The Group Approach to Spreading Awareness of Cyberinfrastructure in the Larger U.S. Scientific Community

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Introduction

The big data, e-science, and cyberinfrastructure movement is gaining increasing attention across the United States. However, there is a lack of awareness among the scientific community about the power and potential of cyberinfrastructure. In order to facilitate a modern approach across disciplines, scientists must progress towards innovative processes to remain competitive. To develop and advance, scientists must gain an awareness of cyberinfrastructure, which would provide the breakthrough working conditions.

Theoretical Perspective

As a manner to date, cyberinfrastructure as an approach to e-science projects is not widely accepted. In the United States, a large reason that certain scientific fields aren't embracing cyberinfrastructure may be due to a lack of awareness of resources that are exponentially more advanced. In order to facilitate a greater increase of big data, e-science, and cyberinfrastructure, the U.S. scientific community must increase their awareness of technology in order to ultimately increase capacity. Past literature has demonstrated that implementing any research outcomes begins with awareness. When potential users learn about products, tools, or findings and gain an understanding about how they work, they're more likely to adopt (Henriksen et al., 2005), further demonstrating the vital process of diffusion of awareness.

In addition, research has also highlighted that the fastest methods of diffusion occurs with a shift in cultural awareness from groups, rather than merely individuals (e.g., Edwards, Jumper-Thurman, Plested, Oetting, & Swanson, 2000; Franke & Shah, 2003; Backer, 2000; Blagescu & Young, 2006; Maxwell & Clifford, 2004; Kelly et al., 2003). In the context of e-science, if an entire virtual organization feels that a new tool coincides with their objectives diffusion of awareness is likely to occur (Backer, 2000).

In contrast, other research argues that the success of diffusion starts with respected members of groups developing support for programs, thus arguing that it starts with powerful individuals from the community (Edwards et al., 2000). However, research has also demonstrated that the power of individuals may be limited to smaller contexts (Edwards et al., 2000), demonstrating that effectiveness of diffusion of awareness is contingent on conditions.

The current study seeks to understand the spread of awareness in cyberinfrastructure. We ask the research question, *"How do the group approach and the individual approach differ in the context of diffusion of awareness?"*

Methodology

This poster systematically analyzed seven instruments for organizational capacity and readiness. These instruments were originally developed in various contexts, such as, non-profit organizations, developing countries, public health, and education. We analyzed these instruments in order to identify important factors and processes relevant to organizational capacity in e-science projects.

Findings

The Group Approach

Group dispersion of awareness is imperative for successful adoption and utilization of new tools. Group spreading of awareness allows for an organic shift in attitudes, facilitating a natural and rapid adoption.

- "Communities can shape individuals' behaviour both symbolically and tangibly, transmitting values and norms. As systems of exchange and influence, communities establish opportunities for people to behave in some ways and not behave in others." (Kelly et al., 2003)

- "An individual may develop an idea, but developing this idea into a functioning prototype often requires the assistance of others. We find that, within user communities, user innovation is not an individual task but a joint effort." (Franke & Shah, 2003)

- "Finally, communities are important because readiness for school success is a community responsibility, not just the responsibility of a parent or preschool teacher." (Maxwell & Clifford, 2004)

The Individual Approach

Individual dispersion of awareness is a slower, less impactful methodology for the spreading awareness and adoption of new tools. However, in smaller communities, powerful individuals in the groups have a greater influence in spreading awareness.

- "The level of individual capacities includes both technical skills or knowledge and the awareness, ability to think critically, and sense of personal empowerment which will help people…" (Blagescu & Young 2006)

- "We submit that these features can improve the effectiveness of social marketing efforts by increasing the likelihood that strategies will ultimately result in individual behavior change." (Kelly et al., 2003)

- "The first strategy was for respected members of the tribe, knowledgeable about tribal culture, to make personal home visits to develop support for the program." (Edwards et al., 2000)

- "Four *elements* in particular - individual behavior change, audience research, segmentation and consideration of the 4 Ps [product, place, price, promotion]- may be enhanced by the Community Readiness Model." (Kelly et al., 2003)

Conclusion

Although further research is required to understand the long term differences between group and individual dispersion of awareness, this poster concludes that the group approach is more effective. Depending on situational factors (e.g., group size, community culture), each community must assess the most appropriate manner to diffuse awareness. The individual approach, according to literature, was successful for more intimate communities when individuals diffusing the information were community leaders. However, literature heavily suggests that the group approach may be the superior method of diffusion of awareness. Given that cyberinfrastructure and e-science are currently not widely accepted, practitioners must understand the diffusion of awareness; this poster lays the foundation for assessing the most effective way for communities to spread awareness.

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