

# Perceived Business Process Knowledge, The Construct, Its Dimensions, and the Measurement

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## Abstract

Drawing from and integrating concepts from several research streams, we propose the existence of a new individual level construct titled **perceived business process knowledge** (PBPK). PBPK is theorized as an antecedent that may predict extant technology acceptance theory (TAM) based constructs. The concepts of knowledge and business processes are identified from past works and integrated to define PBPK. PBPK is theoretically defended using Alters' (1999) Work System Theory, Bostrom and Heinens' (1977) Socio-Technical System theory frameworks, as well as, other lenses from business research. These same sources, as well as, concepts borrowed from practioner perspectives (IDEF0, 1993) are used to identify five PBPK sub-dimensions: 1) Perceived Process Input Knowledge, 2) Perceived Process Resources Knowledge, 3) Perceived Process Activities Knowledge, 4) Perceived Process Constraints Knowledge, and 5) Perceived Process Output Knowledge. To further rationalize sub-dimensions, PBPK components can be mapped to factors found in four empirically tested information systems models. PBPK instrument is currently under development; we are following MacKenzie et al.'s (2011) recommended process; an update to Churchill's (1979) method. Part of MacKenzie et al.'s revision focuses on addressing multi-dimensional and formative constructs. If successful, developing the measure, will expand the field of information systems research by tying current theories to a proposed pre-existing condition (i.e PBPK). We also re-validate research methods by using MacKenzie et al.'s process. This method was published within the last 4 years and addresses construct development process and validation gaps identified in prior methods; it has only followed in a few studies.

**Keywords:** Business Processes, Technology Acceptance Model, Construct Development, Measure Development

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## 1 Introduction

An ongoing effort is hoping to develop a measure of an individual's Perceived Business Process Knowledge (PBPK) within organizational environments. The rationale and justification for measure development is centered on its role in establishing attitudes that predict future actions toward use of information systems (IS). For purposes of discussion, the attitudes we center on are those related to adoption of IS as found in technology acceptance related theories. In other words, PBPK is hypothesized as a factor in developing attitudes toward adoption of IS; it is proposed to explain why past empirically tested information technology acceptance models work. A brief walk through of prior technology acceptance models provides some evidence.

Technology acceptance model (TAM) based theories (Davis, 1986; Venkatesh and Davis 2000; Venkatesh et al., 2003) in information systems research can be traced back to the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1973) and later the Theory of Planned Behavior (TPB) (Ajzen, 1991). They are based on the premise that in a given situation, individuals develop intentions toward specific activities as a result of attitudes gained in current and past environments. The attitude and associated behavior arise due to an individual's knowledge about an object or activity within a given environment (Hunt, 2003).

When the TRA (Ajzen & Fishbein, 1973) and TPB (Ajzen, 1991) are adapted to theories developed within the field of IS research, TAM (Davis, 1986) and TAM2 (Venkatesh and Davis 2000) state that Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) predict intention to use a

specific IS. This in turn predicts actual use (Davis, 1989). These two constructs (PEOU and PU) are attitudes associated with acceptance of an IS (i.e. how it supports activities) and an associated behavior (i.e., use of the IS) within an environment.

Even after TAM development, a number of researchers investigating IS acceptance pursued models and studies: 1) based solely on the TPB modified for IT, (Baker et al., 2007; Zhang & Gutierrez, 2007; Hunsinger & Smith, 2009), 2) integrating TAM with TPB (Riemenschneider et al., 2003; Yiu et al., 2007) or, 3) comparing TPB versus TAM (Taylor & Todd, 1995; Chau & Hu, 2001). Upon close inspection, these studies demonstrate consideration of individuals' knowledge within the environment being assessed.

Examples of knowledge assessment within past studies include items to the effect of:

- 1) Technological knowledge/skill of customers/clients...
- 2) I would not have the knowledge to make use of .....
- 3) I have the resources and the knowledge it takes to use....
- 4) Given the resources, opportunities, and knowledge it takes to use computers.....
- 5) I have the resources and knowledge and ability to share my ... expertise

While the relationship between knowledge and attitude development has been declared (Hunt, 2003), measures addressing IS acceptance view knowledge components as part of separate constructs; specifically Facilitating Conditions or Behavioral Control and not as a construct onto itself. The ongoing study argues that prior research efforts may have unintentionally considered PBPK and used components of the proposed construct.

The originator of the TRA and TPB investigated contextual (environmental) knowledge in the form of information relative to particular environments as a precursor to developing attitudes. Ajzen et al. (2011) performed a series of studies to assess the assumption that being informed (i.e. having knowledge) is a prerequisite for action or to achieve results. The studies demonstrated that sometimes but not always, information or knowledge can guide behavior.

The on-going research effort prescribes that all individuals in organizations execute business processes (Merton, 1957, Davenport, and Short 1990) (see figure 1), individuals develop partial mental models of some or all processes in an organization (Dervitsiotis, 1998) (see figure 2), and that a process can be modeled using 5 components (IDEF0, 1993) (see figure 3). Based on these concepts a first order construct (PBPK) and 5 specific knowledge sub-components demonstrated by individuals related to business processes within organizational environments is rationalized.

The literature review defends that the overall construct and subcomponents can be traced back Alters' (1999) Work System Theory, Bostrom and Heinens' (1977) Socio-Technical System Theory frameworks, and practioner perspectives (IDEF0, 1993). Based on the original TRA (Ajzen & Fishbein, 1973) and TBP (Ajzen, 1991), PBPK is theorized to explain why past IS acceptance theories and associated instruments are successful.

Operationalizing and testing this construct is required to demonstrate if this proposition is valid. **The research plan is to develop a measure for the construct using the MacKenzie et al. (2011) procedures (see figure 4) to include testing it in** relation to existing UTAUT and IS Success Models (see figure 5) in an on-going field research effort. In doing so, we expand the field of IS research by tying existing information systems theories to proposed pre-existing conditions (i.e. PBPK) specifically related to IS use.

## 2 Conclusion

If successful, PBPK construct development will hopefully be relevant to researchers and practitioners. IS researchers are expected to find the measure as a tool to account for differences in individuals and groups when performing empirical studies. Isolating those with greater process knowledge is proposed to enable filtering (removing) those whose perception of a given IS's utility is less important than others. As such this construct should integrate (be a predictor or mediator) in TPB (Ajzen,

1991), TAM (Davis, 1986), and IS Success (DeLone, & McLean, 1992) based models. It should also play a role in theories such as Task-Technology Fit (Goodhue and Thompson, 1995), Punctuated Equilibrium Theory (Gersick, 1991) or in general, any concept where change or adoption of IT is related to business processes.

For practitioners, participation in IT life-cycle decisions by individuals demonstrating greater PBPK may help increase the probability of success for system change as they may exhibit greater understanding of the utility and impacts to existing or new business processes (Frye and Gullledge, 2007; Jukic et al., 2009; Gallagher and Vickie, 2012).

To demonstrate the potential benefit of this construct, consider four extreme scenarios with two combinations of PBPK and Perceived Usefulness (see table 1). Perceived Usefulness (from TAM) was selected for simplicity; use of variables from UTAUT (Venkatesh et al., 2003) increases the examples' complexity. The problem is important under situations where a common IS is used across a large organization with multiple sub-elements, each having different perceptions of how their local processes support other sections. An example might be an enterprise system that integrates sales, procurement, production, logistics, finance, warehousing processes at the operational level with dashboards at the senior management level. If some individuals demonstrate low PBPK (i.e. have less process knowledge, or worse, are misinformed), a given system might be recommended for retirement or modification when it is actually useful or be retained or not modified when it may not be effective. Of course a single individual would not make a difference as they are an outlier; a significant percentage of organizational members with low PBPK could pose a problem.

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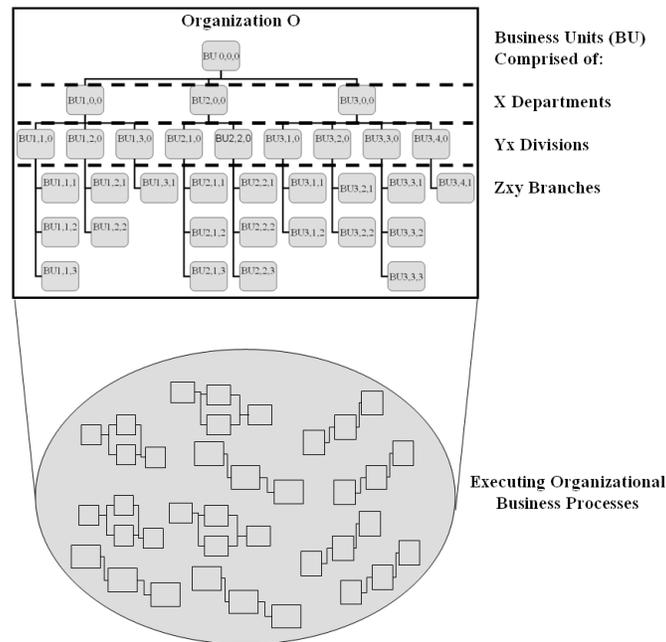
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**Figure 1 – Business Units or Offices Executing Organizational Business Processes**



**Figure 2 – General and Limited Mental Models for Business Processes in an Organization**

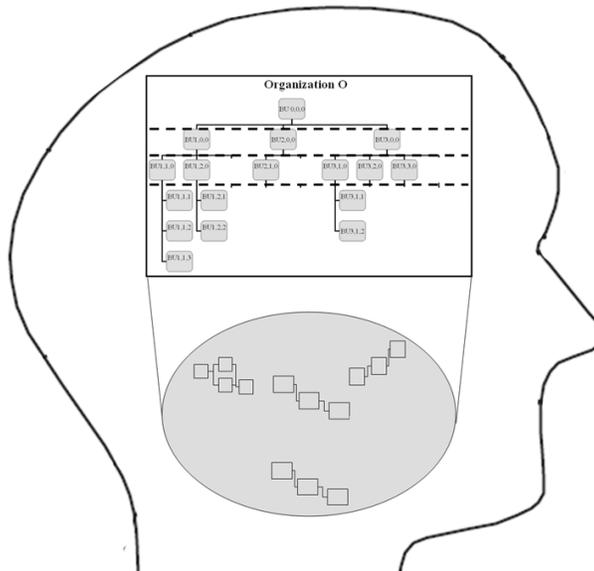


Figure 3 – IDEF0 Model Breakdown – Adapted from IDEF0, 1993

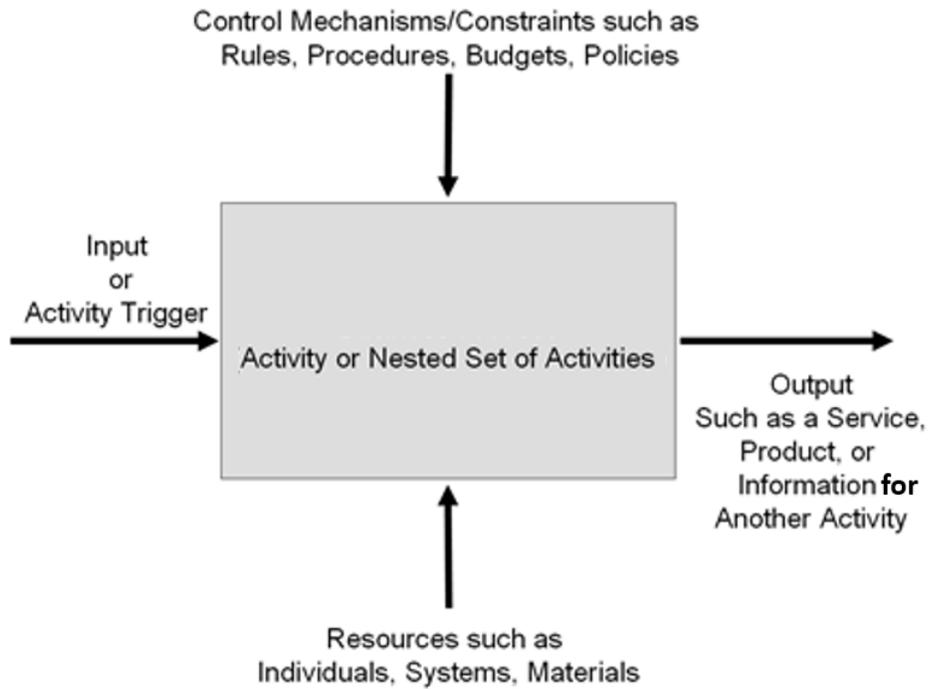
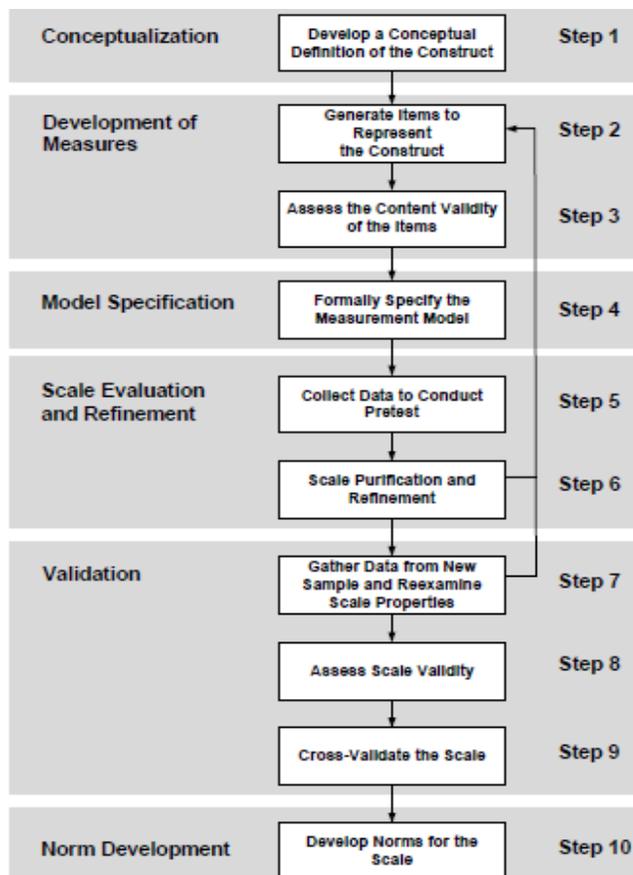


Figure 4 – Construct Measurement and Validation Procedures (MacKenzie et al., 2011)



**Figure 5 – Business Process Knowledge Construct**

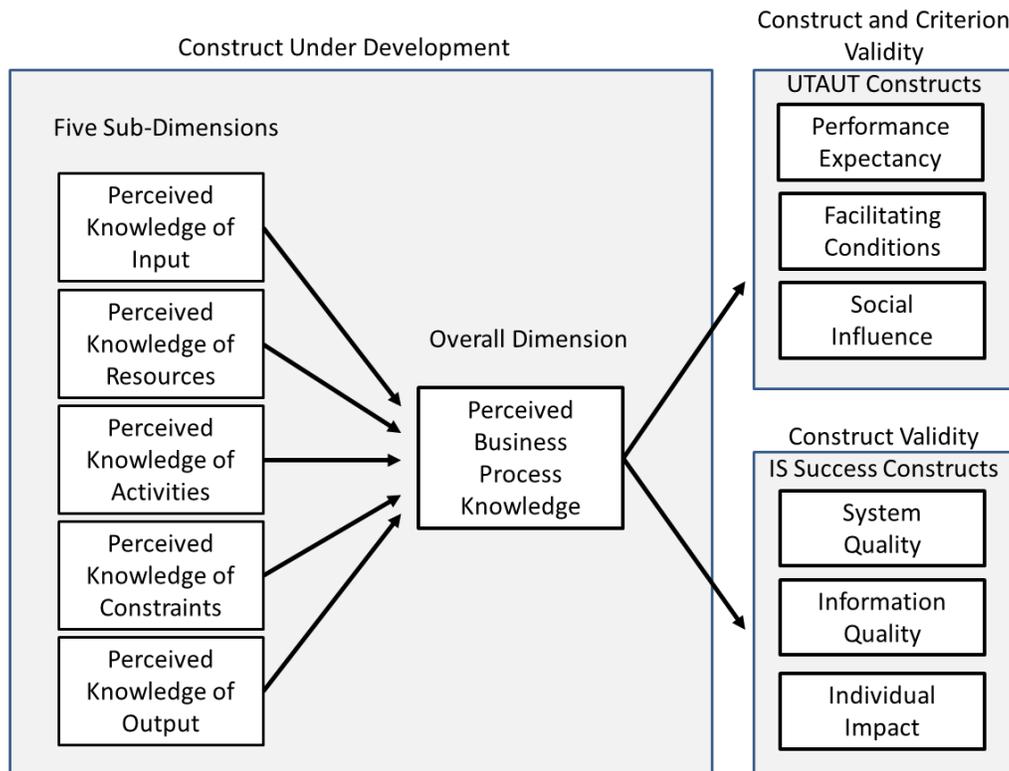


Table of Tables

**Table 1 - PBPK versus Perceived Usefulness (PU) Contingency Table**

	<b>Low Perceived Usefulness</b>	<b>High Perceived Usefulness</b>
<b>Low PBPK</b>	Value of PU not relevant and could be a false indication of IS benefit because member does not understand how the system fits within organizational tasks (i.e. member is less or misinformed). System might be inadvertently removed when it could be of benefit.	Value of PU not relevant and could be a false indication of IS benefit because member does not understand how system fits within organizational tasks (i.e. member is less or misinformed). System might not be considered for modification or removal when it might be of little benefit.
<b>High PBPK</b>	Opinion of individual valid. IS rightfully be removed or significantly modified.	Opinion of individual valid. IS will rightfully remain or be enhanced.