Examining Trends of Technology Diffusion Theories in Information Systems

Research-in-Progress

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Abstract

Since the publication of Roger's fifth edition of Diffusion of Innovations in 2003, there is a need to investigate the recent Innovation Diffusion Theory (IDT) for Information Systems (IS) research for the purpose of finding trends. Much research has been conducted and needs to be synthesized to map a direction for future research. The methodology used in this study is meta-analysis of recent IDT IS research (2003-2011) published in the top eight IS Journals and the International Conference on Information Systems (ICIS). The study's initial meta-analysis findings suggest that more variables are tested by many studies to increase richness and attempts are made for more objective measures of the Rate of Adoption variable to improve clarity. The paper's contribution is the direction of Effective Information Systems which can be measured by diffusion into social systems, internationally and collaboratively.

Keywords: Diffusion of Innovations, Meta-analysis, Trend of Technology Diffusion Theories.

Introduction

The Innovation Diffusion Theory (IDT) for Information Systems (IS) is widely used and important for researchers, entrepreneurs, inventors and innovators for theoretical and practical reasons. As a result, the direction of future research is important. Theoretically, IDTIS trends inform the direction of future academic research. Pragmatically, IDTIS trends shed light on innovations in regard to effective IS which are determined by diffusion into a social system locally and globally. A literature review of IDT and IS meta-analysis articles led to a realization of the need for a meta-analysis of recently published IDT IS research from 2003 to 2011 to examine trends of technology diffusion theories in IS. The most recent meta-analysis of diffusion models found in the literature was dated 1990 by Sultan, Farley and Lehmann (Sultan et al. 1990). Rogers, a leader in the theoretical development of diffusion of innovations, published his most recent book in 2003. New innovations offer opportunities to apply IDT and, as a result, the 5,000 published IDT studies are expected to continue to grow (Rogers 2004). Rogers concludes that "the diffusion process displays consistent patterns and regularities, across a range of conditions, innovations and cultures" (p. 19). The future direction of IDT research is of particular interest to IS Researchers. Research into IDTIS trends is the selected meta-analysis focus of this IDT trends research.

The research on the use of IS involves many theoretical approaches. One theory focuses on the diffusion of innovative IS. The IDT, proposed by Rogers (1962), updated to include communications by Rogers and Shoemaker (1971) and maintained by Rogers (1983; 1995; 2003), theorizes diffusion of innovations is determined, in part, by the individual perceptions of five characteristics (attributes) of innovations. Specifically, the relative advantage, the compatibility, the complexity, the trialability, and the observability of an innovation, as perceived by members of a social system, are related to its rate of adoption. The model of the characteristics of innovations relationship with the Rate of Adoption of Innovations (ROAI) is described as the Basic IDT Research Model because the characteristics of innovations are theorized to explain much of the variance in the ROAI.

The research purpose of this study is to answer the question: what is the past, present and future of IDTIS? In particular, the past and current IDTIS research is studied to answer the following specific questions: (1) Progress: What progress is noteworthy (2003-2011)? (2) Findings: What are the research findings? (3) Authors: Who published research findings? (4) Current: What is the current thinking expressed in the research findings? (5) Future: What directions are delineated in the research? In summary, the objective of the study is to examine the past, present and future of IDTIS. The literature review into IDT and IS meta-analysis is discussed next.

Literature Review

To prepare the theoretical foundation for the propositions, this literature review examines meta-analysis research of IDT trends and meta-analysis of analogous IS theory trends and definitions of key IDT terms. Many research studies have been published about IDT. As a result, meta-analyses have been published about IDT. One study focused on the meta-analysis of application of diffusion models for rate of diffusion and meta-analysis of IS in general (Sultan et al. 1990). An additional research article focused on an understanding of the role of meta-analysis in information system research (King and He 2005). Several studies performed meta-analyses of analogous information system theories (He and King 2008; Lee et al. 2003; Ma and Liu 2004; Montazemi and Wang 1988; Montazemi and Wang 1989; Schepers and Wetzels 2007) and information technology diffusion (Fichman 1992).

These researches set the stage for statistical research of past studies to better understand past results and identify trends. Experts can also identify trends. In 1996, Rogers identified three new kinds of diffusion research as resistance to adoption, rate of adoption and peer network diffusion (Rogers et al. 1997; Singhal and Law 1997). Researching resistance to adoption is important to understand how to encourage adoption. Bass (2004) emphasizes forecasting prior to product launch using the Bass Model (Bass 1969) and notes that good models explain part of reality well and generate higher level theories (Bass 1995).

There are many variables in the IDT for specific IS which are derived from an understanding of the Basic IDT Model. Rogers (1962) originally theorized five stages of adoption, five types of adopters and five

characteristics of innovations. Some research preceded the Diffusion of Innovation Theory and Gabriel de Tarde is considered the father of diffusion research by Rogers (2003). Five adopter categories (innovators, early adopters, early majority, late majority and laggards) can be partitioned based on members of a social system IS innovativeness (the degree to which an individual is relatively earlier in adopting a new IS idea than others) using two parameters of the normal distribution, the mean and the standard deviation (Rogers, 1962). To proceed with this research in IDTIS Trends, several definitions need to be established. Consistent with Rogers (1962), for this study an innovation is an IS idea perceived as new by the individual inventor and diffusion is the process by which an IS innovation spreads. While some studies differentiate between implementation for organizations (putting an innovation into use) and adoption for individuals (the decision to use an innovation) (Rogers 2003), this study defines adoption for both organizations and individuals as the decision to use an IS innovation by putting the innovation into use.

Consistent with Rogers (1962) and for this study, the diffusion culture is defined as the most frequently occurring pattern of overt behavior for the members of a particular international culture to diffuse new IS ideas; the diffusion process (the diffusion period) is measured from the date the first individual is aware of an IS innovation until it has reached complete adoption internationally; the adoption process is the mental process through which an individual passes from first hearing about an IS innovation to final adoption; and the ROAI is the relative speed with which an IS innovation is adopted by the members of a social system locally and globally and is determined by the number adopting in a given year divided by the number yet to adopt that year. The research model and propositions are developed next.

Research Model and Propositions

Building on the theoretical base of prior published meta-analyses of information system theories and published research expert reports, three propositions for IDT Trends are developed. Using prior meta-analyses of information system theories as a starting point, this study proposes to find trends focused on adding value to IDT research. The trends are (1) Addition of Variables for specific IS, (2) More Objective Measures of Observable Variables and (3) Major Changes in IDT Research Methods for IS. These trends are formulated in the form of propositions and summarized in Figure 1. Consistent with strategic direction diagrams summarized by Schilling (2010), the trend research model shows the propositions between the Current IDT on the left and the Future IDT on the right of Figure 1 and is included in the low right part of Figure 2 (discussed in more detail in the Results section).

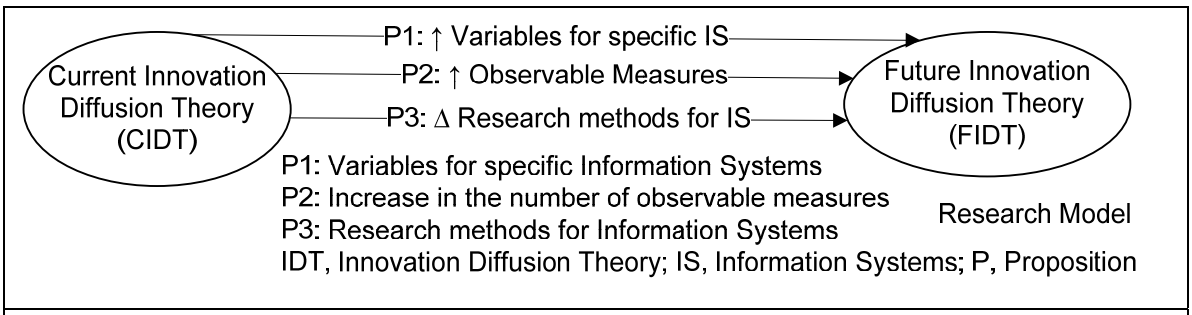

Figure 1 Research Propositions diagrammed in the form of a Research Model

Most researchers would expect to find an increase in the number of latent variables included in the IDT Model as researchers attempt to explain more of the variation in human adoption behavior decisions and as more types of innovative information technology systems are adopted and studied. More importantly, this study expects to find a trend in the addition of variables for specific IS such as the Health Care applications.

P1: An IDTIS trend is the addition of variables for specific Information Systems

The variables contained in the IDT Model are latent variables. Latent variables, such as perception of complexity, are measured to approximate the underlying reality, such as the real complexity of an

information system. Measuring a directly observable variable would enhance the accuracy and validity of the IDT Model. So, this study expects to find an increase in the number of observable measures as researchers attempt to increase the accuracy and validity of the IDT Model.

P2: An IDTIS trend is an increase in objective measure of observable variables

Studies often document limitations of the IDT and propose future directions of research. Even Rogers (2004) and Bass (2004) expect to find changes in the direction of IDTIS Research. As a result, this study expects to find a change in the theory as researchers attempt to address limitations of IDT with changes in research methods for IS.

P3: An IDTIS trend is major changes in IDT research methods for Information Systems

Research Methodology

To find trends in IDTIS research, the past and current IDTIS research is studied to understand the progress, findings, authors, current state and trends of IDTIS research. The methodology used in this study is meta-analysis of recent IDTIS research (2003-2011) to collect data, qualitatively and quantitatively analyze the data and statistically report suggested trends in IDTIS research. Studies of factors influencing adoption led to the theoretical development of over fifty generalizations initially (Rogers, 1962, pp. 311-314), then over a hundred generalizations later (Rao 1971). To focus the research in this study, three types of literature are collected as follows: (1) Meta-analysis for IS, (2) IDTIS history and (3) IDT data.

Meta-analysis conducted by Sultan, Farley and Lehmann (1990) found 30% to 50% of the variability in diffusion models are explained by the latent variables. A meta-analysis type studies have been used for over 30 years as exampled by Farley, Lehmann, and Ryan (1981) and a form of meta-analysis called replication analysis by Assmus, Farley and Lehmann (1984). A general analysis of the use of meta-analysis in Management Information Systems (MIS) Research was conducted (Hwang 1996). Meta-analysis is performed for firm-level research (Kohli and Devaraj 2003) and user-level research (Hwang and Thorn 1999). Consistent with Glass (1976) who coined the term meta-analysis and King and He (2005) who developed an understanding of the role and methods of meta-analysis in IS research, meta-analysis in this study is the combination of the results from many studies to produce a statistical summary of the big picture of the IS research being conducted. However, King and He (2006) reported meta-analytic research in IS can contain bias. Consistent with Hwang and Wu (1990) this research uses meta-analysis, a quantitative literature review technique of articles, to integrate and combine the results from several IS research articles.

The first step in a meta-analysis is the design of protocols to focus data collection and subsequent analyzes. The protocols identify the data to be collected based on the research objectives, facilitate the information collection process and focus the data analysis. In this study, the data analysis consists of qualitative analysis and quantitative analysis. A key protocol for this study is Categories Determining Rate of Adoption of IS. This protocol is discussed later in the paper as the need to understand up to eight categorizes of research to determine the ROAI. Another protocol is Chronological Progress of IDT Research to understand the historical direction of IDTIS. Several protocols were used to collect definitions such as Terms used in IDT, Adopter Categories used in IDT, Stages used in IDT, and Variables used in IDT. In addition, Information Systems used in IDT Studies and Most Prolific Researchers Based on Journals are collected.

A federated search is conducted using an advanced scholar search with “diffusion” in the title and the journal name in publication and 2003 to 2011 in the date. The electronic search focuses on the eight top tier Information Systems (IS) academic journals as follows (with the percentage of articles in this study): MIS Quarterly (MISQ, 6%), Information Systems Research (ISR, 6%), Journal of Management Information Systems (JMIS, 12%), European Journal of Information Systems (EJIS, 6%), Information Systems Journal (ISJ, 9%), Journal of Information Technology (JIT, 3%), Journal of Strategic Information Systems (JSIS, 6%) and Journal of the Association for Information Systems (JAIS, 3%) (Venkatesh 2011) and additional electronic search focusing on top IS Conferences such as the International Conference on Information Systems (ICIS, 39%), and additional journals (9%). The emphasis on ICIS is because of the large number of recent articles found in ICIS addressing IDTIS.

This study could be duplicated from the list of research articles used as data for this research. Although the sample of research articles used as data for this research is not comprehensive, the data is specific to the niche required by this study. The sample is collected from eight top tier journals in Information Systems (IS) plus select conferences and journals. In this study, the meta-analysis consists of qualitative analysis and quantitative analysis and different researchers with different perspectives may disagree with the qualitative analysis. The quantitative analysis should be directly duplicated among researchers from the research articles used as data. Researchers should be able to directly understand and duplicate the data analysis and results shown in the next sections.

Data Analysis

The data analysis is organized by the protocols discussed earlier. The results are organized by the propositions to be evaluated by the data collected for each protocol. Rogers (1995) and Kinnunen (1996) credit Gabriel de Tarde as the Founding Father of Innovation Diffusion Research in 1890, translated from French to English in 1903, with the book titled *Laws of Imitation* (Tarde 1890; Tarde 1903). For every ten ideas that spread through imitation, ninety ideas are forgotten (Tarde 1903/1962). Roger's early thesis research (1955) and doctoral research (1957) led to the study of adoption period (Rogers 1961) and eventually to the most recently published book (Rogers 2003). The basic chronological progress of IDTIS research is collected from references and sources found during this study. The Initial Ideas (Tarde 1903) preceded the Theory Introduction (Rogers 1962). Next, the Model Development with Perceived Latent Variables (Rogers and Shoemaker 1971) led to the need for Measurement Instruments (Moore and Benbasat 1991). Currently the direction seems to strive for Model Clarity while improving Model Richness as seen in recently published research (Hsu et al. 2007). For this study, Model Richness is explaining more variations in the dependent variable ROAI and Model Clarity is communicating the explanations clearly. The periods of research parallels those found by Lee, Kozar and Larsen (2003), as follows: Model Introduction Period, Model Validation Period, Model Extension Period and Model Elaboration Period.

Protocols established in this study are used to collect and analyze recently published research articles. The most prolific researchers' analysis suggests the recent IDTIS research is distributed among many researchers. Characteristics of research subjects may contain statistically useful information even though some studies are found to use research data from secondary sources. The Limitations of IDTIS have future research implications; however, the future research recommendations are not always linked to the limitations by the research authors. Future Research Recommendations analysis suggests future study recommendations included additional data to analyze and relaxing assumption made during the research. Types of Information Systems incorporated into recent IDTIS research are selected and summarized into three IS Category as follows Communications (57%), Local (19%) and Organization (24%).

The Latent Variables incorporated into recent IDTIS research are listed during the study with definitions. The Relationships among IDTIS related variables are shown in the Figure 2 which is discussed in the next section. Recent research is weighted heavily toward organizations. As a result, this study builds on the definitions by Rogers (2003), and defines an organization as a stable system of individuals who work together to achieve common IS goals through a hierarchy of ranks and a division of labor and the innovation process in organizations as the main sequence of IS decisions, actions, events and stages such as agenda-setting, matching, redefining/restructuring, clarifying and routinizing. Time is involved in the diffusion process in three ways: (1) the innovation-decision process, (2) the innovativeness driven adopter categories and (3) the rate of adoption. The ROAI appears as the dependent variable in the DoI model (Rogers, 1995). The stages of adoption are knowledge, persuasion, decision, implementation and confirmation (Rogers 1995; Rogers 2003). The specific articles for the categories determining the ROAI are identified. Based on the categories determining the ROAI, a proposed synthesized research model is developed and discussed for Proposition 1 in the next section.

Initial Results

This section discusses the initial results of this study by focusing on the three propositions proposed as IDTIS research trends. Each proposition is discussed in turn, starting with the first. Recent IS research articles (2003-2011) contain additional variables for specific IS and are aligned with prior research. Specifically, the additional variables for specific IS are aligned with the theoretical foundation of the IDT

recently republished and updated by Rogers (2003) from Rogers (1995). During the data analysis, research articles show alignment with categories for determining the rate of adoption. The eight areas of research, or categories determining rate of adoption (RAO), are defined in Table 1 and are listed as follows (with the percentage of articles in this study): Perceived Attributes of Innovations (PA, 9%), Types of Innovation-Decision (ID, 6%), Communication Channels (CC, 9%), Nature of the Social System (SS, 18%), Extend of Change Agents' Promotion Efforts (CA, 12%), Adopter Categories (AC, 6%), Stages of Adoption (SA, 12%) and Stages of an Innovation Process in an Organization (IP, 27%). As a result, a proposed synthesized future research model, the Innovation Diffusion Trend Model for Information Systems (IDTMIS) is extrapolated from the meta-analysis conducted in this study. The IDTMIS is based on the specific articles for the categories determining the rate of adoption.

Table 1 Definition of Categories of IDTIS Research

	Category	Definition
A	Perceived Attributes of Innovations	The perceived attributes on innovations for Information Systems (IS), also referred to in the literature as characteristics of innovations, are the perceived attributes on innovations for IS
B	Types of Innovation-Decision	Types of information-seeking and information-processing activities in which an individual is motivated to reduce uncertainty about the advantages and disadvantages of the IS innovation
C	Communication Channels	Means by which messages about IS get from one individual to another
D	Nature of the Social System	The established IS behavior patterns (IS Norms) for a set of interrelated members that are engaged in joint problem-solving to accomplish a common IS goal (IS Social System)
E	Extend of Change Agents' Promotion Efforts	Degree an individual influences clients' IS innovation-decisions in a direction deemed disable by a change agency
F	Adopter Categories	Classifications of the members of a social system on the basis of the degree to which a member is relatively earlier in adopting a new IS idea than the other members of a system
G	Stages of Adoption	A series of different information-seeking and information-processing activities in which an individual is motivated to reduce uncertainty about the advantages and disadvantages of a IS innovation
H	Stages of an Innovation Process in an Organization	The main sequence of IS decisions, actions and events (IS Innovation Process) in a stable system of individuals who work together to achieve common goals through a hierarchy of ranks and a division of labor (Organization)
Definitions are derived from Rogers (1962; 1983; 1995; 2003) and Rogers and Shoemaker (1971)		

The proposed future research model is built with progressive elaboration from recent research studies applied to the Basic IDT Research Model. The IDTMIS title focuses attention on the trend orientation of the model. The IDTMIS is development by synthesizing and overlaying many different models. The advancements are needed because much of research is aligned with and affects the theoretical segments established by Rogers (1962; 1983; 1995; 2003). An extension for the expect trends in IDTIS research is needed to visualize the proposed trends studied in this research. Finally, the recent research is added to establish the IDTMIS. The IDTMIS is a summary of the meta-analysis results as shown in the Figure 2.

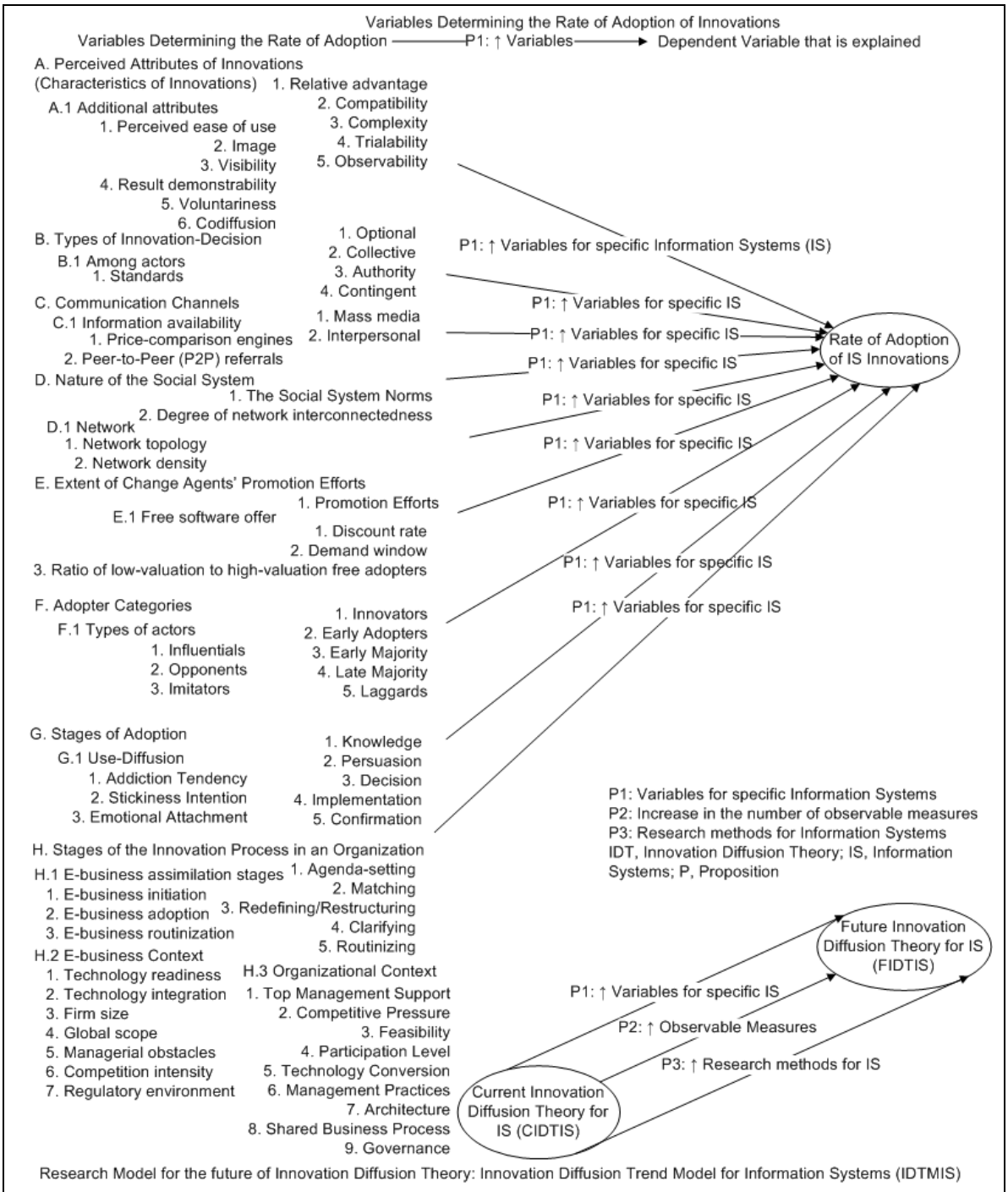

Figure 2 Innovation Diffusion Trend Model for Information Systems (IDTMIS)

The meta-analysis of recent research is included in the IDTMIS. A.1 through H.1 denote recent extensions in the specific areas of research as shown in Figure 2. For Proposition 1, additional variables for specific IS are observed in the research literature for all categories. Specific examples of extensions are as follows: Extension in A.1 by Hsu, Lu and Hsu (2007) and Dewan, Ganley and Kraemer (2009); Extension in B.1 by Yoo, Lyytinen and Yang (2005); Extension in C.1 by Kocas (2003) and Hosanagar, Han and Tan (2010); Extension in D.1 by Weitzel, Beimborn and König (2006); Extension in E.1 by Jiang and Sarkar (2003;

2009); Extension in F.1 by Cavusoglu, Hu, Li and Ma (2010); Extension in G.1 by Theotokis and Doukidis (2009) and Extension in H.1 through H.3 by Zhu, Kraemer and Xu (2006), Zhu, Kraemer and Dedrick (2004) and Nelson and Shaw (2003).

The synthesized future research model shown in Figure 2 suggests Proposition 1 is supported: An IDT trend is the addition of variables for specific Information Systems. For Proposition 1, additional variables for specific IS are observed in the research literature in each of the eight areas of research, or categories determining RAO. The second proposition, about objective measures, is observed for the dependent variable ROA. As a specific example, the United States Census provides useful cell phone usage data in a study by Cavusoglu, Hu, Li & Ma (2010) and case studies provide opportunities to objectively measure of the dependent variable ROA. The third proposition, about research methods for IS, is to be observed and reported. In addition, the findings for the categories determining RAO, suggest the scope of research includes more areas of the IDTIS and major changes in IDT research methods for IS may be needed to study the proposed synthesized future research model in Figure 2.

The data analysis suggests more variables are tested by many studies and attempts are made for more objective measures of the ROA variable. The findings suggest the scope of research includes more areas of the IDTIS and could suggest a major shift in IDTIS research methods for Information Systems. The next section discusses this study and formulates conclusions based on the results just delineated.

Discussion and Conclusions

To fulfill the study's purpose and objectives, three propositions for trends in IDT IS research are developed for the benefit of IDT researchers and are to be tested. This study's initial findings suggest that the IDTIS studies attempt to increase richness while improving clarity of the IDTIS. More variables are tested by many studies to increase richness and attempts are made for more objective measures of the ROA variable to improve clarity. Also since the scope of research includes more areas of the IDTIS, a major shift in IDTIS research methods for IS may be needed for improving clarity.

This research-in-progress may offer renewed interest in the diffusion of technology innovations. Effective Information Systems can be measured by diffusion into a social system, both locally and globally, where East meets West. This diffusion is often accomplished through Connectivity and Collaboration as shown in the synthesized model proposed for further research by this paper; see Figure 2 Innovation Diffusion Trend Model for Information Systems (IDTMIS).

The work on diffusion theory affects connectivity and collaboration among companies and individuals. Research is not limited to a local culture. Effective Information Systems are determined by diffusion into a social system locally and globally. An important practical implication is that entrepreneurs should be able to better connect and collaborate with people, organizations and international institutions with IS which diffuse internationally. Important implications of this study are that the IDT trends shed light on the need for entrepreneurs to focus on the addition variables for specific IS, objective measure of observable variables and major changes in IDT research methods for IS. For researchers and practitioners in IS, this study shows the value of synthesizing the results of many research studies.

This study has two key limitations. The first is the meta-analysis research is focused on the three stated propositions of this study. There are potentially alternative propositions. The second is the meta-analysis research is focused on IDT for IS. A broader and wider study could give other ideas and connections. Other diffusion theories may have crosscutting capabilities and are not currently included in this study.

The first recommendation for further research is the potential for alternative propositions to study. While the propositions for this study is developed using the goal of adding value for IDTIS Researchers based on prior IS meta-analyses with analogous IS theories, there may be other propositions worth investigating. The second recommendation is a broader and wider study could give other ideas, connections and trends. The third recommendation is to focus further research on the proposed synthesized future research model titled IDTMIS. Such a study would require much data to check for Construct Validity, both Convergent Validity and Discriminant Validity, across the large number of variables. Finally, an automated data collection approach is recommended. To synthesize disparate results, additional meta-analysis studies are expected in the future. To facilitate future meta-analysis studies, perhaps an automated data-base could to be developed to collect meta-analysis data when research articles are submitted for publication.

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Appendix 1 References included in IDT Meta-Analysis for IS

Table 2 References included in Meta-Analysis				
#	Authors	Year	Title	Journal
1	Altinkemer, K., & Shen, W.	2008	A multigeneration diffusion model for IT-intensive game consoles	JAIS 9(8)
2	Aral, S., Brynjolfsson, E., & van Alstyne, M.	2007	Productivity Effects of Information Diffusion in E-Mail Networks	ICIS 2007
3	Berger, H., & Beynon-Davies, P.	2008	Knowledge-based diffusion - A case study experience	ICIS 2008
4	Beynon-Davies, P., & Williams, M. D.	2003	The diffusion of information systems development methods	JSIS 12(1)
5	Braganza, A., Hackney, R., & Tanudjojo, S	2009	Organizational knowledge transfer through creation, mobilization and diffusion: a case analysis of InTouch within Schlumberger	ISJ 19(5)
6	Carmi, E., Oestreicher-Singer, G., & Sundararajan, A.	2009	Spreading the Oprah Effect: The Diffusion of Demand Shocks in a Recommendation Network	ICIS 2009
7	Cavusoglu, H., Hu, N., Li, Y., & Ma, D.	2010	Information Technology Diffusion with Influentials, Imitators, and Opponents	JMIS 27(2)
8	Choudrie, J., Papazafeiropoulou, A., & Lee, H.	2003	A web of stakeholders and strategies: A case of broadband diffusion in South Korea	JIT 18(4)
9	Dewan, S., Ganley, D., & Kraemer, K. L.	2009	Complementarities in the diffusion of personal computers and the internet: implications for the global digital divide	ISR 21(4)
10	Han, P., Hosanager, K., & Tan, Y.-W.	2004	Diffusion of Digital Products in Peer-to-Peer Networks	ICIS 2004
11	Hosanagar, K., Han, P., & Tan, Y.	2010	Diffusion Models for Peer-to-Peer (P2P) Media Distribution: On the Impact of Decentralized, Constrained Supply	ISR 21(2)
12	Hsu, C.-L., Lu, H.-P., & Hsu, H. H.	2007	Adoption of the mobile Internet: An empirical study of multimedia message service (MMS)	Omega 35(6)
13	Jiang, Z., & Sarkar, S.	2009	Speed Matters: The Role of Free Software Offer in Software Diffusion	JMIS 26(3)
14	Jiang, Z., & Sarkar, S	2003	Free Software Offer and Software Diffusion: The Monopolist Case	ICIS 2003
15	Kocas, C.	2003	Evolution of prices in electronic markets under diffusion of price-comparison shopping	JMIS 19(3)
16	Mathiassen, L., & Pries-Heje, J.	2006	Business agility and diffusion of information technology	EJIS 15(2)
17	Melville, N., & Ramirez, R.	2008	Information technology innovation diffusion: an information requirements paradigm	ISJ 18(3)
18	Mustonen-Ollila, E., & Lyytinen, K.	2003	Why organizations adopt information system process innovations: a longitudinal study using Diffusion of Innovation theory	ISJ 13(3)
19	Nelson, M. L., & Shaw, M. J.	2003	The Adoption and Diffusion of Inter-organizational System Standards: The Role of Standards Development	MISQ, Special Issue

			Organizations	
20	Oh, J.-h., Susarla, A., & Tan, Y.	2008	Diffusion of User-Generated Content in a Social Network Structure	ICIS 2008
21	Tan, H.-P., & Tan, M.	2004	Adoption and Diffusion of Information Technology in Early Childhood Pedagogy: Crossing the Invisible Chasm	ICIS 2004
22	Teo, T. S. H., & Pok, S. H.	2003	Adoption of WAP-enabled mobile phones among Internet users	Omega, 31(6)
23	Theotokis, A., & Doukidis, G.	2009	When Adoption Brings Addiction: A Use-Diffusion Model for Social Information Systems	ICIS 2009
24	Vitzthum, S.	2008	Influence of Structure Parameters on the Information Diffusion Process in Virtual Networks	ICIS 2008
25	Wang, Y., & Yuan, Y.	2006	The Role of SMS in Mobile Data Service Diffusion in China: A Longitudinal Case Study Based on Actor-Network Theory	ICIS 2006
26	Wattal, S., Hong, Y., & Mandviwalla, M.	2010	Is IT the great equalizer? A social class based longitudinal analysis of technology diffusion	ICIS 2010
27	Weitzel, T., Beimborn, D., & König, W.	2006	A unified economic model of standard diffusion: The impact of standardization cost, network effects, and network topology	MISQ 30(Special Issue)
28	Yang, X., Kishore, R., & Liu, Z.	2008	The Institutional Facets of Innovation Diffusion Initiating: The Case of Wal-Mart's RFID Campaign	ICIS 2008
29	Yoo, Y., Lyytinen, K., & Yang, H.	2005	The role of standards in innovation and diffusion of broadband mobile services: The case of South Korea	JSIS 14(3)
30	Zaffar, M. A., Kumar, R. L., & Zhao, K.	2008	Diffusion Dynamics of Open-Source Software in the Presence of Upgrades: An Agent-Based Computational Economics (ACE) Approach	ICIS 2008
31	Zhu, K., Kraemer, K. L., & Dedrick, J.	2004	Information technology payoff in e-business environments: An international perspective on value creation of e-business in the financial services industry	JMIS 21(1)
32	Zhu, K., Kraemer, K. L., & Xu, S.	2006	The process of innovation assimilation by firms in different countries: A technology diffusion perspective on e-business	MS 52(10)
33	Zhu, K., Dong, S., Xu, S. X., & Kraemer, K. L.	2006	Innovation diffusion in global contexts: Determinants of post-adoption digital transformation of European companies	EJIS 15(6)
MIS Quarterly (MISQ), Information Systems Research (ISR), Journal of Management Information Systems (JMIS), European Journal of Information Systems (EJIS), Information Systems Journal (ISJ), Journal of Information Technology (JIT), Journal of Strategic Information Systems (JSIS), Journal of the Association for Information Systems (JAIS); Additional journals include: Management Science (MS), Omega, the International Journal of Management Science and International Conference on Information Systems (ICIS)				