Assessing Organizational Readiness in E-Science Projects

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Introduction

Diffusion of cyberinfrastructure (CI) resources (e.g., interdependent technologies, remote instruments, big datasets, dispersed experts, and diverse institutions; Kee, 2015) to e-science projects has been challenging due to the complexity of the socio-technical system that is CI. In order to develop a theoretical framework of an organization's capacity for CI diffusion, we must first start by assessing the organization's readiness to adopt new ideas and practices. The success of CI resources is contingent upon its usefulness in e-science projects. However, due to the complexity of diffusion, it is essential to assess those e-science projects to determine their readiness for CI diffusion (Backer, 2000).

Literature Review

As the science fields progress towards virtually organizing, there is a pressing need to understand the functioning and dynamics of these e-science projects within the context of CI. In order to maximize the potential of these e-science projects, it is imperative that the CI community has a method of assessing an organization's readiness to adopt new practices, ideas, and technologies (Backer, 2000). In the context of CI, capacity refers to an e-science project's processes or activities designed to improve leadership, personnel, training and skills, financial management, and physical and technical infrastructure (Kee, 2015; Blagescu & Young, 2006). However, before building an organization's capacity, the group's readiness must be assessed.

Readiness can be defined as "a felt need, that is, an [organization's] sense of dissatisfaction or perceived discrepancy between expectations (what should be) and reality (what is)" (Oetting, 1995). Readiness is measurable and has been used in various contexts; however, little to no research has addressed readiness assessment in the context of e-science.

This poster provides a preliminary investigation of organizational assessment of e-science projects to adopt CI, which will allow these e-science groups to adopt new strategies that would improve their capacity (Kelly et al. 2003) for CI diffusion. When groups assess their readiness and consequently implement capacity building strategies, CI will diffuse through community, ultimately allowing the sciences to advance cohesively and progressively.

Methodology

This poster systematically analyzed two 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. Specifically, this investigation adapted three out of five of Oetting's measures in Assessing Community Readiness for Prevention (1995) and two of the seven measures in the ADRC Readiness Assessment Survey (n.d.) in order to construct an instrument for readiness assessment in e-science enabled organizations. The instrument partly utilizes the Guttman scale, in which items have order of intensity. The underlying assumption is that attitude is a unidimensional phenomenon. If a more intense statement is agreed with, the other less intense statements will be agreed with also. Therefore, the most intense statement that is agreed with becomes the person's score (Baxter & Babbie, 2003).

Instrument for Readiness Assessment in E-Science Projects

Leadership and Community Involvement

Please select 1 out of the 9 statements that best describe your situation.

1. A very large portion of the organization actively speak out against adopting new CI.
2. There is no need, people in the community are closed to adopting CI.
3. People have talked about adopting CI, but so far there isn't anyone who has really "taken charge."
4. There are identifiable leaders who are trying to get something started, a meeting or two may have been held to discuss adoption of CI.
5. Leaders and others have been identified; a committee(s) have been formed and regular meetings take place.
6. Program(s) are being run and supported by their own groups or committees; however there is little coordination or planning.
7. Administrators and leaders are solid supporters of adopting CI.
8. Authorities, program staff, and community groups are all supportive of extending efforts to groups that have not adopted CI.
9. Authorities support programs, staff are highly trained, community leaders and volunteers are involved and an independent evaluation team is functioning.

Knowledge About the Problem

Please select 1 out of the 9 statements that best describe your situation.

1. There is little to no community belief that the lack of CI is a problem or causes problems.
2. Yes, lack of CI is a problem, but there is no problem in this organization.
3. Some people may lack CI, but no have immediate motivation to do anything about it.
4. There is a clear recognition of a lack of CI, but detailed information is lacking.
5. Information on CI adoption is available, but only broad outlines have been published or presented to the community at large.
6. Information on CI adoption has been widely disseminated to both community leaders and the general community.
7. Detailed information about CI adoption is available; it has been disseminated widely and people know where to get specific information.
8. There is considerable specific knowledge about CI adoption.
9. There is detailed specific knowledge about trends and changes in national and local prevalence; staff attend meetings, consult with experts and read scientific publications.

Funding for Prevention

Please select 1 out of the 9 statements that best describe your situation.

1. Why would anybody spend money to adopt CI?
2. CI adoption costs too much, this organization is poor.
3. It should be possible to fund CI, but not sure how much it would cost or where the money would come from.
4. A committee or person is finding out how much CI would cost and is considering where funds might come from.
5. Costs are known. A proposal for funding has been written, submitted, or may have been approved.
6. There is funding for CI, but it is only from grant funds, outside funds, or specific one time donations.
7. A considerable part of support of CI is from local sources that are expected to provide indefinite and continuous funding.
8. There is a continuous and secure funding for CI.
9. There is continuous and secure funding for CI, evaluation is routinely funded and there are substantial funds for trying out new programs.

ADRC Readiness Assessment Survey

Depending on the statement, please indicate "Yes" (Y), "No" (N), or "Don't Know" (DK), as it relates to your situation.

Mission and Structure
- The organization's mission statement was developed in collaboration with staff, consumers, and other stakeholders. (Y) (N) (DK)
- The organization's mission statement is related to diffusion of CI. (Y) (N) (DK)

Leadership
- The organization has a chart showing the organizational structure, staff positions and lines of authority in the organization. (Y) (N) (DK)
- The organization has a director that meets established minimum qualifications. (Y) (N) (DK)
- The organization has a governing body with bylaws and other governing documents in place. (Y) (N) (DK)
- The organization has an advisory body. (Y) (N) (DK)
- The advisory body meets regularly, is active and consistently engaged. (Y) (N) (DK)
- There is a system in place for regularly recruiting new members for the advisory body and replacing inactive members. (Y) (N) (DK)
- The organization has an advisory body with significant consumer representation. (Y) (N) (DK)

Budget
- The organization has a formal budget development process. (Y) (N) (DK)
- The organization has established fiscal accountability procedures. (Y) (N) (DK)

Long Term Planning
- The organization has developed formal strategies for achieving long-term sustainability of the program. (Y) (N) (DK)
- The organization's operating funds come from diverse and varied sources. (Y) (N) (DK)

Conclusion

Readiness assessment in e-science enabled organizations is an essential step in capacity building for CI diffusion that has not been addressed sufficiently. Further investigation of readiness in e-science may shed light on additional factors of this important measure. The current study offers preliminary exposure to readiness assessment by incorporating and adapting previous measures. It is essential to determine if an e-science organization is ready to take steps in the direction of capacity building in order to promote the diffusion of CI. In order for the STEM fields to advance in the progressing science disciplines, readiness assessment will prove to be a vital step in CI diffusion.

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