

The Paradoxical Impact of National Culture on Quality and Innovation

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ABSTRACT

Both quality and innovation are recognized as key competition factors in modern organizations, no matter service or manufacturing. Neither an outdated high quality or an innovative bad quality product can be sustainable. How to achieve both quality and innovation will be an issue for all organizations. This paper will explore the paradoxical impact of national culture on quality and innovation with a view of resolving the paradox and support both quality and innovation.

Keywords: National Culture, Quality, Innovation, PIPE model

1. Introduction

Although there are studies aiming to prove innovation will support quality (Shi et al 2016), there still seem to be a quality-innovation paradox from the management and culture perspective. Taking workforce diversity as an example, Bassett-Jones (2005) argues that diversity is a recognizable source of creativity and innovation but, at the same time, diversity is also a cause of misunderstanding, suspicion and conflict in the workplace that may lead to poor quality. The impact of culture on quality and innovation seems to be paradoxical as well. This paper will explore the paradoxical impact of national culture on quality and innovation with a view of resolving the paradox and support both quality and innovation. This paper will explore the paradoxical impact of national culture on quality and innovation with a view of resolving the paradox and support both quality and innovation.

2. Literature Review

This study is based on the five dimensions of national culture by Hofstede (1991) and the two dimensions by Hall (1989), including Power distance, Individualism, Masculinity, Long term orientation, Uncertainty avoidance, Scientific thinking, and Precise thinking. The five dimensions of national culture by Hofstede (1991) are defined below:

Power Distance Index (PDI) expresses the degree to which the less powerful members of a society accept and expect that power is distributed unequally. The fundamental issue here is how a society handles inequalities among people. People in societies exhibiting a large degree of Power Distance accept a hierarchical order in which everybody has a place and which needs no further justification. In societies with low Power Distance, people strive to equalise the distribution of power and demand justification for inequalities of power.

Individualism versus Collectivism (IDV). The high side of this dimension, called Individualism, can be defined as a preference for a loosely-knit social framework in which individuals are expected to take care of only themselves and their immediate families. Its opposite, Collectivism, represents a preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular ingroup to look after them in exchange for unquestioning loyalty. A society's position on this dimension is reflected in whether people's self-image is defined in terms of "I" or "we."

Masculinity versus Femininity (MAS). The Masculinity side of this dimension represents a preference in society for achievement, heroism, assertiveness, and material rewards for success. Society at large is more competitive. Its opposite, Femininity, stands for a preference for cooperation, modesty, caring for the weak and quality of life. Society at large is more consensus-oriented. In the business context Masculinity versus Femininity is sometimes also related to as "tough versus tender" cultures.

Uncertainty Avoidance Index (UAI). The Uncertainty Avoidance dimension expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. The fundamental issue here is how a society deals with the fact that the future can never be known: should we try to control the future or just let it happen? Countries exhibiting strong UAI maintain rigid codes of belief and behaviour, and are intolerant of unorthodox behaviour and ideas. Weak UAI societies maintain a more relaxed attitude in which practice counts more than principles.

Long Term Orientation versus Short Term Normative Orientation (LTO). Every society has to maintain some links with its own past while dealing with the challenges of the present and the future. Societies prioritize these two existential goals differently. Societies who score low on this dimension, for example, prefer to maintain time-honoured traditions and norms while viewing societal change with suspicion. Those with a culture which scores high, on the other hand, take a more pragmatic approach: they encourage thrift and efforts in modern education as a way to prepare for the future. In the business context, this dimension is referred to as “(short-term) normative versus (long-term) pragmatic” (PRA).

The two dimensions on context and time by Hall (1989) are defined below:

High context versus low context. In a high-context culture, there are many historical and contextual elements that help people to understand the hidden rules in their life and at their work. As a result, everything is taken for granted based on intuition and experiences or the experiences of ancestors. This can be very confusing for person who does not understand the 'unwritten rules' of the culture. In a low-context culture, very little is taken for granted. Everything has to follow clear and scientific method and explanation. Whilst this means that more explanation and experiment are needed, it also means there is less chance of misunderstanding particularly when visitors are present. That is why this dimension is called scientific versus intuition thinking from the perspective of innovation and quality study. China was ranked number one in the intuition direction while German and Japan are number one in the direction of scientific thinking (Hall,1989).

Monochronic time, M-Time, as he called it, means doing one thing at a time and punctual. It assumes careful planning and scheduling and is a familiar Western approach that appears in disciplines such as 'time management'. In Polychronic time cultures, human interaction is valued over time and material things, leading to a lesser concern for 'getting things done' on time as planned-- they do get done, but more in their own time which is mostly delayed or unpredictable flexible. Aboriginal and Native Americans have typical polychronic cultures, where 'talking stick' meetings can go on for as long as somebody has something to say. We called this dimension precise thinking versus flexible thinking in terms of handling time.

National culture has been recognized as a key factor influencing quality, innovation as well as broader management. According to the research by Jabnoun and Khafaji (2005) and Noronha (2003), Power distance, Individualism, Masculinity and uncertainty avoidance are negatively influencing quality while long term orientation, uncertainty avoidance, scientific thinking and precise thinking are positively influencing quality or quality management activities. Using the same national culture dimensions, Sun (2009) found that power distance is negatively influencing innovation while individualism, uncertainty avoidance, scientific thinking and precise thinking are positively influencing innovation. However, there are also authors (Murray, 2004; Root-Bernstein and Root-Bernstein, 2003) believe that the opposite of scientific thinking, i.e., intuitive, non-logic, subconscious thinking enhances innovation or creativity, which is another paradox within innovation study.

3. Results

Based on previous studies reviewed in last section, the influences of national culture on quality and innovation are listed and compared in table 1. From the table, it can be found that the impact of individualism, scientific thinking, and uncertain avoidance are paradoxical while the impact of other dimensions are the same or different but not paradoxical.

Table 1. The paradoxical impact of national culture on quality and innovation

Hofstede (1991) and Hall (1989)	Quality (Siakas & Georgiadou, 2000; Jabnoun and Khafaji, 2005; Noronha 2003)	Innovation (Sun 2009, Murray, 2004; Root-Bernstein and Root-Bernstein, 2003)	Paradoxical
Power distance	-	-	N
Individualism	-	+	Y
Masculinity	-	/	N
Uncertainty avoidance	+	-	Y
Long term orientation	+	/	N
Scientific thinking	+	+/-	Y
Precise thinking	+	+	N

4. Discussions and Implications

To facilitate the thinking changes, a systematic and process-oriented PIPE model by Sun (2012) has been introduced in teaching creativity and innovation in Chinese universities. The PIPE acronym stands for Problem, Idea, Product and Enterprise. The PIPE model is a summary of the four steps of teaching Problem discovery, Idea generation, Product proposal and Enterprise plan, as illustrated in Table 1. It is an effective teaching model for motivating student-centred learning from multi-disciplinary perspectives. Students are motivated to actively look for what they need throughout the process, from the problem to the enterprise plan. The PIPE model aims to help students (from any field) to discover problems in daily life, generate new ideas aimed at solving these problems, design new products accordingly and develop a simple business plan for the enterprise. If sufficient support is available, the team can produce a prototype of the product and prepare an integrated yet simple business plan to present. There is a quality improvement process as well. PDCA, for example, is a repeated process from plan, do, check to act/adjust. At each steps, the thinking styles and culture may be different.

Table 2 The thinking styles and support culture along the PIPE process

PIPE Details:	Problem discovery	Idea generation	Product development	Enterprise plan
Pedagogical focus	Exploration and discovery	Creativity and creative thinking	Innovation and new product development	Entrepreneurship and business plan
Learning objectives	To discover problems in daily life or work	To generate new ideas to solve the problem identified.	To conduct a basic but comprehensive feasibility study of a new idea (for the product)	To incorporate all the above factors into a simple business plan (of the enterprise)
Teaching and learning activity (LTA)	Eye and mouth (Explore, observe and ask)	Brain (Creative thinking)	Hand (Design and make)	Feet (Go and do market search)
Thinking style and supporting cultures	Critical thinking Individual Equal Masculine	Creative thinking Intuitive Individual plus collective Flexible	New product Precise Quality On time	Enterprise Profit On time Precise

There is a paradox with regard to scientific (versus intuitive) thinking. Some researchers believe that intuitive thinking should positively support creativity and innovation. This really depends on how creativity and innovation are defined. If creativity is defined as the process of generating new ideas, intuitive thinking is positive. However, looking at the innovation process which starts with a new idea, develops it further into a feasible product (or service) and commercializes it in the market, intuitive thinking is far from enough and in fact damages the downstream stages. For example, Chinese people and the education system are especially weak in systematic and process-oriented thinking. Even with good ideas, the ideas will lead to nothing if this involves just playing with the ideas. Therefore, a systematic and process-oriented tool like the PIPE model (Sun 2012) is needed in Chinese creativity education and training. This is a same for quality and quality improvement process. Along the process both intuitive thinking and scientific thinking are needed.

Intuitive thinking is useful when identify areas of improvement while scientific thinking is needed to generate improvement method. If people can change thinking gears at different stages, there is no paradox then.

Individualism versus collectivism is a key factor that influences quality and innovation. Quality management, especially total quality management and quality improvement team strongly require collectivism. However, innovation encourages individualism. How to solve the paradox? Although team work is mostly required for quality improvement, individual contribution is also needed in many aspects of quality management. Quality control, for example, very often is conducted by individuals. New ideas for improve quality is similar to idea generation in innovation and needs individualism. So as to innovation, individualism is needed for idea generation at the beginning stage while team work is definitely needed for idea exploration and implementation. One again the process concept (Sun 2012) will make the best use of both individualism and collectivism.

Uncertainty avoidance versus uncertainty acceptance is a factor that influences both quality and innovation but in paradoxical direction. Quality management needs to remove all uncertainties and root causes to make sure that the product quality can be secured while uncertainty has to be very well accepted in innovation process. In fact the paradox is in theory. In practice, it does not have to be in paradox. The quality department can still maintain a quality management culture to remove all uncertainties. At the same time, the new product development department can encourages the tolerance of uncertainty. Different departments can nurture different culture without contradiction to each other. This implies that under the same national culture, there can be different corporate cultures and even different department cultures. This is the concept of sub-culture. Sub-cultures may be totally different or may be partly different. Culture diversity is recommended for company management at department levels.

The above discussions suggest that if people can change thinking gears at different stages of a process or different unit of the company, the paradox can be resolved or compromised. This is especially possible if talking about corporate cultures at company level. Different departments and different steps may embrace different culture and management styles. Sub-culture concept, process concept and contingent theory help to remove the paradox impact of national culture on quality and innovation.

5. Conclusion and Limitations

This study aims to explore the paradoxical impact of national culture on quality and innovation. It was found that there are at least three dimensions that have paradoxical impact on quality and innovation, namely, individualism versus collectivism, uncertain avoidance and precise thinking, and scientific thinking versus intuitive thinking. Paradox is not unusual. If people can change gears at different stages of a process, there is no paradox and clash then. Taking the sub-culture, process and contingent concepts into consideration, both individualism and collectivism, scientific thinking and intuitive thinking, uncertainty acceptance and uncertain avoidance may contribute to quality and innovation in different time and different space. Therefore, the future research may measure individualism and collectivism as two variables separately and use the ambidexterity model to test the dual impact of the so-called paradoxical impact of culture on innovation (Chang & Hughes 2012) and quality (Luzon & Pasola 2011). The Chinese traditional balance philosophy in Taoism and Confucianism may be useful here as well.

The study is very explorative in nature. The result is based on meta-analysis of previous studies. There are a few limitations. First, the result on national culture and quality are both quantitative and qualitative. More quantitative empirical papers on culture and quality should be reviewed later on. Second, the quality in reviewed studies refers to different concepts like quality control, quality assurance, quality expectation or product quality. More consistent definition of quality is needed in future research. Finally, culture and quality studies are mostly at the company level while culture and innovation studies are at country or region level. The two levels may be different. More studies on quality versus innovation at company level and even workforce level are expected as well. At the national culture level, other measures (e.g., Trompenaars 1997, Hampden-Turner & Trompenaars, 2011) can also be considered.

The new dimension in Hofstede new study, Indulgence versus Restraint (IND), was not included in current studies yet. Indulgence stands for a society that allows relatively free gratification of basic and natural human drives related to enjoying life and having fun. Restraint stands for a society that suppresses

gratification of needs and regulates it by means of strict social norms. The dimension may influence both quality control and innovation. Even with the limitations, hopefully the study will inspire more future research on the impact of culture on both quality and innovation. The discussions on quality and innovation paradox was also found in terms of standardization versus flexibility (Wang, Sun & Zhu 2016). Standardization is a base for quality assurance while may be negative to innovation. ISO9001 standard has widely been implemented in organizations to ensure quality management. ISO 50500 on innovation management will be released soon. Whether ISO 50500 standard can really enhance innovation and whether the quality and innovation systems can work in harmony will be a concern. The research triggered by this paper may help companies to find a compromised approach to dissolve the conflict if any.

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Author's Background



Dr Hongyi SUN is an Associate Professor in the Department of Systems Engineering and Engineering Management. His teaching and research areas include the management of technological innovation, quality and supply chain management, project management, and innovation and entrepreneurship education. Dr Sun has published over 130 papers in international journals and conferences. Since 2000, he has also been offering courses in innovation and entrepreneurship at all levels. He was awarded CityU Teaching Excellence Award in 2005 and 2012, the first prize research award on innovation and entrepreneurship education 2013 by China Association of Higher Education, the best Practical/Policy paper on International Conference on Entrepreneurship Education by Emerald Publisher, 2015 CityU Professional Development Award and 2018 IEOM Global Engineering Education Award. Dr Sun has delivered hundreds of training workshops and seminars on innovation and entrepreneurship for universities, government organizations and industries.