Two Worlds: Design Relativity in the Complex World

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Abstract

This paper proposes that there could be 'relative' meanings of design in organizations, according to the different national cultures in which the organizations predominantly reside, due to the different organizational vocabulary that is used in the design of a 'complex product'. The paper suggests that under complex conditions, different meanings of design according to national cultures could influence, not only the development of an organization, but also the design of these complex products. The author contends that much research on the meaning of design and its use in design-led innovation takes a Western perspective; however this paper discusses how different national cultures influence the construction of product design and how different national cultures could influence the meaning of design in complex organizations. This is achieved by examining a case study in Samsung, which has been involved in a global dispute regarding its product design patents with Apple. This paper explores how this lens might help to understand how design-led innovation is viewed differently and how the resulting product design is influenced by national and derived organizational cultures.

KEYWORDS: complex product design, complex organization, design-driven innovation, meaning of design, national cultures, organization cultures

Introduction

Design and organization in innovation

Current design studies on innovation have already reflected the shift of environment that considers digital capability that transforms the entire circumstances of products; design, distribution, production, prices as well as firms (Yoo, Henfridsson, & Lyytinen, 2010). In addition, the meaning of design is developed to consider the contextual features implying all

diffusions of forming social spaces beyond simple physical looks (Krippendorff, 2006; Krippendorff, 1989). In these circumstances innovation studies are addressed from numerous disciplines, from psychology to design studies and from multiple perspectives, at 'organizational/micro perspectives'; firms, market, and customers, to 'macro; the world' including nations, technology and industry, etc (see Garcia & Calantone, 2002; Kao, 2009; Amabile, 1996; Dougherty, 2008; Thompson, 1965; Woodman, Sawyer & Griffin 1993; Dougherty & Corse, 1995). However, organization studies have frequently attempted to address the role of design in a number of ways, including methodologies for organization and management (Romme, 2003; van Aken, 2007; Denyer, Tranfield &Van Aken, 2008; Jelinek, Romme & Boland 2008) and research on the meaning of design (Garud, Jain & Tuertscher, 2008; Scheuer, 2010). This approach to design was developed by Simon (1996), where in his book, 'The Science of the Artificial' he distinguished between the natural sciences that develop valid knowledge of natural objects and the science of the artificial ones that have been made by man. It aimed to present special kinds of solutions to solve field problems and problematic situations, by improving conditions and development based on assumptions that everyone is living in an ongoing daily basis of designing, for instance, involving the specification of system boundaries such as engineering, medicine and law etc., rather than the explanatory sciences that are engaged in a quest for truth in solving 'pure' knowledge problems, such as sociology, economics (Simon, 1996; Denyer, et al., 2008). Therefore, from this stance the design process is defined as understanding cause and effect relationships, based on a complete understanding of them and these are assumed to influence the outcome of organizational activities, i.e., the artifacts upon which the organization is founded (Garud, et al., 2008; Boland & Collopy, 2004). This paper builds on this work by discussing the 'relative' meaning of design (for innovation) in dynamic organizational cultures of firms who produce their own products. Epistemologically, this conception of relativism proposes that we live inside radically different worlds, which form different conceptual schemes to shape our experience and knowledge, and so the realities can be different, ontologically (Fay, 1996). The term 'relative' is important here, according to the Oxford Dictionary (2012), "relative' refers to:

> *1. considered in relation or in proportion to something else 2. existing or possessing a specified characteristic only in comparison to something else; not absolute*

In addition, 'Relativity' refers to:

> *the absence of standards of absolute and universal application*

According to these definitions, in a continually-changing and dynamic world, there is no clear separation between the 'text' and 'context', which means an ill-defined problematic world (Garud, et al., 2008), in which the meaning of design in different and dynamic organizations can be 'relative', with the attribute of relativity, rather than absolute meanings as only judged in the explanatory sciences on the basis of the artificial perspectives. However, looking at the exploratory studies addressing the meaning of design from organizational perspectives (Garud, et al., 2008) and also generating new meanings for design-driven innovation (Verganti, 2008), it is found that the meaning of design is still discussed in the main from the perspective of Western-

organizations, although there are a few studies regarding product development management in cross-cultural studies between the West and East (Lee, Lee, & Souder, 2000). Furthermore, similar issues on design have often been suggested in business circumstances, and addressed in recognition of the features as 'styling' in brand and design studies, by focusing on individual designer level studies in firms (Karjalainen & Snelders, 2010; Person, Schoormans, Snelders, & Karjalainen, 2008; Karjalainen, 2003), rather than studies at the organization level. This paper suggests that (1) there are 'relative' meanings of design in dynamic artificial and organizational contexts that deal with innovation, and (2) the relative meaning of design can become more distinctive between different national organizational cultures. In this sense, this paper will not reach a state of theoretical saturation (Eisenhardt & Graebner, 2007; Glaser & Strauss, 1967), but will offer a set of observations that will generate theoretical tension and form the basis for understanding of this phenomenon, offering an alternative meaning of design based on cultural perspectives and will suggest new perspectives of design-driven innovation.

1.   Theoretical Background

1.1. Innovations by product, product design by organization

Unlike traditional meanings of design which focus on surface level appearance, the changing environment of social and technological development helps change the meaning of design, from creating functional and material objects, aesthetically, to concerning with conceptualizing and immaterial artifacts (Krippendorff, 2006; Krippendorff, 2011). Especially, looking at a wide range of smart devices such as iPad, iPhone, and Kindle, current digitation movements allow the design of physical products to shift into programmable, addressable, sensible, communicable, memorable, traceable and associable artifacts by encoding analog information into huge amounts of digital format, which also lead to further product innovation. (Yoo, et al., 2010). Hence, the notion of the term 'innovation' can be discussed in wider range of perspectives such as psychology, technology management and design studies.   From the psychological perspective, 'innovation' is defined as the successful implementation of new programs, new product introductions, or new services based on a person or team that has a good idea stemming from creative ideas which interact with social and historical domains (Amabile, et al., 1996; Woodman, et al., 1993).   In technology management, 'innovation' is an iterative process initiated by the perception of a new market and/or new service opportunity for a technology-based invention, which leads to development, production, and marketing tasks, striving for the commercial success of the invention' (OECD, 1991 cited in Garcia & Calantone, 2002, p112). In other words, innovation refers to the iterative nature of technological innovation, comprising the technological development of an invention combined with the market introduction of that invention to end-

users through adoption and diffusion (Abernathy & Clark, 1985). Innovation, therefore, has different characteristics depending on the nature of the organization and specific innovation. After Schumpeter (1942 cited in Henderson and Clark, 1990) emphasized creative destruction and the notion of different characteristics of innovation in relation to the capabilities of firms, the different characteristics of innovation generating different competitive effects, such as incremental innovation, really new, and radical innovation, are critical to understanding its impact (see e.g., Henderson and Clark, 1990, Garcia and Calantone, 2002).
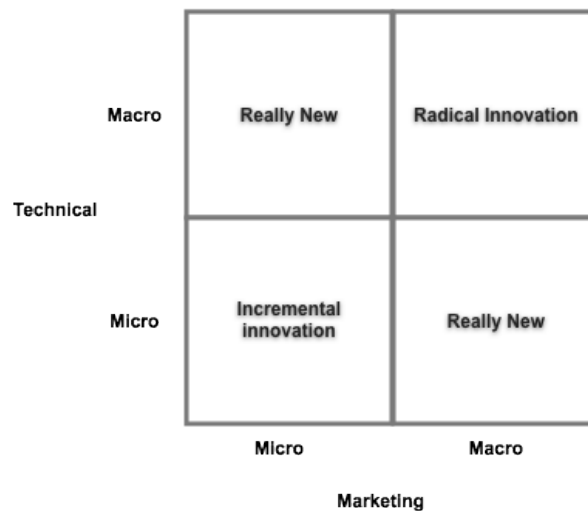

Figure 1 Innovation Typology (Garcia & Calantone, 2002)

Garcia & Calantone (2002) in their typology of the terminology of innovation, determine innovation in relation to the level of 'newness', as to whether it is achieved within reach of micro level (only product, market, firms, technology and customers) or whether it opens up macro-level changes (new markets, new different sets of engineering technology and new scientific principles, implying the world) (Garcia & Calantone, 2002) (see Figure 1). From this perspective, the product that is produced in the organization is often considered as an indicator of the organizational innovation. The product, as the implementation of innovation, has been varyingly discussed as a key feature of innovation within which the organization adapts to change in markets, the technology, and completion (Dourgherty, 1996). From the psychological perspectives on organizational creativity for innovation, the 'product' is simply defined as one of a number of observable outcomes or responses (Amabile, 1983) and so the term 'innovation' has been defined to stem from organization creativity as the distinguishable outcome (Amabile T. M., 1996; Woodman, et al., 1993). In this sense, innovation can be the resulting of the organization creativity and the different characteristics of innovation are seen through the product that the organization creativity is applied. However the definition of the term 'product' is a much more nuanced topic discussed in innovation studies, in terms of its to link to the organization. As Simon (1996) highlighted, the artifact is defined as the interface; a meeting point between an

'inner' environment, the substance and organization of the artifact itself, and an 'outer' environment', such as the surroundings in which it operates.   From the organizational perspective, Schein (2010) stressed that the artifacts, including the technology that organization creates, are a reflection of underlying organizational assumptions. The term 'product' can, therefore, in this sense, be defined as a 'milieu' that is all the man-made material and immaterial objects filling complex systems, and the conception and planning for these products can be denoted as 'design' (Margolin, 1995).   These definitions of the artifact enable a discussion of product design as it implicitly reflects the organization (Junginger, 2008).   To take this debate further, one could consider 'modularity' as it reflects the organization, i.e., a complex system where product components are modules that interact with other modules interdependently (Schilling, 2000; K.Pil & K.Cohen, 2006; Langlois, 2002).   In modularity, new product design is achieved by developing or refining new concepts or extending core design concepts from existing designs between core concepts and components within the product components and architecture design (Henderson & Clark, 1990). In this arena, innovation is determined by the degree of innovativeness or the newness of the products which result from the discontinuity of markets or technology (Garcia & Calantone, 2002; Danneels & J.Kleinschmidt, 2001). The organization's capability to achieve the innovation characteristics could, therefore, be determined by the ability to transfer knowledge for product creation processes between component interaction and configuration within them, in order to improve function and design architecture (Sanchez & Mahoney, 1996). With reference to above, it allows for strategic design studies to consider the notion of design-driven innovation further in terms of development from firm level to market, which involves marketing research, consumer behavior and technology development. This also concerns with whether it is meant for functional driven or reinterpreting meanings in the characteristics of innovation (Verganti, 2008). Above all, the notion of innovation can be established by the implementation, such as products, and the new product design is led by organizational capability. Therefore, designing product as organization activity not only is simply shown the implementation of organization strategy. But, whether the organization develops new product design drawing new meaning to market also implies the significant capability of organization relating to creativity and the characteristics of organization.

1.2. Vocabulary on product and organization, to discuss similarity not only in styling

Almost all organizations have an identity; either real or perceived, and product design has been often addressed as the major competitive element of manifestations of organization which the identity is perceived in tangible asset (Karjalainen, 2003). Product design is thus viewed as the media and visual recognizable designs through which a company can communicate its core brand values by making the product standing out in the market (Karjalainen & Snelders, 2010). Therefore, most reasons of the amount of copyright infringement lawsuits on the similarity to the competitors are often viewed to occur in product styling, for the benefit from the existing design

(Person, et at., 2008).   However, we argue, then, that not only it is the matter of styling of features, but also that there is a nuanced relationship between product design as an artifact of innovation and as a representation of the organization and is, therefore, related to the organization, even in terms of hierarchy and formalization. It is however little explained in terms of design as a whole organization, although the issues on similarity of product design is addressed in the relationship of designers' experiences, the product life cycle, and resource and cost for development of product design within firms, by focusing on the styling of product features in the works of Person and his work group (2008).   Designing a product as an artifact should be further involved in hierarchy and formalization of organization. Design is often shown not simply as 'word' but as 'vocabulary' that implies numerous strategic problem-solving stages because a design project is frequently created according to how it fits with, resonates with, contrasts with, or clashes with other products in order to create a range of products that the organization is associated with (Boland & Collopy, 2004). In other words, 'design' should be concerned with how a product is to be developed within an organizational context, i.e., managerial opinion, how it is approached, and what a good and true course of action is (Simon,1996), which means that design activities themselves are implicitly reflected by the organization's vocabularies, hierarchy and formalization beyond styling of the product features. In a broad sense, hierarchy refers to organizing principles of complex systems composed of interrelated subsystems having their own subsystem, which it implies the decomposition of a complex system into a structured ordering of successive sets of subsystems (Simon, 1996; Sanchez & Mahoney, 1996). Generally, in the classic structure of an organization, an autocratic hierarchy implies a type of top-down pyramid, with the top controlling everything, a number of subordinates who are controlled by a superior directly – a centralized power, implying bureaucracy that is led by higher power and authority for controlling of employees (Perrow, 1993; Mintzberg, 1979; Hofstede, et al., 2010). In this sense, formalization refers to 'planning' to reduce uncertainty within the 'controlled' organization (Hofstede, et al., 2010) and, to an extent, it denotes organizational structure as formulating rules to govern individual behavior explicitly and formulating roles that prescribe an individual's position in that structure (Adler & Borys, 1996). Hierarchy and formalization are, therefore, likely to go together (Hofstede, et al., 2010). Likewise in product design, almost all physical structures in an organized complex object are assumed to be hierarchical (Alexander, 1964) because physical product design is constructed to respond to levels of user needs (Clark, 1985) and even physical feature of digital products is operated by controlling and maintenance of logical operating systems (Yoo, et al., 2010).   Hence, it implies that a new product design can be 'formalized' into 'several layers' of problem solving to meet these needs and can, therefore, determine the hierarchy of product design by forming the new meaning.   From this perspective, earlier organizational studies showed that bureaucratic organization is in pursuit of maximized production (Thompson, 1965).   It was suggested that the relationship between product and organization was that the product design could differ depending on the characteristics of hierarchy and formalization of organizations; whether the characteristics of the product is designed for de-skilled work to workers in 'one-way communication' or leveraging work for users that implies 'two-way communication' by

organizational capabilities (Mintzberg ,1979), and whether the product is characterized as enabling usability types that is seen as 'two way communication' for users or coercive implying 'one-way communication', according to the organization's characteristics (Adler & Borys, 1996). Because software programmes and technology that an organization renders and the objectives to design products can refer to know-how, as the types of formalization resulting by organization's within underlying structures of bureaucratic organizations (Scott, 1992; Adler & Borys, 1996). Therefore, it can be conceived that the processes of developing and designing components for new products require intensive interactions between the developers of interrelated components, in order to solve problems within the components of complex product design (Sanchez, 1995). Therefore, it could be concluded that the product design implicitly reflects formalization of organization characteristics and vice versa in its own right, i.e., that material object design can implicitly reflect the organization in many similar ways (Van Aken, 2007) and implies that the shifts of product design architecture therefore led changes in the logic of organization, interdependently (Yoo, et al., 2010).

1.3. The vocabulary on 'Design', to understand hierarchy in Product and Organization

In relation to organization context current design issues on product show much less hierarchical structure of product in design and it shows the shift of organization.   In a changing environment of technology and society, the term design is evolved into 'discourses' which designers involve in collaboration of participation of members in community for creating every artifact, allowing for the members' capacity to bring forth novel practices, that is *generativity*, beyond simply concerning with function of simple product or selling them at the just project levels (Krippendorff, 2006; Krippendorff, 2011). Especially, current product design in digital technology is accomplished through such *generativity,* producing unprompted change driven by large, varied, and uncoordinated audiences in creating fluid and open meaning (Yoo, et al., 2010). Such current shift of product with digital technology shows the significant shift of conventional product design from single design hierarchy (pyramid) (Clark, 1985), to multiple design hierarchies across several layers of product such as physical devices layers, network, service (e.g., applications) and contents (e.g., texts, sounds, images and video etc., in digital devices), and so it causes the innovation of product across the layers which allows to cascade effects on other layers through *generativity* attitude (Yoo, et al., 2010).   This shift of design to discourse implying *generativity* in product can be useful to consider the different characteristics of vocabularies on product design. The scholars who write about modularity of product design addressed that the degree of user participation (customer involvement) could result in the characteristics of products in terms of different vocabularies of product design – whether it is accomplished by 'assembly or use' vocabularies using 'existing knowledge' for product creation in pursuit of mass production within existing product design, or by 'fabricate or design' demanding 'uniqueness' that requires 'new knowledge' and 'new learning' implying 'uncertainties' to meet users unique needs (Ulrich K.

T., 1991; Duray, Ward, Milligan, & Berry, 2000; Sanchez, 1996). It implies that the more members participate with discourse in the communities the more '*design*'ing product can be established through the *generativity* that draws new meanings and new kinds in future product design. *Discourse* of design has in turn led to new understanding artifact and new understanding organization culture. Since most conventional organization pursues efficiency for maximized production flexible conditions of organization that open '*discourse of design*' vocabulary has been constrained in managing organizations (see Thompson, 1965; Hlavacek & Thompson, 1973; Amabile, et al., 1996; Khazanchi, et al., 2007). As the conventional organization shaped in efficiency is aiming at reducing 'uncertainty' to maximize production in the process, such flexible condition, opening discourse and creativity in the organization, can be seen as 'uncertainty' and refer to 'trade-off' relationship to 'efficiency' that conventional organization wants (Thompson, 1965; Hofstede, et al., 2010; Adler,et al., 1999). However, unlike conventional product embedded the strong physical hierarchy, the current meaning of design is laid in the middle of the democratic; market-oriented and user-driven cultures, led by information-rich environment (Krippendorff, 2011). The shifts of vocabulary in design can cause shift from vertically integrated hierarchy, to network based disintegration of an organization design, so that it leads to the shift of strategic frameworks and organization infrastructure in current digital technology embedded product that opens *generativity* (Yoo, et al., 2010). Above all, in the shift of vocabulary in changing environment and product, design can no longer be established only by focusing on vertical single hierarchical organizing (Krippendorff, 2011). And we convince that organization should be shifted to be away from the conventional hierarchical structure for developing new kind innovative product as realizing 'design' vocabularies; i.e. *generativity* in discourse. It will allow to open creativity, embracing a diversity of meanings and negotiate the possible outcomes, rather than 'assembly' languages in use representing an 'efficiency'-driven organization with traditional tight-coupled organizational structures (see Figure 2).
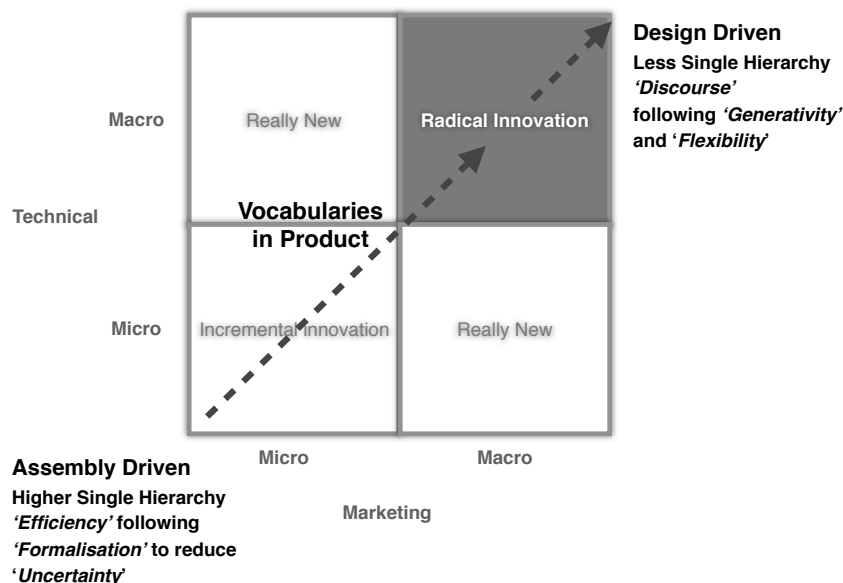

Figure 2 Vocabularies of Product Design in Innovation Typology, after Clark 1985

1.4. Organizational Culture, Nationality and the Product

We identified that product design can to some extent reflect an organization in many ways. However, although there are a few approaches linking product design and organization in this sense, the underlying organizational theories to approach product design have been mostly dealt with by English – speaking nations, which were developed by Mintzberg's classical 1983 organization theory (Hofstede, et al., 2010). Taking a look at organization cultures, the notions of national culture are much more complex, but at the same time, conventional. Culture is defined as the collective programming of the mind that distinguishes members of one category of people from those of another, which is related to our life as humans, defined according to: nations, religious groups, gender, age, generation, social class, occupational culture, type of business, work organization or even families. All nation-related cultures called 'macro cultures' take a place at the highest level of cultures but are less visible and perhaps deeper (Hofestede, 1980; Hofstede, 1994; Schein, 2010; Dawson & Andriopoulos, 2008). However, such national cultural differences often cause conflicts in the multicultural world, especially between East and West (Brett, Behfar, & Kern, 2006; Schein, 2010). In terms of work organization, cultural differences between East and West are clearly distinguishable in the way of communication, attitudes towards the hierarchy and authority and the norms for decision making. For instance, the Western way of communication is typically far more direct and explicit than the Eastern way, while the Eastern organization will adhere more strictly to the hierarchy, even in transferring significant information for management (Brett, et al., 2006). Furthermore, managers in different countries are seen to make different strategic decisions and prefer different types of organizational structures because they hold different underlying values about people and the way they should behave in organizations (Lee, et al., 2000). Hofstede (2010) attempted to demonstrate this relevance between national cultures and the products that one nation made, suggesting that there can be the differences between the desirability of centralization, controlling, formalization, and planning by looking into the case of accounting systems as organizational artifacts - e.g., GAAP; the generally accepted accounting principles in the United States. In this sense, successful product development practices between Eastern and Western cultures were also seen differently with surrounding product development processes being influenced by national cultures, in terms of the level of working procedure formality, authority and top-level involvement etc. (Lee, et al., 2000). These research results imply that different national cultures make different products as a result of organizational products and that there are distinctive differences in artifacts made according to different national cultures in terms of the common organization languages, i.e., that is between hierarchy and formalization.

1.5. Differences between the East and West

In an organizational culture approach, the underlying basic assumptions are reflected by their

artifacts, such as visible and invisible structures and processes or observed behaviour, as well as their technology, products, artistic creations, style, emotional displays, myths and stories told about the organization (Schein, 2010). In terms of this, Hofestede's survey research reveals the distinct characteristics of East and West (Hofstede, et al., 2010; Lee, et al., 2000). In his survey, the Eastern world, for example Korea, Japan and Taiwan, is seen as a "large power distance/low individualism/strong uncertainty avoidance"(Hofstede, et al., 2010), whereas the West (USA, the UK, and Demark) is featured in the "small power distance/high individualism/weak uncertainty avoidance" dimensions (Hofstede, et al., 2010) (See Table 1). Such different organization culture led by different structure between East and West can lead to different product development strategies (Lee, et al., 2000). The results could raise assumptions that in such Asian countries as China, Korea and Japan who have strong beliefs, value and attitudes, these elements could influence the design of their products because they are assumed to have been led by controlling bureaucracy with a centralized power structures, which results in a product design of having higher risk avoidance, precision and perfection in pursuit of contemporary high-tech value-oriented and marketing-driven multifunctional products (see Petersen, 2012).

Organization culture dimensions		Characteristics in organizations	Nations (Hofstede Index in 2010)
Power distance	Small power distance societies	Hierarchy means an inequality of roles, established for convenience Subordinates expect to be consulted Ideal boss is a resourceful democrat	Denmark(18) Germany(35) Great Britain(35) United States(40)
	Large power distance	Hierarchy means existential inequality Subordinates expect to be told what to do Ideal boss is benevolent autocrat (good father)	Canada(40) Japan(54) Taiwan(58) S. Korea(60) Singapore(74) China (80)

Organization culture dimensions		Characteristics in organizations	Nations (Hofstede Index in 2010)
Individualist	Individual societies	Same value standards apply to all: universalism Other people seen as potential resources Task prevails over relationship Calculative model of employer- employee relationship	United States(91) Great Britain(89) Canada(80) Denmark(74) Germany(67) Japan(47) China (20) Singapore(20) S. Korea(18) Taiwan(17)
	Collectivist societies	Value standards differ for in-group and out groups: particularism Other people are seen as members of their group Relationship prevails over task Moral model of employer-employee relationship	
Masculine	Masculine societies	Assertiveness appreciated Oversell yourself Stress on careers Decisiveness	Japan(95) China (66) Germany (66) Great Britain (66) United States(62) Canada (52) Singapore (48) Taiwan(45) S. Korea(39) Denmark (14)
	Feminine societies	Assertiveness ridiculed Undersell yourself Stress on life quality Intuition	
Uncertainty avoidance	Weak uncertainty avoidance societies	Dislike of rules Less formalization and standardization	Singapore(8) Denmark(29) China (30)

Organization culture dimensions	Characteristics in organizations	Nations (Hofstede Index in 2010)
Strong uncertainty avoidance societies	Emotional need for rules More formalization and standardization	Great Britain(35) United States(46) Canada(48) Germany(65) Taiwan(69) S. Korea(85) Japan(92)

Table.1 National differences(Hofstede, 1994;Hofstede et al., 2010)

The table 1 can indicate that the nations that has larger power distance, strong uncertainty avoidance and collectivist societies are shown to be much associated with the tighten control organization, and it can lead much precise artifacts so as to praise maximize production with minimized risks under higher authorities.   This paper will now consider one exemplary case of the product design disputes between two representative innovative companies' - Samsung from South Korea and Apple from the USA and contrasts the product design vocabulary.

2. Research design

This design research methodology is characterized as a pragmatic philosophical frame, based on pragmatic validity, which comes from the problems found in the field to produce anticipated and prescriptive knowledge, and leads to motivation for generating continual goals, especially in this continuing changing world (see Easterby-Smith, Thorpe & Jackson., 2012; Garud, et al., 2008; Denver, et al., 2008). This paper aims, not to reach a state of theoretical saturation (Glaser & Strauss, 1967; Eisenhardt & Graebner, 2007), but to suggest new perspectives on the relationship between product design and national organization cultures and to form an understanding of the phenomenon in the continual changing 'world' by looking into one exemplary case: the dynamic mobile industry case between Samsung and Apple.   Since the individuals who are presented with multiple cases can exhibit a greater ease in their abilities to identify underlying selected patterns (Loewenstein, L.Thompson, & D.Gentner, 1999), this paper looks into the case of

Samsung and Apple's disputes on the product design patent, which has several different contexts: organizational cultures, nationality, and product design. Firstly, to examine the case regarding the relationship between national cultures and product design, Hofestede's survey results (Hofestede, 1994; 2010) were employed to review national cultural differences in terms of generating analytical categories and dimensions on organization cultures in advance. Since Hofstede' s survey purely aimed at clustering organizational cultural dimensions and looking for patterns in nations from the data, without any explicit hypothesis (Easterby-Smith, et al., 2012), it can be insightful to begin organization culture and product design studies with few pre-suppositions for design methodological approaches. Secondly, in order to collect raw data, I tracked available data from a wide range of online sources and contacted experts to articulate them. The multiple data sources included documents, videotapes, newspapers, letters, and books helped to triangulate and may help shed light on the area of questions under study (Jick, 1979; Corbin & Strauss, 1990). Documents, such as visual media, printed newspapers and magazines can help to approach studies in such a continual changing context, because they embody an important primary documentary evidence at the interface of the private and public sectors (Cohen, Mansion, & Morrison, 2007) and provide a discourse that is delivered by texts implying social contexts and interactions (Johnstone, 2007). In this paper, raw data is gathered from a number of sources, including: a government database, authorized online news, magazines and visual media, along with experts interview in person that can support the data.

3. Similarity issues on product design after product design patent between Apple and Samsung

After the launch of the first touch-screen handset combining a mobile phone, internet access, iPod music and video playback features by Apple in 2007 (Sweney, 2007; Darell, 2011), similarly designed products emerged from several mobile firms such as Motorola, HTC and Samsung (Arthur, 2012). In particular the resulting design patent disputes between Apple and Samsung have great significance because these are the top innovative companies in the world (see Businessweek, 2010; Fortune, 2012; Fastcompany, 2012). The disputes between Apple and Samsung began in April, 2011, when Apple sued Samsung for copying the 'look' and 'feel' of its iPhone and iPad in its flagship Galaxy S line of devices, including 13 more products. This was expanded across nine countries, including the USA, the UK and South Korea as Samsung responded with a countersuit that targeted Apple for infringing on five wireless networking technology patents (Albanesius, 2011). Except for the wireless technology patents, the majority of design disputes claimed by Apple claim that Samsung infringed on their design rights from the look of individual phones to the way they display icons and text; such as the so-called 'bounce-back response' (United States Patent and Trademark Office, 2008) and the tap-and-zoom gesture (United States Patent and Trademark Office, 2011), which are relatively less-focused in intellectual property compared to traditional engineering patents (Banks, 2012). Those disputed points over current Smartphone product designs are well described as following an interview in

BBC Technology news, which was broadcast on 16 February 2012.

> *"The disputed product designs between Apple and Samsung are relying on huge change of physical design of the smartphone. As dispensers of any form of information and serious business tools, the problems of confusing product design in such mobile devices are caused by the huge changes of physical design from common design rules that was distinguished by changing keypad design as modules which allow the large degree of flexibility in individual smartphone looks and brand personality, to the design with large screen and one simple pattern button for easy connectivity." (McCormick, 2012)*

Based on these disputed points, the two companies have struggled to win their product design patents in their products. In 2012, the Dutch Appeal Court rejected Apple 's claim that Samsung's Galaxy Tab 10.1 infringes on its design rights (BBC, 2012c). And the UK High Court also rejected Apple's claims that Samsung products have had a damaging impression on the looks of individual products, which has created a different overall impression (BBC, 2012d). In contrast, in the South Korean Court, Samsung was judged to have infringed on Apple's design patents on mobile devices relating to interaction design, called 'bounce – back', but at the same time, the Korean Court rejected Apple's claims that the look of Samsung's product is similar to its products, in terms of the rounded corners and large screens, although the Samsung Galaxy S products have lots of external design 'similarities' to the Apple iPhone (BBC, 2012f). Furthermore, the U.S. District Judge in San Jose, California fined Samsung $1.05 billion, finding that Samsung had "willfully" copied Apple's iPhone and iPad, not only due to the similarity of the interaction design features, such as 'bounce-back' and 'pinch-to-zoom' features but also the look of the Smartphone Galaxy S 4G model, including the display icons and text (BBC, 2012b; Elias, 2012). We can see from these claims that these two companies do have similarities which are confusing in many recognizable features of their external product design. But, what actually made such similarities?

3.1. Silicon Valley, Apple and Korea, Samsung

The matter of national culture can influence developing and designing new products.   Suggested in the personal interview with the writer of *Where Is Asian Design today?(2012)* in Huffington Post,

> *Cultures implying value to live, region's history or geographic matters, and religious etc., between nations can be associated with developing creative cultures and design…it may cascade organization structures to control them and the cultures including risk taking and problem-solving… For instance, historically, Denmark, the UK and the US were all seen as regional and geographic constraints that foster creativity as a competitive advantage, and those environment circumstances may facilitate creating and problem- solving with take-for-granted higher risk taking (Summarized in Petersen, pers. comm. via Skype on 19th Dec 2012)*

Here, we can see significant differences from the two rivals' backgrounds, Apple vs. Samsung. Meeting of the Homebrew Computer Club between two 'Steve' in 1974, one, Steve Jobs, who

worked for video game maker Atari and the other, Steve Wozniak, a high school friend who was a few years older, lead to form Apple Computer on April Fools' Day in 1976, launching the Apple I computer for $666.66 in a Silicon Valley garage (Huffington Post, 2011). It was the parts to build 50 "hobby computers" of their own design for a local computer store called the Byte Shop (The Santa Clara Valley Historical Association, 2008).   In 2012, Appe, Inc, grows up with more than $100 billion in revenue and more than 50,000 employees in the consumer electronics products industry and created a cult following (Smith, 2012).   On the other hand, the company Samsung started as a small noodle business in 1938 in Korea. Now the company earned $227.3 billion in revenue in 2010 and has 315,000 employees worldwide. It has grown into a network of 83 companies and is the largest corporate entity in South Korea and the world's top seller of Smart-phones, high-resolution television sets, memory chips and flat-panel displays (The Economist, 2011a; The Economist, 2010). In terms of this, Samsung and Apple have very different cultural backgrounds and beginnings, for example:

> *Apple is a unique company, it's roots lie in the counter culture revolution of the 1960's USA. Its founders were hippies who wanted to change the world in 'peace and love'… One of the key beliefs of the culture that influenced people was to create the "personal computer" - machines that would empower users, and not just help industry… On the other hand, Samsung and the brand 'Samsung' were born in a different place and a different time, which began with OEM that developed its brand to become more profitable and successful in order to drive the wealth of its shareholders and perhaps of the 'nation'(McCormick, pers. comm. in an email on 17th Sep 2012)*

Looking at product line of both two firms, while Apple keeps up with its own track as the consumer electronic company, producing iMac, iPhone, iPad and iPod (Frommer, 2011), Samsung is however a producer of a wide range of somewhat unrelated industries, such as financial services, information technology services, machinery, shipbuilding, artillery, hotels and amusement parks (Choe, 2012; The Economist, 2011a; Khanna, et al., 2011). These are typical of Korean 'miracle types' of successful business; so-called 'chaebol'; The power of conglomerates' that strongly tied with the political relationship with government (The Economist, 2010; The Economist, 2011b), which are distinguished from the West. Samsung Electronics selling mobile devices is assumed to be 'one flagship of the 83 constituent parts' of the Samsung Empire (The Economist, 2011a). It is strongly controlled by family members at the top, so that it is much more hierarchical, it prizes market share over profits and has an opaque and confusing ownership structure under a 'complex web of cross shareholdings' between 'family members' (The Economist, 2010; The Economist, 2011b). The distinctive Korean corporate cultures feature more harmonious and personal relationships focused in social contact and people-oriented organizational structure and the business relationship compared to the USA (Yoo & Lee, 1987). And so Samsung cultures is all seen as forming the top-down organization cultures from the complex Korean cultures, respecting the seniors who are the older or the higher level, unconsciously and intentionally (Khanna, Song, & Lee, 2011).

3.2. Apple and Samsung Product Strategy

Although the name Samsung is synonymous with sophistication among South Koreans, the company has never created a product so innovative that it has defined an era in consumer culture, like the Sony Walkman or the iPhone (Choe, 2012), which leads not only to 'radical innovation' but also to 'really-new innovation'. Samsung makes hardware as well as components and as such is Apple's biggest parts supplier and its fiercest competitor in the completed Smartphone market (The Economist, 2010). This position allows Samsung to place huge bets on likely product design and do so quickly which allows it to change models by designing and producing faster to make whatever the market needs, based on their greatest strengths of engineering and manufacturing, rather than carrying out tons of market research (Choe, 2012; Michell, 2012; Ken Dulaney, 2012). Looking at product appearance cycles the significant distinctiveness between two firms can be clearly shown. Most all other Apple products have a tendency to get major exterior or structural updates, including color changes, faster components, lower prices, etc., every couple of years with minor to moderate "refreshes" in between (Frommer, 2011). For instance, until iPhone 4s appeared in 2011, it has had only three major significant changes since iPhone3 was first launched in 2007. On the other hand, Samsung's mobile product life cycle is much shorter than Apple as introducing a new product around every six months to live up to its reputation for moving swiftly and nimbly in competitive market (Reuters, 2012) across twenty six Smartphone lines (Samsung, 2012). So hundreds of Samsung people across the globe had come put in long hours to develop the products in short time. For instance, one Samsung's senior designer who came to counter Apple's claims over design patent in August ,2012 in the court of San Jose, US said that she got only ,on average, about two to three hours of sleep a night for designing icons of the product (Lowensohn, 2012).   Those Samsung's design philosophy goes along with the framed aphorisms, such as "Be with Customers", "Create Products that Contribute to Humanity" and "Challenge the World, Create the Future", which all implies a more hierarchical and top-down organization culture, like any other Samsung department (Reuters, 2012) in the pursuit of making a product better and faster at lower cost (Choe, 2012).   Whereas Apple's approach to designing mobile products uses 16 "maniacal" individuals from all over the world used to brainstorm, which means spending a longer time on pre-development research, rather than simply reviewing what the market may think it wants (Ken Dulaney, 2012; Reuters, 2012).   It is also the reason why Apple intentionally keeps small as smaller group working can lead to responsibility and accountability based on meaningful relationship. Apple's culture is thus little seen as top down culture with less complex layers of hierarchy (Smith, 2012). As to whether they are a team member or a leader, they respond to his/her actions internally, and it implicitly aims at encouraging the team members who was hired as the experts to best work as part of a cross-functional team (Richards, 2012). Therefore, the product design disputes between Apple and Samsung imply many meanings, not only in individual product design but also again in their visionary organizational culture.

> *The patent battles are perhaps a symptom of other issues, that the smartphone and tablets were created in a hugely collaborative way,* **no one single company has the skills to develop and 'manufacture'**

them, and 'the speed' that they are developed means that there has been a potential mess of legal problems as they try to bring a new device to market…in terms of this, they are both fighting two different wars.... Samsung has some patents relating to core connection, Apple has patents relating to user experience….most interesting question relates to the vision of each company… Apple seeks to create *a better world* through the development of technology, on the other hand, Samsung desires to be *big and successful.*   (McCormick, pers. comm. in an email on 17th Sep 2012)

4.   Discussion: Formalized Product Design features as an Evidence of Organizational Culture

The more complex, the more hierarchical and the more formalized

The Eastern cultures that emphasize the importance of society, the group, hierarchical relationships and the good of the group (collectivism) are clearly distinguished from Western cultures that take more consideration of personal achievement and individual self-worth, and the good-of-the-individual (individualism) (Lee, et al., 2000; Ralston, Holt, Terpstra, & Kai-Cheng, 1997; Hofstede, et al., 2010). When examining a typical Korean type of business - 'cheabol'- led by complex family shareholding and cultural-born background of foundation, Samsung can be thought of as the typical family-driven and collectivism- centred, Eastern Asian organizational structure.   Like other Asian business firms trust of the ruling family and respect of their senior is mandatory (Kao, 1993), Samsung Electronics which sells the smartphone and is a controller of 83 interdependent companies in complex family shareholdings should be more hierarchical as a flagship of somehow too unrelated product groups with electronics to be standardized and controlled in simple ways.

The faster production in the more complex and the less flexible vocabulary

Although more innovative firms tend to be loosely-structured and possess a clear strategic focus for innovation (Garcia & Calantone, 2002; Johne & Snelson, 1988) flexible organization conditions, such underlying family-centred Asian organizational cultures where it is recognized that seniors should be respected can constrain the organization creativity for innovation in a dynamic world (Kao, 1993) as organizations grow with increasing complexity in their structures. Regarding Samsung's quick production of a wide-range of complex products, including Smartphones, and its complex web of Korean organization, composed of seemingly irrelevant product groups that are hardly standardized, should it be asked to 'tighten control' and to be

more 'formalized' to reduce uncertainty in pursuit of mass production and profit (see Sanchez & Mahoney, 1996; Sanchez, 1995; Hofstede, et al., 2010). Although a product such as the Smartphone is less hierarchical and more inventive with flexible corporate cultures for the fluid ecosystem surrounding mobile technology in collaboration with other firms (The Economist, 2010), Samsung can be seen as being operated with the top-down command structure and decision-making process to control such complex organization structures (Reuters, 2012). This is in pursuit of massive production in line with Samsung's product strategy as a flagship of 83 family organizations. Furthermore, although the incubation (pre product development phase; conceptualizing phase) is important to concretize the brand, in terms of its own product design language by taking time (Person, et al., 2008), typical Korean product development focusing on functional-based structures may have pervaded (see Lee, et al., 2000; Yap, et al., 1998). Samsung product development seemingly much focus on traditional functional forms of structure that is effective for routine, non-radical, and line extension types of projects rather than flexible because of broad authority from top levels in strong hierarchical structures for high profit with mass production. Consequently, Samsung's fast moving product development strategy can, therefore, be seen as 'efficiency' that is made by Korean organization cultures and could form tight and less flexible cultures, compared to Apple.
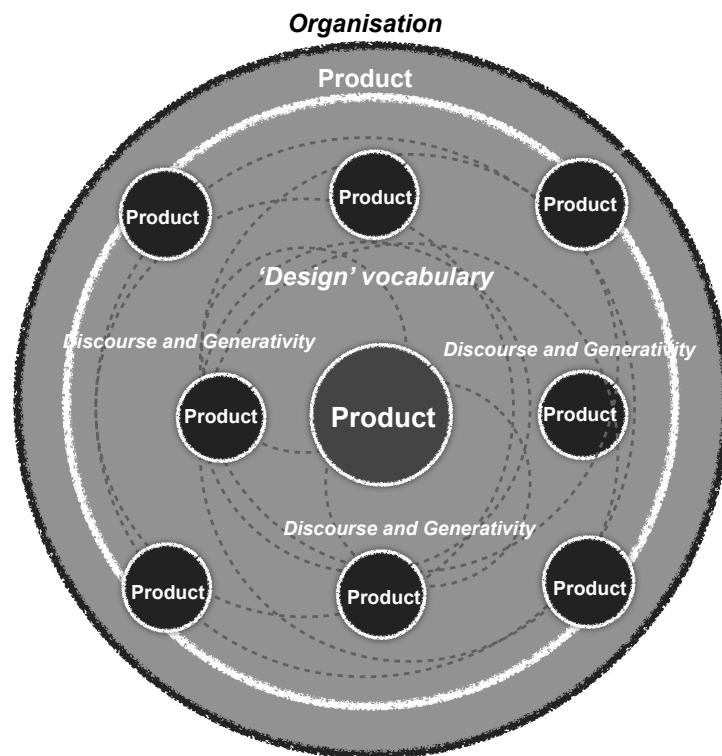

Figure 3 Design - driven innovation in organization by 'design' vocabulary

Product Similarity

Similarity in Smartphone looks between Apple and Samsung's products should be considered in the view of national culture context rather than simply the individual product 'look'. Similarity issues over the design of two products may be partly due to national cultural differences. Eastern cultures dominated by a strong hierarchy, followed by strong formalization, can contribute to decreasing flexible vocabularies, which is led by 'existing knowledge' rather than 'new' or 'creative ideas' within the organization that should be based on a world of continual change.   These organizational cultures may drive functions and efficiency, emphasizing utility, functionality and the aesthetic appearance, in order to appeal to large markets with massive manufacturing rather than the use of 'discourses' (Krippendorff, 2011). Therefore, it will have a different underlying context compared to how Apple's 16 "maniacal" individuals do to design their products. Samsung may begin from a fundamentally more hierarchical situation generated from a profitable organization, not only for the organization, but also for the Korean nation. Such design vocabulary is thought to come from underlying national cultures that dominate the organization (see the contrast in Figure 3 and 4).   In higher uncertainty avoidance and collectivism along with higher power, organization culture should go on the way that is more hierarchical to control the lower, and more formalized to reduce uncertainty, and so the product design can imply more formalized context 'assembly' that is based on more 'existing knowledge'; 'certainty' rather than 'fabricating' or 'designing' based on 'uncertainty'.   And under these conditions, product designs could be hardly flexible; a type of hierarchical pyramid product (See Figure 4).
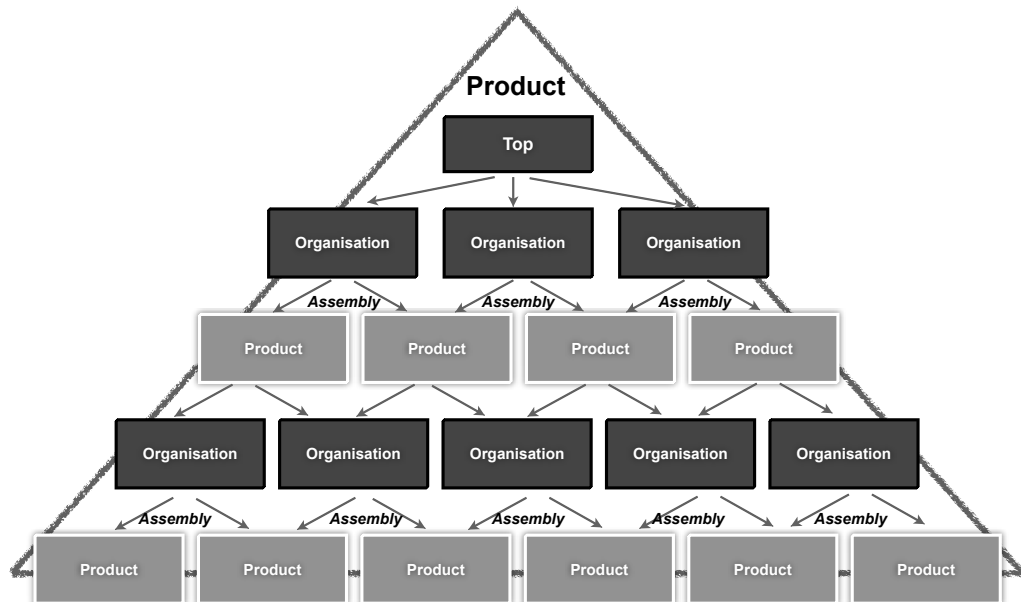

Figure 4. Vocabulary on design-driven innovation by Korean culture intervention

5. Conclusion

This paper has explored the cases raised from the disputes on product design patents between Samsung and Apple in order to outline new perspectives that there can be different views of product design by different cultures at the point of innovation. It has been found that organizational cultures are inherited from the underlying national culture and this could reflect the resulting complexity of the product design made by the organization. The world is continually changing and product design must be dynamic to keep up with the problems and needs of users. In this paper, it is identified that despite product similarities the complex product conceals (e.g. the Smartphone), there are many aspects relating to organisational culture, and this could form 'relativity' in the meaning of design; whether the product is the 'design' by 'assembly vocabulary' for efficiency controlled or the 'design' by 'design vocabulary' for flexibility dialogued. The disputes on product design are not simple issues on looks of the product, but are in fact, manifestations of the organization culture. In order to avoid or solve such prospective and continuing problematic conflicts over complex product designs, which may stem from national identities, the relativity on the meaning of 'design' should be further discussed and be crystallized in regard to the relative cultures of nations to find out ways for collaboration between cultures instead of conflicts.

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