CULTURAL "VALUE CREATION" IN THE DESIGN OF CELLULAR PHONES

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ABSTRACT
The extension of Cagan and Vogel´s "Value Creation Model" with culture as an additional component may enhance the search for superior value and competitive advantage. However, to manage different judgments and positioning of different evaluators, contextual research on users is needed in order to find more valid classifications. It is important to understand how users consider each of these dimensions when they want to define an identity for a product.
As a case, cellular phones were used for discussing cultural factors as well as relationships among values, lifestyles and consumer behaviour. With respect to individual features and components, no specific design recommendation can be made at this point of time. Attribute based methods were not enough for understanding users' real behaviour and tendencies towards a product. A product is more than just a combination of its components or attributes. However, a more elaborate mapping of hardware and software components onto Hofstede´s cultural dimensions can lead to interesting findings based on the identification of cultural specific components, especially when comparing between Asian and Western likings and requirements.

Keywords: Culture, Value Creation, Cellular Phone, Innovation

1. INTRODUCTION
In a globalised economy, companies are constantly seeking competitive advantage through the development of innovative products, services and systems. The creation of "stand-alone" products would no longer meet the needs for solving complex problems within an environment in which technologies become more advanced and complex, as well as where user needs become more diverse.
To some extent technology is seen as a means by which manufacturing companies can strive to adapt to the requirements of a competitive and turbulent environment. The growing complexity and pace of industrial technological change and the emergence of heterogeneous markets are encouraging firms to forge new vertical and horizontal alliances and to seek greater speed, flexibility and efficiency in responding to market changes [1]. From an inside-out perspective, the understanding of cultures is an important aspect to be considered if superior customer value creation is aimed for in search of innovation

Although underlining the importance of "Technology Push" and "Need Pull" in search of innovation, leading edge innovators and scientists, who are believers of the five-generation (5G) innovation processes tend to support an industry dominant design, whereby the nature of innovative activity has shifted from an emphasis on product change to one of manufacturing process change [2]. In such cases firms can become introspective in their innovation selection criteria (manufacturing cost focus), rejecting possibilities for radical product change and failing to respond to significant market shifts.
According to Schumpeter, the process of creative destruction' describes the activity of entrepreneurs who stimulated fundamental change and defined new frontiers in society. Creative destruction takes place through the discovery of new technologies, products, markets, processes and organizational forms that create clear alternatives to existing products and practices [3]. From a product sustainability perspective, incremental improvements will not suffice. Radical or systemic innovation is needed, whereby a change in the approach in the searching for new solutions is essential [4.]
Contemporary scholars of entrepreneurship emphasize opportunity and innovation, as well as the processes and modes of organizing through which entrepreneurs achieve their goals [5, 6, 7, 8].

This article argues that “culture” will become more prominent in generating competitive advantage through radical innovation or superior value creation of products and services. Hereby, it is assumed that the more value in a product, the higher price people are willing to pay, with the price increasing more rapidly than the costs, resulting in a profit margin, significantly higher for higher valued products.
The cellular phone forms an ideal case for discussing cultural factors influencing value creation. They also illustrate the relationship among values, lifestyles and consumer behaviour. Finally, an attempt is made to elaborate on how value creation can be extended, based on cultural input, pertaining the design of cellular phones.

2. FRAMEWORK

Although interactions between technology, society and culture can be felt in all aspects of everyday life, scientific discussions about these interactions are sometimes problematic because of the heterogeneous areas of this discussion. In the next sections, some of these heterogeneous areas are discussed and coherently linked to support the main objective of this article, which is to claim that culture is a complementary key dimension to enhance the value creation model as discussed by Cagan and Vogel [17]. At the same time the cultural aspects of design and use of mobile phones were studied, and the extended model was used for an experiment design which was focused on mobile phones and their interaction with cultural specifications of users. The framework can be seen in the figure 1.

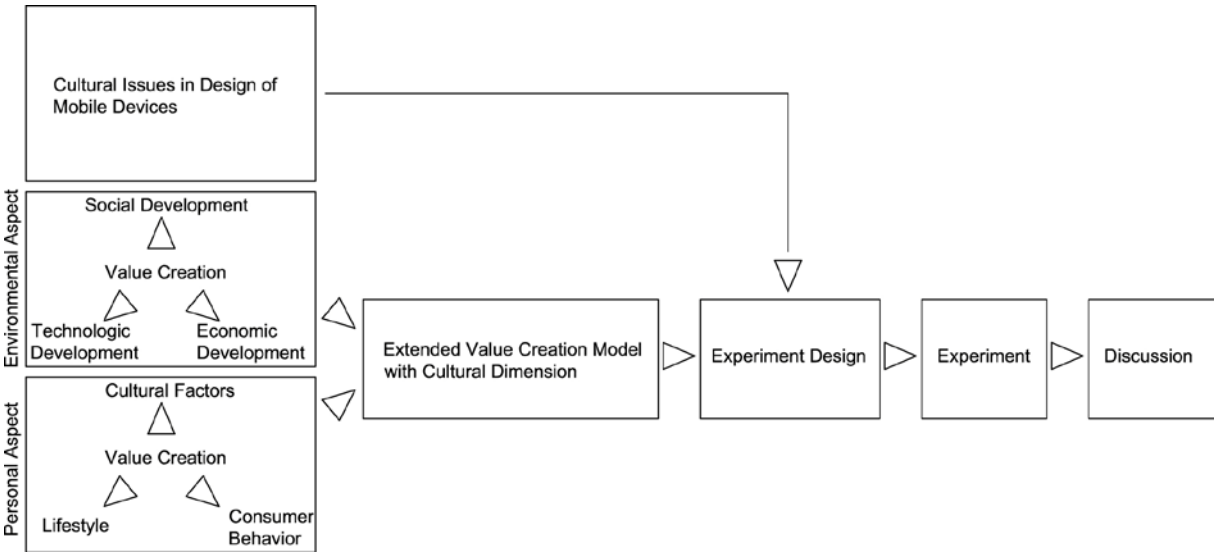

Figure 1. Framework of the study

3. FROM RADICAL INNOVATION TO VALUE CREATION

The changing global environment is compelling organizations and businesses to permanently seek the most efficient models to maximize their innovation management efforts through new methods and paradigms, which efficiently serve existing and new markets with new and/or modified products as well as services [9, 10].
Within the context of integrated product development, the level of innovative success in formulating an effective product strategy and a design goal is highly dependent on how thorough ”Product Planning and Goal Finding” processes were carried out in the Front-End of Innovation (FEI) [11]. The term ‘(fuzzy) front end’ describes the earliest stage of an idea's development and is one of the greatest areas of weakness of the innovation process, but effective management of the front end may result in a sustainable competitive advantage.
Furthermore, the (fuzzy) front end innovation stages are consisting of unknown and uncontrollable factors [12]. In this sense, the focus on the front end is mainly one of opportunity identification and analysis [13]. Hereby, both internal and external sources are important for idea development and goal finding, but the designer’s approach towards the execution of the external analysis determines the level of innovation targeted [14]. In practice, radical innovation is very hard to achieve, as most

companies are mainly supporting external analysis focusing mainly on market, competitor's and stakeholder's analysis. In turn, this has led to incremental innovation, where new products were created for existing markets or new markets for existing products confining itself to the current product or service portfolio of the respective company [10]. In order to achieve diversification, synonymous to radical innovation, a broader approach towards innovation processes is needed to obtain a maximum number of innovative product and process ideas. However, there has been little research done on the issue so far [15].

4. THE CONCEPT OF VALUE CREATION IN PRODUCTS AND SERVICES

As Simon defines it, design is action oriented and aims to change the existing situation into a preferred one [16]. Therefore, particular design research effort is needed for developing tools and methods applicable in design practice that would enable designers to be active in enhancing value creation. In their investigation of what it takes to create breakthrough products, Cagan and Vogel concluded that one of the key attributes that distinguishes breakthrough products from their closest followers is the significant value they provide for users [17]. After all, as Drucker has pointed out, *"customers pay only for what is of use to them and gives them value"*[18].

Value is closely tied with and carries some properties of that experience. According to Dewey, experience is not something that is totally internal to the individual, but instead, *"an experience is always what it is because of a transaction taking place between an individual and what, at the time, constitutes his environment" (p. 43).* [19]. Experiences are context- and situation-specific; which means they change from one set of immediate circumstances, time, and location to another. In a similar way, value changes as cultural values and norms, and external contextual factors, change [20]

Boztepe has categorised user value according to utility, social significance, emotional and spiritual value [21]. Utility value refers to the utilitarian consequences of a product. Social significance value refers to the socially oriented benefits attained through ownership of and experience with a product. These include attainment of social prestige and construction and maintenance of one's identity. People use goods as markers of their relative position in the social nexus [22]. Emotional value refers to the affective benefits of a product for people who interact with it. According to Desmet and Hekkert, experiences occur on three levels: (1) aesthetic, referring to delight experienced in a sensory capacity, (2) meaning, referring to experiences that relate to one's personality or character, and (3) emotion [23].

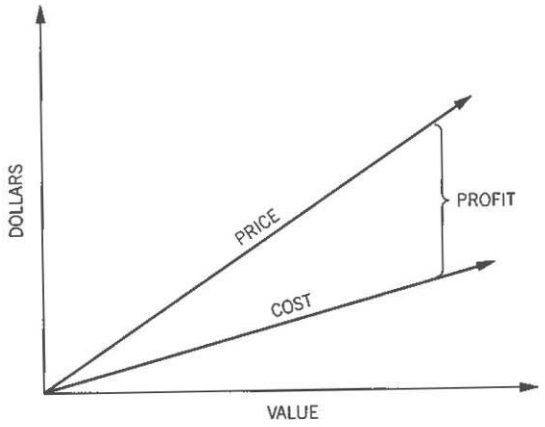

Figure 2. Price and Cost versus Value – Profit increases with added value

Although cost is important in determining market penetration strategies, consumers are willing to pay a higher price for product purchases, which connect with their own personal values [17]. Referenced to figure 2, the more value in a product, the higher price people are willing to pay, with the price increasing more rapidly than the costs, resulting in a profit margin, significantly higher for higher valued products. The remainder of this article argues for cultural understanding as a driver for developing superior valued products, mainly focusing on cellular phones.

5. CULTURAL FACTORS INFLUENCING VALUE CREATION

From an Information, Communication and Technology (ICT) perspective, globalization affects many social and economic aspects of 21st century life. In particular, portable digital devices make users able

to communicate and share information regardless of physical location. This also implies that cultural differences should be considered when technology and products are being used for a sustainable growth [24].
To facilitate value creation within a globalised context, Hofstede´s five cultural dimensions were used to identify characteristics, which are important in strategically designing future cellular phones [25].
However, a broader fundamental and cultural understanding of designing cellular phones is first needed, which positions the sought after characteristics directly or indirectly within the triangular relationship of values, lifestyles and consumer behaviours

6. THE RELATIONSHIP BETWEEN VALUES, LIFESTYLES AND CONSUMER BEHAVIOUR

Several motives of shopping are socially and culturally anchored, including ethnic identifications and acculturation effects [26, 27, 28]. Consumption itself has been linked to 'symbolic meanings, values and lifestyles – all of which are likely to be specific to local cultures' [29]. Several studies have examined and recognized the strong impact of values in shaping consumer motivations and product choices [30, 31] It has been argued that the consumer would place greater emphasis on utilitarian values of products in developing countries rather than hedonic values which would be more important for consumers in developed countries [32].
However, an exception is China's middle class, which is a growing consumer segment, equipped with increasing purchasing power. According to MasterCard Worldwide, Asia Pacific, the population of China's middle class *(defined here as households with annual incomes ranging from $6,000 to $25,000)*, grew from close to zero in 1995 to an estimated 87 million in 2005. In 2006, around 39 percent of urban households were middle class. By 2016, that percentage will likely rise to 60 percent, representing 340 million. At present, the middle class accounts for 27 percent of China's total urban disposable income. By 2015, that percentage is expected to rise to more than 40 percent [33].
In contrast to upper-middle class consumers, who are more experienced with different types of brands, by seeking out relatively high-quality products without paying as much attention to brands or picking out products that merely reflect personal tastes, lower middle class consumers tend to buy top-tier products that hedonistically display their wealth and status. They sometimes spend a large portion of their income on expensive goods [33].
According to the six sub-segments of the middle class, "Trend Followers" to be associated with the lower middle class tend to be junior white-collar workers and civil servants who have some leisure time and a stable salary but are new to the middle class and have less room for discretionary spending.
Following the progression of Chinese needs from social to physiological to safety to self-actualisation in the service of society [34], Belk reviews that evidence suggesting that developing cultures are acquiring hedonistic consumption attitudes in a different sequence and much more rapidly than was the case in Western Europe and the United States [35].
With increases in personal income and greater influences from outside China and especially Western cultures, the values of Chinese consumers have recently been changing in reaction to years of deprivation and institutionalized discouragement towards consumption in the past. More Chinese consumers have accepted buying for hedonic reasons rather than for only utilitarian need, especially the younger generation [36]. There is a tendency for young Chinese consumers to pursue a ''modern'' lifestyle by spending on big brand name products and keeping up with the fashion trends [37, 38] These hedonistic consumption attitudes are complementary illustrated by the following example.
China has roughly 200 million young citizens, aged 15 to 24. Compared to 29 percent of people aged 25 to 39, 36 percent of this powerful demographic of 15- to 24-year-olds often spend money on non-essential items. *(Sinomonitor International, 2004 China Marketing and Media Study/China Target Group Index; and Xinhua News Agency).*

The above example speculates that high-income Chinese consumers are eager and capable of buying larger essential brand name products, while the average young Chinese middle class consumer has limited purchasing power [39]. Although these limited income consumers may not be able to afford famous brand-name products, they have the desire to own them. As a substitute, they search for alternative (non-essential products), which are intrinsically affordable to show off their newly gained wealth, status or identity by paying an extra premium for brand name. Therefore, when targeting today's young Chinese consumer who has stronger hedonic values, marketers should focus on

symbolic or expressive meanings of a product or brand, emphasize the emotional or fantastical experience of consumption, appeal to the consumer's desire for exploration, novelty, variety and innovation in promotion messages [40].

7. CULTURAL ISSUES PERTAINING THE DESIGN OF CELLULAR PHONES

LaRose claims that communication through cellular phones creates 'virtual' communities of friends, or 'psychological neighbourhoods' [41]. Leung and Wei, in their research on the cellular phone, present seven factors of gratification sought by cellular phone users –fashion/status, affection/sociability, relaxation, mobility, immediate access, instrumentality and reassurance [42].

In developing countries, three motives emerge as reasons for using cellular phones: status/relaxation, instrumentality/business and security/sociability. The first motive related negatively to the level of usage, the more the cellular phone was owned for the purpose of showing off, the lower the overall use. Individuals can then use fashion to tailor the social response they desire [43]. It is a form of communication which includes messages of status and power. For example, Chinese college students seek brands that will help them 'say 'I am unique'' without making them 'look weird or socially unacceptable' [44].

According to Wang, the Chinese cell phone market now shifted its focus from technology to design and aesthetics and onto the pursuit of new unique selling points such as music marketing [45]. As 'musical taste' had become such an important demographic index for youth marketing in developed countries, the mission of developing mobile music content and music applications was pushed to the top of the agenda of transnational handset.

Strong differences were observed in mobile phone use across cultures. For example, users from Japan, Korea and Chinese urban centres often customize their phones appearance using stickers, straps, the extreme cases being part of the Japanese Deco-Den *trend (derived from "decoration" and "denwa", Japanese for "phone")* [46]. In sharp contrast, consumers in the USA and Europe do not personalize their mobile, but maintain it in the same state as purchased. As a part of mobile phone usage practices, the psychological underpinnings of mobile phone personalization are examined by using grounded theories or existing frameworks [47]. The motivations of ICT personalization are well associated with basic human needs of autonomy, competence, and acceptance. It is intended to have an effect on other people rather than the user herself". Hereby, physical appearance and personalization serve the functions of emotional expression, ego- involvement, identity expression, and territory marking. According to Alastair Curtis, director of Nokia's design group. "The phone is an extension of your identity" [48.]People respond, often making a conscious choice of the style of their mobile phone [49]. In collectivist cultures people customize their phone's appearance more often because they are more likely to be used as a platform to create, show, and treasure the association with other people, especially group with strong social-ties such as families. According to Scott Durchslag, a Motorola corporate vice president, "In Asia for instance, phones are more of an aspirational statement about who you are and who you want to be,". This statement is reinforced by TCL Mobile's managing director,Wan Ming Jian, asserting that in Asia, "Attaching jewelry on the phone adds a cultural and spiritual dimension to the product. To many Chinese, precious stones symbolize esteem, good fortune, peace and love. So jeweled mobile phones are not just communication tools, they also act as lucky charms" [50].

8. A CULTURAL PERSPECTIVE TOWARDS EXTENDED VALUE CREATION IN THE DESIGN OF CELLULAR PHONES

From a design perspective, a product or service is of value for a consumer if it offers a strong effect on life style from a technology, ergonomic and aesthetic perspective, considering cultural, social and economical opportunities as well as barriers.

Buyers of cellular phones may be clustered into two broad categories. First are those who purchase one simply as a communication tool, claiming to care little about its appearance or symbolism. Second are those who buy one in part because of the status that a design, logo or brand imparts. They seek to individualize them, personalize them and integrate them into their own local cultural meaning [51]. The importance of the cultural setting in considering the meaning of the mobile phone is shared by Cui and other's classification of instrumental and non-Instrumental attributes, whereby the former includes ease of use and security, and the latter covers identity, sociability, and aesthetics [52].

Similar to other products, cellular phones can be positioned according to "Style" (= Aesthetics + Ergonomics) and "Technology". Figure 3 shows a typical example of this positioning. In a heuristic evaluation, a designer categorized a number of different cellular phones in four different quadrants. The designer tried to find the key characteristic of each phone, based on the time of market launch. It is obvious that cellular phones with large screens are positioned in the "high technology – low style" quadrant. This suggests that technological values are determined by software and interface technology When referring to the "high style – low technology" quadrant, cellular phones are dominated by hardware gadets. Cellular phones positioned in the "high technology – high style" quadrant portray a flexible hardware options supported by a highly interactive display. However, these cellular phones are designed for global markets and most likely cultural aspects were not consciously considered in the designs.

Figure 3: Different cellular phones positioned according to "Style" and " Technology"

This article argues that value creation can be augmented by introducing a 3rd dimensions, which is "Culture" *(see figure 4).* This augmentation is to be achieved through the design of hardware and interface features, which appeal to needs and desires of targeted cultures, or the global cellular phone community.

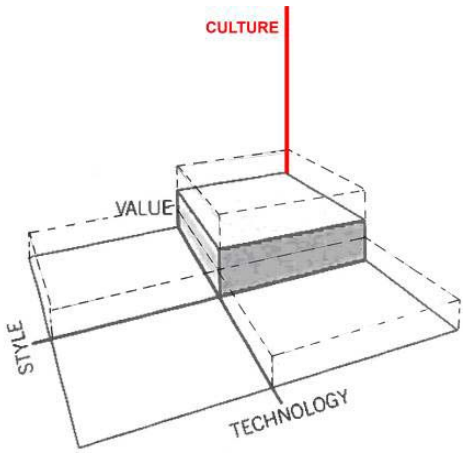

Figure 4: Value creation to be augmented by introducing a 3rd dimensions, which is "Culture"

9. EXPERIMENT

Referenced to an experiment on the "Cultural Customization of Mobile Communication Devices with Focus on Object Oriented Static Design" [53], software and hardware components were mapped against Hofstede's cultural dimensions [25]. At first, a product model was used to define a set of

virtual and real components of mobile communication devices. Aesthetic components include colour specifications (brightness and temperature) and different form factors (such as bar type and slide form factors). Thereafter, 20 Interviewed female subjects with similar demographic specifications were asked to evaluate the presented features and components on a cultural spectrum from ”very masculine” to ”very feminine” (figure 5).

The results show that users associated specific characteristics with gender. For example dark and cold colours, bar form factor and some advance features were connected to the masculinity dimension, while majority of users linked warm and bright colours and more simple features to the femininity dimension. These preferences then changed to some scores for each component of mobile phone. Positive scores were assigned for the femininity and negative ones for the masculinity. In this way each mobile phone can have a femininity or masculinity score which is the sum of its components scores.
The same users then were asked to score different products of the same brand with similar prices. The findings of this second experiment showed that when users face a product (and not its separated components) they may have different preferences; because users did not give highest scores to products which had the most feminine components. At this point in time, attribute based methods are not enough for understanding users real behaviour and tendencies towards a product. Gestalt of a product is an essential factor in the way that users interact with it. In other word, a product is more than just a combination of its components or attributes.

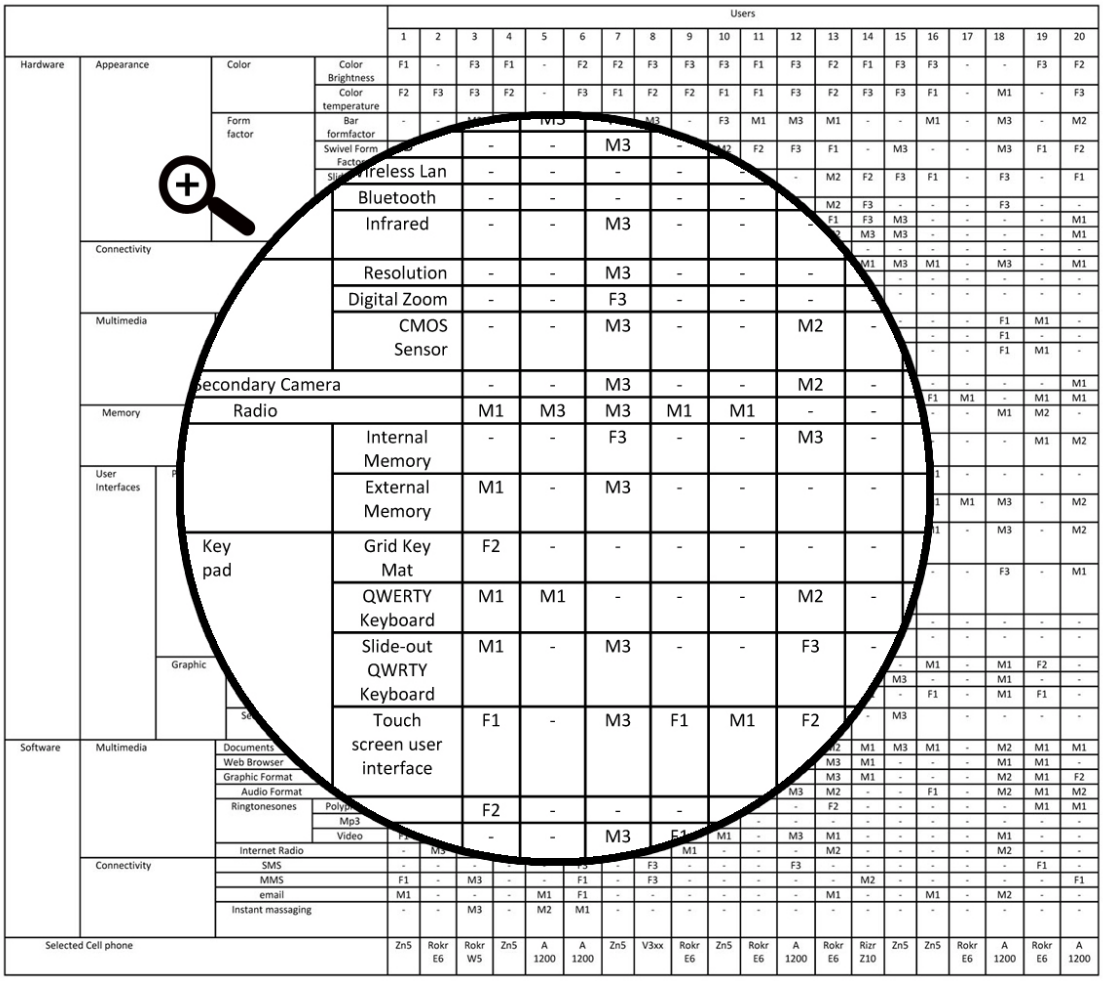

Figure 5. Results of evaluation of mobile phone components by 20 female users. M3 is assigned for very masculine, M2 for masculine and M1 for slightly masculine. F3, F2 and F1 have the same trend for the femininity dimension.

10. DISCUSSION

Superior value creation of products and services, and therefore competitive advantage, can be achieved through the understanding of cultural issues. This is based on the assumption that the more value in a product, the higher price people are willing to pay, with the price increasing more rapidly than the costs. As a case, cellular phones were used for discussing cultural factors influencing value creation. They also illustrated the relationship among values, lifestyles and consumer behaviour. However, further research need to be done to elaborate on how value creation can be extended from a cultural perspective, pertaining the design of cellular phones.

With respect to individual features and components, no specific design recommendation can be made at this point of time. Attribute based methods were not enough for understanding users' real behaviour and tendencies towards a product. Gestalt of a product is an essential factor in the way that users interact with it. In other word, a product is more than just a combination of its components or attributes. However, a more elaborate mapping of hardware and software components onto Hofstede´s cultural dimensions [53] can lead to interesting findings based on the identification of cultural specific components *(see figure 6).*

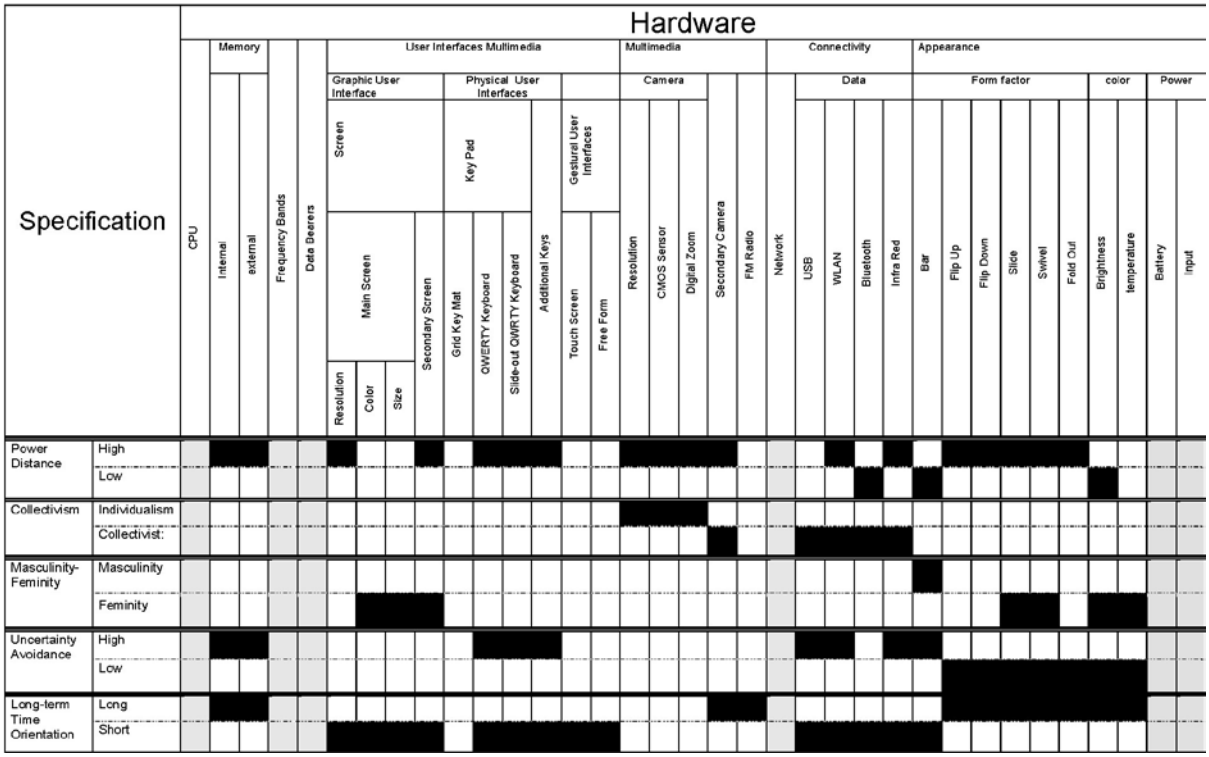

Figure 6. Mapping between hardware components and Hofstede´s cultural model

Hopefully, these findings can be aligned to statements made in a lecture by Aaron Marcus about the Asian mobile devices; "The Asian one is still focused on the dynamic physical form factor, while the Western one (iPhone 4) has a minimal form factor, simple and advanced software components. Aaron compared the iPhone 4 with Seok Hong Jeong's concept for dual display phone. The latter communicates a typical Asian approach towards cellular phone design, where a playful form factor, and multifunctional customizable operating system has been emphasized *(figure 7).*

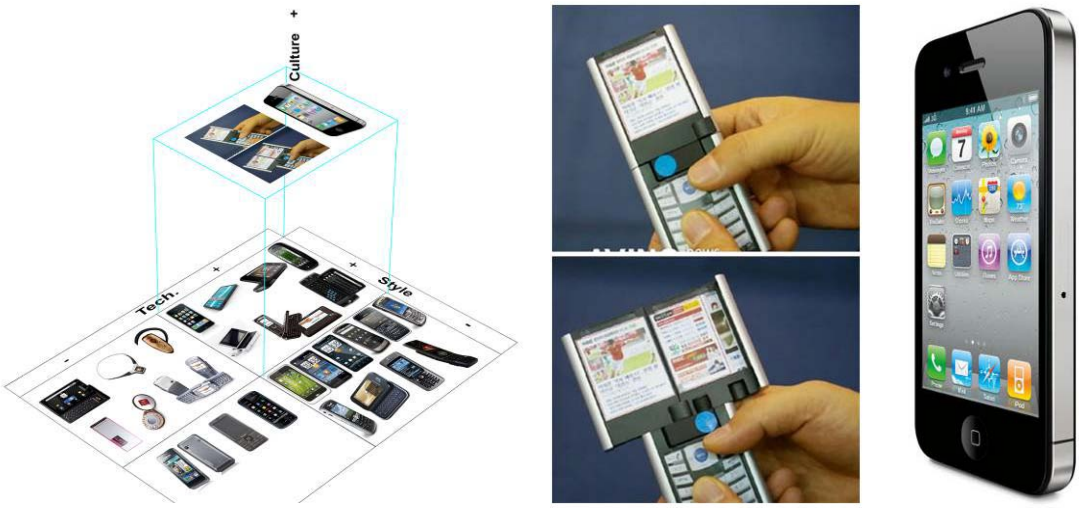

Figure 7. Seok Hong Jeong's concept for dual display phone mapped on a "Cultural" value creation model

The extension of Cagan and Vogel´s "Value Creation Model" with culture as an additional component, might lead to different judgments and positioning when among different evaluators [17], because of the subjective nature of culture and its related values. However this case example shows that this value creation *(Style versus Technology)* model can be extended with culture as an additional dimension. Since with the same set of products, different positionings are to be made by different evaluators, contextual research on users can be helpful in order to find more valid classifications. It is important to understand how users consider each of these dimensions when they want to define an identity for a product.

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