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A Conceptual Framework for Sequential Organizational Technology Adoption with Dynamic Goal and Action Portfolios

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ABSTRACT

This research endeavors to integrate theory from several research streams in order to propose a framework for research into the common situation where organizations make sequential decisions with multiple relevant goals and multiple possible actions where the goals, actions, and decision context display dynamic characteristics in relation to environmental and decision contexts. Goal-driven decision-making for technology adoption decisions has been largely overlooked with a few notable exceptions. Social psychology and consumer-behavior research streams are integrated with traditional technology adoption concepts to yield a holistic framework.

Keywords

Technology Adoption, Conceptual Framework, Goal – Action Framework, Propositions

BACKGROUND AND SIGNIFICANCE

For more than two decades technology adoption/acceptance research has been dominated by variations of the technology acceptance model (TAM) (Davis, 1986; Davis, Bagozzi, & Warshaw, 1989). Although these studies have provided many important insights into the adoption decision (Bagozzi, 2007; Fichman, 2004; Goodhue, 2007), there has been increasing agreement among prominent researchers (Bagozzi, 2007; Benbasat & Barki, 2007; Fichman, 2004) that continuing to pursue technology adoption/acceptance research using variations of the TAM is unlikely to yield meaningful advances.

However, the investigation of these behaviors still holds great importance from both theory development and practitioner perspectives. The study of information systems is differentiated (from computer science and others) by the fact that the central theme is the study of socio-technical systems; that is, the study of how human behaviors (both collectively and individually) interact with the technical environment. One of these behaviors that is core to the field and has dramatic practical implications is the study of why an individual or organization chooses to use (or not use) a particular technology. The managerial implications derived from understanding this behavior has obvious importance to technology vendors who are interested in increasing the number of end-users who purchase or license their technological goods or services. A less obvious connection exists within organizations. Organizations often adopt technologies at the organizational level (Enterprise Resource Planning (ERP), Data Warehousing, etc.) and are interested in stimulating voluntary usage to obtain the most value possible from their investment. This is the difference between the binary adopt/reject decision of the organization and the degree of implementation within the organization (percentage of applicable processes that employ the technology).

It has been argued that the TAM's strengths and weaknesses both revolve around its simplicity and parsimony (Bagozzi, 2007). Its parsimony has allowed researchers to focus on two perceptions of potential adopters, perceived usefulness and perceived ease of use. The insights associated with these studies have dramatically increased our understanding of this complex association. However, many researchers have suggested that this line of inquiry has been 'played out'. Benbasat and Barki (2007, p. 212) summarize their view concerning this as follows:

“Unfortunately, we believe that, in spite of its significant contributions, the intense focus on TAM has led to several dysfunctional outcomes: 1) the diversion of researchers' attention away from important phenomena. First, TAM-based research has paid scant attention to the antecedents of its belief constructs: most importantly, IT artifact design and evaluation. Second, TAM-based research has provided a very limited investigation of the full range of the important consequences of IT adoption, 2) TAM-based research has led to the creation of an illusion of progress in knowledge accumulation, 3) The inability of TAM as a theory to provide a systematic

means of expanding and adapting its core model has limited its usefulness in the constantly evolving IT adoption context, 4) The efforts to “patch-up” TAM in evolving IT contexts have not been based on solid and commonly accepted foundations, resulting in a state of theoretical confusion and chaos.”

Bagozzi (2007, p. 244) states that it “is unreasonable to expect that one model, and one so simple, would explain decisions and behavior fully across a wide range of technologies, adoption situations, and differences in decision making and decision makers.” This state of affairs signals to many researchers in the field that we currently find ourselves at a crossroads. Research that introduces and/or validates new models, frameworks, or paradigms that seek to gain a deeper understanding of the adoption/acceptance process and extend the process to adoption outcomes (and thus the value to the individual/organization) is needed.

Although most of calls for change have focused on perceived problems with continued TAM-based research, other popular models such as the theory of reasoned action (TRA), theory of planned behavior (TPB), innovation diffusion theory (IDT), etc. suffer from similar deficiencies. Additionally, all of these models tend to treat the technology adoption decision as relatively static and each decision is viewed in isolation. However, there is good reason to believe that real world organizational adoption decisions are affected by previous decisions and outcomes and that many of the parameters treated as static are actually quite dynamic in nature.

GOAL-BASED ADOPTION

As discussed above, researchers have pointed to several deficiencies of current technology adoption/acceptance research. Among these are a lack of study of the process of making adoption decisions and a lack of tying adoption decisions to organizational or individual goal attainment (as motivation and outcome). This goal attainment represents a measure of the value of a technology. Although much of the research to date on the value of technologies has been focused on ‘bottom line’ indicators such as market cap, revenue enhancement, and/or cost containment, there are inherent difficulties in isolating the effect of a technology adoption from other organizational and market changes over time. It is often more meaningful to focus on intermediate performance enhancement such as attainment of specific goals (cf. Brandyberry, Rai, & White, 1999).

This decision process of an individual or organization to adopt a particular technology or set of technologies and the determination of the value of information technology to an organization represents two of the most important lines of inquiry in information systems research. Although related, these two lines have rarely been studied simultaneously in the extant literature. This is unfortunate as the value of a technology certainly affects adoption behavior and especially post-adoption behavior (perceived value of various types have been often used in research of adoption behaviors but this is often dramatically different than the realized value of an adopted technology). Conversely, the adoption process may significantly impact the value of a technology. For instance, if an adopter makes the decision to adopt a technology based on specific identified goals that would provide organizational or individual value if realized (rather than non-goal oriented decisions such as those that involve management or individual fashion), there is an increased probability of achieving realized value from that adoption decision.

Several suggestions have been made by researchers as to the direction adoption/acceptance research should take (Bagozzi, 2007; Benbasat & Barki, 2007; Fichman, 2004). To date, none of these proposals have been well explored. This research seeks to adapt the conceptual elements inherent in the model proposed by Bagozzi (2007) that views the adoption/acceptance process as a subset of goal striving, to develop a conceptual model of goal-driven organizational adoption where goals and possible actions are very dynamic. Bagozzi’s model specifically incorporates a temporal perspective of goal intention development and subsequent action intention development that lends itself well to studying the process of developing an intention to adopt/accept a technology. Additionally, action enactment (actually adopting and using) along with goal attainment and evaluation (D in Figure 1) is a further extension of the model. This also allows the study of post-adoption behaviors that can be enhanced by applying expectation-confirmation theory (Oliver, 1977) and feedback mechanisms into the decision process model.

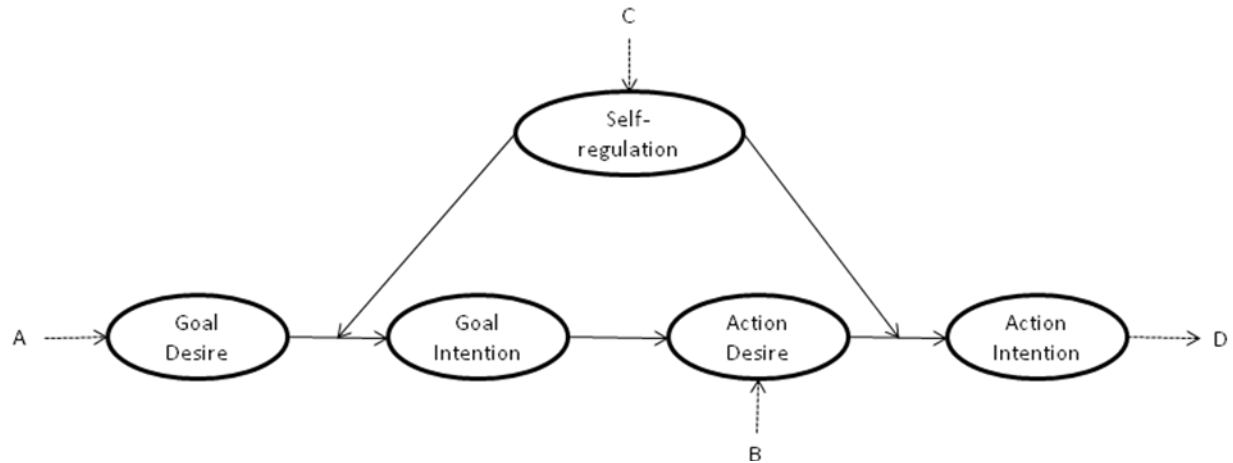


Figure 1. Bagozzi's (2007) Goal-Action Decision Making Core

The Goal-Action Decision Making Core

Bagozzi contends that this model may be used to represent the decision process behind technology adoption and acceptance. This contention is strengthened by the relative success of similar models in modeling consumer behavior and other marketing-oriented decision processes (Bagozzi, 1992, 2006, 2007a; Bagozzi and Dholakia, 1999; Bagozzi, Dholakia, and Basuroy, 2003; Dholakia, Bagozzi, and Gopinath, 2007).

The decision making core displayed in figure 1 represents the portions of the model that are universal (or nearly so) in scope. These goal-oriented items represent a basic decision making process that lends itself to many types of decisions. The portions of the model designated by A, B, C, & D represent items that are contextual in nature. The causes represented by A are hierarchical, superordinate goals, values, & motives leading to a focal goal formation in the decision model (such as the goal of reducing inventory levels). Other items that may be considered in A are beliefs about the means of achieving the focal goal, perceived usefulness of obtaining the goal, perceived ease of obtaining the goal, relative advantage associated with the goal, ingrained attitudes of success, failure, and goal pursuit, amongst others. Causes designated by B influence the creation of a desire for an action-oriented behavior (purchase the technology, try the technology, etc.) and include items such as social norms, social identity, perceived behavioral control, & attitudes towards the action, amongst others. Outcomes designated by D represent goal striving, planning, monitoring, and evaluation. Finally, Bagozzi also contends that self-regulation plays a role in the process. Self-regulation is proposed to moderate any effects of desires on intentions with items represented by C being causes associated with levels of self-regulation (Bagozzi, 2007).

It is noted that this model is at the individual-level rather than at the organizational-level. Next, these concepts are expanded and adapted to fit an organizational-level model in a dynamic setting.

CONCEPTUAL FRAMEWORK

The central focus of the proposed framework is the process of goal formation and prioritizing leading to specific action outcomes that are perceived to best further the pertinent set of goals. This connection is represented by the larger bold arrow (see figure 2), also encapsulating the decision process, and corresponds to the linkage from goal desire to action intention in the goal action decision-making core. The proposed framework expands this concept by formalizing the likelihood that there is a portfolio of focal goals arising from superordinate goals (not shown) of differing levels of perceived importance that would be considered during the decision process. Likewise, there is likely a portfolio of actions (some or all of which may be technology adoption actions) that may be taken in support of the group of focal goals. Goals $1 \dots i$ would have associated weights $w(1) \dots w(i)$ while actions $1 \dots j$ would have associated scores $s(1) \dots s(j)$. This simply designates that there is some method of determining the relative importance of goals and the relative advantage of actions in progressing that set of goals. The method may be formal or informal, objective or subjective as fits the organization and scenario. Factors that would likely be used to make determinations of an actions' relative attractiveness would vary and would likely include components commonly employed by traditional technology acceptance models such as TAM, TRA, TPB, IDT, etc. This process is important but can vary widely and thus the framework recognizes they are necessary but excludes them at the conceptual

level focusing on a surrounding framework in which any evaluation model or metrics can reside. Thus, the framework focuses on elements that are likely to affect the general process. The balance of this discussion will focus on the interactions proposed within the framework.

Action Outcome Feedback:

- Goal Progress (refocus on other goals),
- Goal Commitment (reinforce focus on current goal)
- Outcome Evaluation

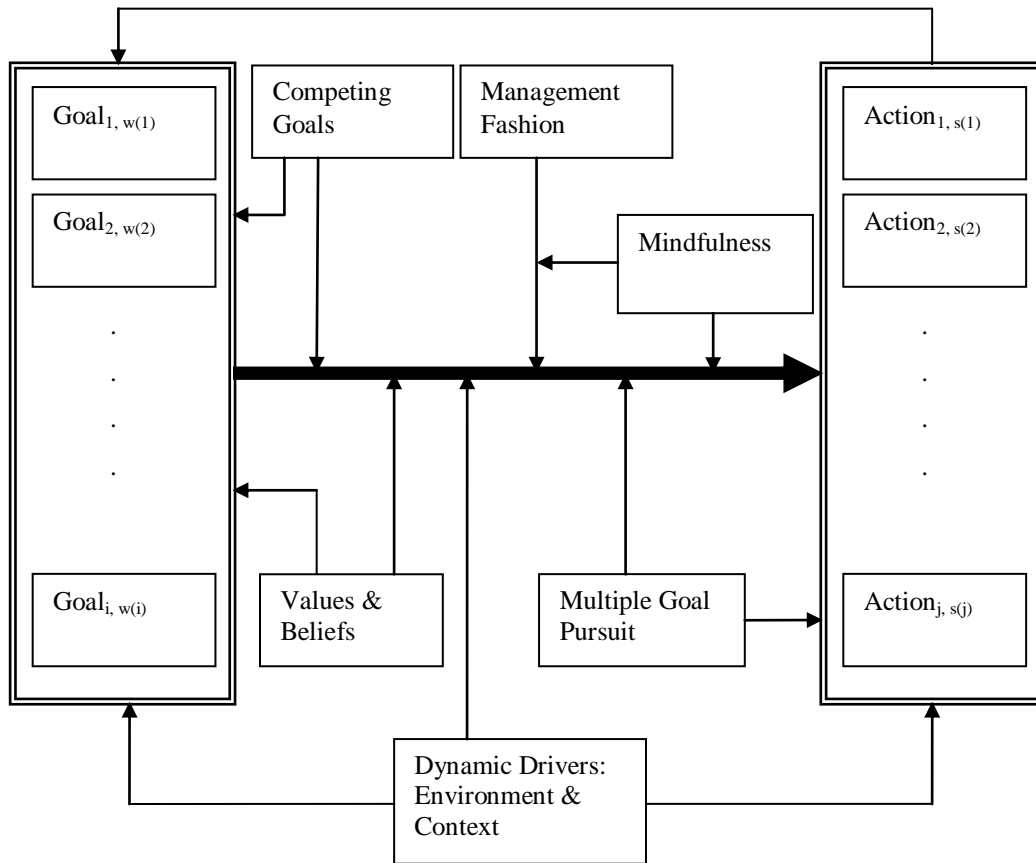


Figure 2. Framework for Sequential Organizational Technology Adoption with Dynamic Goal and Action Portfolios

Dynamic Drivers

A key component of the framework is that it is dynamic by nature. Internal and external forces modify the organizations’ focal goals and weighting. An organization’s focal goals and goal priorities will change according to external and internal factors. For instance, an organization may have focal goals of increasing market share in current markets, cost containment, and expansion into new markets. Market conditions would have a strong influence on the goals’ relative priorities. During periods of austerity, cost containment may be perceived as the most important goal while during growth periods, expansion into new markets may be perceived as most important. Actions and how they are evaluated would likewise be affected by similar and dissimilar forces (for instance, a relevant innovation being introduced in the environment might add another possible action for consideration). The framework emphasizes this dynamic aspect suggesting that goals, actions, and the evaluation process may need reconsideration if there have been relevant changes in the external or internal environment. It is conceptually appealing that, as the scenario becomes increasingly dynamic, uncertainty about future conditions increases.

This is likely to lead to deferring the decision to implement a particular action. This is also consistent with real options (RO) analysis and assumptions. This leads to the first proposition:

P1: As the goal and action portfolios and associated decision criteria become more dynamic, there is a greater propensity to defer the decision until uncertainty lessens.

Values and Beliefs

Organizational values and beliefs are less volatile than the dynamic drivers. Values and beliefs are often antecedents to goal formation as well as antecedents to common decision constructs such as attitude and perceived usefulness (Bagozzi, 2007). These organizational values and beliefs are generally relatively stable and can have a stabilizing effect primarily on goal formation and decision processes in dynamic environments.

P2: Organizations with strong and stable values and beliefs will demonstrate less volatility of goals and decision criteria holding dynamic driver levels constant.

Competing Goals

Goal competition suggests that “simultaneously activated goals compete for limited motivational resources, which lead them to pull away resources from each other (Fishbach & Dhar, 2006, p. 615).” Although it is suggested by normative choice theory that these goals will be integrated through predetermined and stable weights (Baron, 2000), others suggest that goal weights are dynamic and affected by status (focal or background) and contextual variables (such as the dynamic drivers here) (Fishbach & Dhar, 2006). Although these previous studies and developed theory focus on individual decision-making, it is proposed here that organizational decision-making likely follows a similar pattern. Competing goals, especially where background goals are more accessible than focal goals, tend to reduce decision performance on focal goal criteria resulting in poorer focal goal performance (Shah & Kruglanski, 2002).

P3: Increased goal competition leads to poorer focal goal decision performance.

Multiple Goal Pursuit

Multiple goal pursuit refers to the attempt to find an action alternative that simultaneously progresses more than one active goal. This objective of progressing multiple goals is likely to eliminate from consideration action alternatives that do not service multiple goals thus reducing the set of considered actions (Fishbach & Dhar, 2006). This effect can increase the difficulty of the search (Tversky, 1972) and increase the likelihood of finding no action that is evaluated to simultaneously progress the multiple activated goals sufficiently thus deferring action enactment.

P4: Pursuing multiple goals simultaneously leads to a greater likelihood of decision deferral.

Additionally, pursuing multiple activated goals leads to more compromises in the decision process (Simonson, 1989). Since these compromises would make goal progress for specific individual goals lower than if that single goal was solely activated, outcome evaluation may also be negatively impacted.

P5: Pursuing multiple goals simultaneously leads to goal compromises and lowered outcome evaluation.

Management Fashion

Management fashion refers to the “relatively transitory collective beliefs, disseminated by the discourse of management-knowledge entrepreneurs, that a management technique resides at the forefront of rational management progress (Fichman, 2004, p. 320).” This can result in an elevation of evaluation of fashionable actions to a level greater than an objective assessment would suggest. In a decision environment such as this framework is suggested to apply to, this effect can sub-optimize action evaluation so that an action that is less likely to progress the set of activated goals than another is incorrectly evaluated as being superior.

P6: The influence of management fashion suboptimizes action alternative evaluation and leads to lowered outcome evaluation.

Mindfulness

Organizational or collective mindfulness is characterized by cultures and structures that promote open discussion and the ability to detect problems (Weick & Roberts, 1993; Weick et. al 1999). “An organization innovates mindfully to the extent that it attends to the innovation with reasoning grounded in its own facts and specifics (Fichman, 2004, p. 320).” More

mindful organizations are more likely to make judicious action alternative evaluations and, by mindful reasoning, are less likely to be as negatively impacted by negative influences such as management fashion.

P7: Mindful organizations are more likely to maintain focus on factually relevant decision criteria and, therefore, are more likely to make sound action alternative evaluations.

P8: Mindful organizations are less likely to weight non-factual criteria such as management fashion heavily in the decision process. This suggests a negative moderating effect on the impact of factors such as management fashion when present.

Action Outcome Feedback

This is the framework's enactment of the sequential adoption decision effects. The basic premise is that an action enactment leads to action outcome feedback that affects the characteristics of goal formation and weighting for the next sequential decision. If the outcome assessment is that progress has been made on a goal such that it has been fulfilled to a certain extent, this is likely to decrease motivation in subsequent decisions to focus on that same goal and will elevate the importance of pursuing competing goals. However, if that progress suggests further decisions may have similar positive outcomes (if that is the evaluation), this may promote goal commitment. In goal commitment, the motivation for pursuing that same goal is increased (Fishbach & Dhar, 2006). Goal commitment is more likely to manifest where the goal has no predefined terminal objective. For instance, expansion into new markets – it is unlikely that such a goal would have a predefined limit of a certain number of markets and until all markets are accessed additional focus on that goal should yield additional meaningful benefits. If the outcome of an action is positive in this environment it is likely to lead to additional decisions with that as the focal goal. However, where full goal attainment can be defined (individual weight loss goals, reduction of scrap work to a specific level), an action outcome that is judged to fulfill or mostly fulfill the goal would likely suggest that other focal goals would yield greater organizational benefits in subsequent decisions.

P9: Action outcome evaluations will modify the goal portfolio and weights either by refocusing on other goals (goal progress) or reinforcing focus on the current goal (goal commitment).

CONTRIBUTIONS

As previously discussed, there has been a call for more robust, holistic, and realistic models and frameworks in which to study organizational adoption of technologies. It is widely believed that continued reliance on TAM, TPB, IDT and the like is unlikely to yield significant additional insight into the adoption process. This work is a direct answer to that widely held belief.

The proposed framework integrates concepts from divergent fields such as social psychology and consumer behavior and further proposes effects of several important factors on a sequential multi-goal, multi-action, dynamic environment. It is also contended that this environment is more realistic in organizational-level technology acceptance/adoption decisions in practice and has largely been neglected in this sector in favor of simple acceptance/adoption models that view these decisions in stable, isolated environments. It provides a basis to suggest empirical studies to further validate the resulting propositions as well as other relationships based on additional theory integration.

LIMITATIONS & FUTURE RESEARCH

The primary limitation of the theoretical and conceptual arguments is that they are grounded in primarily individual-level decision-making contexts. Although most of the extensions made to the collective organizational-level are conceptually appealing, validating these relationships in an organizational context will be a critical step and thus serves as the suggested direction of future research.

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