Innovativeness and its link to interoperability:

An investigation using a novel Business Narrative Modelling Language (BNML)

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1. Summary of the research - We intend to use multiple case studies to develop a theoretical model concerning the contemporary phenomenon of organizational innovativeness and its link to interoperability. We are interested in particular in interoperability as pertaining to *people and organizations able to operate in conjunction (together) to produce innovation*. Interoperability can be defined as "the ability of a system or an organization to work seamless[ly] with other systems or organization[s] without any special effort" (Mertins *et al*., 2008, p.v) and Gasser and Palfrey (2007, p.ii) state that "One of the reasons why we tend to like interoperability is that we believe it leads to innovation". However, they continue, "the relationship between interoperability and innovation, while it likely exists in most cases, is extremely hard to prove" (Gasser and Palfrey, 2007, p.ii). In so doing we are to test a business narrative modelling language (BNML) that we have developed. BNML is a research method that uses representations combining storylines, roles, ontologies, patterns, assets and value exchanges. We intend to apply our BNML as a main doctoral research effort to map out the creation of value and innovation in organizations. The need for BNML arose given a growing dissatisfaction with qualitative research approaches and also due to the need to bring entrepreneurs, especially those with little training in management theory, closer to the academic (as well as practitioner) discussion of innovation and strategy for value creation. Such studies, which may bring to the fore rich detailed descriptions for example of how collective mind is achieved, are lacking in the literature (Camarinha-Matos, 2008).

2. The Building Block of the Business Narrative Modelling Language (BNML) – Given that in the literature one may find some dissatisfaction with existing qualitative research methods, for a number of reasons including that they lack objectivity and rigour (Yin, 2003), we have developed the Business Narrative Modelling Language (BNML) in an attempt to systematize research without letting it become mechanistic. Following the development of a script to serve as a basis for semi-structured interviews (recorded) during data collection, when in the organization being researched interviewees are also asked to fill out a value network diagram (Allee, 2008) designating the deliverables, both tangible and intangible, exchanged by organizational actors in order to create value. BNML is then developed by the researcher after the interviews have taken place, a visual representation of storylines, characters moving closer together and then further apart as the organizational narrative unfolds, an aspect of BNML which is particularly representative of organizational interaction on the path of value creation; a pattern sequence is then mapped out using pre-defined patterns taken from Bjork and Holopainen (2005), as well as an embedding in the narrative of how asset creation and usage occurs (indicating also when it occurs). This process allows a close relationship between the subject and researcher, as opposed to a more distant relationship when using quantitative approaches (Bouma and Atkinson, 1995), while at the same time saving time both during data collection and during data analysis, shortcomings of other qualitative research methods. This visual BNML representation is further supported by ontologies, those of Uschold et al. (1998) and Fritscher and Pigneur (2010) with the objective of providing additional standardization to our qualitative research methodology tool, thus enabling a comparison across case studies where less variability should now occur.

The Business Narrative Modelling Language is further supported by a story and a plot, defined along certain dimensions, made evident using questions: "Who?" relates to the character; "What?" relates to a deliverable; and "Where?" to the location where the story unfolds; "How?" relates to the unfolding of the story, in a pattern sequence, and "When?" calls

attention to the timeline. Parameterization is added in the figure using the chosen ontologies to improve comprehension.

As Langley (1999) stated, research sense-making strategies differ along essential dimensions such as accuracy, simplicity and generality. By combining the narrative, which scores high on accuracy but low on simplicity and generality, with visual mapping, which scores reasonably well on accuracy, simplicity and generality, and while further allowing room for some quantification, which scores high on simplicity and generality but low on accuracy, BNML offers what we believe to be a balanced solution for organizational theorists.

3. Usefulness of the proposed study - This research is aimed at contributing in a small way to increasing essential knowledge which may lead to improved quality of life. Europe is "in the midst of the deepest recession since the 1930s" (Buti, 2009) and Portugal's economy is no exception, being a peripheral European economy which is having difficulty in converging with the European Union EU-27 GDP per capita average (Mateus, 2006). Furthermore, Portuguese culture is not considered to be innovation facilitating (Javidan, 2004), particularly true in the case of open innovation (Lopes and Teixeira, 2009), despite the need for Portugal's economy to be innovation-driven (Schwab, 2010).

4. Research results - Our research to date has been performed at four companies in Portugal. The first three case studies – Sage Portugal, part of a global management software producer; diafresh, a fresh food distributor; and BTM Travel, a travel agency – were used in order to aid the development of BNML and test its acceptability by entrepreneurs and executives. Our most recent case study, of SoftwareOne - a fictitious name for a software house with fifty employees and five million Euros in annual sales which prefers to remain anonymous – has been used for a more in-depth BNML representation, with tables (pattern instantiations) to analyse and portray our findings there so far, in order to answer our main research question concerning the relationship between interoperability and innovation.

The SoftwareOne case study has already provided insights into how innovativeness can be improved upon, and sponsorship by senior management as well as digital connectivity, both promoting an innovation culture play a big part. There is also an annual internal competition concerning innovation leadership at SoftwareOne which promotes the recognition of those excelling at innovation. Interoperability leads to innovation at SoftwareOne, and Information and Communication Technologies (ICT) play a significant role in the innovation process as customers and employees alike are linked with advanced collaborative innovation technologies to ensure that knowledge sharing occurs.

Having a young specialized team, well versed in ICT to increase interoperability levels, motivated by a profit-sharing scheme to share knowledge and thus contribute to the creation of value for customers, and supported by a highly qualified CEO, with a clear vision for the future, are positive factors which need to be present in a growing number of companies in Portugal. Selling innovative products is an easier task than selling products which are not differentiated, and this is the real value of innovation: sales go up while marketing costs come down. We can thus focus on really improving the quality of life and much of this is due to the leveraging of interoperability.

5. References

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