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Expectation Formation in the Information System Development Process

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Introduction

The concept of consumer expectations has been widely used by information systems (IS) researchers to explain the outcome of information system development (ISD) efforts (Suh et al, 1994; Lawrence and Low, 1993; Ginzberg, 1981). These IS studies assume that users are IS consumers. However, ISD is substantially different from many other product development efforts. Information systems are highly customized, requiring more user involvement in the development. Also, analysts and users can interact directly, rather than through indirect mechanisms requiring limited consumer input such as marketing research, focus groups, and consumer attitude surveys. Therefore, the ISD process provides more opportunities to develop and manage user expectations.

This fact has been overlooked by the IS literature, which main concern is in linking user expectations to perceived system performance. Based on this observation, this paper contributes by explaining how user expectations are formed and updated throughout an ISD process. Using the ISD model developed by Newman and Robey (1992), we conceptualize user expectations as two distinct constructs, *desired* and *predictive* expectations (Spreng and Olshavsky, 1992), which are modified through a series of *encounters* and *episodes*.

The Expectation Formation Process

"An expectation of a product attribute is a consumer's subjective evaluation of the value of that attribute at a particular point in time (Oliver and Winer, 1987, p. 488)."

Expectations form because absolute knowledge about the product does not exist.

However, once the consumer is exposed to the product, performance is compared to the developed expectations. If a match exists, the expectations have been confirmed. If not, the expectations have been disconfirmed (Olson and Dover, 1979). Disconfirmation can be either positive (perceived performance exceeds expectations) or negative (perceived performance falls short of expectations) (Geva and Goldman, 1991).

Anderson (1973) compared the validity of several psychological theories used to predict the effects of disconfirmation on consumers. The results best supported the assimilation-contrast model (Hovland et al, 1957). According to this model, slight differences between

perceived performance and expectations tend to result in the displacement of perceptions toward expectations (assimilation effect), while large discrepancies lead to an exaggeration of the differences (contrast effect).

However, disconfirmation occurs only *after* exposure to the product. Therefore, a standard of comparison other than perceived performance must be in place *during* the ISD process to allow the evaluation of system attributes by the user. Spreng and Olshavsky (1992) proposed that consumers have two distinct states of expectations. *Predictive expectations*, which have been widely used in the literature, are those developed by consumers regarding a specific product. They are formed from information about that particular product or from previous experiences with similar products. *Desired expectations*, on the other hand, are "conceptualized in terms of the levels of product performance that the consumer wants" (Suh et al, 1994, p. 32). They are intrinsically connected to the values and beliefs held by the consumer about a specific product. Thus, during an ISD process, the user compares predictive expectations against desired expectations. A disconfirmation occurs when the predictive expectations either exceeds or falls behinds the user's desired expectations.

Disconfirmation of expectations is closely related to the level of satisfaction with product performance (Oliver, 1980). However, Oliver and Winer (1987) proposed that the expectation formation process should also be considered when predicting satisfaction. This occurs because of unknowability, uncertainty and ambiguity dimensions of the expectations formation process.

Processing expectations about a product attribute requires the consumer to have them at an active processing state (Kahneman and Tvesky, 1982). Passive expectations, on the other hand, are held as generally true assumptions about an attribute which are not processed until disconfirmed. For example, a user does not evaluate the usefulness of a system attribute until she is exposed to and becomes aware of that attribute. However, exposure to this attribute in previous experiences creates unconscious assumptions about it.

Uncertainty and ambiguity are also dimensions of expectations. Ambiguity occurs when consumers are not sure about an attribute's meaning, hindering them from properly forming and updating their expectations. Levels of uncertainty, on the other hand, are associated with the individual's confidence that her expectations will be confirmed. For example, a user might not be able to accurately develop expectations about attributes of a system which do not convey meaning to her or if the system specifications change over time.

Satisfaction, therefore, depends not only on the disconfirmation of expectations but also on the levels of unknowability, uncertainty and ambiguity of these expectations. This implies that the process of expectation formation plays an important role in altering the probability of future satisfaction with the product because it is through this process that the dimensions of expectations are set. We turn now to an ISD model that explains this process of user expectation formation.

Information Systems Development Through an Expectation Formation Model

Our model borrows from the ISD conceptualization provided by Newman and Robey (1992). The relationship between users and analysts is interpreted as a series of encounters and episodes (Figure 1). Encounters are characterized by information exchanges between the two parties while episodes are the elapsed time between encounters.

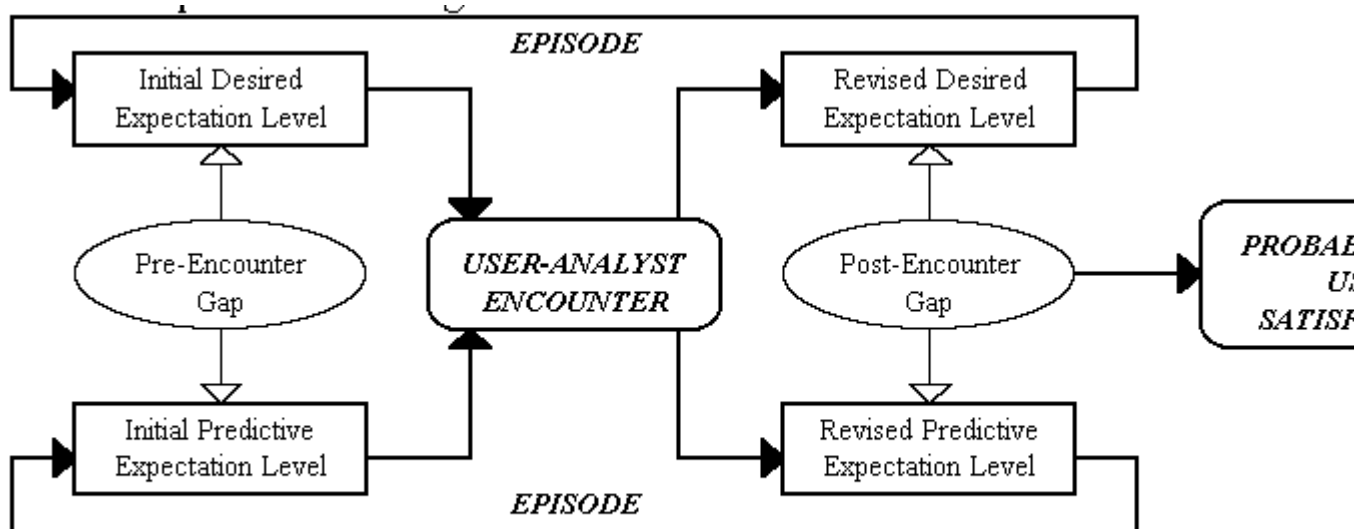


Figure 1 - Expectation Formation During an ISD Process

The user brings an initial set of desired and predictive expectations to the first encounter. The initial desired expectations represent the system performance that the user wants (Suh et al, 1994). The initial predictive expectations are the user's interpretation of the "outcomes of a whole history of prior projects" (Newman and Robey, 1992, p. 255).

An encounter offers "an opportunity for new claims to be proposed" (Newman and Robey, 1992, p. 255). Through the user-analyst interaction, a clearer view of the system, based not on history, but on facts about the current project, is developed. User and analyst present and learn about each other's expectations. This provides for an initial knowledge and understanding of the system. New system attributes are learned and moved from a passive to an active expectation state. Attributes are evaluated, leading to a change in uncertainty and ambiguity levels. Consequently, the user's predictive expectations about the system are modified.

Three general responses to claims proposed during an encounter can arise during an episode (Newman and Robey, 1992): *user acceptance* occurs when the expectations gap gets smaller, characterizing a process of assimilation or incorporation of the user's desires into the system. Similarly, *user rejection* occurs when the expectations gap gets larger, where the new claims lead to a contrast effect. Finally, *user equivocation* occurs when the

uncertainty and ambiguity of predictive expectations increase. While no changes in the expectations gap is observed, the predictive accuracy of the user is reduced.

It is theoretically possible to observe changes in the levels predictive expectations during an episode. However, this is unlikely because no significant information exchange occurs between the parties. Similarly, changes in desired expectations during an encounter are less likely, given the fact that desired expectations change less over time.

User satisfaction with the final system is a function of expectation formation and the disconfirmation of the final predictive expectations against the perceived performance of the system. While the effect of disconfirmation have been studied elsewhere (Suh et al, 1994; Ginzberg, 1981), our model suggests that the probability of user satisfaction depends on how close and accurate the user's final predictive expectations are from the desired expectations. Therefore, encounters and episodes become important means through which changes in the user's expectations occur.

Propositions

The first two propositions deal with when and how the levels of user expectations are changed during the process. During an encounter, new information about system attributes are exchanged. This information primarily updates the user's predictive expectations. During an episode, however, no information is gathered by the user because no user-analyst interaction occurs. Hence,

***Proposition 1:** User's predictive expectations experience a greater degree of change during encounters than episodes.*

Desired expectations, on the other hand, are very unlikely to change during an user-analyst encounter. Desired expectations are connected directly with the user's values and beliefs, which require longer periods of time to change. Episodes, therefore, offer a better opportunity for the assimilation process to occur. Thus,

***Proposition 2:** Users' desired expectations experience a greater degree of change during episodes than encounters.*

Newman and Robey (1992) predicted that changes "will be initiated in critical encounters involving users and analysts (p. 253)." Consistent with their model, changes in the user's expectation gap will occur in greater degree during an user-analyst encounter. The nature of predictive expectations makes it more flexible than desired expectations, which are linked to the user's values and beliefs. A change in the user's predictive expectations is, therefore, contingent only on the exposure to new information about the system. A change in desired expectations, on the other hand, requires the user to re-evaluate her understanding of the system design as well as of her tasks and roles. Thus,

***Proposition 3:** User-analyst encounters lead to greater changes in the gap between the users' desired and predictive expectations than episodes.*

As discussed before, the user's final expectations gap allows us to predict the *probability* of user satisfaction. A small gap would lead us to predict that, if no "unpleasant surprise" (negative disconfirmation of passive expectations) occurs, the user will probably be satisfied. A large gap, on the other hand, would indicate that the system is far from meeting the user's requirements and, unless a "pleasant surprise" occurs, satisfaction with the system will be low. Thus,

Proposition 4: *The probability of user satisfaction with the system is negatively associated with the gap between the user's desired and predictive expectations.*

Our final proposition deals with the extent of the user-analyst interaction. As discussed before, encounters provide an opportunity for users to update their predictive expectations positively (in the direction of the desired expectations) or negatively (otherwise). When an encounter has led to an increase in the levels uncertainty and ambiguity, an attempt to clarify and redirect the system development process may take place (Newman and Robey, 1992). Thus, in the long run, more frequent user-analyst encounters should lead to more accurate predictive expectations of the user. Therefore,

Proposition 5: *The accuracy of the user's predictive expectations is positively associated with the number of user-analyst encounters.*

Conclusion

This paper explores the multi-faceted impact that user expectations have on ISD processes. First, one must distinguish between predictive and desired expectations to capture the dual nature of expectation formation. Second, expectation formation is an on-going process and thus there is potential to manage evolving expectations so that the probability of user satisfaction is increased. Therefore, more theoretical development and testing is needed to fully understand the role of expectations in the ISD process.

References

- Anderson, R.E. (1973) The effect of disconfirmed expectancy on perceived product performance. *Journal of Marketing Research* , 10, 38-44.
- Geva, A. & Goldman, A. (1991). Duality in consumer post-purchase attitude. *Journal of Economic Psychology*, 12, 141-164.
- Ginzberg, J.J. (1981) Early diagnosis of MIS implementation failure: Promising results and unanswered questions. *Management Science*, 27(4), 459-478.
- Hovland, C.I, Harvey, O.J. & Sherif, M. (1957). Assimilation and contrast effects in reactions to communication and attitude change. *Journal of Abnormal and Social Psychology* , 55, 244-252.
- Kahneman, D. & Tversky, A. (1982). Variants of uncertainty. *Cognition*, 11, 143-157.

Lawrence, M. & Low, G. (1993). Exploring individual user satisfaction within user-led development. *MIS Quarterly*, 17(2), 195-208.

Newman, M. & Robey, D. (1992). A social process model of user-analyst relationships. *MIS Quarterly*, 16(2).249-266.

Oliver, R.L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research*, 17, 460-469.

Oliver, R.L. & Winer, R.S. (1987). A framework for the formation and structure of consumer expectations: Review and propositions. *Journal of Economic Psychology*, 8, 469-499.

Olson, J.C. & Dover, P.A. (1979). Disconfirmation of consumer expectations through product trial. *Journal of Applied Psychology*, 64(2), 179-189.

Spreng, R.A. & Olshavsky, R.W. (1992). A desire-as-standard model of consumer satisfaction. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, 5, 45-54.

Suh, K., Kim, S. & Lee, J. (1994). End-user's disconfirmed expectations and the success of information systems. *Information Resources Management Journal*, 7 (4), 30-39.