

The Influence of Realist Ontology on Technological Projects: The Case of Irish Electronic Voting

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Abstract. This paper discusses the relationship between ontology, seen as the understanding of reality, and the management of technology. It introduces two ontological positions: realism and constructivism. This ontological debate is explored with the example of the Irish attempt to introduce e-voting. In order to understand the mistakes made during the Irish e-voting project, it is helpful to consider the ontological position taken by the responsible decision makers. It is argued that only a realist conception of technology can give rise to the sort of mismanagement that was observed in the case study. In conclusion, the paper suggests that following a constructivist ontology would have helped avoid some of the serious mistakes that were made.

In 2004 the Irish government attempted to introduce electronic voting for local and European elections. This was the first attempt to implement electronic voting holistically within the European Union. During the implementation time, there were many indicators that e-voting may not be feasible. However the Irish government resolutely held on to the idea. Just five weeks before the start of the election, in the context of widespread public opposition the government abandoned the idea of electronic voting. In the end, this technological adventure cost Irish taxpayers more than €50 million Euro.

Based on the case of the Irish e-voting project, this paper discusses the relationship between ontology and the management of technology, especially of Information Systems (IS). We argue that realism is the predominant ontology to be found in the field of technology management and research. The aim of this paper is not only to question the realist ontology in technology research but also to propose constructivism as a more pragmatic worldview. We argue that the realist ontology tends to overemphasise the use of technology. However, the expected goals are very often not met. The problem lies not in the technology itself but in its poor management, which often takes the technology out of social context.

Two different Ontologies: Realism vs. Constructivism

Realism, as we use the word, means that reality is given independent of the observer [1]. It is the ontology that used to be prevalent in the natural sciences and it is what Husserl called the "natural attitude" - the ontological assumption that we seem to pick up most easily during our socialisation. Realism is the ontology of positivism which

arguably is the prevalent research paradigm in most natural but also many social sciences [2]

If realism is so widely spread, then it is worth asking what may be problematic about it. The most famous presenters of natural sciences Albert Einstein argues: 'Physical concepts are free creation of the human mind, and are not, however it may seem, uniquely determined by the external world' [3]. Human beings arguably describe their world according to their paradigmatic lenses. This leads to the charge that realist research, instead of describing an objectively given world, actually produces self-fulfilling prophecies or, to put it more simply, that it invents those things that it pretends to be measuring,.

We need to ask ourselves, what ontological alternative do we have. The history of philosophy offers many examples of non-realist ontologies. We will just pick the one we think is most important to current practices in IS research. The constructivist position is rooted in the notion that there is no observed phenomenon without an observer. The constructivist view of the world 'acknowledges the legitimacy and reality of differing perspectives on social phenomena'. Reality is not given but it is the result of the human action of perception which constitutes the phenomena under investigation.

Consequently, the constructivist view challenges the instinctive drive towards the rational implementation of technology. Constructivist ontology holds a position that technology cannot be seen objectively. It is rather created, invented, and constituted during the process of design, development, and use. Information systems, for instance, should be studied and managed within a specific social context. Furthermore IS would not only be influenced by various technological features but also by human factor.

Under these proposed conditions empirical research of IS and its management takes on a different meaning. One can no longer find out the reality about technology but one can study how it is put to use, what aspects affect its creation and use, which hidden assumptions shape it, etc. Management should not conceptualise technology as a tool that can be used to achieve some purposive-rational aim. Instead, the constructivist's proposal suggests that the managerial use of technology interacts with its use, and forms a part of the environment that shapes its reality.

Case Study

In order to illustrate the ontological argument, we discuss the case study of electronic voting in Ireland. During the general elections in 2002, the government piloted electronic voting in three constituencies. Despite minor problems the government was pleased with the results. The decision was made to introduce electronic voting nationwide for the local and European elections in June 2004.

Despite the euphoria at the pilot stage, a reasonable amount of Irish citizens cast their doubts from the start that e-voting would be feasible on a national level. One opposition party pointed out that the system did not have paper trails and therefore was open to manipulation. The lack of a paper trail was also the main reason for the establishment of the lobby group comprising of computer experts. They argued that a paper trail allows voters to review a print-out of their expressed preferences, which would add confidence to the system. Without such a paper trail an independent random check of the system would not be possible.

Regardless of the growing opposition to the introduction of e-voting in June, even in February 2004 the Irish government remained committed to the agenda. Finally, due the public resistance against electronic voting the Irish government decided to establish an independent Commission on Electronic Voting. The report [4] published on 1st May stated that the 'Commission finds that it is not in a position to recommend with the requisite degree of confidence the use of the chosen system at elections in Ireland in June 2004'.

After the commission's clear recommendation against the introduction of electronic voting the Irish government was forced to rethink its strategy. Mr. Cullen the main politician responsible for the Irish electronic voting disaster was faced with sustained accusation of arrogance, incompetence and neglecting for a long time the public voice against electronic voting. Five weeks before the election date, the government abandoned the proposal to carry out the elections electronically and went back to manual voting.

The government's hope to be able to improve the democratic process implementing e-voting proved to be fallacious. It did not only cost the Irish state more than €50 million but it also massively influenced elections. The ruling party experienced the worst election results since 1920s. The question which arises is, how was it possible for the Irish government to not be aware of different weaknesses of the system before 1st May 2004.

Discussion

Researchers and practitioners who subscribe to the position of ontological realism see technology as a tool, which serves humanity in achieving its common objectives. While they would concede that technology is created by humans, it eventually matures from human tutelage and leads an existence of its own. The resulting view is that a technological tool is tailored towards a certain task, which can successfully be used to address the task and solve the problem. Management of the system thus has to make sure that the right tool for the task at hand is present. Once this has been achieved, the rest is a matter of detail and skilled application.

The story of Irish e-voting fits this description. How else could one explain the fact that the Irish government believed that it could go ahead with the new technology? Ignoring societal resistance and the facts that it has never been used successfully on a nation-wide scale. The opposition that the Irish government faced could only be overcome (or ignored) on the basis of a strong conviction that e-voting, once installed, will eventually be successful and the opposition voices will slowly disappear.

Had the Irish government been of a constructivist persuasion, then the entire project would have presented itself in a different light. Constructivists do not believe in the independent existence of technology but see it in the social context, where technology is being constantly constructed and reconstructed through its use and interaction. The constructivist ontology assumes that technology is not determined by engineers or designers but it is negotiated by all stakeholders. Consequently, apart from responsible politicians and technical consultants the input of the public opinion and independent computer experts would have been crucial in decision-making.

One example of the constructivist alternative could be the issue with the paper trail. The realist ontology supports the position of using e-voting for rational and economic purposes. Irish experts also welcomed the technical advantages such as accuracy and

speed of e-voting. At the same time they argued that elimination of the paper trail could endanger Irish democratic principles. One can argue that the constructivist ontology would put democratic principles into first place, accepting the higher costs, if necessary. A constructivist would advocate, that e-voting should be adjusted to the public requirements, and not vice versa.

In this paper we have tried to put forward the idea that the underlying ontology is of great importance for the use and understanding of technology. We used the example of the Irish attempt to institute electronic voting showing that the management of this technology and its eventual failure can be explained by looking at the ontology upon which it is built. We have argued that realism, as the current predominant ontology of the technology, is not always tenable. In our view, realists tends to overemphasise the benefits of IS. Furthermore we have proposed constructivism as a more viable alternative, which puts the technology into the social context.

Although the IS managers might not be aware of the ontological discourse, they can not escape the fact that the technological failures happen on a regular basis. The above described case is a typical sample of it. Another example is the unsuccessful attempt of the German government to introduce an electronic autobahn toll system. We strongly believe that a shift in ontological thinking would also improve the management of technological systems. Instead of seeing technology as 'universal' solution to our societal problems, technology should underlie social rules. Doing so, one would recognise that, despite all technological advantages of e-voting, for instance some societies would still prefer to vote manually. In other words, although the e-voting would speed up the voting procedure, it would not improve a country's sense of democracy.

What we are proposing is not a panacea. Constructivism as an ontological theory has to contend with theoretical problems that we did not discuss in this paper. However, it gives us a different perspective and it may allow us to avoid some of the mistakes that are frequently made. We believe that the story of Irish e-voting supports this contention. At the very least, it can be understood as a motivation to reflect upon and question the ontological assumptions one holds and thereby maybe improve the way one deals with technology.

References

1. Burrell, G. and G. Morgan, *Sociological Paradigms and Organizational Analysis*, London: Heinemann. (1979)
2. Orlikowski, W.J. and J.J. Baroudi, *Studying Information Technology in Organizations: Research Approaches and Assumptions*. *Information Systems Research*, 2(1): (1991) p. 1-28.
3. Von Glasersfeld, E., *The Radical Constructivist View of Science*. *Foundation of Science*, 6(1-3): (2001) p. 31-43.
4. Commission on Electronic Voting. (2004) *Secrecy, Accuracy and Testing of the Chosen Electronic Voting System*, [Online]. Available: <http://www.cev.ie/html/report/V02.pdf>; 11/08/2004.