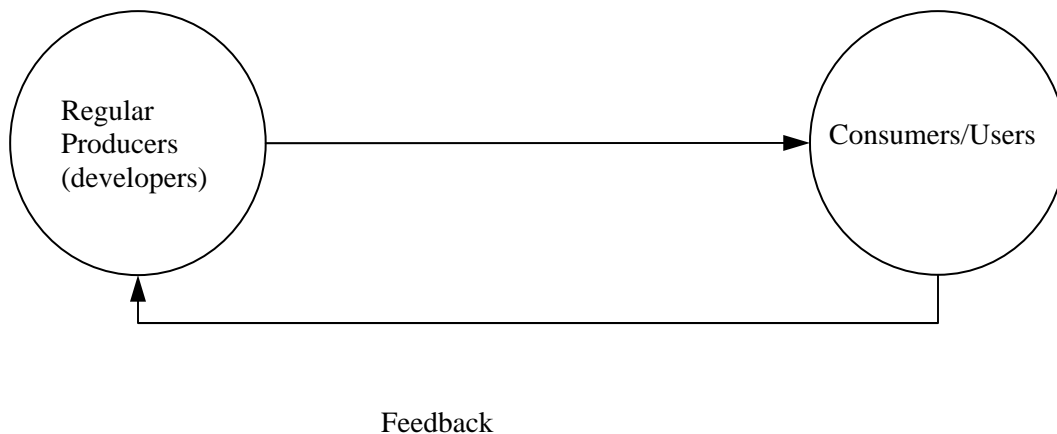
Figure 1: Traditional model of service production (Brudney and England 1983)

Brudney and England (1983) depict the two groups, regular produces and consumers, as normally distinct. The degree of co-production is the degree to which they overlap and some of the consumers become producers. These differences should be expected as social scientists attempt to comprehend a complex social activity. While definitional difficulties may complicate

comparative and synthesis studies, we should appreciate the diversity of perspectives. Scholars

should therefore clearly disclose what operational definition they are using in their writings

(Percy 1984, 433-434).

Table 1: Two views of value production

Industrial view	Co-productive view
Value creation is sequential, unidirectionally transitive, best described in value chains.	*Value creation is synchronic, interactive, best described in 'value constellations'*
All managed values can be measured in monetary terms.	*Some managed values cannot be measured or monetized.*
Value is added.	*Values are co-invented, combined and reconciled.*
Value is a function of utility and rarity.	*Exchange the source of utility and rarity.*
Values are 'objective (exchange) and 'subjective' (utility).	*Values are 'contingent' and 'actual' (established interactively).*
Customers destroy value.	*Customers (co-)create values.*
Value 'realized at transaction, only for supplier (event).	*Value is co-produced, with customer, over time—for both co-producers (relationship).*
Three-sector models pertinent.	*Three-sector models no longer pertinent.*
Services a 'separate' activity.	*Services a framework for all activities considered as co-produced.*
Consumption not a factor of production.	*Consumers managed as factors of production (assets).*
Economic actors analyzed holding one primary role at a time.	*Economic actors analyzed as holding several different roles simultaneously.*
Firm and activity are units of analysis.	*Interactions (offerings) are units of analysis.*

(Ramirez 1999, p. 61, Table 61)

Background of the co-production concept

Co-production generated much interest in the 1970s (Lovelock and Young 1979; Percy 1984), see Parks et al.(1981) and Parks et al. (1999) for a good overview. The concept was originally developed by the workshop in political theory and policy analysis at Indiana University. During the 1970s, they struggled with dominant theories of urban governance underlying policy recommendations of massive centralization. This area of study was primarily focused on the provision of government services to the public. Another term used is "participationalism" which also captures another facet of the concept (Pestoff 2007).[1]

Co-production differs from the traditional model of software development where the developers are the high priest and determine for the users what their needs are and undertake the development for users who demand, consume and evaluate them with little input into the process. Under co-production, service delivery becomes a joint venture and is therefore characterized by a mix of activities that both developers and users contribute to the system development (Pestoff 2006, 506). Co-production fundamentally alters the relationship between developer and user—users are no longer passive (Pestoff 2006, 510). Importantly, neither party can do the job alone, inputs from *both* are necessary. Yet "institutional incentives are necessary for co-production to exist" (Parks et al. 1981, 1002-1006) in (Pestoff 2006, 507).

Percy (1984) would probably indicate that co-production occurs when *both* developers and users undertake efforts to produce the *same* goods or services. There is no requirement that developers or users interact directly only that they undertake these efforts fairly concurrently (Pestoff 2006, 507). Therefore survey participants were paired even if users and developers had

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[1] Is it legitimate to consider the citizens as clients? One way of viewing the relationship is that clients pay not in money, but in compliance to norms, regulations, and requirements (Alford 2002, 40).

no direct contact. Developers in, at least, one company pressed to pair with users conceded that they didn't communicate with customers; they just developed what they thought the market needed, marketed and shipped. Without analyzing the company's performance, they appear to the researcher to be a going concern with reasonably-normal operating performance.[2]

Warren et al (1982) and Rosentraub and Warren (1987)are concerned about an overly broad definition which may include normal citizenship behavior and includes parallel production. Such work is undertaken without contact or cooperation (Pestoff 2006, 507). However, Rich (1981) identifies other important components. The efforts can be positive or negative, cooperative or compliant, active or passive, individual or organizational. Formal organization is not necessary but organization's structure and leadership certainly affect co-production (Pestoff 2006, 507).

An anecdotal and unsubstantiated example of this type of parallel production that may or may not improve the outcome is found in the construction industry from a previous era. A western engineer went to view foreigners drilling a tunnel through a large mountain. Labor was cheap and to facilitate the process teams were furiously digging from both sides of the mountain with apparent abandon and lack of coordination. This puzzled and greatly disturbed the westerner. At last he asked, "What happens if they don't meet in the middle?" The unexpected reply, "Then we'll have two tunnels!" This illustrates that parallel uncoordinated efforts may not always yield the intended effect.

However, today such waste is anathema and as in government, businesses and the information systems development entities seek to reduce cost amidst sharp global constraints,

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[2] Although paired data was collected, it was insufficient to drive the model so only user data was analyzed. Nevertheless, the paired data collection procedures are reported briefly since to do otherwise would be confusing to an astute reader who would note that the documents in the Appendixes reference pairs of participants, e.g. Survey Solicitation Letter.

crunch of globalization, and losing jobs to low-wage countries (Pestoff 2006, 509). Co-production evolved from generating a lot of interest in the 1970s, but it became well established in some public and private sectors by the 1990s (Bovaird 2006, 95).

<u>Co-production</u>

Co-production is a new form of partnership (Bovaird 2006). Co-production refers to the arrangement where users produce their own services at least in part.[3] Co-production[4] in the restricted use of the term refers to an arrangement where citizens produce their own services; at least in part this is a specific interpretation of user involvement although there are of course various other types.

Co-production management has similarities but also important differences from other partnership perspectives. Foremost among these is its "focus on the complex and multidimensional nature of value added client contributions to partnership success." (Bettencourt et al. 2002, 115). Additionally, co-production management places simultaneous emphasis on the role of individuals in managing a successful partnership in addition to organizational activities and finally co-production management partnerships are relatively short term. The contribution of this study is that it focuses on the individuals' inputs effective partnerships, which the literature has heretofore tended to overlook—behind-the-scenes behavior that contributes to functional working relationships that some may refer to as back-room politics. By contrast, the literature on

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[3] This is not to be confused with co-governance in which the third sector participates in planning and delivery of public services or co-management in which the third sector produces services in collaboration with the state (Pestoff 2006, 592).
[4] There are different types of cooperation called co-governance, co-management, and co-production.
Co-governance refers to an arrangement in which the third-party participate in planning and delivery of public services.
Co-management refers to an arrangement in which third sector organizations produce services in collaboration with this date.

prosocial organizational behavior emphasizes understanding the range of behaviors of employees that contribute to the effective functioning of the organization. "The start of the client relationship, just like a personal relationship, is critical for setting the tone for the future of the relationship" (Bettencourt et al. 2002, 116).

There are three relationship norms in the client training, education, and socialization process: information exchange, flexibility, and solidarity. This is reminiscent of some of the key factors noted by Thomas J. Peters and Robert H. Waterman, Jr. in their book *In Search of Excellence* where they refer to simultaneous loose-tight properties. Successful companies held strongly to core values but were very flexible about how they implemented and achieved their goals within those core values. They noted co-location and a host of other factors (including physical, philosophical, and technical) which encouraged a lot of good open communications among and between individuals and groups necessary to achieve goals. Much of this appears to be common sense but many organizations have artificial boundaries and silos that prevent a free flow of effective communication. An important aspect of client socialization is positive, even fun interactions that contribute to interpersonal liking, sharing, and understanding of similarities that are fundamental ingredients to interpersonal trust and therefore motivations to help each other. While it is important to be precise with the definition of co-production and other terms, the definitional issue can be crippling to the debate in research. This paper will attempt to avoid such problems.

Societal and organizational shifts

Before returning to the details of co-production's definition, an understanding of the organizational and societal context in which it might operate is relevant, helpful, and even necessary. Although no organization can be regarded as pure, and totally distinct, many organizations have now reached the point where the ideal types of organizations no longer help us to understand the reaction to such developments. Therefore, there has been a trend to isolationism: the call for stricter demarcation of the sector, both in the conceptual and normative sense (Brandsen and Pestoff 2006, 494). However, viewing organizations as strictly separate entities no longer describes the complexity of many organizations.

Society is shifting from a paternalistic top-down boss knows best mentality to incorporating customers feedback in product development. Mass collaboration changes everything, Web 2.0 changes how information flows and the social dynamic. Not only has this affected the way people communicate socially, but how they work together professionally. A *Wall Street Journal* article describes how at Goldcorp, the in-house geologists were unable to estimate the location of gold on their properties so they made it open source and allowed the public access to previously confidential intellectual property. Contestants applied various disciplines such as math, physics, computer graphics, and even military strategy and converted the half million dollars in prize money into billions of found gold. This is a good example of the specialist enlisting valuable input from lay people.

This is not unlike the strategy that the US government organization, Defense Advanced Research Projects Agency (DARPA), is taking with The Urban Challenge. Rather than develop in secret the program for vehicles that can find their way around traffic, they have made a contest out of this endeavor which publically brings to bear the best minds in the country. The federal

government has launched several wikis which permit staffers to post information and expand on it until consensus is reached. The same concept is utilized among the intelligence agencies in password protected wikis. Users are told, "We want your knowledge not your agency seal." The hope is to be able to connect the dots across 16 different agencies (Wikinomics to Government 2.0 2008). Part of the problem of software development is the compartmentalization between departments and individuals who do not want to share information because they view it as an evisceration of their *raison d'être*.

Democracy and the process of governing are complex, and technology may facilitate information exchange among stakeholders. Groups know best—better than so-called experts (Surowiecki 2004). This phenomenon has been demonstrated by the popular TV program "Who Wants to be a Millionaire," and DARPA's more open approach to intelligence gathering as evidenced by the development of the Urban Challenge.

The context of collaboration and cooperation has changed and continues to change. Boivard sees a couple drivers of co-production: the shift in government and business from an adversarial approach to a collaborative one; a growth in the number of interfaces, parties in transactions, unbundling of services, and overall increase in complexity (Bovaird 2006, 83).

The conceptual framework of the production of governmental and social services is here applied to the equally complex process of information systems development. One recurring theme is extending the organizational boundary alter the relationship so as to adopt the client as a partial employee (Mills, Chase, and Margulies 1983, 305), rethink organizational structures (Ramirez 1999, 49) This will be the next frontier of competitive effectiveness (Bendapudi and Leone 2003).

Co-production renders boundaries which separate firms more permeable and changeable, overlapping, and linked. Co-production does not bring "boundary-less" firms which consider them liabilities, but assets with feelings and intuitions which become recognized as resources to be mobilized (Ramirez 1999, 56).

According to Garn (1973, 42),, "Traditional distinctions of economic theory are blurred, for service agent 'producers' together with recipient 'consumers' are *mutually* responsible for the quantity and quality of services produced, or the extent of client transformations. 'The production process itself and, therefore, the level of outcomes achieved is jointly determined by the interaction between the two distinct sets of participants.'"

Today, even in manufacturing, there are much closer links between producers, subcontractors and consumers than in the Fordist productive systems as a result of the direct relationships between the various actors (Gadrey 2000, 373). According to Gadrey, "Co-production is the cooperation or interaction between producer and consumer in achieving the desired outcome" (2000, 370). Co-production has been with us all along. Complex relations have not been more readily observed because of the conceptual frameworks that view organizational life disjointedly (Ramirez 1999, 55). In the context of the Industrial Revolution, it was not long ago, Lovelock and Young (1979) describe five examples of the co-productive phenomenon without using the term "co-production." Only recently have socio-technical breakthroughs allowed co-production to emerge in practice. Co-production offers an alternative to the industrial-era view which is more attuned to the nebulosity engendered by managing ignorance in deliberately under-designed organizations so that they are flexible, adaptive, and interactive (Ramirez 1999, 56, 57, 61). Interaction is not with machines but with individuals—a fundamental fact of the post-industrial service society (Bell 1973).

Model and subset

Expertise coordination (user)

Project performance (user)

Developer | Co-production | User

Bringing expertise to bear (user)

Creativity outcome (user)
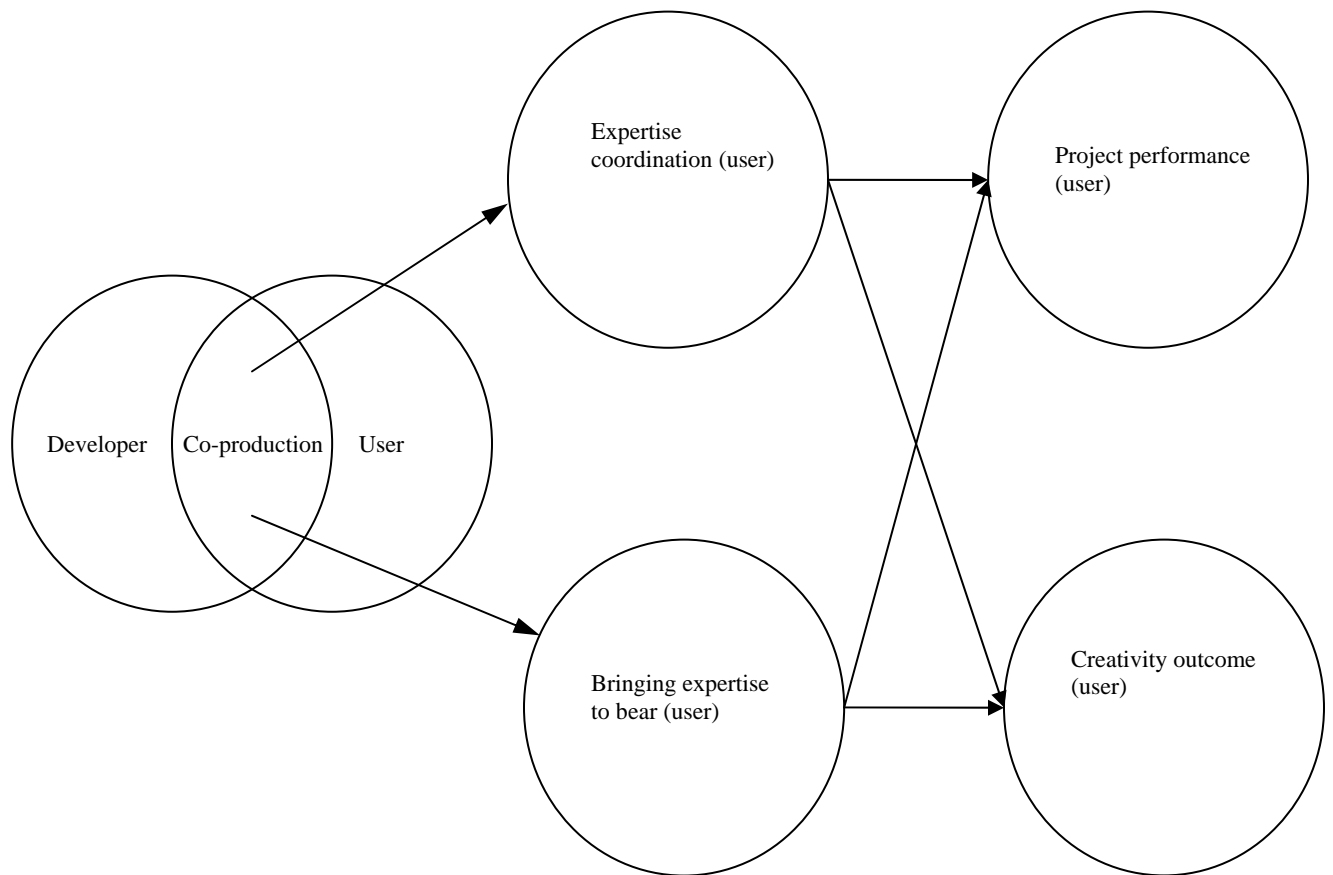
Figure 2: Overall model

Project Performance and Creativity Outcomes were also analyzed individually since they are sufficiently distinct both from a face validity perspective and also academically/scholastically that they were also modeled and analyzed as separate constructs in and of themselves. See Figure above.

When users and developers blur the boundaries and users become partial employees of and with developers they not only are consumers but co-producers of the software, information systems, and knowledge intensive business services (KIBS) that they will be using.

The co-production activities that were measured are indicated in the expanded Venn diagram immediately below. Note that the boundaries have blurred and spanned and developers and users share activities. This is in contrast to the traditional silo-istic model shown in Figure 1.

CO-PRODUCTION:
User comm,
Shared prob solv,
Tolerance,
Accommodation,
Advocacy,
Proj Governance,
Personal Dedication
Relationship Com.

Developers

Users
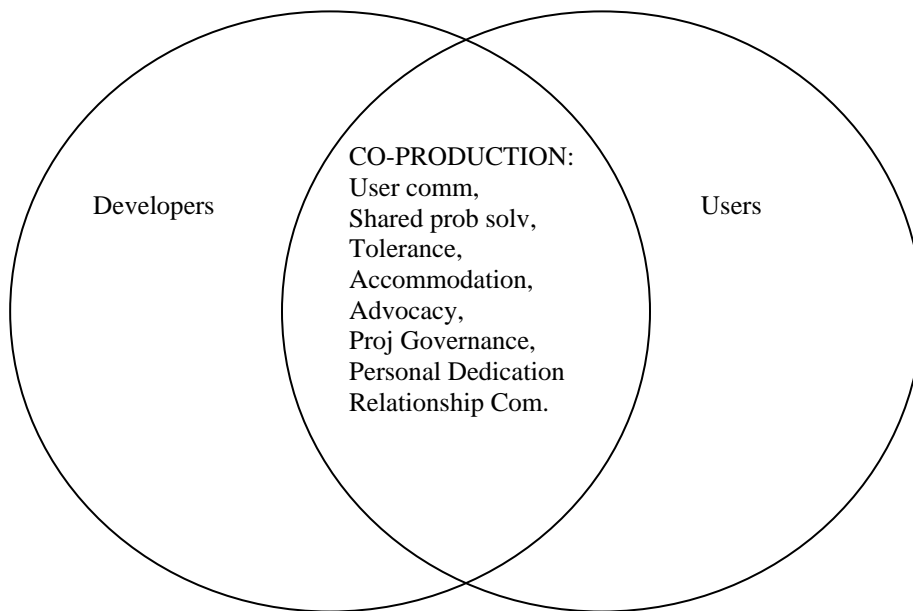
Figure 3: Co-production and components

In the following figure, Bettencourt (2002) explains the constructs within the dotted lines and Faraj and Sproull (2000) and Tiwana and McLean (2005) explain the remaining constructs and connections.
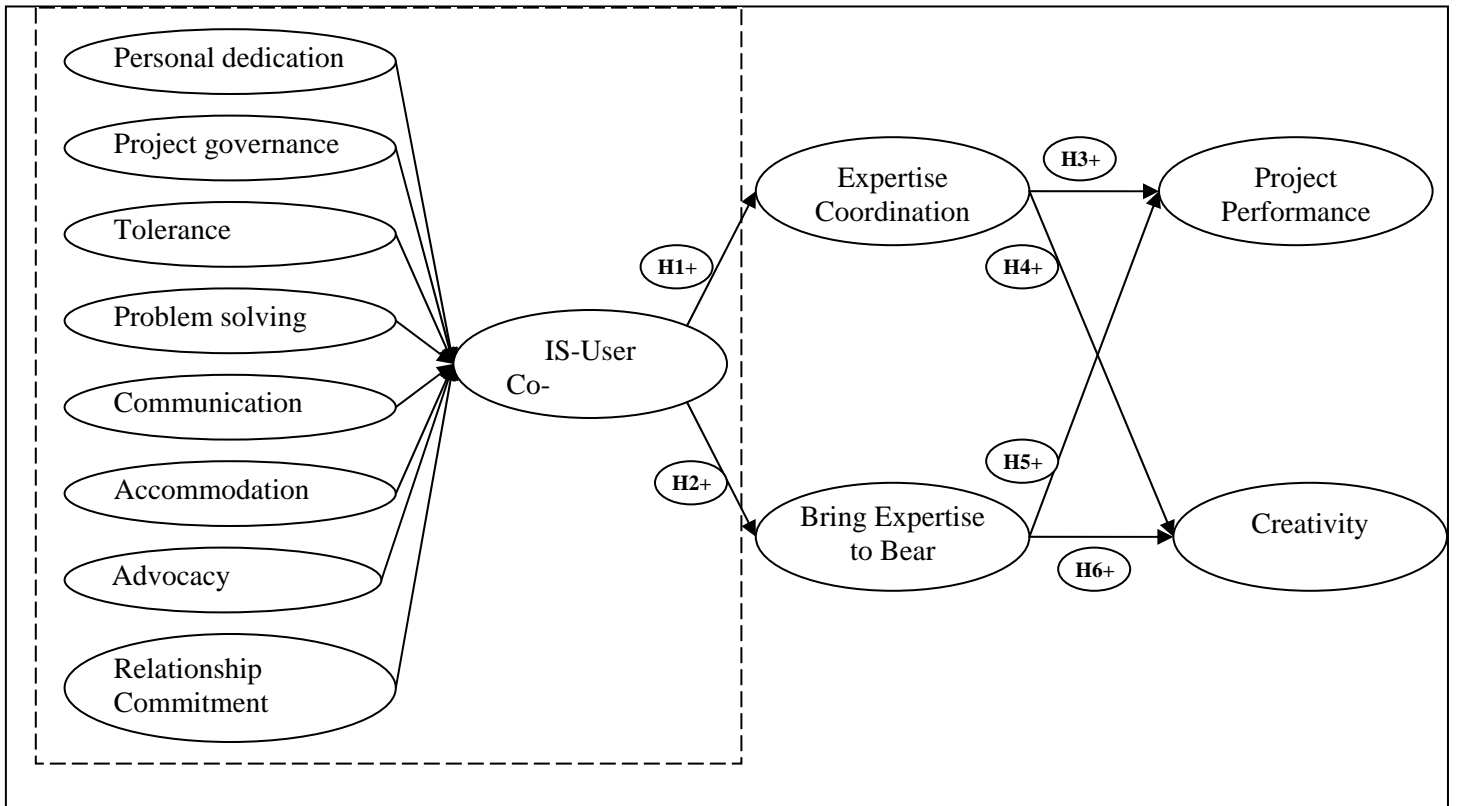
Figure 4: Co-production as a formative second-order construct

Co-production definitions

> *"When I use a word,"* Humpty Dumpty said, in rather a scornful tone, *"it means just what I choose it to be — neither more nor less."*
>
> *"The question is,"* said Alice. *"Whether you can make words mean so many different things."*
>
> *"The question is,"* said Humpty Dumpty, *"which is to be master — that's all."* Lewis Carroll (Zeleny 2005, 61).

How users and developers define terms can make a large difference in the outcome; how researchers define terms can make a large difference in a research study. There are definitional difficulties with the term co-production. For example, there may be some confusion with the term co-production when it also refers to the more restricted meaning of user involvement (Brandsen and Pestoff 2006, 497).

For our purposes, co-production can be defined as the active involvement of users in the design and development of information systems (Williams 1999, 152). More specifically, this paper shall use "*Co-production refers to the range of client collaborative activities that contribute to more optimal knowledge-based project solutions, effective relations with the KIBS firm and likelihood of project goal achievement*" (Bettencourt et al. 2002, 102).

Co-production describes active involvement by the consumer/user in the production of the output. The developer/producer alone cannot determine the quality of the output. The student-teacher relationship is an prime example. No amount of the teacher's effort will enable a student to learn if that student doesn't engage in that process (Rice 2002, 165).

In addition to Gadrey 's definition, scholars have sought to develop precise definitions of citizen co-production. A variety of definitions have ensued without consensus. The Workshop in Political Theory and Policy Analysis at Indiana University distinguishes between consumer producers and regular producers—"Co-production is said to result when *both* consumer and regular producers undertake efforts to produce the *same* good or service." Whitaker (1980) takes a broader view that includes "many types of interactions between citizens and service agencies should be recognized as co-production." He would include citizen demands for services, citizen provision of assistance to service agencies, and interactions between the two that adjust expectations or actions as instances of co-production.

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While Rich (1981) sees "citizen co-production as the combined efforts of citizens and service personnel that affect the quantity and quality of urban services," Warren (1982) takes a narrower view limiting co-production to direct cooperation. "Co-production is defined as those actions by citizens which are intended to augment or contribute to the actions of public agencies and involve conjoint behavior."

An acceptable respondent for user is anyone who has at least nominal input into the IS development process, directly or indirectly, whether they are a consumer or an employee. An end user, like the typical Microsoft Word user, is not deemed to be an appropriate respondent.

The role of trust in co-production

Since it's impossible to foresee all contingencies that might affect an ongoing relationship, it is necessary to have at least some elements of mutual trust otherwise the risk of opportunistic behavior may be perceived as excessive (Vidal 2006, 588). Social capital is "the generation of trust and cooperation relations and their value as an intangible asset" (Williamson 1993). An interesting and relevant definition of trust is "the total time that the groups of interest do *not* have to spend verifying their activities" (Vidal 2006, 588).

According to Sundeen (1985, 388) co-production involves "mutual trust, problem solving, and shared responsibilities, all of which are intrinsic to the idea of community." Therefore one of the consequences of co-production may be the resurgence of community (Ben-Ari 1990, 483). Trust will be addressed in more detail in the section on Social Exchange Theory.

Motivations for actors to engage in co-production

In the early 1970s and 1980s the concept of co-production generated interest in public administration thinking, and it explains volunteerism in local government service (Rich 1981, 60) or organizational citizenship behavior (OCB) in software development. Since then, the idea of involving people outside of government in producing public services has attracted continuing although sporadic attention. We are interested in understanding what influences clients to coproduce. But this has attracted relatively less attention. Some incentives include material solidarity also known as *sociality. Expressive* incentives such as intangible rewards are those that derive the sense of satisfaction of having contributed to the attainment of worthwhile goal (Alford 2002, 35).

The concept of co-production is important in explaining volunteerism in local government service (Rich 1981, 60) or organizational citizenship behavior (OCB) in software development. Co-production can be active or passive, individual or collective, and positive or negative (Rich 1981, 62). Sundeen includes the qualifier "voluntary" (Sundeen 1985, 388) but voluntariness of participation is not a major concern nor a measured component in this study.[5]

"What motivates customers? Self interest - the same thing that motivates everyone." (Alford 2002, 36). There are four cases. In the first example, the Australian Post Office used optical character recognition (OCR) requiring customers to write postal codes in predetermined positions. The second case is the department of employment, education, and training (DEET) which acted as an agency to place job seekers. Jobseekers were marketing to potential employers with DEET's assistance, advice and support. The potential employees needed not only to be job

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[5] A search for "volunt" (to cover both "volunteer", "voluntary" and variants), "choose" "choice" in the user survey yielded no hits. This confirms that measures of voluntariness were not deliberately introduced into the instrument nor incidentally measured.

ready, but willing so that they could present themselves professionally before clients. The third

case involved the clients of the Victorian Ministry of Housing (VMH), where tenants wanted

their facilities to be in a reasonable state of repair with good security and clean surroundings

without the costly addition of staff and an unacceptably repressive atmosphere. This could not be

achieved without tenants contributing to the collective value of their tower block. In the fourth

example, the Australian taxation office (ATO) could not operate a modern income tax system

fairly and efficiently without taxpayers reporting income and claiming deductions honestly and

maintaining accurate records. The previous strategy of checking every return was labor-

intensive. They altered their strategy to encourage prompt compliance by simplifying the tax

system and then targeting audits to the segment that are likely to be noncompliant (Alford 2002).

In all cases, the participants had a vested interest whether it be letters being delivered in a timely

fashion by Australia Post, getting jobs with DEET's help, maintaining housing security and

value with VMH, or not being audited by ATO.

Alford (2002) distinguishes between three sources of motivations for citizens: material,

solidarity and expressive incentives. Motivations can be complex, particularly if the system has

high visibility. "Eliciting co-production is a matter of heightening the value that clients receive

from the services by making more explicit its non material aspects through intrinsic rewards,

solidarity incentives or normative appeal" (Alford 2002, 48).

Advantages of co-production--why managers and stake holders should be interested in co-production

A contributing factor to the importance of this research is that IT is no longer done in

isolation for a single department (Markus and Mao 2004). It is much more involved in process

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improvement. It's no longer merely an IT initiative but a business process initiative where technical aspects are intermingled and co-mingled with social technical issues, shifting the balance of power and the way things have been done. While this is often done with the best of intentions, there are often many adverse, unintended consequences. This leads to an opportunity for naysayers to attempt to sabotage the development, implementation, and utilization of an information system.

Today's implementations move to a higher level of integration. They involve process redesign, physical layouts of the workplace, changes in job design and compensation, as well as development of IT infrastructure. Additionally, there are shifts in the political landscape.

Many complex tasks cannot be accomplished unless individuals put their efforts and resources together and work as a team. Team production however is rarely simply a process of pulling the efforts and resources as individuals—they need to be structured in a complementary and interactive way that yields synergistic results and levels of productivity. Co-production is a form of interdependent team co-production. Interdependence gives rise to the problem of shirking--the free rider syndrome. For co-production to succeed, incentives must be in place so that producers are motivated to serve the interests of the consumers (Lam 1997). It is noteworthy that FedEx routinely prints on payroll checks a message that conveys "This check made possible by a satisfied customer." The efforts of the employees should be aligned to meet the needs, wants and desires of the customer. Hopefully the managers and leaders of the organization are in tune with the customers and align the organization's efforts appropriately.

In co-production, not only the complex tasks, but even the simplest task calls upon tacit knowledge. The more compliant, or at least less obstructive, the client, the easier it is for the organization to achieve its goal and/or to do so less expensively (Alford 2002).

The concept of co-production is appealing because it can lead to cost reductions, higher service, expanded opportunities, and greater satisfaction. It can induce greater/higher quality and quantity.

While software developers probably approach the software development process with a more contractual mindset, like government agencies did and continue to do with the public, and hence less emphasis is given to relationships built on trust and social capital (Tsukamoto and Nishimura 2006), cooperation is likely to yield better communication, resource allocation, and adaptation to stakeholders (Vidal 2006, 584-585).

Relationships are complicated and cannot be adequately encapsulated in legal documents and trust is a necessary factor for success, lest individuals and organizations expend tremendous time assessing compliance, checking and double checking, and basically keeping score. The co-production model requires developing partnership (Bettencourt et al. 2002)

When people are required to do things they are less likely to do it before the intrinsic pleasure and are likely to resist sanctions and to undertake opportunistic behavior to minimize their contributions of time and effort. Therefore, the organization steps up rules and enforcement, clients find loopholes, and a downward spiral ensues. Therefore, sanctions generally do not incite a willingness to coproduce (Alford 2002, 42-43).

Disadvantages of co-production

The literature demonstrates several advantages of co-production, but also major hurdles and unintended adverse consequences.

Professionalism implies a particular social orientation (Bode 2006, 553) which professionals often suspect that clients may not have.

Also, since users may not be as highly trained they may need so much training, supervision and coordination that the incremental benefit may be largely mitigated.

Costs—while co production is a strategic endeavor to cut cost and boost productivity, there are participation costs. Participants may require formal or informal screening, testing, training, insurance, equipment, and coordination to enable them to be productive (Percy 1984, 476). This may require the dedication of additional paid staff (Percy 1984, 474) and opportunity cost (Percy 1984, 437). Thus empowered and in contact with the organization they may make inquires, requests and demands that drag down an already beleaguered bureaucracy (Brudney 1984, 468).

Not only are there training and cost issues to deal with, but the reaction of the highly-trained who may be concerned, (Bovaird 2006, 85) legitimately or otherwise, about the security of their high-paid jobs and/or status should those with lower status be able to perform much of what they do with lower compensation--substitutability. These types of schisms can lead to the need for internal selling of the co-production concept along with additional management efforts to sell the concept to whom this may be threatening to their status quo.

While the users may get to provide input and influence the development process and the outcome of a superior system, there is also the possibility that there is some bilateralism involved (Ben-Ari 1990, 486). For example, the utilization of ZIP codes and ZIP+4 may be good at speeding the routing of mail and lower the processing cost for the postal service (and the consumer) and increase the speed of delivery but it concurrently can be utilized to track consumers as a group for marketing and census purposes. It can become onerous and coercive

when the USPS insists that it be utilized even though the USPS charter disallows them

from legally mandating its utilization. This is like the requirement in a Japanese housing project

that the family garbage be labeled with the family name and therefore it became a matter of

family honor to produce good garbage (Ben-Ari 1990). This is what Hart referred to as "incipient

totalitarianism" (1972, 102).

Naturally, users who get the most benefit from the new information system are more

likely to engage in co-productive behavior. Issues of free-riders who benefit with little or

nominal effort ought to be taken into consideration when studying co-productive behavior. Co-

productive behavior may not only have tangible benefits but intangible political

overtones. Usually, only those with discretionary resources can undertake co-productive

activities. This further enhances their influence in the organization not only because their

participation is noted but the participation itself can alter the process and outcomes (Pestoff

2006, 508-510).

With relatively predictable workflows efficiency is gained by limiting contact with

customers/clients (Mills, Chase, and Margulies 1983, 303). However, this may be

counterproductive in complex and iterative tasks where a great deal of nebulosity exists. In other

words, while co-production is a great concept, when the task at hand is routine, invoking the

overhead of bilateral relationships may be overkill.

Co-production today

How does co-production work in practice? A contributing factor is co-location...an

observation strongly noted by Peters and Waterman in "*In Search of Excellence*" (Peters and

Waterman 1982). They note that companies who have achieved a degree of excellence as measured by a variety of factors, including financial measures, have a tendency to arrange the flow of people so that they have many opportunities to interact informally and frequently. In the entrepreneurial realm of a business incubator the co-location allowed for 'counseling by walking around' (Rice 2002, 175) evidently a spin off of MBWA, management by walking around.

Good leaders and managers lower barriers to enter into communication. They also lower the barriers to failure and create "learning space" (Koh 2000, 89) so that people are more willing to undertake experiment and learn without fearing that an action with a less-than-desired result is deemed as career damaging or even career ending (Peters and Waterman 1982).

Although there is a high discrepancy between what the entrepreneurs know and what the incubator manager knows and consequently great potential for learning to occur, there is also resistance of various kinds. For the flow to be effective, the entrepreneur has to be aware that there is a gap in his/her knowledge, skills and resources, recognize that the incubator manager can help and be ready and willing to receive that help (Rice 2002, 186).

Entrepreneurs also need access to a "know how network" (Rice 2002, 176) so that they can identify and obtain resources that they need to successfully launch their endeavors. Software developers are little different. On a very basic level, they need to know where to find those who can give them a good idea of what the real requirements are for the information system or how they can be ascertained.

Alford (2002) states that "eliciting co-production is a matter of heightening the value that clients receive from the services by making more explicit than nonmaterial aspects through intrinsic rewards, solidarity incentives or normative appeals."

Co-production in this context is distinguished from related concepts such as partnership, joint policymaking and negotiation. The demands of the definition go beyond the nature of most existing partnership arrangements between neighborhood groups and public agencies in the United States. The concept of co-production should connote something more than cosmetic treatment of traditional superior-subordinate forms of interaction similar to the high priestly role of the system designer in software developer. The co-production process cannot be left to well-intentioned vagaries about collaboration across sectoral lines, some tough preconditions may have to be met along the way (Spiegel 1987).

Customer relationships are the new focus. The core idea of the new concept can be expressed as a shift from "tell us what color you want" to "let's figure out together whether and how color matters to your larger goal." The idea of customer satisfaction is hence complemented by the comprehensive integration of customer into an interactive value-generating process based on independence and reciprocity (Jüttner and Wehrli 1994, 54). It is a shift from being merely an order taker to engaging the customer in a consultative manner.

This leads to the maintenance of longer-term customer relationships, changes in focal points, and modification of the management process.

Memory-based relationships refer to the knowledge about a "partner's exchange-related expectations and preferences" (Jüttner and Wehrli 1994, 51). This is more like relationship customization and cannot be imitated by competitors and therefore provides that entity with competitive sustainable advantage.[6]

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[6] This also a contributing factor to explain why making a second million dollars is so much easier than the first—the entity has already established an understanding of how best to interact with specific individuals and also that genre of individual, e.g. not only does X company know Mr. Smith the banker and vice versa but if Mr. Smith was replaced with a Mr. Jones or Company X goes to another banker Mr. Jordan, Company X now knows that bankers like to loan money at rates that cover their risk and that if they loan only to safe borrowers their loss ratio will be too

It requires time to gain the trust of the client (Bonchek and Howard 2006) so that one can

obtain an understanding of what they truly want. Operating with a co-production concept in

place allows for developers to understand what users really want. Knowing what they really want

can be a crucial system input. The input function is perhaps the most important function because

the more accurate the information the easier it is to perform other functions (Mills, Chase, and

Margulies 1983, 303).

<div align="center">Theory</div>

This dissertation ventures to say that there is no co-production theory per se.[7] However,

there is a co-production model that is proposed by (Bettencourt et al. 2002, 103) in Figure 1 of

Bettencourt's article "The Client Co-Production Management Process."

In this model, the clients' role responsibilities include: Communication Openness, Shared

Problem Solving, Tolerance, Accommodation, Advocacy, Involvement in Project Governance,

and Personal Dedication.

In Table 1 of Bettencourt's article (not shown here), "A Comparison of Co-Production

Management with Related Partnership Perspectives," the Primary/Focus Outcomes dimension is

described in part for co-production, "How the range of functional, relationship-oriented

behaviors that clients contribute to a partnership can be managed using a variety of both formal

and informal activities…" In the Relationship Appropriateness/Source of Value Relative to

Client dimension for co-production "when the service/product is complex, customized, and the

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low and their portfolio managers may chastise them for being too conservative, not being aggressive enough, and
therefore not optimizing the money they have to lend. In some respects it's like playing chess, being able to reliably
anticipate the other party's response allows one to predict, plan and act proactively. Others without this institutional
memory are often, but not always, at a disadvantage. Sometimes acting without preconceived prejudices and
constraints leads to novel, positive outcomes.
[7] This assertion is supported by personal telephone conversation with Lance Bettencourt in which he concurs that
there is no co-production theory (circa 2007).

environment is dynamic; when the client role is multidimensional and closely integrated with that of the partner for the purpose of recombining or creating specialized knowledge that is the source of value in the partnership…" (Bettencourt et al. 2002, 104).

Therefore, to the original seven client role responsibilities, is added an additional Bona Fide Occupational Qualification (BFOQ), Relationship Commitment.

The model suggests that since clients have certain responsibilities: they have a job to do, they need training, motivation, and a clear role etc. They're like partial employees. The client's roles in KIBS are "emergent, multi-faceted, and highly collaborative because clients themselves possess much of the knowledge and competence that a KIBS firm needs to successfully deliver its service solution" (Bettencourt et al. 2002, 101). Markus and Mao (2004, 530) seem to think that *who* participates is important, not that there is just someone to fill the slot and play the role.

The importance of competence and role fit is illustrated by incidents in the early days of the space program. Primates were used to fill the slot later occupied by humans. Since monkeys were not entrusted with autonomy of exiting the vehicle, there was no internal release mechanism. When humans replaced monkeys, this residual artifact was not disposed of with disastrous results for astronauts Grissom et al. Who fills the role of client can make a difference in how the position is structured and set long-lasting precedents.

<div align="center">Social Exchange Theory</div>

Blau (1964) referred to an economic exchange, which stipulates exchanges and contrasted it with social exchange which entails unspecified obligations. Economic exchange equivalency is precise and easily calculable and what is to be exchanged is declared in advance. In a social exchange, the parties to the exchange leave it up to the other to decide subsequently

how to repay an obligation. In economic exchange, they spell out clearly in advance and monitor whether it occurs subsequently. By contrast, the social exchange involves favors that create defused future obligations, not precisely-defined ones (Blau 1964, 91).

Blau (1964) pointed out that "social exchange tends to engender feelings of personal obligation, gratitude, and trust; purely economic exchange as such does not." This is because the very fact that the exchange lacks specificity defines reciprocity "requires trusting others to discharge their obligations" (Blau 1964, 94). Thus, social exchange fuels a spiral of rising trust.

By discharging their obligations for services rendered, …individuals demonstrate their trustworthiness and gradual expansion of mutual service is accomplished as a company by a parallel growth of mutual trust (Blau 1964, 94, 315).

Intuitively, it makes sense that the converse would be true—economic exchange tends to promote a spiral of falling trust. When someone checks up on you or audits you, it tends to diminish trust as Fox 1974 explained: the specific nature of the exchange embodies little trust by each and generates a probability that each will watch the other with increasing vigilance both to secure for him or herself and it an acceptable bargain and to ensure the full observance of its terms. Relations are therefore low in trust to the extent that they approach the wholly contractual form postulated by economists as pure economic exchange, with precisely defined in specific obligations on both sides, and with each party watching the other for infractions; jealously guarding concessions; and refusing any request for *extra-contractual favors* [italics added] a more precisely-defined reciprocation is guaranteed (Blau 1964, 72).

Eliciting co-production is a matter of heightening the value the client receives from the service by making more explicit its nonmaterial aspects through intrinsic rewards, solidarity incentives, or normative appeals (Alford 2002, 48).

Similarly to government, KIBS shares similar features—it is impossible to deliver services without contributions of time and effort by clients (Alford 2002, 51).

Social capital provides the necessary support and infrastructure for social exchange. It is clearly critical, although one of the most neglected and ignored, which defines people's ability to work towards common goals and objectives in groups and organizations, for the new associations and operative networks, dismantle and slough off the old institutions without conflict or violence. It is the enabling environment for human capital to become effective. Strong communities are characterized by a preponderance of a horizontal organizations, self-reliance, self organization, and self management. Conversely, autocratic centralized and hierarchical vertical organizations are found in societies of less trust, lower spontaneous sociability and thus lower economic performance. The state then has to compensate with more resources allocated to auditing behavior.

Organizations with weak cultural and civic ties will generally be poorer; higher performing organizations will typically be characterized by "strong, dense and horizontally-structured cultures of trust cooperation in…associations" (Zeleny 2005, 9).

According to FA von Hayek, the central question of all social sciences is precisely how combining the fragments of knowledge residing in different minds can bring about results, which if they were to be brought about deliberately, would require knowledge of the part of the directing mind which no single person can possess. No single individual or even a group of individuals knows how to build a space shuttle and yet space shuttles get built (Zeleny 2005, 29).

While it's necessary for people to specialize, information needs to be reintegrated to achieve specific goals.

Organizations are faced with simultaneous pressures for differentiation and integration. Empirical research shows several means by which they alleviate these pressures: acquiring soft skills, moving from staffing to sourcing[8], strengthening all mechanisms of coordination, and changing management style. In such a way, they adapt to the network context in which they operate as an end result. They contribute actively to network integration and innovation in public services (Brandsen and Pestoff 2006, 499).

When special skills or information are needed, they are often not available within the organizations themselves; members seek through their network to access them. Given such requirements, the identification of new partners will be a skill of great value. One difficulty is to assess the viability of others. Here we come back to the tension between competition and cooperation. Integration requires an investment in the long-term trust-based relationships as managers no longer maintain full control of the services they had. Their organization increasingly operates through incentives and persuasions rather than hierarchy. This is where co-management starts to undermine the manager. Realistically, the managers will lose power as the organizations diversify. They will have to exercise power based on charisma and inspiration rather than rulemaking and regulation. It becomes more important to watch the quality of the organization's gatekeepers and boundary spanners (Brandsen and van Hout 2006, 548)—and find the right people with which to align.

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[8] Sourcing refers to add sourcing co-sourcing outsource in and in sourcing.
One, the combined forcing of organizations delivering comparable services like home care and elderly care on the basis of flexible contracts and informal personal networks of contractors and subcontractors so-called *ad-sourcing*.
Two, where multiple organizations voluntarily work together to establish temporary organizations in an interdependent fashion. We refer to that as *co-sourcing*.
Three, a rapidly growing form of sourcing in which specialized staffing agencies deliver staff to actually take over contracts is called *outsourcing*.
For the merges of third sector organizations to increase their labor potential is *in-sourcing* (Brandsen and van Hout 2006, 546).

Trust is a crucial component in social exchange theory. Generally, unless one acts altruistically or under duress, players in the network assume some level of latent *quid pro quo*. There is a perceptual, unwritten, and implicit nature of psychological contracts (Argyris 1960) which distinguishes it from a legal contract (Weick 1979) in (Pavlou and Gefen 2005). This drives the accountability down to an individual rather then a contractual or organizational level.

There is an interplay of strategic actors who are interested in their own well-being, but understand that they may perform better by going for partners, partnerships, centering around product development joint marketing or common research (Bode 2006, 553-554).

Reiterated exchanges create interdependency. This transformation of networks is complex in nature (Bode 2006, 561).

User-IS Partnership

One central premise of my dissertation is that, to some extent, users should be viewed as part of, rather than as external to, the IS development effort because of the central role that they play in the system development process. The call to view users as "partial customers" can be traced back to the early beginnings of the management literature (Barnard 1940), although it has become more refined in recent years (Bowen and Jones 1986; Mills 1986; Mills, Chase, and Margulies 1983; Mills and Morris 1986). One unique feature of knowledge-intensive product/service development is customer involvement in the production of services. To view customers as partial employees therefore acknowledges the importance of their role as "co-producers" and "participants."

Customer participation has been defined as resources and actions supplied by customers for the production and/or delivery of services (Rodie and Kleine 2000). Mills and Morris (1986)

argue that customer co-production can decrease production costs for organizations and, at the same time, increase customers' involvement and sense of obligation and responsibility as their role expands. Rodie and Kleine (2000) suggest that customer participation can fill market niches, enhance customer loyalty and retention, and allow for offering value-added services that would be too expensive to provide otherwise.

Furthermore, customers can be a valuable source of new ideas for business strategies (Jüttner and Wehrli 1994) and can even act as organizational consultants (Wolstenholme 1988). Especially online service businesses, whose reputation is often largely built on customer recommendations, can benefit from customer participation by means of word-of-mouth and referrals to friends and family. Empirical evidence has generally supported the benefits of customer participation and has successfully linked it to service quality and customer satisfaction (Cermak, File, and Prince 1994; Kelley, Skinner, and Donnelly Jr 1992; Kellogg, Youngdahl, and Bowen 1997) as well as purchase intentions (Cermak, File, and Prince 1994).

Despite the obvious advantages of customer participation, it can also have negative effects on organizations and customers. For example, customers' behaviors have been identified as a major source of their own dissatisfaction and negative perceptions of the service delivery process (Bitner, Booms, and Mohr 1994; Mohr and Bitner 1995). Verbal abuse, uncooperative behavior, or breaking company policies can result in employee frustration and experience of stress. Furthermore, customers can be the source of their own dissatisfaction by behaving in ways inconsistent with the expected role of customers in the particular service organization. Customers who do not perform at the desired level can become angry and frustrated and may require additional organizational resources, therefore increasing the cost to the organization. For example, an airline passenger who did not prepare for a long flight by bringing reading materials

and wearing warm clothes may become restless and complain. Especially in e-businesses, customers who do not perform adequately often make use of online or telephone help lines, therefore increasing the costs to online service organizations. Even though these behaviors are the exception rather than the norm, in most service industries isolated incidents can nevertheless be frustrating to employees and expensive to organizations.

These positive and negative consequences may even be accentuated in the IS development environment. Successful user participation depends on users' ability to perform the desired behavior and their motivation to engage in that behavior. For managing users' behavior, traditional management practices that manage employees often do not apply to users in the IS development content. For example, "firing" customers who do not perform often is impractical, if not impossible. It goes against the ingrained mentality of a culture that views the "customer as always being right." In fact, researchers (Goodwin 1988; Kelley 1992; Kelley, Skinner, and Donnelly Jr 1992; Rodie and Kleine 2000) have focused on how to enhance customers' ability to perform the desired behavior by providing them with necessary behavioral tools and training. Goodwin (1988), on the other hand, provides a conceptual framework that argues that customers' motivations are the most critical factor for customers engaging in participation activities.

Several other theoretical approaches to managing customer behavior have also been proposed. Bowen and Jones (1986) used transaction cost analysis to create guidelines on how firms should manage exchanges with customers. According to their model, the level of customer involvement should depend on performance ambiguity and goal congruency. Performance ambiguity refers to the difficulty for one party to evaluate the performance of the other (e.g.

lawyers, auto mechanics). Goal congruency refers to the difficulty in establishing equitable

agreements between customers and service providers due to different and incompatible goals.

According to Bowen and Jones (1986), framework service organizations should seek the

highest customer participation when performance ambiguity is high and goals are congruent,

whereas customer involvement should be minimized when performance ambiguity is low.

The various approaches to managing customer behavior discussed here support the

usefulness of the conceptualization of customers as partial employees and co-producers of

service organizations. However, it has yet to be applied to the domain of IS users behavior in the

IS development literature. Therefore, one major aim of this dissertation is to empirically test the

impacts of co-productive behavior on team process quality.

Hypotheses

Although Chin (1998), under the subhead "Clear Reporting" admonishes that researchers

avoid "explicitly providing hypothesis statements for each structural path in the model" by

suggesting that such superfluosity is "redundant and a wasteful of journal space," nevertheless

this dissertation does just that. It is attempted in concise fashion. H1 and H2 are the new ones,

and H3-H6 are considered to be fairly well established.

The component factors of co-production facilitate expert coordination. Expertise

coordination refers to "team-situated interactions aimed at managing resources and expertise

dependencies." (Faraj and Sproull 2000, 1555). The ability for a team to communicate with each

other and to advocate for themselves or others field of expertise or specialization would certainly

assist in coordinating their expertise. Weick and Roberts (1993) describe HRO (high-reliability

organizations) working because individuals repeatedly and iteratively knit their knowledge

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together through "heedful interrelating" until they have "collective minds" which is then capable of handling rapid operations under adverse weather and battle conditions and where the consequences of violating razor thin tolerances are often catastrophic. Communication is the basis for people to exchange and understand each other's expertise and knowledge. Transactive memory systems (TMS) research stream has indicated that frequent interaction is the basis for forming TMS (Liang, Moreland, and Argote 1995; Moreland 1999). When both users and developers build commitment toward the co-production relationship, more efforts will be put in and real engagement will increase also. These will lead to better understanding toward each other. Therefore, it is hypothesized that:

H1: IS-user co-production is positively associated with expertise coordination.

To maximize teamwork efficiency, specific tasks will be undertaken by members individually and/or in smaller teams. However, some parallel and/or sequential sub-tasks will be inter-related and each member and/or sub team has to coordinate with other entities. Marks et al. (2001) defined the coordination activities as the process of orchestrating the sequence and timing of interdependent actions. Zalesny et al. (1995) also suggested that good coordination would script the sequence and timing of independent actions. Synchronous and/or simultaneous activities must be managed to get high levels of team performance. Team members have to be explicitly and/or implicitly coordinated to achieve goals efficiently.

While co-production allows for expertise to be coordinated, it also allows users and developers to bring their expertise to bear on the problems at hand or pursue the goals and objectives of the project. Bringing expertise to bear refers to both parties, developers and users, bring their unique knowledge or expertise to carry out the final product. In an IS development

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project, the developer/producer alone cannot determine the quality of the output. The final outcome should satisfy actual user requirement and fit into the business environment. Knowledge or expertise from users should be brought into the system development process, so that it can reach predefined and/or emergent goals.

Co-production describes active involvement by the consumer/user in the production of the output. During the process, users communicate with developers as well as other stakeholders to engage in the development process, to understand problems that developers are facing, and sell the system to other stakeholders. The commitment of a party in a relationship, whether reciprocated or not, predisposes that party to put forth effort to maintain and/or improve that relationship. User participation research indicates that users are more willing to put effort and accept system when strong commitment has been built (Keil et al. 1998). Therefore, it is hypothesized that:

H2: IS-user co-production is positively associated with bringing expertise to bear.

Expertise that is not in silos but that is coordinated will tend to increase measures of the project's performance. Project performance refers to whether the team can reach the predefined goal effectively and efficiently. When various expertise from different individuals are available, search cost is reduced. The project team can determine the right direction as early as possible and avoid frequent changes by having comprehensive view. Faraj & Sproull (2000) also demonstrate that expertise coordination is positively related to team performance. Therefore, a link between expertise coordination and project performance is built:

H3: Expertise coordination is positively associated with project performance.

Bringing expertise to bear, similar to the concept of knowledge integration, allows for higher levels of creativity outcomes (Tiwana and McLean 2005). A creative product requires stimulus from more than one perspective. Cross-functional teamwork is popular because the final product involves perspectives from different functions and tends to be more comprehensive and creative (Dougherty 1992). When knowledge from different perspectives can be combined, it allows developers to experiment with new concepts from users. Therefore, we hypothesize that:

H4: Expertise coordination is positively associated with creativity outcomes

Recognizing a need for knowledge, knowing where it is located, and even co-locating it is insufficient for success. Whether expertise from individuals is spontaneously or intentionally brought to bear on the project at hand, it must be occur for project performance to occur (Faraj and Sproull 2000, 1557). Bringing the proper expertise to bear will naturally improve measures of the projects performance. The measures used in Faraj and Sproull (2000) to measure expertise coordination actually include measures of bringing expertise to bear. For a finer grained analysis, this model parses these into two separate constructs:

H5: Bringing expertise to bear is positively associated with project performance.

Bringing expertise to bear refers to (1) users and IS developers on the development team sharing their special knowledge and expertise with one another and (2) a project fostering an environment that is conducive to the users own abilities to produce novel and useful ideas (or services/products). Having intensive interaction between team members is likely to result in greater measures of creativity outcomes such as this project produces many novel and useful ideas or services/products. Providing an environment safe for members to experiment with new

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concepts without fear of negative impacts to reputation, career and/or compensation allows creative idea to be implemented.

Tiwana and McLean (2005) have shown that when at least one piece of knowledge from an individual is used together with expertise from another team member to accomplish a project task, the degree to which a project team's processes are novel is significantly increased (pp. 16, 17, 31, 32). Therefore, it is also hypothesize that:

H6: Bringing expertise to bear is positively associated with creativity outcome.

3. RESEARCH METHODS

Sample

Sampling is not random but deliberately selects samples that include the variable presumed to be relevant. Sampling was intentionally heterogeneous to allow for broader perspective and allow for conclusions to be more likely generalizable since causal relationships are less likely to be found in heterogeneous samples than homogenous samples due to error variance in analysis. For example, the size of projects was not constrained to large development projects but includes web development on a small scale.[9] The ideal sample sought were pairs of developers and users who participated in the development process. This gives the broadest spectrum of perspectives on system development. However, the end users were often not directly involved in the development and proxy was permitted, e.g. the business analyst who represents the views and perspectives of the end users a la (Markus and Mao 2004, 529). One business analyst who worked in a Fortune 500 company who has a programming background, conceded that as an analyst, unless he's forced to, he keeps the two groups out of the same room because the mindsets and mentalities of users and developers were so vastly different and they speak different languages. Probably he has encountered the conflict such encounters can engender (Robey, Smith, and Vijayasarathy 1993).

The original proposal included a target of Orlando MSA because of the geographical propinquity of the academic institution, professional and personal networks in the area.

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[9] In one case, the web development was undertaken between a married couple, playing their respective roles of developer and user. With current divorce rates so high, marriage does not guarantee of personal or professional congruence or agreement. Therefore, while atypical, this pair was deemed to be compromised valid participants.

However, data gathering was not constrained by geographical area. Due to the diverse nature of some company operations (i.e. multiple locations, etc.) discriminating between Orlando and non-Orlando MSA participants can be problematic and no tracking was undertaken.

Data was collected from users who participated in the IS development process. Due to the research purpose, users who have had some input into software development, directly or indirectly (if mediated by a business analyst) were and are qualified to complete the survey.

In general, Dillman's approach was followed because not only are his methods widely accepted but the researcher finds his recommendations backed up by field research. Furthermore, Dillman has earned this researcher's respect by not only clearly advocating what to do and what not to do but also indicates the relevant range of his recommendation by indicating boundaries beyond which his testing has not investigated. In other words, rather than let the reader infer that he doesn't know certain circumstances, he affirmatively and explicitly states in which areas he does not have adequate empirical data to make a recommendation.

Contacts were made via USPS, e-mail, phone, and in person. A mailing on UCF letterhead and stationery soliciting qualified leads will be made from researcher's personal database at the researcher's expense and use the USPS endorsement ADDRESS SERVICE REQUESTED so that those non-current addresses can possibly be corrected for a 37-cent fee, whether forwarded (for first 12 months after change of address (COA) is filed or returned (12-18 months). [10]

Among others, a snowball technique was employed where these primary contacts were also solicited to refer researcher to additional qualified people thereby allowing for secondary, tertiary, and n-iary participants.

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[10] After 18 months, it will be returned without fee but without any correction.

If participants agreed to complete the survey, the questionnaires were mailed, hand delivered or e-mailed to IS users from local companies primarily in the local Metropolitan Statistical Area (MSA) were recruited to participate in this research by completing the appropriately 15-minute survey.

Due to familiarity, flexibility and features this study used Survey Monkey.[11] Although susceptible to "ballot stuffing," appropriate care and precautions were taken to mitigate this potential anomaly as Dillman et al advised. This study used this data collection methodology that will accelerate the process, mitigate errors due to illegibility, etc. with acceptable tradeoffs. In general, online collection is deemed more acceptable because of greater Internet accessibility and other factors.

More specifically, the Survey Monkey system did not allow for random users to participate. All users had to be preapproved through an in-person, voice or e-mail vetting as qualified before they were offered an invitation which had a unique identifier so that the responses could be tracked and paired.

This *modus operandi* was deemed too slow in accumulating respondents so a data base that was advertised at ICIS and operated out of Syracuse University was employed. The research was conducted in two waves towards two separate respondent pools so that we could learn from the former how to fine tune for the larger group. Despite great care in wording the survey solicitation, respondents also had difficulty identifying their role as a user or a developer and then recruiting an appropriate counter part.

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[11] Instead of the free university-based on-line data collection system called Form Manager http://formmanager.ucf.edu/.

A total of 97 users responded. Many (23) of them were collected from on paper-based surveys, but most (74) of them are from online surveys. Twenty three (23) were from Study Response and the remainder (51) were from Survey Monkey. Most of the paper-based surveys were hand delivered and hand collected. Occasionally, they were mailed out and mailed to the office address of the researcher, or hand delivered and returned by mail. Statistics on these various variants of distribution were not captured as there is no anticipated difference. Per Dillman, postage was affixed rather than using Business Reply Mail.

Table 2: Demographics

Gender	#	%	Industry	#	%
Female	38	39.18%	Service	37	38.14%
Male	55	56.70%	Manufacturing	10	10.31%
Missing	4	4.12%	Education	33	34.02%
Age			Other	5	5.15%
<20	1	1.03%	missing	4	4.12%
21-30.	25	25.77%	**Number of users involved**		
31-40	28	28.87%	<3	15	15.46%
41-50	28	28.87%	4-7	23	23.71%
51+	12	12.37%	8-15	21	21.65%
Position			16-25	10	10.31%
Senior manager	13	13.40%	26-50	15	15.46%
Manager	32	32.99%	51-100	10	10.31%
Professional	48	49.48%	>100	4	4.12%
Missing	4	4.12%	Missing	4	4.12%
Years working FT			**Project Duration**		
<1 year	5	5.15%	< 1 year	35	36.08%
1-5 years	12	12.37%	1-2 years	34	35.05%
6-10 years	20	20.62%	2-3 years	11	11.34%
11-14 years	15	15.46%	3-5 years	5	5.20%
16-20 years	6	6.19%	>5 years	9	9.28%
>21 years	35	36.08%	Missing	3	3.09%
Missing	4	4.12%			

N= 97

Demographic analysis

There were 97 IS users who participated in the system development process and responded to our survey. Among those people, 57% of them are male and 39% of them are female, and the remainder omitted registering a valid response. The bulk of the respondents were relatively evenly distributed among the age decades of 20's, 30's and 40's with only 1 below 20 and 12 above 50. Half listed themselves as professionals, about a third as managers, 13% as senior managers and a residual (4) failed to register a valid response. The number of years of working full time was somewhat bi modal. The peak category was a catch all of 21+ which surprisingly was selected by over a third of the respondents. The next highest was 6-10 years which a fifth selected. Service and education made up about a third each of the industries, manufacturing a tenth, "Others" a twentieth. The number of users involved seemed to be somewhat evenly distributed but slightly weighted towards smaller projects with a peak of 24% in the 4-7 range and trailing off to only 4% in the 100+ range. Over seventy percent of projects were under two years and frequency appears to be inversely proportional to duration.

Constructs

User-IS partnering activity was assessed with a modified measure developed by Bettencourt and Brown (1997). In surveying the service management literature, the few available empirical measures of customer co-production either raised construct validity concerns (Cermak, File, and Prince 1994), or had been developed for a specific service context deemed inappropriate for this study (Claycomb and Martin 2001). Thus, the Bettencourt and Brown (1997) measure was deemed the best alternative for this study, given its thorough scale

development process and satisfactory psychometric properties. Because Bettencourt and Brown's measure assesses required in-role behavior of service employees, some items were slightly reworded in order to refer to IS users instead of customers. A total of seven dimensions were included: (1) User Communication (3 items), (2) Shared Problem Solving (3 items), (3) Tolerance (3 items), (4) Accommodation (3 items), (5) Advocacy (3 items), (6) Involvement in Program governance (3 items), and (7) Personal Dedication (3 items). All items of these dimensions were on a five-point Likert-type scale (from 1=Strongly Disagree to 5=Strongly Agree) to measure the frequency of aforementioned behaviors.

Relationship commitment measures were adapted to "development team" from "major supplier" and were taken from (Morgan and Hunt 1994, 35). They includes three items from the same stem, "The relationship that I have with my development team:…is something I am very committed to,…is something I intend to maintain indefinitely," and "….deserves my maximum effort to maintain."

Expertise Coordination: This was measured by four items obtained from (Faraj and Sproull 2000, 1562). They are "The team has a good 'map of each others' talents and skills," "Team members are assigned to tasks commensurate with their task-relevant knowledge and skill," "Team members know what task-related skills and knowledge they each possess," and "Team members know who on the team has specialized knowledge that is relevant to their work." The items were developed in an ISD context by the authors in a methodical and rigorous manner and were deemed appropriate to the context so no modifications were made and no reverse coding implemented (Faraj and Sproull 2000).

Bringing Expertise to Bear: The instrument used four items from Faraj and Sproull (2000, 1562) in an attempt to measure Bringing Expertise to Bear. They included "Users and IS

developers on the development team share their special knowledge and expertise with one another," "If someone on the team has special knowledge about how to perform the team task, he/she is likely to tell other members about it." The original item was reversed coded and had a "not" before "likely." The transcription process the instrument used failed to include the negation. The omission is not apparently intentional. However, the second reverse coded item was properly included as "There is virtually no exchange of information, knowledge, or sharing of skills among members." As discussed elsewhere in this dissertation in more detail, the "no" was evidently not noticed by respondents resulting in spurious results so the item was dropped. The last item is "More knowledgeable team members freely provide other members with hard-to-find knowledge or specialized skills."

Project performance: Seven items were adapted from (Jiang, Klein, and Chen 2006) who took two of the three traditional dimensions of meeting budget, schedule and user requirements (Wateridge 1995) but omitted user requirements since the multiplicity of stakeholders other than just users is obfuscatory in that dimension (DeLone and McLean 1992; Linberg 1999). They also expanded their view to include additional dimensions, i.e. efficiency, amount of work produced, quality of work, ability to meet project goals (Henderson and Lee 1992). The items are from various sources that reflect a variety of success measures that can be assessed (Henderson and Lee 1992; Jones and Harrison 1996). "Maintain high work morale" was also added. All items were measured on a five-point Likert-type scale ranging from "Strongly Disagree" to "Strongly Agree." Subsequent usage of this scale has not been noted. Cronbach's alpha of 0.83 was reported.

Team Creativity: Team creativity is "the creation of a valuable, useful new product, service, idea, procedure or process by individuals working together in a complex social system"

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(Woodman, Sawyer, and Griffin 1993, 293). Four items were adapted from Lee and Choi's 2003 JMIS article "This project produces many novel and useful ideas (or services/products)," "This project fosters an environment that is conductive to users' own abilities to produce novel and useful ideas (or services/products)," "This project considered producing novel and useful ideas (or services/products) for important activities and goals," and "This project actively produces novel and useful ideas (or services/products)" (Lee and Choi 2003, 225). Developers have been known to assess a project as a success when by other measures it was a failure because they learned a lot (Glass 1999). Similarly, creativity outcomes should be measured and analyzed independent of project performance even if assessed by users only. In other words, creativity and project performance should not be lumped into one construct.

<div align="center">Pretesting</div>

Incremental pretesting was conducted. First approximately 30 doctoral students and candidates in the College of Business were considered colleagues and were requested to conduct pretest the online survey without regard to IRB approval and primarily were asked to test the logistical aspects and to secondarily to comment on content. Typographical corrections, logistics, and instructions were clarified and corrected as needed and as they were identified so that as each was winnowed out, subsequent testers could focus on ferreting out the fewer there were to find and not be distracted by already-identified deficiencies.

Concurrently agreement in principle was sought from practitioners to provide their assessment of the survey. After the feedback from peers trailed to a trickle, a cooling off period allowed for any fatal flaws to rear their ugly heads or for some eagle-eyed colleague to point out some methodological madness. No such eruption occurred. Not until the legitimate

<div align="center">47</div>

findings of colleagues were implemented were the four practitioners enlisted to evaluate the surveys' validity. This allowed practitioners to focus on more important content and not be distracted by typos and other errors that may have crept in. Practitioners responses ranged from a perfunctory "It looks fine to me" to an in-depth analysis of the wording of individual items and an assessment of the global view.

One practitioner explained the complexities of the many roles many different people play in the software development process. So many so that she indicated that many of the questions are not relevant to several component members of the software development team who may legitimately be classified as a developer or a user. This reinforced my *a priori* decision to allow the online participants to skip questions--just as a paper participant can do. Not only was parallelism important but the researcher realizes that to some it is infuriating to be forced to provide responses that are totally inappropriate when surveys require that every question be answered even when inapplicable and irrelevant to respondent. Furthermore, extracting forced responses to questions that are not applicable to the respondent tends to corrupt the data and distort the findings.

4. DATA ANALYSIS

"If we knew what we were doing, we wouldn't call it research."[12]
– Albert Einstein

<u>Data analysis for user only</u>

Structured Equation Modeling (SEM) with Partial Least Squares (PLS) (Löhmoller 1989) analysis allows empirical assessment of the measurement model used in this study (Chin 1998). PLS is selected since it is not contingent upon data having multivariate normal distributions nor does it require the large sample sizes of other methods. Additionally, unlike LISREL which only supports reflective relationship PLS supports both types of relationships: formative and reflective. The IS-user co-production relationship examined in this study is a formative second order construct. Latent variables attached to formative measures are the summation of the formative observed variables associated with them (Barclay, Higgins, and Thompson 1995; Campbell 1960). These observed variables are not assumed to be correlated with each other or to represent the same underlying dimension (Chin 1998). Using ordinary least squares as its estimation technique PLS performs an iterative set of factor analysis and PLS applies a bootstrap approach to estimate the significance (t-values) of the paths. In this study, PLS-Graph Version 3.01 (Chin 1994) was used to verify the measurement and test hypotheses.

In addition, PLS is a latent structural equation modeling technique that uses a component-based approach to estimation that involves two steps. The first step is to examine the measurement model and the second step is to assess the structural model.

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[12] This sentiment echoes in today's publications "PM Network" March 2008, Volume 22, No. 3, page 3, in "Opening Shot"—"Managing research projects is difficult. If the answers to problems were obvious or self-evident, it would not be research." T. Charles Yun, manager EXPREeS at JIVE.

Measurement model

Item reliability, convergent validity, and discriminant validity test are often used to test the measurement model in PLS. Individual item reliability can be examined by observing the factor loading of each item. A high loading implies that the shared variance between constructs and its measurement is higher than error variance (Hulland 1999). Factor loading higher than 0.7 can be viewed as high reliability and factor loading less than 0.5 should be dropped.

Convergent validity should be assured when multiple indicators were used to measure one construct. It can be examined by bivariate correlation analyses, reliability of questions, composite reliability of constructs, and variance extracted by constructs (AVE) (Fornell and Larcker 1981). Bivariate correlation can be calculated by Pearson correlation coefficient. Construct reliability can be assessed with Cronbach's alpha. To obtain composite reliability of constructs, the sum of loadings should be squared and then divided by the combination of the sum of squared loading and the sum of the error terms. AVE, proposed by Fornell and Larcker, (1981), reflects the variance captured by indicators. If the AVE is less than 0.5, it means that the variance captured by the construct is less than the measurement error and the validity of a single indicator and construct is questionable (Fornell and Larcker 1981). In addition, the item-total correlation between indicators and the construct they belong to should not be lower than 0.3.

Discriminant validity focuses on testing whether the measures of constructs are different from each other. It can be assessed by testing whether the correlation between pairs of construct are below the threshold value of 0.90 (Bagozzi 1991) and whether the square root of AVE is larger than correlation coefficients (Chin 1998; Fornell and Larcker 1981).

The composite reliability, AVE and Cronbach alpha, factor loadings, and significant level are provided in table 3 and table 4. As the results show, factor loading of each indicator is significant and higher than 0.7 and the AVE of each construct is much higher than 0.5. CR values alpha values are also very high. None of the item-total correlation values is below 0.3. In addition, the square-root of AVE, in table 8, is much higher than the correlation coefficient. The above evidences indicate that validity and reliability are assured in this study.

Table 3: Reliabilities

Constructs	CR	AVE	Cronbach Alpha
User Communication	0.913	0.779	0.85
Problem Solving	0.923	0.800	0.87
Tolerance	0.937	0.832	0.89
Accommodation	0.937	0.831	0.90
Advocacy	0.938	0.835	0.90
Project Governance	0.937	0.832	0.90
Personal Dedication	0.936	0.829	0.90
Relationship Commitment	0.915	0.783	0.86
Expertise Coordination	0.899	0.691	0.85
Expertise to Bear*	0.904	0.759	0.83
Project Performance	0.938	0.683	0.92
Creativity	0.963	0.866	0.95
* Reverse coded and item 3 dropped. Note: CR: Composite Reliability; AVE: Average Variance Extracted			

Table 4: Items' Loadings, t-values and ITC. (Refer to Appendix D for actual items.)

Constructs	Items	Loadings	t-value	ITC
User communication	UserCom1	0.91	41.75	0.76
	UserCom2	0.93	81.35	0.82
	UserCom3	0.81	14.88	0.61
Problem Solving	ProbSol1	0.86	24.47	0.69
	ProbSol2	0.93	64.38	0.82
	ProbSol3	0.90	31.84	0.76
Tolerance	Tol1	0.87	29.25	0.73
	Tol2	0.92	50.44	0.80
	Tol3	0.94	94.62	0.86
Accommodation	Accom1	0.93	57.73	0.83
	Accom2	0.91	35.23	0.79
	Accom3	0.90	41.48	0.78
Advocacy	Advoc1	0.92	47.84	0.81
	Advoc2	0.90	32.85	0.77
	Advoc3	0.93	56.10	0.83
Project Governance	ProjGov1	0.86	23.14	0.71
	ProjGov2	0.95	77.43	0.87
	ProjGov3	0.92	52.24	0.82
Personal Dedication	PersDed1	0.88	32.61	0.75
	PersDed2	0.93	59.67	0.85
	PersDed3	0.92	57.89	0.83
Relation Commitment	RelCom1	0.86	23.75	0.69
	RelCom2	0.92	40.58	0.81
	RelCom3	0.88	26.59	0.74
Expertise Coordination	ExpCord1	0.77	11.89	0.62
	ExpCord2	0.84	18.71	0.70
	ExpCord3	0.87	27.70	0.75
	ExpCord4	0.83	20.93	0.69
Bring Expertise to Bear	ExpBear1	0.90	33.39	0.75
	ExpBear2	0.85	26.42	0.67
	ExpBear4	0.86	27.07	0.67
Project Performance	ProjPer1	0.86	28.48	0.81
	ProjPer2	0.84	24.51	0.77
	ProjPer3	0.89	44.96	0.83
	ProjPer4	0.80	19.22	0.73
	ProjPer5	0.70	9.73	0.62
	ProjPer6	0.90	43.81	0.86
	ProjPer7	0.77	13.57	0.68
Creativity	Creat1	0.91	27.09	0.84
	Creat2	0.93	51.02	0.87
	Creat3	0.92	36.84	0.86
	Creat4	0.96	101.39	0.93

Harman's single factor test was used to test the common method variance. The result indicated that more than one factor was extracted and total variance extracted is 76% and the first factor accounts for 41.33% of variance only. Since no one factor can represent all indicators, common method variance is not evident in this study.

Validation of Co-production activities—the formative second order construct

Co-product is a formative construct which indicates that all eight activities form the co-production concept. The approach proposed by (Pavlou and Gefen 2004) was partially adopted to validate the validity of this construct. This approach contains three steps. First, the first order construct should contribute to the second order construct significantly and constructs with insignificant coefficient should be removed. Although Petters et al (2007) might not oppose this procedure no theoretical support for excluding constructs was identified and in other contexts "vestigial" constructs may encounter salience renewal. Therefore, constraints in this nomological net were *not* removed. In Pavlou and Gefen's second step collinearity among first constructs should be avoided. Third, the second order formative construct should mediate the relationships between first order constructs and one potential predicted variable.

There are eight first order constructs included in the measurement. Four of them (share problem solving, tolerance, project governance, and personal dedication), although not significant, were retained. When the four remaining factors are analyzed as first order constructs they are all significant, however, when they are analyzed as second-order constructs of co-production their significance is eviscerated. One might argue that despite the theoretically

nuanced differences, Problem Solving is subsumed under Communication and that good communication solves problems; that Accommodation includes Tolerance; that obviously Advocacy implies a high degree of Involvement, and that Relationship Commitment would include Personal Dedication.
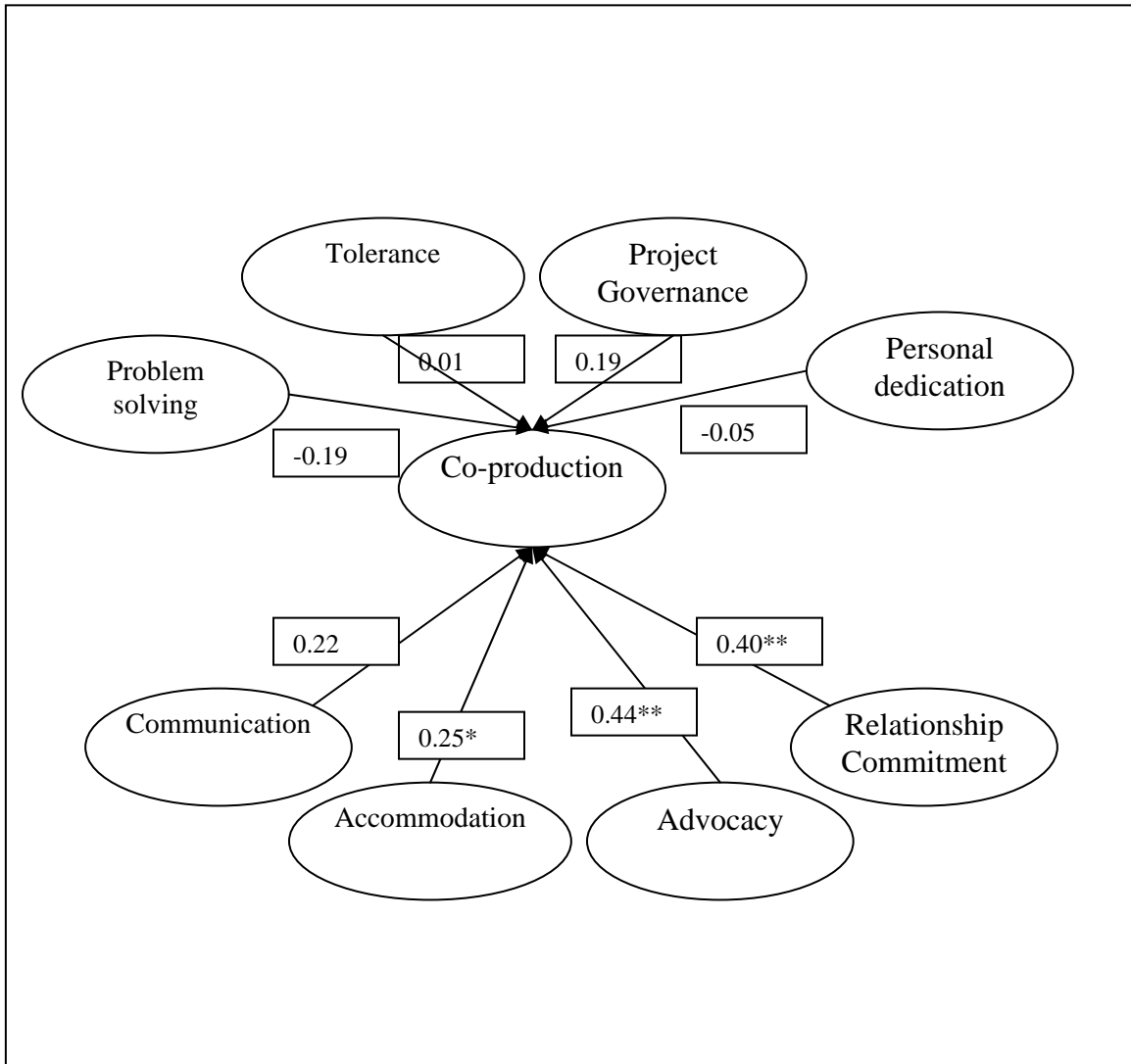
* p<0.05; ** p<0.01

Figure 5: Four factors that statistically form second-order formative construct co-production.

Table 5: Collinearity Statistics

	Tolerance	VIF
communic	.460	2.173
probsol	.407	2.455
toleranc	.471	2.125
accom	.547	1.829
advocacy	.558	1.792
projgov	.385	2.600
PersDed	.345	2.902
relcom	.588	1.699

VIF value for each variable is lower than 10.
No apparent collinearity issues.

Table 5 shows the collinearity test result. Collinearity is a measure of how much IVs stick together. It gives one an indication of how much one IV is likely to predict other IVs. If such were the case, this could be viewed as a form of partial dependency resulting in dysfunctional form of denormalization (when one field determines another it essentially renders the other superfluous). Tolerances that are close to zero and/or excessively large values of Variance Inflation Factor (VIF) can affect the reliability of the analysis because it might be excessively sensitive to fluctuations. Some say look for values of 10 or larger but "there is no certain number that spells death."[13] [14] Therefore with all the VIFs in the single digits, there is no apparent cause for concern and subsequent analysis did not reveal anything to dispute this initial assessment. If collinearity had been discovered to be an issue, then may be one of the IVs isn't needed and they could be combined.

After analysis, co-production is assessed to be a second-order construct which formed by eight different activities. Even though only four of them were demonstrated to be significant in

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13 http://encyclopedia.thefreedictionary.com/Variance+Inflation+Factor (accessed June 06, 2008).
14 http://luna.cas.usf.edu/%7Embrannic/files/regression/Collinearity.html (accessed June 06, 2008).

the nomological relationship that they were tested, and we could drop them per Petter, Straub, and Rai (2007),[15] we retained the insignificant ones also to maintain the theoretical composition of co-production. These first-order constructs and other mediators and dependent variables are then entered into PLS for structural model testing.

<u>Structural model</u>

Table 7 and 8 shows the descriptive statistics and correlation matrix among variables. The structural model is shown in figure 6. The analysis results indicate that IS-user co-product has a strong effect on both expertise coordination and bringing expertise to bear. Expertise coordination leads to both project performance and creativity. Bringing expertise to bear only has significant effect on project performance but not creativity.

Table 6: Descriptive Statistics.

		Descriptive Statistics				
	Minimum	Maximum	Mean	Std. Dev.	Skewness	Kurtosis
UserCom	2.00	5.00	4.05	0.76	-0.64	0.15
ProbSolv	1.33	5.00	3.85	0.86	-0.61	0.06
Tolerance	1.67	5.00	3.65	0.89	-0.30	-0.64
Accom	2.00	5.00	4.03	0.72	-0.38	-0.31
Advocacy	2.00	5.00	4.01	0.76	-0.45	-0.30
ProjGov	2.00	5.00	3.90	0.93	-0.49	-0.80
PersDed	1.67	5.00	4.00	0.85	-0.78	-0.07
RelCom	2.00	5.00	4.35	0.84	-0.26	2.47
ExpCord	1.75	5.00	3.91	0.72	-0.35	-0.19
ExpBear	2.50	5.00	3.55	0.58	0.49	-0.13
PP	2.14	5.00	4.08	0.75	-0.75	0.09
Creativity	1.00	5.00	4.02	0.83	-0.73	0.53

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15 Table 7. "Summary of Literature Related to Assessing and Analyzing Formative Constructs" Phase II: After Data Collection, Step 2.1(2) on p. 642.

Table 7: Correlation Matrix.

	1	2	3	4	5	6	7	8	9	10	11	12
1 UserCom	**0.88**											
2 probsolv	0.66	**0.89**										
3 tol	0.47	0.52	**0.91**									
4 Accom	0.46	0.41	0.62	**0.91**								
5 advoc	0.43	0.49	0.44	0.38	**0.91**							
6 ProjGov	0.50	0.59	0.54	0.49	0.52	**0.91**						
7 PersDed	0.65	0.67	0.51	0.47	0.47	0.75	**0.91**					
8 RelCom	0.41	0.44	0.28	0.33	0.55	0.50	0.49	**0.88**				
9 ExpCord	0.52	0.37	0.44	0.52	0.67	0.55	0.44	0.57	**0.83**			
10 ExpBear	0.38	0.42	0.32	0.33	0.53	0.43	0.41	0.47	0.59	**0.87**		
11 PP	0.43	0.38	0.33	0.42	0.41	0.46	0.45	0.52	0.59	0.45	**0.83**	
12 Creativity	0.39	0.25	0.20	0.36	0.55	0.30	0.28	0.40	0.60	0.37	0.62	**0.93**

Note: The diagonal line represents the square root of AVE
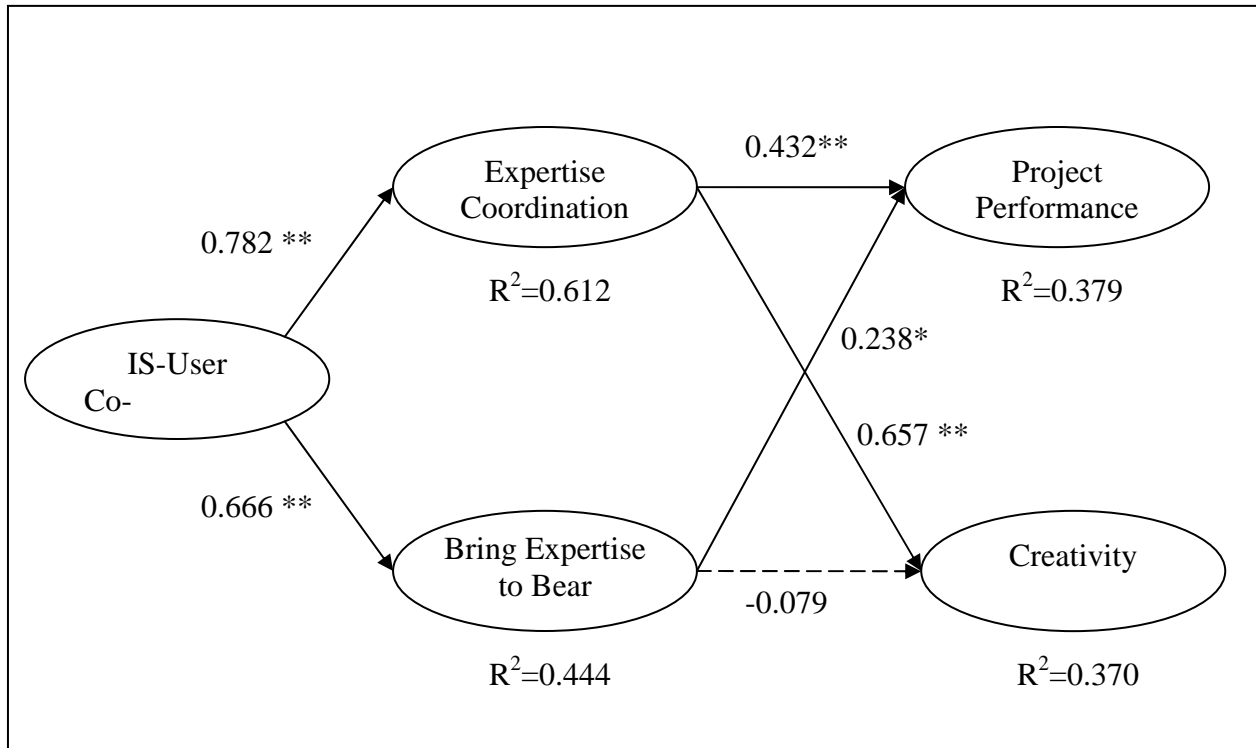
Figure 6: Results of tested model.

<u>Discussion</u>

Most of our hypotheses were supported except the relationship between bringing expertise to bear and creativity. Although (Tiwana and McLean 2005) model on p. 30 shows a strong relationship between Expertise Integration and Creativity, it is possible that in this study the effect of Expertise Coordination subsumes the impact of Bringing Expertise to Bear on Creativity outcomes. They define creativity as "the degree to which a project team's processes are novel in the context of the project's objectives" (Tiwana and McLean 2005, 16). They define Expertise Integration as "the coordinated application of individually held specialist expertise in the accomplishment of tasks at the *project* level" (Tiwana and McLean 2005, 17) [emphasis in original]. Expertise Integration is approximately equivalent to Bringing Expertise to Bear but not the same.

Bring expertise to bear is not enough to generate creativity works while considering expertise coordination. The significant correlation coefficient (0.37**) between bringing expertise to bear and creativity indicates that bring expertise to bear does have an effect on creativity. However, this relationship diminished after joining expertise coordination. This indicates that bringing expertise from either side is not enough to generate creative work. Creative outcomes are more likely when diversified expertise is blended to form a comprehensive view toward the problem.

They are measured with different items. For example, the items can be found in Appendix A (Tiwana and McLean 2005, 42-43). Creativity is measured by three items: "Our team frequently experiments with alternative ways to carry out our work," "Our team is highly

imaginative in thinking about new or better ways to perform our tasks," and "When a non routine matter comes up in our work, we often invent ways to handle the situation."

For Expertise Integration the four items are "Members of this team synthesize and integrate their individual expertise at the project level," "Members of this team span several areas of expertise to develop shared project concepts," "Members of this team can clearly see how different pieces of this project fit together" and "Members of this team competently blend new project-related knowledge with what they already know."

While this paper concurs with Tiwana and McLean that merely assembling expertise is inadequate to spark results and that managers who fail to conduce integration can expect to fail, these differences in definitions and measures, combined with the alternative path of Expertise Coordination, might explain the counterintuitive non significant link between Bringing Expertise to Bear and Creativity outcomes.

<u>Contribution toward academia.</u>

Towards co-production theory

This study examine the importance of co-production with data from 97 IS users who joined the development process and noted a distinct second-order construct utilizing eight first-order constructs. A possible explanation has already been offered for the finding that only four of the constructs where significant as tested in the nomological net. Future studies may wish to use this strategy for measurement as did Smith, Milburg and Burke (1996) and Stewart and Segars (2002).

For expertise coordination research

This study highlights the importance of developers co-producing the system with end users. Users contribute actual requirement or business domain knowledge without which the technical team cannot succeed. The way for users transfer their knowledge to the technical team is through the co-production activities.

For the user engagement research stream in IS

This paper advances it by introducing a new concept: co-production that goes beyond user participation just as knowledge integration goes beyond mere knowledge sharing and knowledge transfer where each team member recognizes the "mutual equivalence structure" and that there is an interdependence of expertise relevant to the ISD project's success (Tiwana and McLean 2005, 18).

A retrospective search of databases and the 19 articles in Social Sciences Citation Index (SSCI)[16] did not reveal any other who examined co-production as a second-order construct. The results of this study suggest that future researchers who empirically study the co-production construct may wish to a view it as a valid second-order construct.

Contribution toward practitioner

Project managers should not view users as requirement provider only. Instead, users play a more important role and should be viewed as part of the team. IS developers co-produce the system with users to carry out the final system.

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[16] Accessed June 12, 2008.

Encouraging expertise coordination within project can lead to better performance and increase individual creativity. Stakeholders who provide an environment for individuals to identify each others knowledge may provide an enriched working situation which may stimulate the individual to make new connections that may directly or indirectly facilitate the project's progress.

While these may be axiomatic to many practitioners, this study provides empirical support for these practices to continue, be emphasized and/or adopted. There may be those who are object to investments in infrastructural and environmental factors because they in and of themselves do not engender a direct payback. However, this study may provide adequate support for activities that build trust, communication, etc. Conversely, this also supports the notion of refraining from activities that would inhibit trust, communication, etc.

Change agents, whether managers, stakeholders and participants, should encourage team members to conduct more of the eight co-productive activities:
While communication, accommodation, advocacy, and relationship commitment have primary impact in this nomological net, it should be recognized that the other areas of shared problem solving, tolerance, project governance and personal dedication are relevant. Depending on the context, the relative importance of components will wax and wane.

These activities like exercise, eating fruits and vegetables, while not necessarily enjoyable in the short-term, and not a guarantee of success, tend to yield the desired results in the long run.

<u>Limitations and Future study</u>

Only included users

   This study was originally designed to capture the perspectives of both the users and developers. The perspective of both can often be so vastly different that obtaining both perspectives is like obtaining a binocular view of a subject of interest. This strategy provide not only more data but offers a richer understanding. More can be developed out of the combined data set than can be from one group who tend to share the same ethnocentric perspective. Photographically, it might be analogous to shooting RAW vs. JPG where a richer set of data is captured in RAW and allows for clearer pictures to be elicited from the underlying data. Therefore, future study should include developers also.

   Social exchange theory allows for amorphous, non discrete transactions with lax accountability and large lag between "settlement" dates, if any. It involves the suspension of explicit *quid pro quo*. While such could be attributed to altruism, a sense of *noblesse oblige*, such informal exchanges are more likely facilitated by a significant amount of trust. Future study should include measures of trust.

Small sample size

   The original goal was to obtain at least 200 pairs. A larger sample size would better feed and drive the statistical model. It would also be able to provide the various industries with greater coverage so that greater granularity might be obtained and variances teased out when focusing on a single industry that might not be apparent when studying ISD across multiple industries.

Cross-sectional instead of longitudinal

A single snap shot of the sun above the horizon is insufficient to determine if it's a sunrise or a sunset. Similarly a snap shot study offers no empirical evidence of temporal precedence hence no support for causality. A longitudinal study can be conducted to upgrade associations to support assertions of causality.

Based on this study, future research can discover who should be involved in the co-production process through other methodologies, such as social network analysis. In addition to expertise coordination, researchers should keep exploring the consequences of co-production.

In conclusion: The relationship between first-order formative constructs may be re-represented in the following figure. This leads to a reconceptualization and provides a paradigmatic shift. In this context trust could be viewed as lubricative, like synovial fluid that facilitates interaction of the elements.
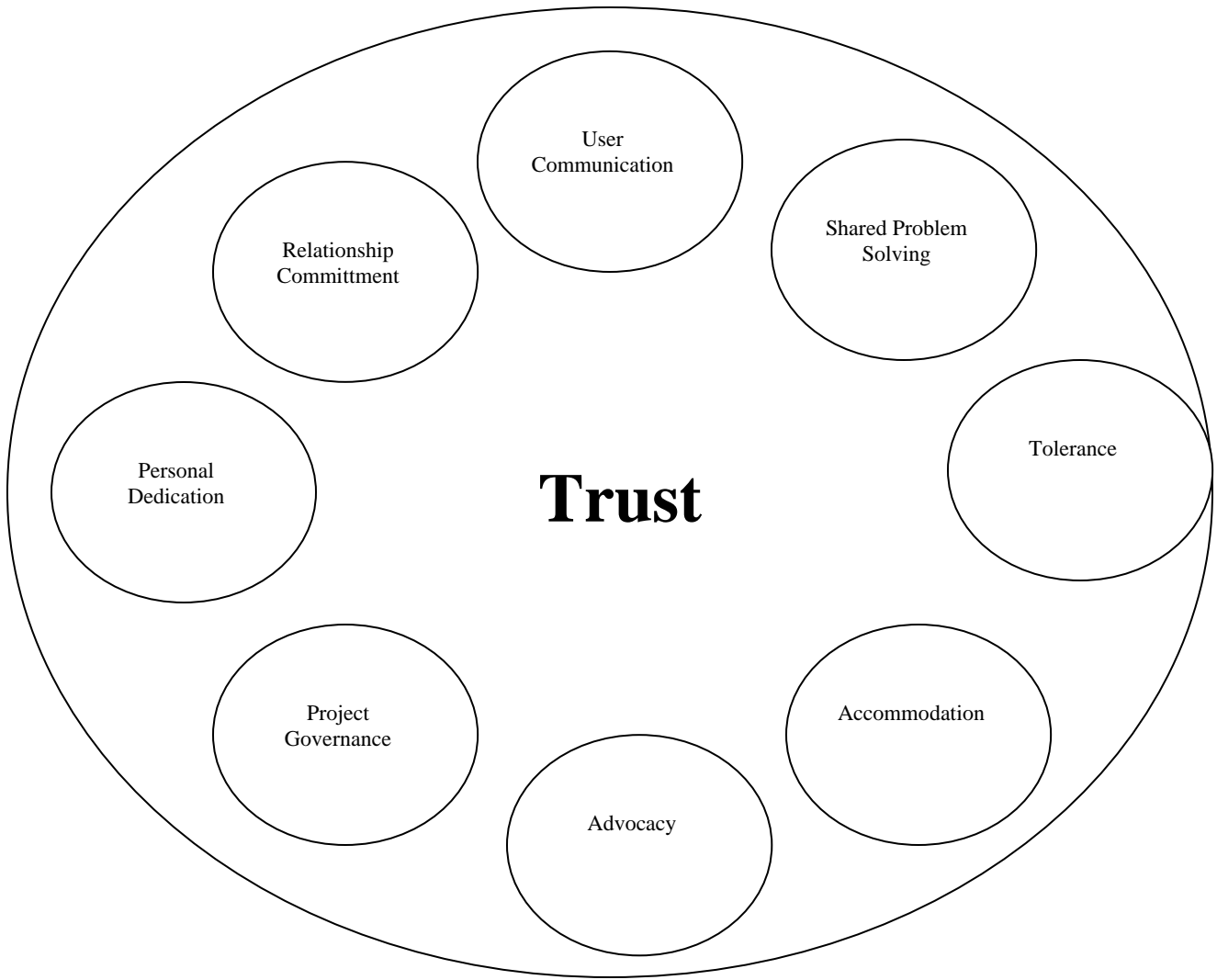
Figure 7: Reconceptualization.

APPENDIX A: IRB APPROVAL

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901, 407-882-2012 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Notice of Expedited Review and Approval
of Requested Addendum/Modification Changes

From: **UCF Institutional Review Board**
         FWA00000351, Exp. 5/07/10, IRB00001138

To: **J.T. Shim**

Date: **October 17, 2007**

IRB Number: **SBE-06-04031**

Study Title: **User-IS Partnership and IS Development Success**

Dear Researcher:

Your requested addendum/modification changes to your study noted above which were submitted to the IRB on
10/17/2007 were approved by **expedited** review on 10/17/2007.

Per federal regulations, 45 CFR 46.110, the expeditable modifications were determined to be minor changes in
previously approved research during the period for which approval was authorized.

Use of the approved, stamped consent document(s) is required. The new form supersedes all previous versions,
which are now invalid for further use. Only approved investigators (or other approved key study personnel) may
solicit consent for research participation. Subjects or their representatives must receive a copy of the consent
form(s).

This addendum approval does NOT extend the IRB approval period or replace the Continuing Review form for
renewal of the study.

On behalf of Tracy Dietz, Ph.D., IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 10/17/2007 03:37:51 PM EDT

IRB Coordinator

Internal IRB Submission Reference Number: 000969

APPENDIX B: SURVEY SOLICITION LETTER

UCF
COLLEGE OF
BUSINESS

J.T. Shim
Ph.D. candidate
jtshim@bus.ucf.edu
http://www.bus.ucf.edu/jshim
407-823-1713 voice, 407=823=2389 FAX

February 14, 2007

I am writing to ask for your help in an important study being conducted to examine how the interactions of information systems (IS) developers and IS users affects the success of IS development projects.

You are selected because you are either an information systems developer or an information systems user. If not already identified, it would be greatly appreciated if you would find a corresponding developer or user with whom you have recently completed an information systems development project to complete the appropriate survey and return them to me in the self-addressed stamped envelopes.

The results may be used to help researchers and practitioners better understand some of the factors that enhance the success of complex IS development projects.

Your responses are confidential and will be released only as summaries in which individual answers will not be identified. Occasionally individual comments may be quoted but this will be done without direct attribution unless explicitly so authorized. This survey is voluntary. However, you can help greatly by taking a few minutes to share your experiences and opinions about IS development.

If you have any questions or comments about this study, I would be happy to talk with you. My number is 407-823-1713 or you can write to me at the address on the letterhead.

Thank you very much for helping with this important study.

Sincerely,

J.T. Shim

PS If you have received this in error, you may pass it along to someone who is qualified to respond.

Enclosures: information systems developer' survey,
                information system user's survey,
                self-addressed stamped envelopes for each survey.
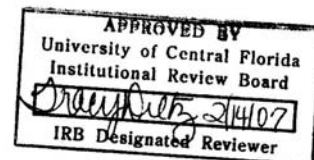
APPROVED BY
University of Central Florida
Institutional Review Board

IRB Designated Reviewer

Management Information Systems Department
College of Business Administration
P.O. Box 161400 • Orlando, FL 32816-1400 • 407-823-3174 • 407=823=2389 FAX

An Equal Opportunity and Affirmative Action Institution

APPENDIX C: INFORMED CONSENT

J.T. Shim
Ph.D. candidate
jtshim@bus.ucf.edu
http://www.bus.ucf.edu/jshim
407-823-1713 voice, 407=823=2389 FAX

COLLEGE OF BUSINESS

February 14, 2007

Informed Consent

Dear participant:

You are being asked to participate in a survey designed to gather information on developers' and users' co-production in IS development.

This research project is designed for research purposes and your individual responses are paired and intended solely for the research team. Please do not complete more than one of these surveys. Responses will be reported in summary, statistical form unless you specifically authorize otherwise. Your responses are considered as confidential, and security will be maintained to the degree permitted by the technology used and Standard Operating Procedure (SOP) of research methods. Specifically, no guarantees are made regarding the interception of data sent via the internet.

Your participation is voluntary. You do not have to answer any question(s) that you do not wish to answer. Please be advised that you may choose not to participate in this research, and you may discontinue participation at any time without consequence. There are no direct benefits or compensation for participation. This survey will take approximately fifteen (15) minutes during one (1) session. There are no anticipated risks associated with participation.

The nature of this research does not warrant a debriefing session; however, you will be given the opportunity to provide your comments, suggestions, and questions at the end of the survey.

If you have any additional questions or comments about this research, to request a copy of the results, or to volunteer to participate in future studies of this kind, please contact:

J.T. Shim, Ph.D. Candidate
Management Information Systems
College of Business Administration
University of Central Florida
POB 161400
Orlando FL, 32815-1400   James J. Jiang, Committee Chair
1-407-823-1713   OR   1-407-823-4864
jtshim@bus.ucf.edu   jjiang@bus.ucf.edu

Questions or concerns about research participants' rights may be directed to the UCFIRB office
IRB Coordinator
Institutional Review Board (IRB)
University of Central Florida (UCF)
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 1-407-823-2901
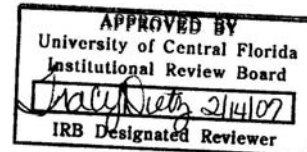
You must be at least 18 years of age to participate in this study. Your submission of a completed questionnaire constitutes your consent to participate in this study.

Management Information Systems Department
College of Business Administration
P.O. Box 161400 • Orlando, FL 32816-1400 • 407-823-3174 • 407=823=2389 FAX

APPENDIX D: USER SURVEY

IS User's Survey

Description of Project
Please provide the name and a short description of the information systems development project:

Section I. User Partnering Activities. We would like your impressions about your most recently completed (i.e., within a couple of years) or almost-completed (i.e., greater than 95%) information systems (IS) project that involved you as a user member in the IS development team. Please respond to the questions by circling the most appropriate response according to the extent to which each following statement best represents your experience. Each item is represented by a 1 to mean "Strongly Disagree" and a 5 to represent "Strongly Agree."

User Communication	Strongly Disagree			Strongly Agree	
1. Users articulate to the IS development team a clear vision of the solution desired.	1	2	3	4	5
2. Users communicate clear expectations and requirements for project outcomes to the IS development team.	1	2	3	4	5
3. Overall, users share honest, clear, and pertinent information for project success with the IS development team.	1	2	3	4	5
Shared Problem Solving					
1. Users raise potentially problematic issues in a timely manner.	1	2	3	4	5
2. Users are proactive at identifying and resolving potential problems with proposed solutions.	1	2	3	4	5
3. Overall, users take individual initiative and shared responsibility for developing solutions.	1	2	3	4	5
Tolerance					
1. Users are patient when minor problems arise from project development.	1	2	3	4	5
2. Users respond to project complications in an understanding manner.	1	2	3	4	5
3. Overall, users respond in an understanding and patient manner in the face of project encumbrances, difficulties, and inconveniences.	1	2	3	4	5
Accommodation					
1. Users rely on the advice and recommendations of IS developers.	1	2	3	4	5
2. Users are receptive to the IS developers' attempts to influence the direction of the project.	1	2	3	4	5
3. Overall, users seriously consider the desires, approaches, and expert judgment of the IS developers.	1	2	3	4	5
Advocacy					
1. Users sell key stakeholders on the merits of the project.	1	2	3	4	5
2. Users gain internal commitment among key stakeholders (secure buy-in to the project).	1	2	3	4	5
3. Overall, users advocate the project and sell its merits to other stakeholders.	1	2	3	4	5
Involvement in Project Governance					
1. Users stay informed about project progress on key issues.	1	2	3	4	5
2. Users periodically monitor the progress of the key solution.	1	2	3	4	5
3. Overall, users take an active role in monitoring progress toward stated project goals.	1	2	3	4	5
Personal Dedication					
1. Users stay personally involved in the project as it progress.	1	2	3	4	5
2. Users make sure that they are available and easy to reach by IS developers.	1	2	3	4	5
3. Overall, users commit to project success by satisfying responsibilities in a persistent, conscientious, and responsive manner.	1	2	3	4	5

Relationship Commitment	Strongly Disagree			Strongly Agree	
The relationship that I have with my development team:					
1…is something I am very committed to.	1	2	3	4	5
2…is something I intend to maintain indefinitely.	1	2	3	4	5
3. …deserves my maximum effort to maintain.	1	2	3	4	5

Section II. Users and IS Developers Relationships in the IS development team. Please respond to the questions by circling the most appropriate response according to the extent to which each following statement regarding the relationship between users and IS developers (in the IS development team) is met in your most recently completed or almost-completed (i.e., greater than 95%) information systems (IS) project. Each item is represented by a 1 to mean "Strongly Disagree" and a 5 to represent "Strongly Agree."

Collaboration in the IS Development Team	Strongly Disagree			Strongly Agree	
1. Users are satisfied with the degree of collaboration with the IS developers.	1	2	3	4	5
2. Users feel the IS developers are supportive.	1	2	3	4	5
3. Users and IS developers are helpful to each other.	1	2	3	4	5
4. Users and IS developers are willing to collaborate during the project development.	1	2	3	4	5
5. Both users and IS developers are willing to accept responsibility for failure.	1	2	3	4	5
Expertise Coordination in the IS Development Team					
1. The users and IS developers on the development team have a good "map" of each others' talents and skills.	1	2	3	4	5
2. Users and IS developers on the development team are assigned to tasks commensurate with their task-relevant knowledge and skills.	1	2	3	4	5
3. Users and IS developers on the development team know what task-related skills and knowledge each possesses.	1	2	3	4	5
4. Users and IS developers know who on the team has specialized skills and knowledge that is relevant to the work.	1	2	3	4	5
Bring Expertise to Bear in the IS Development Team					
1. Users and IS developers on the development team share their special knowledge and expertise with one another.	1	2	3	4	5
2. If someone on the team has some special knowledge about how to perform the team task, he/she is likely to tell other members about it.	1	2	3	4	5
3. There is virtually no exchange of information, knowledge, or sharing of skills among members of the development team.	1	2	3	4	5
4. More knowledgeable team members freely provide other members with hard-to-find knowledge or specialized skills.	1	2	3	4	5
Administrative Coordination in the IS Development Team					
1. The team uses formal policies and procedures for coordinating work between users and IS developers.	1	2	3	4	5
2. The team uses project milestones and delivery schedules between users and IS developers.	1	2	3	4	5
3. The team uses project documents and memos between users and IS developers.	1	2	3	4	5
4. The team has regularly scheduled meetings between users and IS developers.	1	2	3	4	5
5. There are requirements and design review meetings with users and IS developers.	1	2	3	4	5
6. There are design inspections with users and IS developers.	1	2	3	4	5
Flexibility in the IS Development Team					
1. Flexibility in response to requests for changes is a characteristic of this users-IS developers relationship.	1	2	3	4	5
2. Users and IS developers are expected to be able to make adjustments in this ongoing relationship to cope with changing circumstances.	1	2	3	4	5
3. When some unexpected situation arises, users and IS developers would rather work out a new deal than hold each other to the original terms.	1	2	3	4	5

Solidarity in the IS Development Team	Strongly Disagree			Strongly Agree	
1. Problems that arise in the course of this users-IS developers relationship are treated by the parties as joint rather than individual responsibilities.	1	2	3	4	5
2. The parties are committed to improvements that may benefit this users-IS developers relationship as a whole, and not only the individual parties.	1	2	3	4	5
3. The parties in this users-IS developers relationship do not mind owing each other favors.	1	2	3	4	5

Section III. User Readiness. Please respond to the questions by circling the most appropriate response according to the extent to which each process performance and product performance is met in your most recently completed or almost-completed (i.e., greater than 95%) information systems (IS) project. Each item is represented by a 1 to mean "Strongly Disagree" and a 5 to represent "Strongly Agree."

Role Clarity	Strongly Disagree			Strongly Agree	
1. I feel certain about how to effectively participate as a member of the team.	1	2	3	4	5
2. I am NOT sure how to participate in the team properly.	1	2	3	4	5
3. I know what is expected of me as a member of the team.	1	2	3	4	5
4. The steps in the process of being a team member are clear to me.	1	2	3	4	5
5. I believe that there are only vague directions regarding how to participate as a member of the team.	1	2	3	4	5
Ability					
1. I am fully capable of participating as a member of the team.	1	2	3	4	5
2. I am confident of my ability to participate as a member of the team.	1	2	3	4	5
3. Being involved as a member of the team is well within the scope of my abilities.	1	2	3	4	5
4. I do NOT feel that I am qualified for the tasks required of a member of the team.	1	2	3	4	5
5. My past experiences increase my confidence that I will be a successful member of the team.	1	2	3	4	5
Extrinsic Motivation--Instrumentality					
1. Involvement with the team will provide me with convenience.	1	2	3	4	5
2. Involvement with the team will allow me to advance more quickly.	1	2	3	4	5
3. Involvement with the team will get me what I want.	1	2	3	4	5
4. Involvement with the team will provide me more control/influence over the final system.	1	2	3	4	5

Section IV. Project and Process Performance. Please respond to the questions by circling the most appropriate response according to the extent to which each project performance objective was met in your most recently completed information systems (IS) project or almost-completed project (i.e., greater than 95%). Each item is represented by a 1 to mean "Strongly Disagree" and a 5 to represent "Strongly Agree."

Project Performance	Strongly Disagree			Strongly Agree	
1. Projected goals were met.	1	2	3	4	5
2. The expected amount (scope) of work was completed.	1	2	3	4	5
3. Completed work was of a high quality.	1	2	3	4	5
4. The schedule was adhered to.	1	2	3	4	5
5. The budget was adhered to.	1	2	3	4	5
6. Task operations were carried out efficiently.	1	2	3	4	5
7. High work morale was maintained.	1	2	3	4	5

Creativity Outcomes	Strongly Disagree			Strongly Agree	
1. This project produces many novel and useful ideas (or services/products).	1	2	3	4	5
2. This project fosters an environment that is conductive to the users' own abilities to produce novel and useful ideas (or services/products).	1	2	3	4	5
3. This project considered producing novel and useful ideas (or services/products) for important activities and goals.	1	2	3	4	5
4. This project actively produces novel and useful ideas (or services/products).	1	2	3	4	5
Personal Job Satisfaction					
1. After this project, I could draw a positive balance for myself overall.	1	2	3	4	5
2. I have gained from the collaborative project.	1	2	3	4	5
3. I would like to do this type of collaborative work again.	1	2	3	4	5
Personal Learning					
1. I am able to acquire important know-how through this project.	1	2	3	4	5
2. I see this project as a technical success.	1	2	3	4	5
3. I am learning important lessons from this project.	1	2	3	4	5
4. This project promotes me personally.	1	2	3	4	5
Growth Satisfaction					
1. I am highly satisfied with the personal growth and development I get working on this team.	1	2	3	4	5
2. I get a feeling of worthwhile accomplishment from working on this team.	1	2	3	4	5
3. I have the opportunity for lots of independent thought and action working on this team.	1	2	3	4	5

Section V. Please provide the following information about yourself and your project.

1. Your gender: ___ female ___ male
2. Your age: ___ < 20 ___ 21 ~ 30 ___ 31 ~ 40 ___ 41 ~ 50 ___ 51 ~ 60 ___ 61 +
3. Which best describes your position: ___ Senior Manager ___ Manager ___ Professional
4. The industry class of your company: ___ Service ___ Manufacturing ___ Education ___ Other
5. Number of years that you have been working full-time? ___ < 1 year ___ 1 ~ 5 years ___ 6 ~ 10 years ___ 11 ~ 15 years ___ 16 ~ 20 years ___ > 21 years
6. Number of users from functional departments involved in this project:
   ___ <= 3 ___ 4 ~ 7 ___ 8 ~ 15 ___ 16 ~ 25 ___ 26 ~ 50 ___ 51 ~ 100 ___ >100

7. The project duration:
   ___ < 1 year ___ 1 ~ 2 years ___ 25 months ~ 3 years ___ 37 months ~ 5 years ___ > 5 years
8. Is this project completed?
   _____ No   If no, how much longer do you expect this project will take to be completed? _____ months
   _____ Yes   If yes, how long ago was this project completed? _____ months ago.

Thank you very much for your participation in this study.

Print on ivory

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APPENDIX E: DEVELOPER SURVEY

IS Developer's Survey

Description of Project
Please provide the name and a short description of the information systems development project:

Section I. Pre-Project Activities Conducted by the IS Unit. We would like your impressions about your most recently completed (i.e., within a couple of years) or almost-completed (i.e., greater than 95%) information system (IS) project with which you were involved as an IS member of the IS development team. Please respond to the questions by circling the most appropriate response according to the extent to which each statement regarding pre-project activities best represents your experience. Each item is represented by a 1 to mean "Strongly Disagree" and a 5 to represent "Strongly Agree."

User Role Clarification	Strongly Disagree			Strongly Agree	
1. IS developers have a thorough understanding of the range of behaviors that constitute the responsibilities of users.	1	2	3	4	5
2. Users have a clear understanding of the tasks and behaviors expected of them for an effective partnership.	1	2	3	4	5
3. Users have sufficient motivation to perform their role responsibilities at the level expected.	1	2	3	4	5
4. Users have the knowledge, skills, and abilities needed to effectively enact their role responsibilities.	1	2	3	4	5
Project Selectivity					
1. IS developers screen potential projects based upon the urgency and/or priority of the projects.	1	2	3	4	5
2. IS developers screen potential projects based upon the budget and resources users plan to devote to the projects.	1	2	3	4	5
3. IS developers screen potential projects based upon the compatibility of the operating philosophy and culture of the user units and their own.	1	2	3	4	5
4. IS developers screen potential clients based upon the client's understanding of the level and types of involvement expected of them for a successful project.	1	2	3	4	5
5. IS developers screen potential clients based upon the complexity and/or level of customization of the desired product.	1	2	3	4	5
User Training, Education, and Socialization					
1. IS developers establish early opportunities with users to develop desired relationship norms and trust.	1	2	3	4	5
2. Our organization provides opportunities for informal individual development (other than formal training).	1	2	3	4	5
3. Our organization encourages members to attend seminars, symposia, and other learning opportunities.	1	2	3	4	5
4. Our organization provides various programs such as clubs and community gatherings.	1	2	3	4	5
5. Our team members are satisfied by the content of job training or self-development programs.	1	2	3	4	5
Project Leadership and User Performance Evaluation					
1. IS developers match the authority level and personality characteristics of the project leads with those of the user project leads.	1	2	3	4	5
2. Users share common relationship norms and values with IS developers for the purpose of aligning their behavior to desired contributions.	1	2	3	4	5
3. IS developers conduct post-project reviews focused on user production behaviors to identify problematic users or recurring performance problems.	1	2	3	4	5

Section II. Relationships among IS Development Team Members. Please respond to the questions by circling the most appropriate response according to the extent to which each following statement regarding the relationship among IS developers is met in your most recently completed or almost-completed (i.e., greater than 95%) information systems (IS) project. Each item is represented by a 1 to mean "Strongly Disagree" and a 5 to represent "Strongly Agree."

Communications	Strongly Disagree				Strongly Agree
1. There was frequent communication within the IS development team.	1	2	3	4	5
2. The team members communicated often in spontaneous meetings, phone conversations, etc.	1	2	3	4	5
3. The team members communicated mostly directly and personally with each other.	1	2	3	4	5
4. Project-relevant information was shared openly by all team members.	1	2	3	4	5
5. The team members were happy with the timeliness in which they received information from other team members.	1	2	3	4	5
6. The team members were happy with the precision of the information received from other team members.	1	2	3	4	5
7. The team members were happy with the usefulness of the information received from other team members.	1	2	3	4	5
Coordination					
1. The work done on subtasks within the project was closely synchronized.	1	2	3	4	5
2. There were clear and fully understood goals for subtasks within the team.	1	2	3	4	5
3. The goals for subtasks were accepted by all team members.	1	2	3	4	5
4. There were conflicting interests in our team regarding subtasks/subgoals.	1	2	3	4	5
Effort					
1. Every team member fully promoted the project.	1	2	3	4	5
2. Every team member made the project their highest priority.	1	2	3	4	5
3. Our team put much effort into the project.	1	2	3	4	5
4. There were conflicts regarding the effort that team members put into the project.	1	2	3	4	5
Balance of Contribution					
1. The team recognized the specific potential (strengths and weaknesses) of individual team members.	1	2	3	4	5
2. The team members were contributing to the achievement of the team's goals in accordance with their specific potential.	1	2	3	4	5
3. An imbalance of member contributions caused conflicts in our team.	1	2	3	4	5
Cohesion					
1. It was important to the members of our team to be part of this project.	1	2	3	4	5
2. The team members were strongly attached to this project.	1	2	3	4	5
3. The team worked in a friendly atmosphere.	1	2	3	4	5
4. Our team stuck together.	1	2	3	4	5
5. Every member felt responsible for maintaining and protecting the team.	1	2	3	4	5
6. The members of our team felt proud to be part of the team.	1	2	3	4	5
Mutual Support					
1. The team members helped and supported each other as best they could.	1	2	3	4	5
2. If conflicts arose, they were easily and quickly resolved.	1	2	3	4	5
3. Discussions and controversies were managed constructively.	1	2	3	4	5
4. Suggestions and contributions of team members were respected.	1	2	3	4	5
5. Suggestions and contributions of team members were discussed and further developed.	1	2	3	4	5
6. Our team was able to reach consensus regarding important issues.	1	2	3	4	5

Time Compression	Strongly Disagree				Strongly Agree
1. Our team identified many new ways to speed decisions and remove bureaucratic roadblocks.	1	2	3	4	5
2. Our team has been able to cut the amount of time it takes to accomplish the task.	1	2	3	4	5
3. Working on the team was a slow and cumbersome process.	1	2	3	4	5
Information Creation					
1. The team developed many new ways to look at our tasks and took an innovative approach to solving the problem.	1	2	3	4	5
2. This team made major innovations along the way.	1	2	3	4	5
3. Our team produces an outcome that was greater than the sum of the individual contributions.	1	2	3	4	5
4. The team produces knowledge or information that did not exist before the team formed.	1	2	3	4	5
Externalization with Users					
1. IS developers and users often have creative and essential dialogues	1	2	3	4	5
2. IS developers and users often adopt the deductive and inductive thinking for problem solving.	1	2	3	4	5
3. IS developers and users often use metaphors in dialogue for concept creation.	1	2	3	4	5
4. IS developers and users often exchange various ideas and dialogues.	1	2	3	4	5
5. Subjective opinions from IS developers and users are encouraged.	1	2	3	4	5
Collective Mind Between Users and IS Developers					
1. IS developers make their contributions to the joint outcome with attention and care	1	2	3	4	5
2. Users and IS developers have a global perspective of each other's tasks and responsibilities.	1	2	3	4	5
3. Users and IS developers carefully interrelate actions to each other to maximize joint performance.	1	2	3	4	5
Trust Between Users and IS Developers					
1. Users and IS developers respect each other's competence.	1	2	3	4	5
2. Users and IS developers on the project show integrity	1	2	3	4	5
3. Users and IS developers expect the truth from each other	1	2	3	4	5
4. Users and IS developers can trust each other	1	2	3	4	5
5. Users and IS developers count on each other to live up to their word.	1	2	3	4	5
Task Conflicts Between Users and IS Developers					
1. Users and IS developers often disagree about opinions regarding the work being done.	1	2	3	4	5
2. There are frequent conflicts about ideas between users and IS developers	1	2	3	4	5
3. There are often differences of opinions between users and IS developers.	1	2	3	4	5
4. There is often conflict regarding the work done by the joint efforts.	1	2	3	4	5
Relationship Conflict Between Users and IS Team					
1. Personal friction exists between users and IS developers	1	2	3	4	5
2. Personality clashes are evident between users and IS developers	1	2	3	4	5
3. Tension exists between users and IS developers	1	2	3	4	5
4. Grudges are evident between users and IS developers.	1	2	3	4	5
5. Users and IS developers often raise their voices to each other.	1	2	3	4	5
3. I am learning important lessons from this project.	1	2	3	4	5
4. This project promotes me personally.	1	2	3	4	5

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Section III. Project and Process Performance. Please respond to the questions by circling the most appropriate response according to the extent to which each process performance and product performance is met in your most recently completed or almost-completed (i.e., greater than 95%) information systems (IS) project. Each item is represented by a 1 to mean "Strongly Disagree" and a 5 to represent "Strongly Agree."

Project Performance	Strongly Disagree				Strongly Agree
1. Projected goals were met.	1	2	3	4	5
2. The expected amount (scope) of work was completed.	1	2	3	4	5
3. Completed work was of a high quality.	1	2	3	4	5
4. The schedule was adhered to.	1	2	3	4	5
5. The budget was adhered to.	1	2	3	4	5
6. Task operations were carried out efficiently.	1	2	3	4	5
7. High work morale was maintained.	1	2	3	4	5
Creativity Outcomes					
1. This project produces many novel and useful ideas (or services/products).	1	2	3	4	5
2. This project fosters an environment that is conducive to the users' own abilities to produce novel and useful ideas (or services/products).	1	2	3	4	5
3. This project considered producing novel and useful ideas (or services/products) for important activities and goals.	1	2	3	4	5
4. This project actively produces novel and useful ideas (or services/products).	1	2	3	4	5
Personal Job Satisfaction					
1. After this project, I could draw a positive balance for myself overall.	1	2	3	4	5
2. I have gained from the collaborative project.	1	2	3	4	5
3. I would like to do this type of collaborative work again.	1	2	3	4	5
Personal Learning					
1. I am able to acquire important know-how through this project.	1	2	3	4	5
2. I see this project as a technical success.	1	2	3	4	5
3. I am learning important lessons from this project.	1	2	3	4	5
4. This project promotes me personally.	1	2	3	4	5
Growth Satisfaction					
1. I am highly satisfied with the personal growth and development I get working on this team.	1	2	3	4	5
2. I get a feeling of worthwhile accomplishment from working on this team	1	2	3	4	5
3. I have the opportunity for lots of independent thought and action working on this team.	1	2	3	4	5

Section IV. Please provide the following information about yourself.

1. Your gender: ___ female   ___ male
2. Your age: ___ < 20   ___ 21 ~ 30   ___ 31 ~ 40   ___ 41 ~ 50   ___ 51 ~ 60   ___ 61 +
3. Which best describes your position: ___ IS Manager   ___ Project Manager   ___ IS Professional
4. # of years that you have been working as full-time?
     ___ < 1 year   ___ 1 ~ 5 years   ___ 6 ~10 years   ___ 11 ~ 15 years   ___ 16 ~ 20 years   ___ > 21 years
5. Number of IS developers involved in this project:
   ___ <= 3   ___ 4 ~ 7   ___ 8 ~ 15   ___ 16 ~ 25   ___ 26 ~ 50   ___ 51 ~ 100   ___ >100
6. Number of users from functional departments involved in this project:
   ___ <= 3   ___ 4 ~ 7   ___ 8 ~ 15   ___ 16 ~ 25   ___ 26 ~ 50   ___ 51 ~ 100   ___ >100
7. The number of full-time members on the project team: ___ < 7 members   ___ 8 ~ 15 members
   ___ 16 ~ 25 members   ___ > 25 members
8. Project duration: ___ < 1 yr   ___ 1 ~ 2 yrs   ___ 25 months ~ 3 years   ___ 37 months ~ 5 yrs   ___ > 5 yrs

Thank you very much for your participation in this study.

Print on gray

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APPENDIX F: DATA OUTPUT

Reliability

Scale: User Communication

Case Processing Summary

		N	%
Cases	Valid	96	99.0
	Excluded[a]	1	1.0
	Total	97	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.854	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
UserCom1	8.18	2.463	.764	.760
UserCom2	8.23	2.115	.823	.698
UserCom3	7.86	2.939	.610	.897

Reliability

Scale: Problem Solving

Case Processing Summary

		N	%
Cases	Valid	97	100.0
	Excluded[a]	0	.0
	Total	97	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.874	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ProbSol1	7.68	3.345	.693	.879
ProbSol2	7.70	3.003	.824	.762
ProbSol3	7.73	3.011	.761	.820

Reliability

[DataSet1] C:\Documents and Settings\jtshim\My Documents\Dissertation\DataCollection\SHIMJT_2008Feb19_DataUSEROnly.sav

Scale: Tolerance

Case Processing Summary

		N	%
Cases	Valid	97	100.0
	Excluded[a]	0	.0
	Total	97	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.893	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Tol1	7.34	3.248	.730	.905
Tol2	7.30	3.191	.798	.840
Tol3	7.24	3.537	.861	.800

Reliability

[DataSet1] C:\Documents and Settings\jtshim\My Documents\Dissertation\DataCollection\SHIMJT_2008Feb19_DataUSEROnly.sav

Scale: Accommodation

Case Processing Summary

		N	%
Cases	Valid	97	100.0
	Excluded[a]	0	.0
	Total	97	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.898	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Accom1	7.99	2.052	.831	.827
Accom2	8.20	2.180	.791	.862
Accom3	8.02	2.291	.778	.873

Reliability

[DataSet1] C:\Documents and Settings\jtshim\My Documents\Dissertation\DataCollection\SHIMJT_2008Feb19_DataUSEROnly.sav

Scale: Advocacy

Case Processing Summary

		N	%
Cases	Valid	94	96.9
	Excluded[a]	3	3.1
	Total	97	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.900	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Advoc1	8.02	2.279	.809	.854
Advoc2	8.09	2.530	.774	.882
Advoc3	7.98	2.473	.830	.836

Reliability

[DataSet1] C:\Documents and Settings\jtshim\My Documents\Dissertation\DataCollection\SHIMJT_2008Feb19_DataUSEROnly.sav

Scale: Project Governance

Case Processing Summary

		N	%
Cases	Valid	97	100.0
	Excluded[a]	0	.0
	Total	97	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.898	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ProjGov1	7.70	4.003	.713	.925
ProjGov2	7.87	3.430	.873	.790
ProjGov3	7.84	3.431	.819	.838

Reliability

[DataSet1] C:\Documents and Settings\jtshim\My Documents\Dissertation\DataCollection
\SHIMJT_2008Feb19_DataUSEROnly.sav

Scale: Personal Dedication

Case Processing Summary

		N	%
Cases	Valid	96	99.0
	Excluded[a]	1	1.0
	Total	97	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.903	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PersDed1	8.02	3.136	.745	.913
PersDed2	8.02	2.968	.850	.823
PersDed3	7.98	3.094	.828	.844

Reliability

Scale: Relationship Commitment

Case Processing Summary

		N	%
Cases	Valid	95	97.9
	Excluded[a]	2	2.1
	Total	97	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.859	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
RelCom1	8.67	3.648	.690	.855
RelCom2	8.71	2.657	.810	.726
RelCom3	8.75	2.680	.738	.806

Reliability

Scale: Expertise Coordination

Case Processing Summary

		N	%
Cases	Valid	94	96.9
	Excluded[a]	3	3.1
	Total	97	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.849	4

86

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ExpCord1	11.80	5.045	.617	.840
ExpCord2	11.73	4.929	.702	.803
ExpCord3	11.81	4.694	.753	.780
ExpCord4	11.64	5.180	.687	.810

Reliability

[DataSet1] C:\Documents and Settings\jtshim\My Documents\Dissertation\DataCollection \SHIMJT_2008Feb19_DataUSEROnly.sav

Scale: Expertise to Bear--NOT reverse coded

Case Processing Summary

		N	%
Cases	Valid	92	94.8
	Excluded[a]	5	5.2
	Total	97	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.355	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ExpBear1	10.28	2.864	.544	-.119[a]
ExpBear2	10.03	3.680	.308	.185
ExpBear3	11.98	4.747	-.211	.832
ExpBear4	10.26	3.184	.497	-.017[a]

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

Reliability

[DataSet1] C:\Documents and Settings\jtshim\My Documents\Dissertation\DataCollection \SHIMJT_2008Feb19_DataUSEROnly.sav

Scale: Expertise to Bear--Reverse coded

Case Processing Summary

		N	%
Cases	Valid	78	80.4
	Excluded[a]	19	19.6
	Total	97	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.554	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ExpBear1	12.33	4.069	.466	.393
ExpBear2	12.05	4.101	.644	.317
ExpBear4	12.29	4.366	.422	.436
ExpBear3Corrected	12.44	3.782	.106	.813

Reliability

[DataSet1] C:\Documents and Settings\jtshim\My Documents\Dissertation\DataCollection
\SHIMJT_2008Feb19_DataUSEROnly.sav

Scale: Expertise to Bear--#3 dropped. Confirming if #3 dropped.

Case Processing Summary

		N	%
Cases	Valid	92	94.8
	Excluded[a]	5	5.2
	Total	97	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.832	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ExpBear1	8.08	2.049	.748	.709
ExpBear2	7.83	2.409	.667	.790
ExpBear4	8.05	2.404	.664	.793

Reliability

[DataSet1] C:\Documents and Settings\jtshim\My Documents\Dissertation\DataCollection
\SHIMJT_2008Feb19_DataUSEROnly.sav

Scale: Project Performance

Case Processing Summary

		N	%
Cases	Valid	90	92.8
	Excluded[a]	7	7.2
	Total	97	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.918	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ProjPer1	24.43	20.248	.806	.900
ProjPer2	24.38	20.530	.766	.904
ProjPer3	24.34	20.206	.830	.898
ProjPer4	24.67	19.034	.726	.911
ProjPer5	24.49	20.814	.619	.920
ProjPer6	24.43	20.001	.859	.895
ProjPer7	24.46	21.172	.682	.912

Reliability

[DataSet1] C:\Documents and Settings\jtshim\My Documents\Dissertation\DataCollection
\SHIMJT_2008Feb19_DataUSEROnly.sav

Scale: Creativity

Case Processing Summary

		N	%
Cases	Valid	94	96.9
	Excluded[a]	3	3.1
	Total	97	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.948	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Creat1	12.05	6.567	.839	.943
Creat2	12.09	6.423	.871	.933
Creat3	12.09	6.401	.861	.936
Creat4	12.06	6.060	.929	.915

Frequencies

[DataSet1] C:\Documents and Settings\jtshim\My Documents\Dissertation\DataCollection\SHIMJT_2008Feb19_DataUSEROnly.sav

Statistics

		Age	Sex
N	Valid	94	93
	Missing	3	4

Frequency Table

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<20	1	1.0	1.1	1.1
	21-30	25	25.8	26.6	27.7
	31-40	28	28.9	29.8	57.4
	41-50	28	28.9	29.8	87.2
	51-60	6	6.2	6.4	93.6
	61+	6	6.2	6.4	100.0
	Total	94	96.9	100.0	
Missing	System	3	3.1		
Total		97	100.0		

Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male?	55	56.7	59.1	59.1
	Female?	38	39.2	40.9	100.0
	Total	93	95.9	100.0	
Missing	System	4	4.1		
Total		97	100.0		

Bar Chart
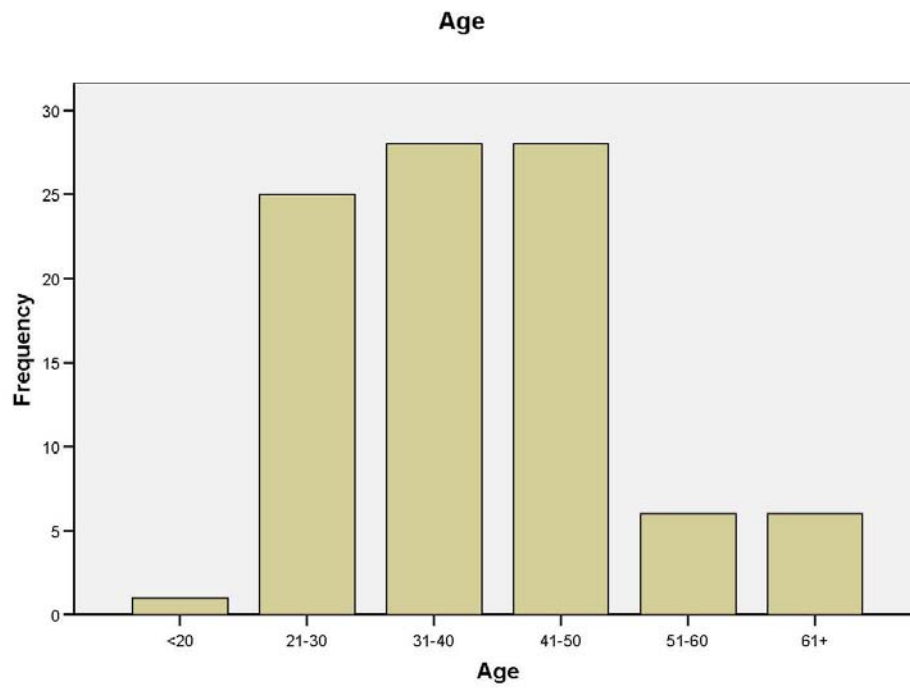
APPENDIX G: PAIRED PROJECT DESCRIPTION RESPONSES ANALYSIS

Please provide the name and a short description of the information systems development project:	Please provide the name and a short description of the information systems development project:	RESEARCHER ASSESSMENT--ARE THESE SAME?		If you have any comments, concerns, or questions that you would like to share with us, please type them in the space provided.
Open-Ended Response	Open-Ended Response			Open-Ended Response
	Content claims - A contents replacement solution for insurance adjusters			
	Design a system to track cases through the criminal justice system and integrate the production of all documents with the system, convert data from an existing database to the new system			
[REDACTED] Directory services which is utilized to store user role relationships that are referenced to indicate what a user has access to in an application.	[REDACTED] Directory Services	SAME		
FAST: STUDENT SIGN IN DATABASE.	Job Connection (for Work-Study Students) - Employers can find work study students eligible, post open positions, etc. online.	SAME		
On Line Facility Work Request Program	Facilities Ticket Tracker - application whereby users can submit work orders to the Facilities department via the web. Allows the Facilities team to track and report on types of issues, resolve time, etc.	SAME		xcellent survey... one of the best I have complete...
Microsoft patch implementation	[REDACTED] Project for Northeast Region (company name kept classified due to nature of work). Work with Northeast Regional Technical Manager to make sure that Microsoft workstations and servers are updated with Microsoft Security Patches and Windows Update patches.	SAME		
Filemaker- database	Database - It houses all the information to run the college	SAME		
PeopleSoft SA/HR 8.9 Upgrade Project... implemented on 11/1/06 which upgraded the software database that is used to track student and employee data. This was upgraded from version 8.0.	PeopleSoft Upgrade from 8.0 to 8.9.	SAME		

PeopleSoft upgrade project for [REDACTED]. Team Lead for Financial Aid Office.	PeopleSoft Enterprise Campus Solutions	SAME		
Financial system	Business info systems--financial and accounting application system.	SAME		
Process for loading off-cycle HR files	Created a process for manually loading an HR file to our system for our clients. Our clients are companies whose health benefits we manage.	SAME		
FS	blank			
[REDACTED]	[REDACTED]	SAME		
Identifying stat orders in pharmacy "[REDACTED] connect" system (electronic archive + workflow management tool for new orders).	Identify state orders with the pharmacy [REDACTED] connect system.	SAME		
Testing charges submitted into EMR and interfacing to billing application system.	Charger entries and testing of charge entry for various departments. Other analyst will have given me information which I enter into the charge for processing through to the financial system.	SAME		
[REDACTED] hospital pharmacy formulary conversion and build [REDACTED] go live.	[REDACTED] hospital--pharmacy formulary conversion and build.	SAME		
[REDACTED] resp	[REDACTED] respiratory	SAME		
[REDACTED] Clinical Manager	[REDACTED] Clinical Manager	SAME		
blank	Surgical information system. The system allows the user to document the surgical procedure, medications, nurses, material used or any observation per patient.			
Nursing Notes	Nursing notes	SAME		
ICU/Critical Care order sets	ICU critical care order set.	SAME		
Implement [REDACTED] system at [REDACTED] facility in the out-patient areas. The physician+other clinical staff will be able to use [REDACTED] to access medical records that have been scanned into the system.	Educationlog	DIFFERENT?		
	Oracle 9: upgrade-this involved upgrading the database to 10g.			
I used the software called [REDACTED], which was used to purchase park admission tickets to	[REDACTED] which is an online ticket system for amusements parks. Users can purchase tickets online	SAME		Can you please be sure to let Professor John Tracy that I

[REDACTED]	and print at home to take to the park for admission.		participated in your survey. Thank you.
Integration with bank data and implementation of [REDACTED] Bank Card module.	Application Development Project: Procurement Cards	SAME	Feel free to email or call if you have any questions or need more information. All the best.
[REDACTED] - It is a wireless billing system.	[REDACTED] was a flagship product of [REDACTED]. It's a billing system that is scaled to 60-million customers. [REDACTED] provides the entire billing solution for the wireless service provider e.g. US [REDACTED]	SAME	
	[REDACTED] - Reporting Application		
[REDACTED]			
[REDACTED]- designed to handle both HR and Payroll needs in the Conference setting.			
The Order Management System (OMS) Provides Order entry, order tracking and invoicing for all customer orders. Including sales analysis and specialized order handling process developed specifically for company purposes. The system is integrated with the Warehouse management system, the company transportation system, the in-house account payable system and the corporate financial systems.			I believe I should let you know that I am what we call an Applications administrator. My expertise and responsibility are really between the Users and IS development. I have a long IS back ground so my responses are from that perspective. Good Luck sir
[REDACTED] Application - allows users to view detailed data within invoicing system			
blank	Implementing a replacement clinical system in a multiple-facility healthcare organization.		
blank	blank		
	blank		
	Student records system--PC-based client systems for keeping students' records, grade input, transcript printing, etc.		
[REDACTED] Clinicals CPOE project - development of physician order entry system			
			I have a few suggestions JT...if you want to give me a call I would be happy to discuss. My new

			office number is [REDACTED]
Home telehealth clinician interface/dashboard			
One-to-One: A project to connect Small Schools (one-teachers schools with 6 grades present) through different technologies like Videoconference, common web-based course management system, email, etc.	[REDACTED]. A distributed education program using telepresence technology and collaboration tools to reverse focus distance education philosophies in essence bringing each student into the center of campus rather than bringing the campus to the student.	SAME.	
[REDACTED]	[REDACTED] - self service interaction management software	SAME.	
	[REDACTED]		
	[REDACTED]		After three and a half years, the key person on [REDACTED] died and we had to find a quick replacement. Therefore, the person I am paired with--the lead web designer, has had limited experience with the project. Because of the death, which was very sad and tragic, his experience was limited to a few months, and he experienced a different team than the one I did for four years. Answers will certainly vary for this reason.
JT's Doctoral Dissertation	[REDACTED]. Basically we [REDACTED] develop financial systems for Credit Unions.		I hope Mr. Shim that the information I just provided will help you achieve your goals. Thanks.
General Process Improvements to the Transportation Management System			We have so many small projects, I answered the questions considering the group of projects instead of a single project.
[REDACTED]	Order Management System - Progress based system that contains the set up and controls the process for the product and supply orders. Acts as the Hub system throughout the filling and invoicing process for multiple systems that either do other processes or need information.	CAN'T TELL.	

	Logistics and Transportation - To handle the flow of product from loading to unloading the truck and to provide departmental reports.		
	Management		
[REDACTED] Adoption and Deployment and the elimination of Open Source Software and legacy apps from our network			
	private info - cannot provide		
	Frequent Guest Program - Revamping our rewards program.		
	We are merging 3 corporate entities onto one common platform for operations, billing and administration.		
for a communications company			
	Database Development, Website Development,		I want to appreciate the organisers of this survey it is indeed a study research
[REDACTED] It deals with the banks treasury and how to manage the treasury .It is been developed in dotnet framework		SAME	The survey is very cool and easy to understand.
	Service operations [REDACTED]. A system that contains all knowledge transitioning documents and information of a client. This system serves as a repository or archive of the client's past knowledge transitions using another system		
SAP, system analysis procurement for manufacturing.			
m.s info form			no comments
	Merge three clinics database to one database to have them all for one software		ty
	Frequent Guest Program - updating site.		
	Email search tool using dynamic filtering		The questions on the survey forced me to reflect on a prior commercial software project I worked on, rather than the current

			project I'm working on. That project was horrible; the connection between users and developers was essentially nil, the architect
?			
name:design and development of grooving fixture...			thank you... no comments...
	I am working on a CRM project ([REDACTED], reporting tool [REDACTED])		
	Accounting Frameworks Upgrade Developing new functionality in our main system.		
No			nothing
Internet and Networking			no
	DEVELOPMENT OF IT INDUSTRIES		VERY GOOD SURVEY, I REALLY ENJOYED IT
	Financial Information Management project		
	Police Reports: to implement a tool to enable users to communicate with remote vendor and to be able to send data via FTP to the remote vendor		
	[REDACTED]		
	Network security		
blood banking information system			
	Microsoft with intensible valuable product and high standard reasonable		Interesting surveys/
	CIS - Customer Information System Integrated solution to accommodate ALL customer related transactions by our company This includes Service Processing, Billing, Collections and all other customer related stuff		Any information system will never succeed if there are no users to use it
	Document Solutions - we build bank statements and what not for our many clients		Pretty interesting
	[REDACTED] crm		
	08 reserve		

EDS Australia			
	Billing system - system used to do monthly billing of large industrial and cooperatives		
	Data Warehouse development - we are developing a data warehouse of our Line of Business		
	ERP Implementation		
	Web based tickets system		
	Information portal for the network and systems group of a 5,000 person state agency		
	C# .NET Windows application development with SQL database and some ASP.NET.		
	creating web applications in java and .net (C#)		
	[REDACTED] - a upgrade from .net 1.0 to 2.0		
	Multiple web projects for education and retail industry		
	Digital Photo System Web-based photo archival and retrieval system with keyword searches, multiple resolution output, and batch input.		
	ongoing maintenance of several projects		You have not taken into account office politics. Also, your questions were much too wordy, e.g., "IS developers make their contributions to the joint outcome with attention and care." or "This project promotes me personally" sounds like pompous mumbo jumbo to me. No developer talks like that.
	[REDACTED] GPS		
	Multiple in house development projects to support business processes		
	[REDACTED] LLC Christian values Social Network web presence		The survey had a bias toward business systems. Our project is created for consumers, so we have customer relations people who represented the user roles in

			planning our system.
	[REDACTED] - project where client has a field photography business, needed for clients to be able to register, request work and pay via the internet. The job is then broadcast via e-mail to all photographers who cover the zip code of the property that needs to be photographed. The photographer then logs in and the first one who accepts the job is given the job. The job then is performed; photos are uploaded, reviewed by admin, and approved to be viewed by client.		
	[REDACTED] Collects rates from major [REDACTED] shippers and provides quotes to [REDACTED] on total move costs. Also collects feedback from the transferees (persons being moved by their companies) on performance satisfaction and claims information. Utilizes cost + performance + claims to help determine the best Shipper for each move.		Despite the pitfalls of communication failures between users and developers the project has been a financial success. Management at this company does not see any value with involving users in the development process which has been an on-going concern of mine.
	[REDACTED] Custom software applications		
	Various in-house development projects that relates to high volume and high capacity transactions applications. The projects vary from small applications to more complex systems.		
	[REDACTED] - Gather and report information concerning multiple real estate developments		
	This question doesn't make any sense. I am involved in many projects, all somehow related to providing financial aid to college students.		
	[REDACTED] is an application for the home builder industry revolving around carpet, tile, and vinyl.		
	Oncology Database - Keeps track of brain tumor exams, radiology treatments, chemo treatments and surgeries.		
	Games		
	New Web Site		

		SAME=20	
		CAN'T TELL=1	
		DIFFERENT?=1	

To protect the potentially-proprietary nature of some of the responses, information deemed to be identifying was replaced with [REDACTED].

Discussion:

The researcher is very aware of the subtle confounds that can be introduced by the researcher (e.g. Hans the horse) and the demand characteristics that may inadvertently be introduced (Shadish, Cook, and Campbell 2002, 77-78) so he sought to minimize interactions that might be construed or misconstrued by anyone to be leading the witness. In retrospect, this *modus operandi* may have been counterproductive because 18% (14/78) of paired responses (at the time of analysis) were unusable because they claimed to share the same role. The 14 were about equally divided between users and developers (6 users, 7 developers, 1 other).

Despite pre-pairing user and developer respondents, about 14 of the 78 total pairs were homogeniuses. This is a term coined by the research to describe situations where *both* of the pair indicated that they were playing the same role, i.e. two users or two developers. If errors were made on elementary of a level, it was feared that there would be mismatches on the mutual project being evaluated. However, of those who provided descriptions, they were overall very clear and consistent--20 were clearly the same, one was not and one was undeterminable. Possibly there is some selection bias--i.e. those who provided descriptions might not have been the ones who had role confusion.

Of the 14 pairs homogeniuses, 5 users provided descriptions and 12 developers provided descriptions.

Of the 78 total pairs 14 were unusable, which left only 64 pairs.

Of the 64 correct pairs, user provided 50 descriptions, and developers 58.

Despite much pre-pairing, 74 responses were from either a user only or a developer only. 28 users and 44 developers (2 w/o response) of which 18 users provided descriptions and 40 developers provided descriptions. In call cases, developers provided descriptions at a higher rate than users. The researcher speculates that developers are more vested in the process and project and also may have more time to allocate to survey response than do users. This is consistent with previous finding that users compared to developers have difficulty making themselves available (Markus and Mao 2004, 528)

One of the respondents provided her phone number and asked me to call. She originally was under the mistaken impression that the survey switched the direction of the anchors midway through the survey despite the fact that they consistently range from Strongly Disagree to Strongly Agree. She also suggested that the direction of the anchors is the reverse of the norm. Based on my recollection of many surveys taken and read, I disagreed. No other respondents reported this confusion.

APPENDIX H: SUCCESS

This mini case is one of two that offers insight into the dynamics of successful co-productive relationships that a theoretical and empirical perspective alone may not illuminate.

DARPA—Urban Challenge official site http://www.darpa.mil/grandchallenge/index.asp [17]Accessed May 7, 2008

Due to the characterization of this project as successful and the heavy reliance on publicly-available information, participants and their context is not heavily disguised as in subsequent vignette illustrating project failure.

Team UCF consisted of a doctoral candidate, president of a local technology firm and several of his staff.

Purpose—the purpose of the DARPA challenge is to develop alternatives to sending humans into harms way yet be able to deliver supplies, etc. to troops on the ground.

Site visit assessment—the researcher read in publicly-available media about an upcoming demonstration and observed a site visit in 2005± from DARPA where the UCF team's vehicle drove a course several times without any intervention and without anyone in the vehicle. It successfully navigated a path avoiding a nearby vehicle-wrecking steep ravine on the left of a turn and a nearby tree on the right side after the turn. The vehicle wasn't always successful in avoiding the garbage cans thrown into its path. It also successfully navigated an oval course. The researcher assesses that a vehicle programmed to achieve this level of self-guidance was a

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17 Additional background information may be found at "DARPA Car, Cornell Vehicle will try to drive 175 miles of rough terrain without human control for a price of $2 million," Cornell University News Service. September 27, 2005, http://www.news.cornell.edu/stories/Sept05/DARPAchallenge.ws.html (accessed June 06, 2008) and http://en.wikipedia.org/wiki/Darpa_grand_challenge (accessed June 06, 2008).

success. DARPA approved the vehicle for competition. Although the entry did not complete the course the accomplishment was significant particularly in light of funding levels.

Funding/resources—the vehicle is donated from by one of the team member's wife. While it is not operating on a shoestring, it's not operating on any huge operating budget either. Several other teams are sponsored by companies with deep pockets or joint ventures between organizations and have already spent more than the $2 million prize money in this competition. Some vehicles are custom made.

Vehicle—the vehicle is a Japanese made station wagon stacked with computer equipment in the front passenger seat, and kill equipment on a tray over the rear luggage area. Computers on board—one Windows, 3 Unix, 1 real-time computer. The vehicle comfortably leaves room for one driver and two rear passengers. The exterior of the vehicle is equipped primarily with a host of sensors, but includes lights and noise-making devices. Some of the sensors are moving as they scan to give the computers better and faster depth perception, but most are stationery. Although this was originally a normal street vehicle, it has major additions to and the vehicle cuts a unique and unmistakable profile. It is not in pristine condition appearing to have had scrapes with walls. No inquiry was made into the source of the injuries to the vehicle as it was not deemed highly relevant and could have even been preexisting before the car became the property of Team UCF.

Although not apparent in the rules or regulations it is perceived by the team that a standard vehicle with modifications is preferred to a custom-built vehicle. The rear right seat is equipped so that the programmer can sit and copy files, update programs, etc. while the vehicle is running. For all of the gadgets and gauges it contains, it could all come to a grinding halt if the engine runs out of oil. Observations of the dip stick in the semi-dark revealed that it was dry. A quart was added. Buying a case was added to the team's to-do list.

Oil—despite the huge investment in computing, sensors, programming, etc. the team could have been stymied for the lack of something as fundamental as oil.

Presentation to ISM3253 class—on a Sunday in early 2007, researcher observed the vehicle being driven on campus and coincidentally also stopped at a STOP sign and spoke with the engineering coordinator and requested that the vehicle be demonstrated to both sections of the introduction to programming class so that the class could see that the programming that they were doing was just the very beginning and that many and complex challenges still exist. The coordinator expressed agreement in principle. Subsequent repeated attempts to track down the coordinator or his graduate student by e-mail, phone, in person, via intermediary, to do the demo or even to come to speak to the class without the demonstration of the vehicle, were unsuccessful due to scheduling, venue, weather, daylight, and a variety of variables and a strong desire to maintain equity and comparability between the two sections of the course because an adequate number of students in both sections expressed moderate to strong interest yet were not flexible enough to switch sections if the vehicle was demonstrated on only one occasion. In pursuit of this guest lecturer, the researcher perceives that the coordinator does not wish to allow a student to demonstrate the vehicle without his supervision. The researcher personally went hunting for the engineering coordinator and learned from many of the people when asked about his whereabouts that he was very busy. Therefore, the researcher perceives that the coordinator was acting in good faith when he expressed a willingness to demonstrate the vehicle to the class and lecture a little but just was not able to find the time.

Recent rendezvous—the researcher went over to the engineering coordinator's office and spoke with a professor who called the coordinator's cell phone to cell phone and explained that a researcher was in the office to see him. Then he handed the phone to the researcher who

explained the purpose of the call. The engineering coordinator explained that they were in a big push to get ready for the competition and it would be several weeks before he would have time to be interviewed. The coordinator in the office also provided the office where the engineering doctoral student might be found. The researcher wandered around the new building and was unable to locate the student's office although he was not there. Then in a Colombo-like maneuver, the researcher returned to the coordinator's office and casually asked the staff where they were testing the vehicle--the top of the new parking garage at nights.

On his way home the researcher drove up there and immediately saw the vehicle, and parked. The coordinator and student saw him, the coordinator, who was driving, stopped, the student rolled down the right rear window and had a short pleasant conversation, after which the driver invited the researcher to jump seat in the only remaining seat—the one behind him. Subsequently other students who came by to observe addressed questions not only to the engineering coordinator but also to the researcher in a manner that made the researcher realize how deeply imbedded with the participants being interviewed and under observation.

Operating practice—trails were conducted at the top of the new parking garage. Although it is designed without outside intervention, a human was always at the controls during the trial runs. The risk of an errant vehicle destroying itself, and/or driving off the roof, and/or damaging other vehicles and/or skateboarders, dance-practicing students, etc. was just too great to run the trials without a human back up in control. Although there is an external emergency kill switch, there is the possibility that the transmission might not get through because of some radio interference, or the toggle switch that disables the $20,000 kill switch box might be flipped. This caution is warranted as other teams have experienced close calls due to unexpected vehicle maneuvers. For example, during a period where the human controller in the chase vehicle lost

visual contact in a tunnel the experimental vehicle came out of the tunnel at an unexpected angle and full-open throttle position! The unintended effect of this precautionary equipment is that the altered weight distribution creates an altered angle which causes the sensitive detection devices that used to be able to see curbs to miss them. The professor brings along an external laser pointer is used to measure the azimuth. Even though the practice session took place at night the vehicle operated sans headlights. Again the researcher didn't inquire (nor did anyone offer insight) into this particular operating practice as it was incidental to studying the interaction between team members but presumes that the vehicle's operating specs require it to be able to operate in adverse conditions and that the vehicle doesn't need it to see and the battery power was allocated for the more vital computer and sensory apparatus.

Challenges—a parking garage ramp might be misinterpreted as a wall and the vehicle may stop. The team's vehicle is expected to be able to maneuver a series of way points alone— without interference or aid from the team. If it can successfully do that, and thereby demonstrate that it is relatively safe for other vehicles, it may proceed to the group event where other unattended vehicles are concurrently competing on the same course.

Rules interpretation regarding warning light.[18] (See page 14 of 28). To warn people operating around a vehicle there should be visual and auditory indication. If the vehicle is placed in auto operating mode, it can be PAUSED, or it can be DISABLED. Without argument, the light should be extinguished when the automatic guidance is killed. However the rules indicate that the light should ALSO be deactivated when the vehicle is in PAUSE mode. The UCF team disagrees and believe that they have a verbal exemption. On one hand they want to comply with

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18 http://www.darpa.mil/grandchallenge/docs/Urban_Challenge_Rules_071007.pdf
See page 14 of 28 (accessed June 06, 2008).

the spirit of safety engendered by the regulations but also do not wish to be disqualified for a technical violation of the rules. Programming it both ways to cover both interpretations is a prohibitively complex and time and energy consuming effort. The researcher cringes at the thought of an auto with a mind of its own but is in a PAUSED mode could with the flick of a switch spring back into action without warning and concurs with UCF team that the rule is misguided—and so stated. He also recommended that they seek documentation. They will seek to e-mail the site visit official who verbally agreed with their interpretation to confirm that their exemption is secure. The researcher doubts that his observations or advice influence the final decision but contributed his input because he believes it to be a safety issue and to accelerate the decision they were already going to make. This was made in recognition of the fact that they admitted to working many hours, many nights from 20:00-03:00 and therefore their judgment might not have been as clear as normal. While the researcher attempted to converse with the team during periods of slack, his contribution was made in an attempt to compensate for the extensive time the team took to explain procedures, problems, rules, mechanical and electrical devices that were often fascinating but sometimes baffling.

Test of emergency stop[19]—5.2.1. Safety. Interestingly, the speed is in MPH but the stopping distance is in meters. Stopping within required distance was one of the tests that was being tested during the ride along/observation period which lasted several hours. The testing appeared to be informal and ad hoc. There were no white coats, clip boards, checklists, rule books, etc. They all appeared to be firmly and clearly aware of what needed to be done and internalized the requirements.

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19 http://www.darpa.mil/grandchallenge/docs/Urban_Challenge_Rules_071007.pdf Page 17 of 28 (accessed June 06, 2008).

Partnership—during the course of the evening a tall man in a black Lexus drove up and the professor stopped to speak with him. He turned out to be president and CEO of the local company that teamed with UCF to write software for the car according to the Orlando Sentinel article referenced above and who the researcher had considered tracking down and visiting in his downtown office. While the engineering professor and president/CEO spoke, this left the researcher with the doctoral student who described the president/CEO's role as team leader in this endeavor. After the evenings testing had concluded, the researcher spoke alone with the president/CEO who confirmed that his role was team leader and explained that he was there to bring some discipline to help harness the raw talent, to bring to awareness that there are finite resources, to dictate that after certain points in time, no software changes are to be made.

As he casually leaned on his black Lexus and explained more of his recollection echoed the coordinator's previous disclosures that the president/CEO was like a breathe of fresh air and that they provided valuable guidance, new energy and a business perspective to a project where the engineers and students were exhausted and losing perspective. The coordinator, student and president all conversed effectively in an egalitarian, informal, and cheerful manner. They were clearly very familiar with each other and their roles. The coordinator got out to move his vehicle into the path of the hurtling experimental vehicle and to operate the kill switch (but declined to do both concurrently!), while the president got in and folded his tall and lanky 6' 6" [estimated] frame into the rear seat and ran the computers after the student moved into the driver's seat.

Research paradigm—researcher tried to fit their relationship into the research paradigm under investigation and after several days realized that these are all team members on the same development team and that DARPA is the user who is requesting this be developed for use in the military field.

DARPA's Technical Officer and Agreements Administrator/Officer responded. Jan [last name redacted] said (October 22, 2007) that Team UCF is a Track B team (receiving no funding from the government and therefore owns the technology developed) and as such they have limited interaction because this is a prize approach vs. a contract, although there was a site visit and e-mail contacts to clarify.

Numerical odds—of 89 teams who entered the competition, 53 received site visits, and the field was narrowed to 36 teams[20].

Uncertainty—among many other things, the routes are not known very much in advance[21].

Anticipated alternative uses—the researcher ties this in with another presentation made on the medical front about battlefront medicine that stated that by law, planes in war zones will be pilotless. They will be all remotely controlled like the Predator observation planes are flown over Iraq by pilots stateside. If we can develop systems to allow vehicles to autonomously and without even the need for remote controlling, it might be feasible to generalize this technology to aircraft! Also science publications in the 1960s predicted civilian cars that would be able to drive themselves along the new but boring interstate roads following an imbedded electronic track in the road or send the car home (by itself) to fetch another family who might have other destinations on his/her agenda. The problem is chicken-and-the-egg like—who wants to put in the expensive infrastructure first? More specifically, who wants to pay to put tons of tracking cable so that cars can follow the road and not get lost or crash when there are so few cars that have such capability?

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[20] http://www.darpa.mil/grandchallenge/docs/FACT_SHEETS_Media0807.pdf (accessed June 06, 2008).
[21] See pages 55-57 at link below
http://www.darpa.mil/grandchallenge/docs/Urban_Challenge_Participants_Conference_FINAL.pdf (accessed June 06, 2008).

Conversely, who wants to equip cars with such auto tracking systems when there are no cables to follow? When perfected this new technology might allow not only military convoys and aircraft to transfer their loads unaccompanied by humans but also civilians to send their kids to school locked in their vehicles, sleepy drivers can turn over the driving to the autopilot and sleep safely and comfortable. Vehicle-to-vehicle communication and intelligence could avoid some collisions and/or mitigate the severity of the others collisions. If under manual control, the collision avoidance system could be activated to take over at predetermined zones to prevent most collisions. Police cars that need to ram other vehicles would obviously not activate collision avoidance. On auto pilot, the vehicle-to-vehicle communications could calculate optimal road density, separation, speed, etc. for optimal throughput with minimal accidents.

Although the team did not win the grand prize nor place in the top three nor were they one of the six cars who finished[22], the team made it through the semi finals to the final 11 out of 89 initial applications, survived 2 hours in the 6-hour course, and the level of technical accomplishment of the 6-member UCF team relative to other teams with as many as 40 members[23], particularly given the Spartan resources, qualifies this endeavor as a success. This is in part a subjective judgment made by the researcher.

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[22] http://www.darpa.mil/grandchallenge/ (accessed June 06, 2008).
[23] http://news.ucf.edu/UCFnews/index?page=article&id=0024004107de59bdf0115d2e014420070ac (accessed June 06, 2008).

APPENDIX I: FAILURE

This mini case is second of two that offers better insight into some of the contributing factors of a failed co-productive relationships that theory and empiricism alone do not expose. These are not intended to replace either theory nor the empirical data but merely to provide supplemental perspective that whether potentially-triangulatory or contradictory.

The researcher had a former student who took a job at a state school that requires major management of building facilities numbering close to triple digits with few people and administrative and state oversight. The current management process took an excessively long time to update with top management getting updates on only a monthly basis. One significant goal is to increase the timeliness of the information. When invited, this researcher very wisely chose not to attempt to tackle this task himself. The employer of the student was sure that COTS would not solve the problem so the researcher drew upon industry organizations and personal contacts to recruit three (3) qualified to bid for the business and facilitated in the communication and negotiation process.

The organization eventually selected and contracted with one of the three companies that the researcher brought to the table, most likely because of perceived competence and low bid. Although the researcher attempted to make it clear that he was acting in the best interest of the organization and all parties concerned, i.e. a transaction broker and not a dual agent or agent for any particular entity or organization, there was detected through secondary sources, a sense that other vendors perceived this as procedurally unfair to have brought others to the table instead of sole sourcing it.

Eventually, it is reported by the student that the principle of the software vendor [here after referred to as EPS] received an optional lucrative offer to serve in Iraq. This has been corroborated by industry contact. This left the organization where the former student worked in a

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lurch and she reports that other clients were similarly left dangling and has apparently ceased

Orlando area operations. Researcher's own investigation reveals that the e-mail no longer works,

all three phone numbers, no longer work and so researcher has resorted to sending snail mail to

the last known address and a relative eventually e-mailed. Although researcher has been to

developer's home, he has not ventured there for a personal visit due to its relatively remote

location and allowing time for the lagged effect of a snail mail letter to take effect.

Checked with www.usps.com to identify which county the property is in. Checked with

county tax appraiser and property records are inconclusive, i.e the name is not the name expected

but often complex legal arrangements preclude a straightforward ownership of property and the

date of last sale apparently predates last visit to the principle software developer. This was done

in an attempt to triangulate on the suggestion that developer liquidated assets. Industry contact

was not been able to locate him either. Researcher's personal contact on the ground in Iraq do not

know of this particular software developer and expressed a desire not to launch an investigation

on researchers behalf because he is there as a civilian to support missile technology and doesn't

know who to trust. Googled programmer's name without success. Researcher believes that it is

important to obtain both the user and the developer's perspectives. The researcher had hoped that

these particular contacts would provide one pair of respondents to his doctoral dissertation

survey. However, such was not the case—after this relatively massive investment of time and

energy not even a pair of data from this! While this is an atypical investment it is indicative of

the lengths the researcher is willing to go to gather data.

Researchers relationship with developer:

They had met informally on a couple occasions at industry meetings. Exchanged business cards,

view website [redacted from this account and which is no longer functional]. Conversations with

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developer prior to contracting process were informal and primarily social in nature. At programmer's invitation, researcher and his family met programmer and his father at programmer's home, talk, eat, play pool, and incidentally tour programming area. Programmer provided credentials and assurances that would lead a reasonably-prudent person to believe that he was reliable and trustworthy.

Researcher's relationship with construction manager:

Researcher met the construction manager on only a couple occasions incidental to when former student (then de facto assistant to construction manager), and developer were meeting with him. They were introductory and non substantive.

Background to meeting with construction manager:

Construction manager who manages portfolio of projects. Researcher sent e-mail to construction manager requesting additional perspective on this failure. He very kindly responded with a couple days and offered to come to meet researcher at 10:30 for 20 minutes. Since this was for the benefit of the researcher the researcher countered offered that he would come to wherever the construction manager was (to minimize the adverse impact on his productivity but also to observe the manager in his environment and hoped that he would be at the new construction site for the medical school. Telephone negotiations revealed that researcher's office was on the way to construction manager's 11:00 meeting. He arrived promptly, as did a research assistant.

Researcher's case study methodology:

From years of mental health counseling, reporting, private investigations and other case studies, the researcher has developed an open-ended, cathartic style of questioning which allows subjects to express his/herself at their own pace and with minimal intervention. One might categorize this is as an exploratory approach (Yin 2003, 5). It is often amazing what subjects will reveal when

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the researcher does not fill the conversation space but allows the silence to draw them out. No coercion is involved. Researcher is also proficient at the rapid-fire interrogatory style where one addresses a wide range of issues in quick succession. The researcher's operating style is not bimodal and he is proficient with intermediate paces and strategy that run the gamut of these two extremes.

He debated which dosage of questions to introduce into the manipulation and opted that for this initial session the optimal strategy would be the former. The researcher is confident that the ensuing narrative would yield many answers. He trusted his instincts to be able to discern relevant questions discern when the interview could be guided to them and/or any preconceived questions. This process was expected to yield far more questions than a 20-minute interview could contain but they would be culled, organized and structured for future encounters. Although some may perceive this intuitive technique to be sloppy, this researcher has had success with this m.o. and deem it highly appropriate for preludatory case study (Yin 2003, 6).

Although recording devices, media and power were available, the researcher opted not to record any conversations explicitly nor covertly because the former may intimidate participants and the other is ethically questionable. Furthermore, the overhead involved with keeping the tapes secure and possibly transcribing them yields nominal incremental value compared to carefully listening and note taking.

Interview with construction manager:
Since time was of the essence, the researcher dived in with an explanation of the academic research purpose, set some parameters and launched the question "What happened?"

He countered, "So what are you going to do for me?" Researcher, not knowing the scope of the problem, was non committal.

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The construction manager indicated that they relied strongly on the reference of the researcher in the selection of EPS to do the programming. They did their due diligence, drew up contract that was approved by legal, spoke with a few sites where his work was operating satisfactorily and proceeded. The contract was for $40,000 of which $30,000 has been spent. Payments were made at the conclusion of each milestone. Researcher understood that these milestones corresponded to completion of modules, of which there were seven.

It was their goal to have this work completed before commencing with a relatively-unique and major construction project.

A basic question researcher asked construction manager's assistant even before the selection of vendor process, and again asked the construction manager, "Is there no COTS (Commercially-Off-The Shelf) software that does what you need?" He said that there are software packages that are coming out now that have certain features they seek but none have it all. Specifics of the features sought are considered proprietary and were not disclosed to the researcher.

EPS, developer, was a corporation essentially operating as a sole proprietorship. A bid from a reputable, established firm would be two to ten times more. Developer would subcontract components to other programmers. However, these subcontracted programmers desired to be compensated on a more passage-of-time-oriented, best-efforts basis whereas the contract paid out on a results-oriented basis. The subcontractors found this untenable and unsustainable. Eventually, developer unsuccessfully sought programmers in Serbia and Russia who would work on the project.

Developer was tasked with 7 modules. Four were completed, 5th is buggy, 2 reporting and summary modules are undelivered. Naturally, other programmers are reluctant to utilize the

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existing 70% of code because of the liability involved. Even if they did, it would consume a

tremendous amount of time to just review and understand the existing code.

State [Tallahassee] is making cuts (estimated 3.6% this year, 6% next year) and not likely

to fund additional development particularly when they are not even funding travel for the

construction manager to visit site where important building is sourced.

Since developer had no construction industry experience, construction manager spent at

least 100 man hours to get programmer up to speed on construction issues and procedures,

flowcharts, etc. and does not have the time to do that again. Because of that unfamiliarity with

the industry he underbid the job because he underestimated the scope of the project.

Since the corporate assets of EPS are liquidated, state organization has little legal

recourse.

Currently there is a buggy website that is not presentable to the president, board of

governors, nor officials in Tallahassee or other schools. The March 2007 internal target was

missed when developer called from Washington DC to report in February 2007 that he was

unable to complete the job.

School wishes to retain intellectual property (IP) rights to the product and be able to

showcase, share and market the software. Subsequently, a couple weeks later, the researcher

drove near the new medical school site and so dropped by to visit with construction manager

without an appointment to talk about possibilities for finding a solution. He was preparing for a

meeting so didn't have time to talk. He is supported at that site by an assistant and a financial

person. Sent follow up e-mail requesting additional information and direction on how to structure

a potential win-win situation with a do-no-harm approach so that school would not have to invest

much more to assess viable options and to structure a deal with upsides and nominal downside. This may not be feasible.

Summary of interview: IS development is not complete and completion in the near future is unlikely because of lack of resources both time and money and what is completed is not presentable. Considered failure by user even if developer deems otherwise (Wateridge 1995, 171)

Former assistant's perspective:

Construction manager is a competent and amazing individual without de facto peer although there may be others that have the same title. His experience and vision are great, his high degree of discipline inhuman. He has (re)-built hospital and school in Iraq/Iran, which makes operating in a US environment relatively easy. He has within his mental noggin an amazingly accurate running total of where a project is.

An attempt by researcher to independently verify that was conducted. Analysis of organizational chart reveals that there are 19 on staff, two of whom have the title "Construction Manager."

Construction manager was mad and disappointed that this project did not get completed.

Final product incorporates Dundas dashboards, written in C#, runs on MS Server 2003, for database uses Access database. State organization collaborated with developer in development process. When developer complained of overwork, organization took on entering data from about 12 projects to populate the database.

Assistant originally was assigned to director but the priority of the project took precedence and she ended up working almost full-time to support this development project. The developer kept making excuses about technical, family issues with resultant delays and

slippages. Construction manager was patient and accommodating during these delays. Developer utilized the time to dissolve the corporation and liquidate the assets. Sergei was an off site programmer attempting to contribute by helping to code but when he couldn't communicate with developer he didn't want to proceed without direction. Now developer works for DOD and the internal target dates for demonstrations to the president and board of governors in Tallahassee has past. Even after abandoning the project, the developer even had the audacity to ask for a letter of reference from the construction manager.

Phase I should have produced a beta version that would meet state requirements, have dashboards and is almost done.

Phase II would have included workflow.

Vision—a large three-ring binder contains the goals and specifications of the information systems development project would be to end up with a visually-oriented dashboard with pictures of projects indicating progress measured by both time and money. The dashboard would provide users information about current real-time status and historical trends like an EKG but also future projections. Individual line item expenses would roll up so that one could get a big picture but drill down to get views at various levels. It would be very easy to use and provide a high level of accountability. Problem identification would be enhanced as would the speed to do so. Documentation of problems and solutions adds to a knowledge management system. Program would meet the unique state-specific funding and reporting requirements. Future state-mandated regulatory reporting changes would generate revenue for the developer, as would adaptations for full functionality for use in other states, or reporting in other contexts. UCF would retain intellectual property rights. Users could be licensed to run the software or could purchase subscription/membership to utilize the software.

Summary: State school despite working as a team with the developer, taking up the slack where possible, exceeding their contractual role, yet they do not have a completely developed, fully-functional information system.

Successful completion would require a good understanding of dashboard technology primarily and construction work secondarily.

Prelude to researcher conversation with developer and his agent:
Industry contact doesn't think that someone would be willing to speak about their failures. Researcher believes that people often want an opportunity to share their side of the story and factoring in social desirability one would expect at least a self-serving attribution of failure to external factors over which they had no control. Researcher has had success in previous cases where interviewees would confess to culpability. Researcher is not so cynical as to suspect that all interviewees will deny responsibility. Even if they do, the way in which they do so can be insightful.

Programmer/developers perspective (10/22/2007 13:30-14:00):
Repeatedly stated that he is not allowed to speak about the project due to the confidentiality agreement that is in place even though researcher may have been involved, the researcher is not in the loop or on the inside and he wouldn't want to violate any agreements. He indicated that if researcher got access to the records, all of it is documented; and if researcher obtained permission for him to speak with researcher, he would be inclined to discuss the situation.

All of those disclaimers not withstanding, he went on to say that he would veto the idea of providing further assistance to a follow up team because they've more than fulfilled their contract and they are also very busy now saving lives with technology with IED's in Iraq where 60-70% of the lives lost are due to IEDs. There is only so much that a developer can do when

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there are so many changes the client wanted beyond the scope of the original agreement. The developer can only afford to assume so much financial risk and still expect to survive.

The half hour conversation was interspersed with non controversial discussions of the Ph.D. he had pursued at UCF, why he hadn't completed it, his 30 years of teaching experience, and some professors desire to do research rather than teach. We reminisced about the pool we'd played, children, the old days of IBM 360s, punched cards, punched tape, rubber-banded card decks, greenbar printouts, compiles, Fortran, etc. and bemoaned the students who complain even with the instant feedback that VB often gives, that programming is hard.

Researcher's observation: the perspectives on what transpired are vastly different. The client thinks that the developer underperformed to a degree that suit for breach of contract is contemplated; developer believes that not only was contract complete but that the client got much more than they bargained for.

Strategy moving forward:

Possibly find someone to finish project. Construction manager believes that no one would want to pickup the project from this point forward because of the liability involved with the existing code. Subsequent contacts with multiple vendors have not resulted in any viable options to bring to the table.

Future action:

Identify what procedure is appropriate to understand the scope quickly. Identify what is confidential and what is not and how to appropriately recruit with minimal disclosure and when does an NDA come into play?

Identify what IP split is reasonable and how to do a JV in that case.

Possible replacement firms:

These were gleaned from referrals and from trade show contacts. Idea.com, Cognizant—US based but Indian subsidiary, Computer Associates, Research In Motion. While this m.o. of research is more along the lines of action research, the researcher finds intrinsic practical and academic value in attempting to cobble together the component players and pieces and grapple with the real-world complexities of software design.

One prospect for white knight to rescue the project is John [last name redacted]. Researcher spoke with receptionist who was a delightful conversationalist. John was not in the office. She offered his cell number. Researcher already had it correctly in Outlook and read it back and she confirmed. Researcher was reluctant to call John with the ludicrous proposal that he undertake a project on which he had been underbid and attempt to complete it with the little remaining resources as no additional funds are authorized in an environment where state budgets were being cut university wide. Even the researcher with his great gall was sane enough to approach this with legitimate temerity. Nevertheless, receptionist encouraged researcher to call. Researcher sought the context of his current situation to gauge his receptivity to a call by estimating what John might be interrupted doing when he received call. Receptionist suspected that at 12:30 he was on the way from a client to a lunch.

Due to the intense mental concentration required for such delicate negotiations, risk of eavesdropping, and the poor cellular connections offered by Cingular [name has not been disguised], researcher makes calls of this nature from landline because of superior audio quality, the ability to take notes undistracted by attempting to drive safely. Therefore, although, researcher had pressing appointment to pick up two young children ages 4 & 7 at 13:00 half hour away, he made the call, reintroduced himself quickly, specified the date of last contact, per Notes in Outlook. Asked John if he knew who was calling, he remembered; asked if he knew why he

was being called—he remembered that the last time we spoke was about the contract—which was a perfect segue to introduce the topic at hand.

Fully recognizing the ludicrosity of the errand, the researcher's goal for the call was a bit indistinct but focused on feeling him out and seeking his advice. Possibly a shift in property rights from state school to the developer might make the deal a doable one for all parties concerned. This shift of IP rights might make it possibly and even plausible for an organization to justify undertaking adopting this abandoned development project. Researcher kept the call on light note as he viewed this as a written-off project and felt like a mortician attempting to resurrect a client. Under the circumstances, objectively observing how unreasonable his request could be potentially be interpreted, a bit of gallows humor appeared appropriate.

John reciprocated and he was good natured and jovial. Currently he's hemorrhaging out of personal funds $10,000-$15,000 per month for software programming costs plus torching $10,000-$12,000 per month for additional overhead to get this off the ground. They are developing software for the restaurant industry and they're making good headway and should go into beta testing in a few months.

So he can't afford to lead this in addition to the couple software projects under way but would be willing to take a look at the existing progress and provide advice and guidance if another team would tackle this project. Possibly a pretty good Ukrainian group at $20/hour for 8-9 months. Subsequently, no additional follow-up was undertaken and the project remains incomplete.

APPENDIX J: WANDERING IN THE WILDERNESS

Wandering in the Wilderness

During negotiations for access to data one gate keeper challenged the value of identifying key success factors to successful software development by asserting that even with divine guidance Moses wandered through the wilderness for 40 years to go only 38 miles. The gatekeeper stated this to illustrate how difficult it is to get a group to achieve goals even when it is clear to some members on how to achieve those goals. He further extracted a *quid pro quo* that access to research respondents would be granted on condition that this illustrative anecdote be referenced in the dissertation. The researcher recognized that the difficulty of changing human behavior in spite of overwhelming clear evidence to the path to optimal outcomes is relevant to implementation of significant findings and acquiesced to the request.

The map titled "The Exodus from Egypt" between pages 576 & 577 of SDA Bible Commentary Volume 1 shows about *300 miles* were traversed. This challenges the gate keepers factual assertion that the distance was only 38 miles.

SDA Bible Commentary Vol 1, page 560 on Exodus 13:17 "in all probability they expected to be in Canaan within a *few weeks.*"

Ex 13:18 "...instead of permitting the Israelites to proceed by the most direct route God led them by a more circuitous one."

He purposed to meet with the people at Mt. Horeb. There they were to enter into a covenant relationship with them as a nation, there He would impart to them His holy law, and there the sanctuary services were to be instituted. The children of Israel were not ready to

understand or appreciate the need of these things...the privations of their long and wearisome journey through the mountainous desert would provide situations in which they would have an opportunity to learn to trust Him. This was the very training they needed in preparation for the difficult task of the conquest of Canaan." [This is like pre-project partnering.]

"And the Lord's anger was kindled against Israel, and he made them wander in the wilderness forty years, until all the generation, that had done evil in the sight of the Lord, was consumed" Numbers 32:13.

All but Joshua and Caleb--who gave a positive report, were allowed to die off. No retraining--house cleaning by attrition facilitated the culture change.

Assuming that there was no additional direct travel time in addition to the 40 years wasted in wandering, the total time was the 40 years. This would work out to a travel rate of about 4.5 feet/hour.

"Visiting the iniquities of the fathers upon the children unto the third and fourth generation" (Ex 20:5) indicates the strength of the grip of natural causal sequence of accumulated bad habits and ignorance can have (ibid p. 603).

Wikipedia "...a simple calculation shows that a group of 3 million walking 10 abreast with 6 ft between rows would extend for around *340 miles*" which means that a 38-mile trip seems unlikely.[24]

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[24] http://en.wikipedia.org/wiki/The_Exodus (accessed June 06, 2008).

However, modern-day Egypt and Israel *do* share a common border so it is conceivable that the distance between point of origin and destination aren't extremely far apart.

Maps. Map under Figure 4 [7th map from top][25] shows "Route of Exodus" and according to legend it's approximately *400 miles [highest estimate].*

Route commentary. "We are informed it is 11 days journey by the way to Mount Seir from Mount Horeb (Mt. Sinai) to Kadesh (De 1:2). The actual distance as the crow flies is about *160 miles [shortest estimate].* This is possible if Israel covers 15 miles a day or 165 miles in *11 days.* If her flocks of goats, sheep and herds of cattle allow only 6 to 10 miles a day it is not possible."[26] This shortest-estimate appears to be misleading since Mt. Sinai is in the Sinai Peninsula well into the journey and Kadesh-Barnea is about 2/3 into the journey (and not near the end). This is based on a visual inspection of Map 2 titled "Israeli's Exodus from Egypt and Entry into Canaan"[27]

If Egypt to Canaan can be represented by Cairo to Jerusalem then the distance is *264 miles (425 km)* (230 nautical miles).[28]

SUMMARY

Even after a desired destination has been identified, getting a group of people to proceed by the most expeditious route can be difficult. This can be attributed to a variety of reasons including entrenched bad habits, leadership, and required en route training, e.g. the Israelites trip to Canaan

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[25] http://www.bibleorigins.net/ExodusRouteMapsVarious.html (accessed June 06, 2008).
[26] http://www.bibleorigins.net/YamSuphTimsahElimAyunMusa.html (accessed June 06, 2008).
[27] "Bible Maps and Photographs" by Intellectual Reserve, Inc. © 1999.
[28] http://www.indo.com/distance/ (accessed June 06, 2008).

took 40 years to traverse a distance that could have been covered in weeks (SDA Bible

Commentary on Exodus 13:17, Vol. 1, p. 560).

APPENDIX K: AUTHOR'S RÉSUMÉ

J.T. Shim

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EDUCATION:

UNIVERSITY OF CENTRAL FLORIDA, Orlando, Fla. Scheduled graduation: August 2, 2008.
Ph.D. candidate in Business—MIS track, Accounting minor.
Dissertation: User-IS partnership and IS development success. Defended June 11, 2008!
Recipient of BE2000 Leadership Scholarship.

ROY E. CRUMMER GRADUATE SCHOOL OF BUSINESS MBA conferred May 1989.
ROLLINS COLLEGE, Winter Park, Fla.
Recipient of Tupperware Merit Scholarship
Matched through Mentor Program with George V. Grune, Chairman and CEO, *Reader's Digest*.
Dean's List.

SOUTHERN ADVENTIST UNIVERSITY, Collegedale, Tenn. Three degrees simultaneously conferred May 1986.
BS in Computer Science—Business Emphasis,
BA in Communications—Journalism Emphasis,
AS in Accounting, and minor in Behavioral Science.

PAPERS & PRESENTATIONS:

"Concern for Information Privacy, Risk Perception and Online Consumer Purchasing."
Craig Van Slyke, J. T. Shim, Richard D. Johnson, and James J. Jiang.
Journal of the Association for Information Systems, 7(6) Article 16, June 2006, 415-444.

"Does Trust Reduce Concern for Information Privacy in E-commerce?"
J.T. Shim, Craig Van Slyke, James J. Jiang, and Richard D. Johnson.
Presented at *Southern Association of Information Systems*, (SAIS) 2004, Savannah, GA.

"Comprehensive Review of EDI-enabled Interorganizational Relationships research Through Multiple Conceptual Lenses."
Wafa Elgarah, Natalia Falaleeva, Virginia Ilie, Carol S. Saunders, J.T. Shim, and James F. Courtney.
Database, 36(1), Winter 2005, 8-29. [An earlier version of this paper was accepted at AMCIS 2002]

"The Impacts of Conflicts on Requirements Uncertainty and Project Performance."
Houn-Gee Chen, James J. Jiang, Jun-Cheng Chen and J.T. Shim.
Journal of International Technology and Information Management 13(3), 2004, 157-168.

"My GTA Experience and Some Advice."
Published in UCF's *Faculty Focus*, 2(3), August 2003 and Collected Editions, Volumes I & II, 2002-2003.
Presented at College Teaching and Learning Conference, Walt Disney World, Orlando, Fla, January 5, 2004.

BOOK:

Instructor Manual (ISBN-13 9780130093936) by J.T. Shim
for Database Design and Development: A Visual Approach by Frost, Day and VanSlyke
(ISBN-13 9780130351227) Prentice Hall, 2006.

REVIEWER FOR:

Southern AIS
Journal of Information Systems Education
International Journal of Electronic Marketing & Retailing

TEACHING:

Instructor of record for: ISM 3253—MIS Techniques—Programming with Visual Basic 2005 (4 hour).
                            ISM 3005—MIS Techniques—Programming with Visual Basic 6.0 and .NET (3 hour).
                            ISM 4212—Database Management (3 hour)
Teaching assistant for ISM 3011, ISM 3005, ISM 4212, and other courses as assigned.

WORK EXPERIENCE:

SENATOR D. LEE CONSTANTINE and
EXECUTIVE OFFICE OF THE GOVERNOR, Tallahassee, Fla. (May 2003)
Intern
Tracked legislation and assisted in Information Systems department, respectively. Other duties as assigned.

KAPLAN EDUCATIONAL CENTER, Orlando, Fla. (February 1994 - present)
Instructor
Teach/tutor P/SAT, GMAT and MCAT review/test preparation sessions designed to significantly raise students' scores. Repeatedly recognized for outstanding teaching.

FEDEX, Orlando, Fla. (April 1999-August 2001)
Senior Customer Account Services Agent
Mastered many complex and proprietary computer systems to make timely and accurate decisions and adjustments to both domestic and international customers. Determine root cause, suggest and implement solutions.

RE/MAX 200 REALTY, Winter Park Fla. (May 1994-January 1999)
Licensed Real Estate Marketing Assistant
Interfaced between top-producing agents and the technology they own to operate their business. Assisted with design, implementation and refinement of systems to accomplish the myriad of details necessary for successful closings.

INACOM INFORMATION SYSTEMS, Altamonte Springs, Fla. (June 1992-December 1993)
Account Representative
Responsible for sales of training, service contracts, computer stand-alone and network solutions to new clients and existing customers both retail and corporate. Repeatedly recognized for outstanding customer service.

SUNBELT SYSTEMS CONCEPTS, INC. Orlando, Fla. (May 1990-May 1992)
Operations
Maintained Standard Procedures, Production and Policy Manual--involved writing and revising in consultation with managers and technical experts. Participated in tape management and report distribution.

DOW JONES & COMPANY, INC. Orlando, Fla. (January 1990-January 1991)
News Assistant for *The Wall Street Journal.*
Proofread text, refers, headlines, indexes and art for adherence to Journal style and internal consistency.

U.S. CONGRESSIONAL INTERNSHIPS, Washington DC
BILL McCOLLUM, (January 1989); MARILYN LLOYD, (May 1985), AL GORE, JR. (August 1984)
Lobbied for H.J. Res. 60--Older Americans' Month; researched Foreign-Trade Zones; responded to constituent mail.

MOTOROLA, Orlando, Fla. (1986-1988)
Personal Communications Representative
Specialized in cellular portable and mobile telephones sales. Responsible for developing business contacts, lead generation, cold calls, mailings, resolving customer complaints. Recognized as one of area's top performers.

BEST AMERICAN HEALTHCARE CORP, Chattanooga, Tenn. (May-September 1986)
Assistant to President and Chairman
Worked with President and Chairman of the Board to develop occupancy and financial projections for acquisitions, recruit physicians, and rebuild patient and community support. Editor of newsletter.

STUDENT ASSOCIATION OF SOUTHERN ADVENTIST UNIVERSITY, Collegedale, Tenn. (1980-1986)
President, Executive Vice President, Senator (2 terms), Editor of **Numerique**, Associate Editor **Joker**, Assistant to the President of Adventist Intercollegiate Association (AIA), and numerous other positions.
Formulated budgets, appointed officers, coordinated activities of 12 officers, certified elections, long-range planning, conceptualized and implemented streamlined operations resulting in two time-sensitive publications being distributed in 2 weeks instead of 2 months with increased data integrity and completeness. [July 13, 2008]

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