Information Quality Research Challenge: Predicting and Quantifying the Impact of Social Issues on Information Quality Programs

JOHN TALBURT and THERESE L. WILLIAMS, University of Arkansas at Little Rock
THOMAS C. REDMAN, Navesink Consulting Group
DAVID BECKER, Mitre Corporation

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There are many challenging issues in the field of Information Quality (IQ), and experience has taught us that they are not all technical. As Thomas Redman points out, "Veterans also know that it is not the hard, technical issues that stymie an organization's efforts to better manage and utilize its data and information assets, but rather the soft organizational, political, and social issues" [Redman 2008, p. 159–160]. Doan et al. cite a similar issue with data integration, that many projects fail simply because the data owners do not want to cooperate [Doan et al. 2012]. Most current IQ methodologies and frameworks now acknowledge and incorporate this reality, for example, the McGilvray Framework for IQ posits that in addition to the what (i.e., data) and how (i.e., processes and technology) context, the who (people and organizations) must also be considered in order to effectively address IQ problems [McGilvray 2008].

The impact of organizational and social issues on the success of IQ programs is now well recognized. For example, knowledge and skills in project and change management are seen as essential elements of IQ practice. New organizational positions, such as the Chief Data Officer, are evolving as data and data governance issues capture corporate attention [Lee et al. 2014]. However, the research on social and political IQ issues has primarily been qualitative, based on what worked/did not work in a given organization or two.

Just as defining data quality dimensions and formulating metrics to quantify the impact of poor data quality was a focus of early IQ research, a new round of research is

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Authors' address: J. Talburt, University of Arkansas at Little Rock; email: jrtalburt@ualr.edu.

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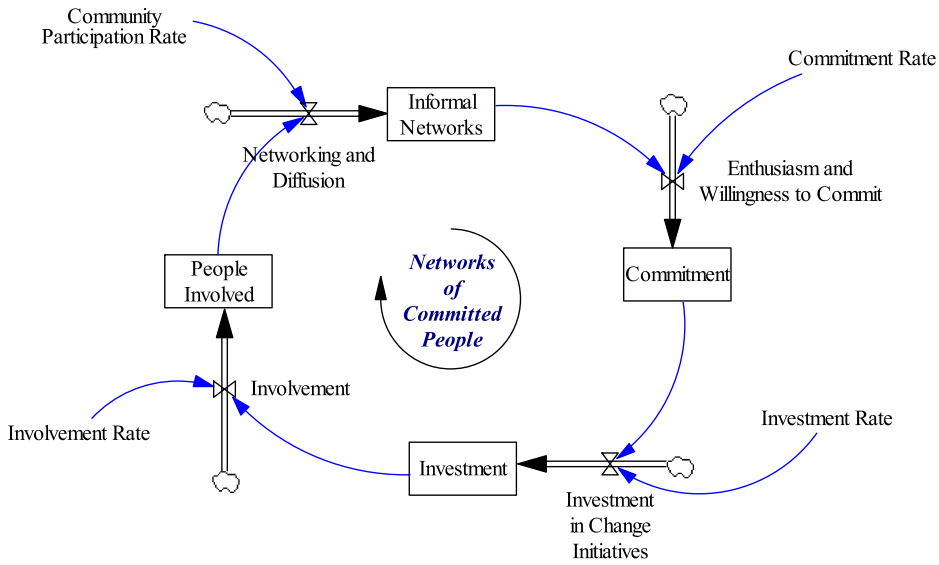

Fig. 1. Network of committed people.

needed to quantify and predict the true impact of social and political issues. Other than by example, we do not even know what the categories and definitions of the relevant soft issues are. For example, how do personal attitudes about the importance of IQ influence the organization, both positively (promoting) and negatively (resistant)? We suspect that the degree of influence depends upon the position of both influencers and those being influenced, but we do not know enough to reliably predict whom to enroll in the effort. There are dozens of possible factors, including training, competitive threats, degree of centralization, and so forth. Further, they all interact, for example, just a bit of training may cause an influential person to join the information quality effort.

A possible way forward in this research is to again draw on the manufacturing paradigm and the richness of the total quality management (TQM) movement. A 1992 book discusses the birth of quality programs at AT&T and quality archetypes that were discovered [Zuckerman and Hatala 1992]. Are the archetypes for manufacturing quality the same as those for information quality? Can any insight be achieved looking at the rise of Total Quality Management in the 1980s? What can be done to convince management that business processes should change to include information quality?

At least one joint academic-industry research team has started work in this direction through review of several management organizational change models [Williams et al. 2013]. The initial goal is to identify candidate soft issues, isolate the impact of a few, and incorporate them into a computer simulation. The simulator is, in effect, a testbed that can be used to experiment with the impact of various combinations of social factors. An important first step is to calibrate the model against actual IQ projects and programs.

Currently, this research employs the principles of Systems Dynamics, a theory first mentioned by Jay Forrester in 1958 [Forrester 1958]. Much of the initial work uses models of growth processes for profound change proposed by Senge et al. [1999]. Thus our first task is developing a believable computer model of this process. We're narrowing the focus to the process of gaining full commitment of a network of people. Figure 1 displays that process as a positive feedback loop. Start with an initial "investment" in the lower right, which leads one or more people to become "involved." Networking

and diffusion lead to "informal networks" (or communities of practice), in turn leading to true commitment on their part. This commitment leads more individuals to invest time in the effort and completes the positive feedback loop. Note to that the figure is depicted as a continuous loop—consistent with the way networks expand in the real world. These features are simulated in a VenSim software implementation. Finally, other positive feedback loops and counterbalancing negative loops can be developed and added to the simulation.

While it is too soon to know whether this line of inquiry will bear fruit, we are encouraged. System dynamics has proven itself necessary in the complex computer modeling needed to address policy and planning issues, and even a small breakthrough may be of profound practical significance. For example, John Kotter writes that change can be successful when approximately 75% of an organization's management is "honestly convinced that business-as-usual is totally unacceptable" [1995, p. 62]. If simulation can verify this for IQ and suggest ways to enroll those 75%, the pace of data quality improvement would increase dramatically! Thus, specific near-term research questions include the follolwing.

(1) How does one get the first individual to invest in the effort? And then the second and the third? Is it education? Is it some outside influence, a case study, a session with a trusted lower-level employee?
(2) Does "level" really matter? Are there other distinctions of "influence" among managers of equal level?
(3) When does the process reach a "tipping point?"

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