

An E-Collaboration Overview of Behavior and its Relationship with Evolutionary Factors

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INTRODUCTION

The collaboration of individuals across large geographic distances began some time ago, perhaps as far back as the 19th century, with the invention of the telegraph, due to its significant impact on communication (Teresko, 2000). Today, with the increased use of computers, the Internet, and the World Wide Web, electronic communication (e-communication), as well as **electronic collaboration** (e-collaboration) offer individuals around the world the possibility of working together. The wide use of tools such as e-mail and instant messaging, among others, captured the attention of scholars, who began searching for theories that could explain the behavior surrounding the use of electronic media (Kock, 2005b; Simon, 2006).

Throughout the years, researchers have provided a number of explanations in order to offer a better understanding of the factors influencing the use of technology in communication. For instance, the media richness theory holds that face-to-face communication is the richest media available, therefore other forms of communication (such as e-mail) are leaner types of media (Daft & Lengel, 1986). On the other hand, in task-technology fit theory, the outcomes do not necessarily depend on the media being used. In this theory, outcomes do not depend on the technology itself, but vary according to how appropriate the technology is for the task being accomplished (Dennis, Wixom, & Vandenberg, 2001). Other explanations involve social context and its influence on the use of technology (Kock 2005b; Markus, 1994; Simon, 2006). A more recent explanation is the media naturalness model, which goes a step forward and presents evolution as a means to understanding human communication. This view holds that, throughout evolution, humans have become adapted to certain elements of communication, which today are considered “natural” and relates these elements to the use of electronic communication tools (Kock, 2004, 2005b). The objective of this article is to provide an overview of some of the views surround-

ing e-collaboration, focusing on possible evolutionary explanations of behavior toward it.

BACKGROUND

In order to understand what e-collaboration encompasses one must begin with **computer mediated communication** (CMC) as well as **computer-supported cooperative work** (CSCW). The former deals with the use of computers for any type of interaction, while the latter involves all instances in which humans use technology for any type of activity. **E-collaboration** is described by Kock (2005b) as including both CMC and CSCW, since it does not exclusively deal with computers but may involve other electronic devices (such as a telephone). Kock also states that e-collaboration may involve instances in which there is no actual communication; an example of this would be the collaboration of individuals in creating an online resource without ever directly communicating with each other. Taking these aspects into consideration, **e-collaboration** can be defined as the use of electronic technologies by individuals who are working together to reach a common goal (Kock, 2005a; Kock & D’Arcy, 2002).

There are a number of explanations, dealing with communication, as well as technology in general, which are related to e-collaboration. The well-known **media richness theory** suggests that the use of electronic media depends on how rich or lean the media is (Daft & Lengel 1986). The benchmark for such “richness” is face-to-face communication, which is considered the most effective method for communication because it involves important factors like immediate feedback, tone of voice, and facial expression (Lee, 1994). This means that individuals’ behavior towards certain collaboration tools may be explained by their level of “richness” as defined by this theory. While the media richness theory has been supported by a number of studies it has also been challenged by others (Kock, 2005a; Lee, 1994; Simon, 2006). Another available

theory is the **task-technology fit theory**, which suggests that outcomes will vary in any given situation depending on the type of technology used and on the fit between the technology and the task (Dennis et al., 2001, on Goodhue & Thomson, 1995). This can be applied to e-collaboration because some of the available technologies may be perceived as more appropriate than others for achieving specific tasks. The **social influence view** holds that behavior toward a particular technology may be affected by social influences and not by the technology itself. This would occur in the case of an employee who is required to provide prompt responses using instant messaging, therefore forcing the technology to increase in “richness” (Kock, 2005a, on Fulk, Schmitz, & Steinfield, 1990).

While these views attempt to explain human behavior by focusing either on the technology itself, or on social influences surrounding it, they do not seem to provide a scientific explanation for such behavior. This has led to the creation of a more recent explanation: the **media naturalness model**. The main idea in this model is that evolution has prepared the human body for certain types of communication that are perceived as being more “natural.” This view holds that as more elements of face-to-face interaction are used in a medium, the “naturalness” of such medium will increase. The basis of this argument is found in Darwinian evolution, which may provide some insight into human behavior towards e-collaboration (Kock, 2001).

EVOLUTIONARY PSYCHOLOGY, DARWINIAN EVOLUTION, AND E-COLLABORATION

Darwin’s theory of evolution, studied in evolutionary biology, was extended, not too long ago, into the field of psychology, creating what is now known as **evolutionary psychology**. In more recent years, this theory has also been expanded to the field of information systems and has been used to provide more in-depth explanations of human behavior towards areas such as communication, technology and e-collaboration. **Evolutionary psychology** searches for the “origin of behavior,” which is presumed to have developed over millions of years (Dunn, 2004, p. 126). Cosmides and Tooby (2001) state that “a complete causal explanation of any behavior-rational or otherwise-necessarily invokes theories about the architecture of [humans’]

computational devices” (p. 327). In other words, humans possess built-in “devices” which have been formed by millions of years of biological evolution and the creation of theories is required in order to find an explanation for these devices. All of these devices, or mechanisms, are believed to have evolved in order to solve particular problems faced by humans throughout the evolutionary process. However, these problems are not necessarily in existence today (Buss, 1995). Because the world we live in today has only existed for a relatively short time and evolution has taken place “after millions of years of gradual change” (Lindahl, 2000, p. 28), most of the built-in devices found in humans were developed for a completely different hunting and gathering world (Cosmides & Tooby, 2001; Jones, 1999; Kock, 2005a). An example of this theory would be women’s greater spatial-location memory, an evolutionary adaptation useful for gathering, or men’s superior upper-body strength, an adaptation useful for hunting. Both of these are examples of a built-in mechanism, which, in the past, was used for survival (Buss, 1995).

In his **evolutionary theory**, Darwin (1859, 1998) argued that human facial muscles are not pointless divine creations. On the other hand, Darwin saw that these muscles are mainly used for facial expression of emotion and that the expressions used are relatively similar across different populations. This similarity across cultures, religions and other groups, implies that, through evolution, humans have become adapted to certain forms of communication which include nonverbal cues (like facial expressions) and which have been embedded in humans’ internal mechanism. Hence, the majority of these expressions appear to be unaffected by factors such as culture and distance. In addition, while most of these facial muscles are used for communication, only a few are used for other physical activities (like chewing). Many of these muscles are used primarily for communication through facial expression. Therefore, humans have been programmed by evolution to take part in face-to-face communication involving nonverbal cues, which provide additional meaning to the message being conveyed (Jones, 1999; Kock, 2005a). In other words, because of evolutionary reasons, face-to-face communication is the most effective and effortless communication media for human beings.

These evolutionary theories are some of the basic ideas espoused by the **media naturalness model**, in which face-to-face communication is presented as the most natural communication medium. Contrary to

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