Contributing Influences on an Individual's Attitude Towards a New Technology in the Workplace

David T. Bill

Abstract

New technological changes face employees in the workplace everyday. Some employees embrace the changes that technology brings. They seek new applications for the innovations, while others resist and become defensive. Is the defensive behavior of some, a symptom of a sociological system controlling the individual? Does cognitive ability govern individual attitudes toward technological innovations? Do race, age or gender play a role in one's perception of incorporation of new technology in the workplace? Is an individual's attitude predetermined by past experiences? This paper is the summary of a review of the literature around the above questions. The objective is to identify contributing influences of an individual's attitude towards a technological innovation in the workplace.

Technological change has become the mode of operation in the 20th century business community. As the workplace product transforms from paper to information services, employers and employees scramble to keep abreast of the rising tide of information and the new service opportunities created by the innovations in technology available to business. Employees, are naturally expected to adapt to the ever changing norms of technology.

If the intent of an organization adopting a technological innovation is to improve work processes, then why do attitudes vary towards the innovation? Are there underlying forces within the organization that govern an individual's attitude towards a new technology? Does individual experience, good or bad, govern perception and in turn, attitudes?

To begin to understand these forces we must first consider the various lenses that individuals view an innovation through. Weick refers to innovations as *equivoque* or something that lends itself to be misunderstood or interpreted differently by others (Weick 1990). If perception and interpretation of an innovation varies on an individual basis, then we must consider them as contributing factors of an individual's attitude. How an individual perceives the introduction of the technology is critical to whether the individual will eventually adopt the innovation.

Beliefs and Values

People of varying backgrounds often have different belief and value systems which give rise to dissimilar attitudes (Rathus and Nevid 1987). Beliefs and values form a basis of attitudes towards technology (Pancer, George and Gebotys 1992; Gardner, Dukes and Discenza 1993). Therefore varying backgrounds and belief systems contribute to an individual's attitude towards a technology.

Belief systems also contribute to attitudes towards innovation adoption rate. A study contrasting early innovation adopters and the early majority concluded that not only do early innovation adopters use new products more, but also seek new applications of the innovation more than later adopters (Ram et al., 1994). The authors point out that usage rate may linked to individual perception of the technology.

Findings in other studies confirm a relationship between the perception of usefulness of computers to perform job tasks and the level of usage (Koohang, A., 1989; Sacks, C., Bellisimo, Y. and Mergendoller, J., 1993; Baack, S., Brown, T. and Brown, J., 1991) In addition, all studies identified a positive correlation between favorable attitudes toward computers and computer familiarity. Allowing individuals to become familiar with the technology and the perception of usefulness were noted as a critical contributors to successful adoption of the technology. A question for further research is *as individuals become increasingly familiar with the innovation, does the individual's attitude change significantly towards the new technology and does the adoption tendency increase?*

Often used as a foundation for one's perception and in turn attitude, is past experience. A study by Gardner (1993) identified a positive correlation between experiences with computers and beliefs towards them. Not surprisingly, negative experiences with computers correlated with negative beliefs and attitudes toward the technology. Individuals that had positive experiences also espoused positive beliefs and attitudes. Personal experience plays a strong role in forming an individual's attitude. Its no wonder that experience also influence attitudes towards technology

Age, gender and cognitive/mechanical ability

Other considerations are that of gender, age and cognitive ability. Attitudes toward computers differ between the genders. Males tend to display more positives attitudes toward computers, regardless of the level of familiarity, while female attitudes become more positive as the level of familiarity increases (Sacks, Bellisimo and Mergendoller, 1993).

In contrast, a survey of older adults indicated that they are less likely than their younger counterparts to use a computer unless there is a perceived need. The same study attributed the low usage rates to low levels of familiarity (Baack, Brown and Brown, 1991). It is also suggested that older individuals do not respond as well to rapid change as their younger counterparts unless the change is gradual over time (Linden and Adams 1992).

A third study by technology Arthur and Hart (1990) identified a positive relationship between cognitive ability and computer familiarity. The authors suggest that individuals with low cognitive ability levels may consciously opt not to become familiar with computer due to the challenging nature of the technology.

Mechanical reasoning skills can also contribute an individual's attitude. If the innovation is not user friendly and the individual is not mechanically adept, the user may choose not to adopt it A study of mechanical-reasoning skill and

attitude towards Automated Teller Machines concluded that are related to adoption of the innovation (Smither and Braun 1994).

The factors of age, gender and cognitive/mechanical ability all influence perception of an innovation and consequently, attitude.

Organizational Control Factors

Often organizations portray new technology in a in a positive light. They tout the benefits that the innovation will bring to the employee and the organization without addressing the possible negative aspects. When the user encounters a negative experience with the innovation, an environment for rejection occurs. This scenario is called the *paradox of positive value* (Griffith and Northcraft 1993).

Users have a need to reduce uncertainty in coping with the innovation (Lester 1986). By only addressing the positive aspects of an innovation, users are not prepared to deal with any of the negative features when encountered, thus increasing the probability of adoption failure (Griffith and Northcraft 1996).

In contrast, users that are well apprised of the negative aspects may also reject the innovation if not allowed to learn from the experience. This is what Griffith and Northcraft (1996) refer to as the *paradox of negative experience*. They studied the effects of introducing a new technology on attitudes and perceptions of the innovation. It was concluded that attitudes towards the innovation were more positive when given enough time to become familiar with the technology in a risk free environment. Both satisfaction levels and feelings of expertise were positively related to the user's perception of having control of the environment pertaining to interfacing with the technology.

Murrell and Sprinkle (1993) concluded that if an organization addresses the user's phobia of the technology, and allows for a gradual introduction of the innovation, the likelihood of negative attitudes will decrease. The same authors also concluded that individual job attitudes have an impact on the employee's overall attitude towards the organization.

Shani and Sena (1994) studied the affect of and organization's culture on an individual attitudes and the adoption of a technological change. The authors found that when employees were given control of the implementation and application of the innovation attitudes tended to be positive. Employees felt a sense of ownership and perceived a need for the innovation.

Also noted was the self-learning aspect of the culture. The authors identified this aspect, along with employee competence, as the critical elements of the adoption, utilization and internalization of the technology innovation.

Organizational Social Factors

Much research and theory suggests that individuals tend to adopt the attitudes and norms of the group with whom they associate (Coleman, Katz & Menzel, 1966; Davis 1969; Homans, 1950; Newcomb, 1943; Sprague 1982). Burkhardt (1994) in a study of the formation of attitudes towards computers, found that individuals developed their attitudes through interactions amongst peers and informal discussions.

Over time, separate cliques formed between those individuals who understood the technology and those who did not. As a result, individual attitudes changed as a result of the migration to one group or the other, but did not appear to have an impact on the use of the innovation. This could be in part to the job requiring use of the innovation.

Conclusion

Individual attitudes are influenced by many factors, stemming from the individual's knowledge and value base as well as from organizational culture and social information processing. Because an organization is comprised of many individuals with various combinations of the above, careful consideration must be given to the introduction of a innovation.

Organizations must provide individuals a risk-free environment to become familiar with the innovation. A system of learning should be established to provide an environment for information sharing around pertaining to the innovation. Higher adoption rates have been observed when employees have control over the innovation and its implementation. Table 1 lists the contributing influences on attitudes identified in this paper. As the rate of innovation advances increases, organizations must consider the influential forces acting upon their workforce as they grapple with technology.

Table of Contributing Factors to an Individual's Attitude Towards a New Technology (Table 1)

Study	Construct
Weick 1990	1. Perception or interpretation of an innovation varies on an individual basis, and must be considered as contributing factors of an individual's attitude.
Pancer, George and Gebotys 1992; Gardner, Dukes and Discenza 1993	2. Varying backgrounds and belief systems contribute to an individual's attitude towards a technology.
Gardner 1993	3. Personal experience with a technology contributes to an individual's attitude.
Sacks, Bellisimo and Mergendoller, 1993; Baack, Brown and Brown, 1991; Arthur and Hart 1990	4. Age, gender and cognitive/mechanical ability all influence perception of an innovation and consequently, attitude.
Griffith & Northcraft 1996	5. When an organization only addresses the positive aspects of an innovation, users are not prepared to deal with any of the negative features when encountered, thus increasing the probability of adoption failure.
Griffith & Northcraft 1996	6. Users that are well apprised of the negative aspects may also reject the innovation if not allowed to learn from the experience.
Shani & Sena 1994	7. Perception, by the individual, of ownership of the innovation influences attitude and adoption success.
Shani & Sena 1994	8. The establishment of learning systems within an organization affects individual attitudes towards integration of the innovation.
Burkhardt 1994	9. Social interactions amongst peers and informal discussions contribute to the development of individual attitudes.

References

Arthur, Winfred, Jr. And Hart, Darren. (1990). Empirical Relationships Between Cognitive Ability and Computer Familiarity. Journal of Research on Computing in Education,.21, 457-463.

Baack, S., Brown, T. and Brown, J. (1991) Attitudes Toward Computers: Views of Older Adults Compared with Those of Younger Adults. Journal of Research in Computing,.23, 422-433.

Burkhardt, Marlene E. (1994). Social Interaction Effects Following a Technological Change: A Longitudinal Investigation. Academy of Management Journal. Vol 37, Number 4. pp 869-898.

Coleman, J.S., Katz, E., & Menzel, H. (1966). Medical Innovation: a difussion study. New York: Bobbs-Merrill.

Davis, J.A., (1969). Group Performance. Reading, MA. Addison-Wesley.

Gardner, Donald G., Dukes, Richard L. and Discenza, Richard. (1993). Computer Use, Self-Confidence and Attitudes: A Causal Analysis. Computers in Human Behavior. Vol. 9, Number 3. pp 427-440.

Griffith, Terri L. and Northcraft, Gregory B. (1996). Cognitive Elements in the Implementation of New Technology: Can Less Information Provide More Benefits? MIS Quarterly. Vol. 10 Number 1. pp 99-110.

Homans, G.C., (1950). The human group. New York: Harcourt, Brace & World.

Koohang, Alex A. (1989). A Study of Attitudes Toward Computers: Anxiety, Confidence, Liking, and Perception of Usefulness. Journal of Research on Computing in Education, 20. 137-151.

Liden, Robert C. and Adams, Susan M. (1992). Technological Change: Its Effects on the Training and Performance of Older Employees. In Luis Gomez-Mejia and Michael Lawless (Eds.), Advances In Global High-Technology Management. (pp. 217-234). Greenwich, CN.

Murrell, Audrey J. and Sprinkle, Jodi. (1993). The Impact of Negative Attitudes Toward Computers on Employees' Satisfaction and Commitment Within a Small Company. Computers in Human Behavior. Vol. 9, Number 3. pp 57-63.

Newcomb, T.M., (1943). Personality and social change. New York: Holt, Rinehart & Winston.

Niosi, Jorge. (1994). New Technology Policy and Social Innovations in the Firm. London: Printer Publishers.

Pancer, S. Mark, George, Margo, and Gebotys, Robert J. (1992). Understanding and Predicting Attitudes Towards Computers. Computers in Human Behavior. Vol. 8, Number 2. pp 211-222.

Ram, S. and Jung, Hyung-Shik. (1994). Innovativeness in Product Usage: A Comparison of Early Adoptors and Early Majority. Psychology & Marketing. Vol. 11(1) pp 5-13.

Rathus, Spencer and Nevid, Jeffery S. (1987). Psychology and the Challenges of Life. Forth Ed. Forth Worth, TX:Holt, Rinehart and Winston, Inc.

Sacks, Colin, Bellisimo, Yolanda, and Mergendoller, John. (1993). Attitudes Toward Computers and Computer Use: The Issue of Gender. Journal of Research on Computing in Education, 26. pp 257-269.

Shani, A.B. and Sena, James A. (1994). Information Technology and Integration of Change: Sociotechnical System Approach. Journal of Applied Behavioral Science. Vol30 No. 2. pp 247-270.

Smither. Janan Al-Awar and Braun, Curt C. (1994). Technology and Older Adults: Factors Affesting the Adoption of Automatic Teller Machine. Journal of General Psychology. Vol. 121 Number 4. pp 381-389.

Sprague, J. (1982). Is there a micro theory consistent with contextual analysis? In E. Ostrom (Ed.), Strategies of political inquiry: 99-121. Beverly Hills, CA: Sage.

Weick, Karl E. (1990). Technology as Equivoque: Sensemaking in New Technologies. Goodman, Paul S. (Ed.). Technology and Organizations. San Fransico, CA: Jossy-Bass Publishers.