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INNOVATION OF NEW PRODUCT AND SERVICE DEVELOPMENT MODEL HARNESSING CULTURAL HERITAGE

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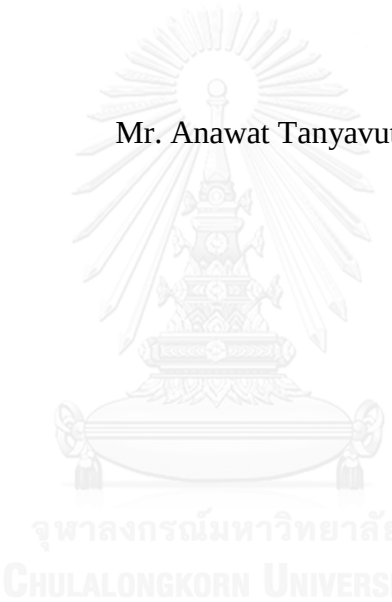

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อนวัช ธัญญะวุฒิ : นวัตกรรมตัวแบบการพัฒนาผลิตภัณฑ์และบริการใหม่บนฐานมรดกภูมิปัญญาทางวัฒนธรรม (INNOVATION OF NEW PRODUCT AND SERVICE DEVELOPMENT MODEL HARNESSING CULTURAL HERITAGE) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ผศ. ดร.พงศ์พันธ์ อนันต์วรณิชย์, อ.ที่ปรึกษาวิทยานิพนธ์ร่วม: รศ. ดร.กฤตินี ณัฏฐวุฒิสิทธิ์, 197 หน้า.

จุดประสงค์ของวิทยานิพนธ์ฉบับนี้คือการนำเสนอวิธีการและกระบวนการพัฒนาแนวคิด (Front-end of Innovation) ของสินค้าและบริการโดยการนำมรดกภูมิปัญญาทางวัฒนธรรมไทยมาสร้างมูลค่า กระบวนการสามารถแบ่งออกได้เป็น 2 ลำดับขั้น ได้แก่ กระบวนการพัฒนาแนวความคิดใหม่ (Idea Generation) และกระบวนการคัดกรองแนวความคิด (Idea Screening) โดยในส่วนกระบวนการพัฒนาแนวความคิดใหม่ได้มีการนำทฤษฎี Morphological Analysis กับทฤษฎี Cultural Design Model มาประยุกต์ใช้และพัฒนาเป็นเครื่องมือพัฒนาแนวความคิด โดยข้อมูลในเครื่องมือนี้ได้มาจากการสัมภาษณ์เชิงลึกกับนักออกแบบและผู้ที่ทำงานเชิงสร้างสรรค์ในอุตสาหกรรมสร้างสรรค์จำนวน 10 ท่าน หลังจากนั้น เครื่องมือได้ถูกนำไปทดสอบด้วยการทำวิจัยเชิงกรณีศึกษากับนักออกแบบและผู้ที่ทำงานเชิงสร้างสรรค์ในอุตสาหกรรมสร้างสรรค์จำนวน 10 ท่าน แนวความคิดที่ได้จากการทำวิจัยเชิงกรณีศึกษานี้ ได้ถูกนำมาประเมินทั้งด้านปริมาณและคุณภาพ เพื่อพิสูจน์ประสิทธิภาพของเครื่องมือพัฒนาแนวความคิดใหม่ ในส่วนของกระบวนการคัดกรองแนวความคิด ผู้วิจัยได้นำทฤษฎี Means-end Chain และทฤษฎี Universal Human Values ของ Schwartz มาประยุกต์ใช้ เพื่อหาความสัมพันธ์ของ องค์ประกอบของสินค้าหรือบริการ พฤติกรรมที่ตามมาของผู้บริโภค และค่านิยมของผู้บริโภค (Attributes-Consequences-Values Linkages) โดยสามารถระบุได้เป็น 8 รูปแบบ ผลจากการวิจัยทั้ง 2 ลำดับขั้นถูกพัฒนาเป็นเครื่องมือช่วยพัฒนาแนวคิด (Idea Generation Support System) ในการสร้างแนวความคิดของสินค้าและบริการโดยการนำมรดกภูมิปัญญาทางวัฒนธรรมไทยมาสร้างมูลค่า ซึ่งเครื่องมือได้ถูกประเมินในด้านการใช้งานและการยอมรับนวัตกรรม โดยทฤษฎี Technology Acceptance Model วิทยานิพนธ์นี้ มีคุณค่าทางด้านวิชาการเนื่องจากเป็นการศึกษาและพัฒนากระบวนการพัฒนาแนวคิดที่นำมรดกภูมิปัญญาทางวัฒนธรรมไทยมาใช้ซึ่งยังไม่มีงานวิจัยทางด้านนี้มาเพียงพอแม้จะมีศักยภาพมาก งานวิจัยจากวิทยานิพนธ์นี้สามารถนำไปศึกษาเพิ่มเติมในศาสตร์ด้านการพัฒนาสินค้าและบริการใหม่และการใช้วัฒนธรรม ในเชิงการบริหาร เครื่องมือช่วยพัฒนาแนวคิด (Idea Generation Support System) ของสินค้าและบริการโดยการนำมรดกภูมิปัญญาทางวัฒนธรรมไทยนี้ สามารถช่วยนักออกแบบ ผู้ประกอบการ และผู้ที่ทำงานในอุตสาหกรรมสร้างสรรค์ในการพัฒนาแนวความคิดจากมรดกภูมิปัญญาทางวัฒนธรรมไทยซึ่งถือเป็นสินทรัพย์ที่มีมูลค่า และสามารถช่วยพัฒนาเศรษฐกิจของประเทศได้อีกทางหนึ่ง รวมถึงพัฒนาวัฒนธรรมไทยให้ยืนยาวสืบไป

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ANAWAT TANYAVUTTI: INNOVATION OF NEW PRODUCT AND SERVICE DEVELOPMENT MODEL HARNESSING CULTURAL HERITAGE. ADVISOR: ASST. PROF. PONGPUN ANUNTAVORANICH, Ph.D., CO-ADVISOR: ASSOC. PROF. KRITTINEE NUTTAVUTHISIT, Ph.D., 197 pp.

The purpose of this dissertation is to propose Front-end of Innovation (FEI) process for the concept development of cultural products by harnessing cultural heritage as source of inspiration. The process is divided into 2 phases, idea generation and idea screening. The ideation technique combines Morphological Analysis (MA) with Cultural Design Model theory. The morphological matrix is built based on in-depth interview with 10 designers with rich experience in cultural product design from key cultural industries of Thailand. The matrix is further developed into web-based ideation tool for conducting case study research with 10 designers. The results from case studies, the concepts generated, were evaluated in terms of quantity of ideas and quality of ideas for validation of the idea generation method. Regarding idea screening phase, Means-end chain theory and the Schwartz's universal human values were applied to discover attributes-consequences-values linkages of consumers purchasing cultural products, and 8 types of chain were identified. Data from 2 phases of the research were incorporated to develop the idea generation support system assisting designers and entrepreneurs seeking to develop concepts of products and services harnessing Thai cultural heritage as central value. The final idea generation support system was evaluated in terms of usability and thereby the diffusion of innovation employing Technology Acceptance Model. The study yields multiple implications. Regarding academic contribution, this study contributes to the domain of Front-end of Innovation process of culture-driven products, which have not been widely discussed despite their great potential. The proposed techniques and the idea generation support system would be used as foundation for future research regarding new product development of cultural products. As for managerial implication, the idea generation support system would assist designers and entrepreneurs to develop concepts of culture-driven products, essentially those in countries with rich cultural asset and in industries which rational benefits or technological advancement are deemphasized.

Field of Study:	Technopreneurship and Innovation Management	Student's Signature .....
		Advisor's Signature .....
Academic Year:	2016	Co-Advisor's Signature .....

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Chapter 1
INTRODUCTION

Background of the Study

Creative Economy

There has been discussion regarding the post-industrial era, associating with many terms and concepts namely Globalization, the Information Economy, the Knowledge Economy, and the Creative Economy, which is the overarching term of this research. Since the turn of twenty-first century, the concept of creative economy and creative industries have been in the focus of researchers, public-policy makers, statisticians, and cultural specialists in hope to stimulate post-industrial economic growth (Cunningham, 2011; Eger, 2006; Matheson, 2006; Vivant, 2013), solidify cultural identity, develop creative cities (Alvarez, 2010; Durmaz, Platt, & Yigitcanlar, 2010; Florida, 2003; Goede, 2009; Pratt, 2010; Sepe & Trapani, 2010), preserve the cultural diversity and cultural heritage (Daugstad, Rø nningen, & Skar, 2006; Jaw, Chen, & Chen, 2012), advance social and cultural development (Matheson, 2006), and generate employment and investment opportunities for entrepreneurs (Martínez & Vázquez, 2013; UNESCO). The rising interest results in elevating amount of research and theories of creative economy in various perspectives, namely public policies, urban planning, national branding, regional development, cultural studies, among others (Goede, 2009; Hsueh, Hsu, & Liu, 2012; Matheson, 2006; Salman & Uygur, 2010).

In the perspective of economics, creative economy is regarded as the new engine to drive economic growth of nations, yielding various business opportunities, job creation, trade flows, and resilience to economic crisis. Particularly, developing countries that habitually have long-standing traditions and rich cultural heritage possess advantage to capitalize on these inherited assets by transforming culture into commercial products and services in creative industries (UNCTAD, 2011; UNDP & UNCTAD, 2010).

Creative Economy and Competitiveness of Nations

Acknowledging the impact of creative economy, countries across continents have initiated campaigns to foster their creative economy so as to elevate the nation's Soft Power in the global landscape, essentially by harnessing country's own cultural capital (Graves, 2012; Shuqin, 2012). In 1997, the United Kingdom under Blair's Labour government launched the initial creative economy effort called *Create the Future* cultural policy along with the term *Cool Britannia*, leveraging Britpop cultural wave of music bands, including Blur, Oasis, and Spice Girls (Vivant, 2013). In 2009, the UK's National Endowment for Science, Technology and the Arts (NESTA) issued a report named *Soft Innovation*, the termed introduced by Paul Stoneman concerning innovation in creative industries. The report called attention of policy makers to focus not only on the scientific and technological innovation but also on soft kinds of innovation, including marketing and aesthetic innovation, which rely extensively on intangible values (NESTA, 2009; Stoneman, 2010; UNDP & UNCTAD, 2010). In New Zealand, the Labour government issued *the Heart of the Nation* report in 2000, incorporating arts and culture policy that expressed the vision to foster arts and cultural sector (Matheson, 2006). On Asian continent, Taiwan has invested approximately 9.85 billion TWD in order to nourish creative industries with the campaign *Creative Taiwan* under Cultural and Creative Industries Development Plan (Hsueh et al., 2012). These are only few examples of nations attempting to ride on the creative economy wave by leveraging cultural asset.

Culture as Source of Product and Service Value

Recognized as one branch in creative economy, culture and cultural heritage possess elements which can be ingrained, or play as central value, in products or services to convey meanings and emotions, thereby satisfying psychological preference of consumers. Cultural features are considered to be unique characteristics that can be embedded into products or services both for the enhancement of its identity in the global market and for the enhancement of the individual consumer experience (Lin, 2007). A shining example of the utilization of culture to gain economic

value leading to commercially successful endeavor would be the case of "Cool Japan" initiative.

Originating from the term "Japan's Gross National Cool", *Cool Japan* campaign is initiated by The Ministry of Economy, Trade, and Industry (METI) of Japan with a special unit responsible for raising the country's pop-culture power (Graves, 2012; McGray, 2002). The goal of METI is to promote pop/ subculture trends of Japan, which have obsessive fans around the world. Cultural products, such as cosplay, manga and anime, pop music, fashion, and cuisine, including Sanrio's Hello Kitty, a simplified cat icon that drives almost $1 billion in global sales per year, have met with global popularity (McGray, 2002; Yano, 2009). The influence of Japanese culture also leads global brands to find ways to exploit the cultural power; for instance, to attract Asian consumers, Coca-Cola developed a regional brand of juice called Qoo that capitalizes on the attraction for Japanese pop culture, which has met with great success in Asia (Cayla & Eckhardt, 2007).

Aligning with *Cool Japan* phenomenon, *Hallyu* or Korean pop culture Wave, firstly termed by Chinese mass media in 2002, has enormously contributed to the South Korean's economic growth as well as strengthen its stand in global arena (S. S. Kim, Agrusa, Lee, & Chon, 2007; Park, 2011).

The culture wave hit neighboring countries throughout Asia starting with Korean TV drama series titled *Winter Sonata;* the drama was a smash hit and has been aired extensively in Egypt, Thailand, Taiwan, Hong Kong, China, and United States. The success of *Winter Sonata* led to spiking demand for drama-related products and services, such as film-induced tourism to locations where film was shot, coffee shop with *Hallyu* theme, and various products with pictures of *Hallyu* stars. *Hallyu* effect is not confined to only film industry but later on branches out to include music, cuisine, tourism, fashion, and many more as people crave Korean products and services. Hallyu have emerged inarguably not chance but by a result the effort of South Korean government to shape creative industries by organizing rigorous training courses for inter-disciplinary creative talents (Shuqin, 2012).

Another example of the product exploiting cultural heritage is that of traditional Taiwanese glove puppetry called "*Budaixi*". Budaixi is a traditional form of entertainment that has been popular in Taiwan for more than 200 years since Ming Dynasty. Leveraging on the cultural heritage of the nation, later generation of entrepreneurs running puppetry theatre has recently revolutionized the performing arts by incorporating technological special effects and modern storyline to catch up with new consumer preferences. The effort results in dramatic success (Jaw et al., 2012).

The last example of attempt to exploit cultural heritage is the prominent research project on cultural heritage of European Commission; called NET-HERITAGE consisting of 14 European countries, namely Italy, Belgium, Bulgaria, France, Germany, Greece, Iceland, Latvia, Malta, Poland, Romania, Slovenia, Spain, and United Kingdom, the research project led to conference named "Increasing Europe's competitiveness through cultural heritage research" with the aim of utilizing cultural heritage for national development (Roders & Oers, 2011).

The examples of Cool Japan, Hallyu, Budaixi, and NET-HERITAGE clearly demonstrate that national and local inherited culture can be transformed into new products and services for exchange in a growing global marketplace (George, 2010; Lin, 2007).

Creative Economy in Thailand: Harnessing Cultural Capital for Value Creation and Economic Growth

Since the emergence of globalization, the Kingdom of Thailand has been struggling to find new strategic competitiveness in the global market. Until now, the nation relies deeply on external markets with majority of businesses being original equipment manufacturer (OEMs) producing electronic components and automotive parts for multi-national companies, which Thailand has gradually lost the market to emerging countries with lower production cost, namely Vietnam, China, and Indonesia, among others (Akaraseranee, 2010; Maesincee, Nuttavuthisit, Ayawongs, &

Phasukavanich, 2003; OSMEP, 2011; Pornpipat, 2010). On the other pole, countries possessing competitiveness in value-adding differentiation strategy, namely Italy, Japan, Taiwan, and South Korea are many steps ahead of Thailand. Given such scenario, in order to maintain economy growth, Thailand is in need of finding new competitiveness, replacing labor-intensive and resource-based products and services with creativity-based products and services that are unique and cannot be imitated by other countries (Pornpipat, 2010).

Fortunately, Thailand possesses invaluable assets that can be strategically harness for economic purpose. Those assets include long-standing traditions, beautiful scenery of various attractions, craftsmanship and hospitality, and friendly nature of Thais, among others, which are fond by travelers and consumers across the globe. The Kingdom of Thailand is one of the countries with rich and unique cultural heritage that can be traced back for more than 2,000 years. The diversification of races in the nation, being the center of commerce since the ancient time, and high level of interaction with foreigners due to being one of the world's top tourist attractions, allow Thailand to absorb and blend multiple foreign cultures with that of the nation. As a result, Thai culture is sophisticated and unique, consisting of several cultural facets (Pinkeaw, 2011; Pornpipat, 2010). Such inherited competitive advantage, when to commercially exploited, is self-sustaining, possessing less risk of losing market when compared to electronic and automotive OEMs, which clients can swiftly shift away to other countries with more favorable production conditions (Akaraseranee, 2010).

Realizing the advantage and the need for change, the Thai government has initiated policies to encourage creative economy development since 1997, incorporating creative economy development policies in The Eight National Economic and Social Development Plan (1997-2001) and continues through the current plan, The Eleventh National Economic and Social Development Plan (2012-2016). The goal is to push creative economy as a new engine for economic growth in the state, essentially

creating creative value-added products and services based on Thai culture and wisdom in connection with innovation and technology.

Thailand defines definition of creative economy by combining that of UNESCO and UNCTAD with more emphasis on cultural heritage dimension as “the concept of mobilizing economy based on knowledge, creativity, and intellectual property linked with cultural capital, technology, and innovation.” (OSMEP, 2012; Pitdumrong, 2010; Pornpipat, 2010). Among 15 subcategories of Thai creative economy, cultural heritage products and services is the second largest group in terms of economic value and has the highest growth rate at 9.04% per year (Pinkeaw, 2011). It can be seen that, in the context of Thailand, culture is considered upstream content of the creative-economy value chain, and entrepreneurs are advised to ingrain Thai cultural content in business model to enhance business value. Entrepreneurs can leverage cultural story and content to enhance value and create differentiation point in products and services (Pinkeaw, 2011). While cultural heritage helps create values in goods, on the culture side, well-developed cultural products sustain and move the development of culture forward, preventing culture from disappearing (Ketmanee, 2012; Lin, 2007).

The Thai Small and Medium Enterprises

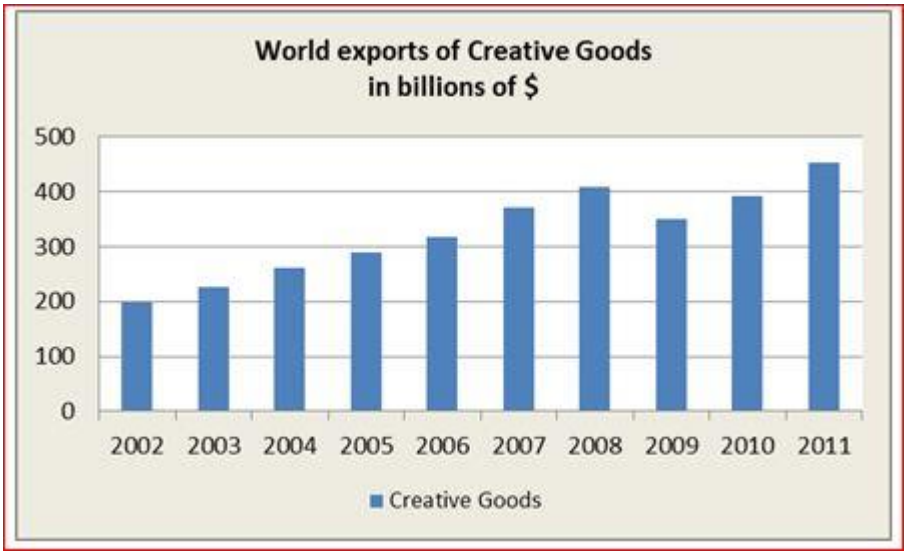
In order to stimulate economic growth of the country by creative economy, small and medium enterprises (SMEs) is the group that is hardly be neglected since it accounts for 99.60 percent of total Thai enterprises and contributes 42.35 percent of Thai GDP (OSMEP, 2011). Given critical role of Thai SMEs to the Thai economy, changing Thai SMEs from OEMs entrepreneurs to creative entrepreneurs would greatly strengthen their businesses and would in turn contribute a great deal to the economy. As a result, The Office of Small and Medium Enterprises Promotion, Thailand (OSMEP) created the Third Small and Medium Enterprises Promotion Plan (2012-2016) with the focus of nourishing creativity, innovation, and cultural identity in products and service among Thai SMEs, aligning with the Eleventh National Economic and Social Development Plan. Specifically, the plan focuses on developing new products and services

development capability among Thai SMEs so as to generate more high-value products and services and less reliance on OEMs business.

Rationale of the Study

In the international perspective, harnessing cultural heritage in products and services has gained increasing interest in the academic domain of new product development in recent years due to elevating demand for cultural heritage products and services; because of better standard of living and higher level of education throughout the world, consumer demands for heritage products, leisure, and cultural activities have grown drastically over the past 50 years (Colbert & Courchesne, 2012; Eltham, 2009; Howkins, 2002; Matheson, 2006). The statistics of global trade of creative products and services unmistakably validate the trend. In May 2013, United Nations Conference on Trade and Development (UNCTAD) revealed data of creative goods trade from 2002 to 2011, including global exports of arts and crafts, books, fashion, film, graphic and interior design works, among others. The numbers evidently prove drastic growth of creative goods and services with annual growth rate of 8.8 percent globally and 12.1 percent for developing countries (UNCTAD, 2013). The illustration of global creative goods trade is presented below:

Figure 1-1 World Exports of Creative Goods in Billion of USD



Source UNCTAD, Based on Official Data in UN COMTRADE Database

The reason for such consumption trend is because consumers do not satisfy with only adequate function and high quality anymore as most makers are able to produce up to the consumers' expected standard. Instead, consumers demand for additional values in products and services; quality-driven consumers not only buy products or services based on sufficient function and production quality alone but also consider associated intangible values, including brand, associated image and meaning, when making buying decision (Maesincee et al., 2003; Utterback et al., 2006; Verganti, 2009).

Consequently, several studies point out the advantage of embodying intangible values, including cultural heritage, in products and services in order to follow the shift of consumers' buying decision criteria and to enhance competitiveness of products and services. Cayla and Eckhardt (2007) and Charters and Spielmann (2013) suggest that local brands should capitalize on local cultural capital to increase value in products and services. Beverland and Luxton (2005) state that marketers have increasingly turned to cues with historical association to create differentiated products in consumers' mind. Ko and Lee (2011) assert that embodying cultural heritage in a brand is a tool to strengthen the brand competitiveness and generate image of authenticity, which cannot be imitated by others in the global market since cultural heritage is derived from and shared only by a certain culture. Furthermore, during environmental turbulence and crisis, products and services ingrained with cultural heritage convey sense of stability and confidence, thereby bringing peace of mind to consumers (Hakala, Lätti, & Sandberg, 2011). Zhou, Wang, Zhang, and Mou (2013) point out that adopting branding strategies with nostalgic association generates positive consumer response about past and alleviate negative feelings. Urde, Greyser, and Balmer (2007) state that corporate brand infused with a heritage can provide leverage for that brand and increase customer loyalty, especially in global markets.

While embodying cultural heritage in products and services yields various advantages, studies in this field is still in its infancy; Lin (2007) notes that the study of embedding culture in product development has so far been

scarce. McKercher, Ho, and du Cros (2004) state that studies regarding successful product development in relation to cultural heritage have not been widely discussed despite their great potential. Ko and Lee (2011) assert that the term "cultural heritage branding" referring to a brand with a positioning and value proposition based on cultural heritage is relatively newly introduced and has not been studied extensively. It is apparent that the study regarding cultural heritage product development process referring to methodology to embody intangible values of cultural heritage in products and services rarely exists and is in need of further in-depth study.

In the perspective of Thailand, cultural heritage can be a great tool for enhancing products and services given the characteristics of the nation; cultural heritage is a fit strategy for countries with profound history and for industries which rational benefits or technological advancement are deemphasized (Abbott, Holland, Giacomin, & Shackleton, 2009).

Nevertheless, although the kingdom is in grand position to commercially exploit cultural heritage due to the nation's abundant cultural capital, the key issue prevents the implementation, the lack of the product development process to systematically embody Thai cultural heritage to enrich value in products and services. In fact, based on research by The Office of Small and Medium Enterprises Promotion, Thailand (OSMEP), new product and service development is a major weakness of Thai entrepreneurs since Thai business owners have relied on low-margin OEMs business for decades. In addition, Thai SMEs lack the methodology and tool to systematically collect local wisdom (OSMEP, 2011, 2012; Termpittayapaisith, 2008).

Realizing the need to investigate the new product development (NPD) process to harness cultural heritage, it has come to the researcher's intention to study and develop NPD process model that incorporates cultural heritage value. In particular, the concentration of the study will be on the initial phase of the new product development process referred to as Front-end of new product development, which encompasses idea generation to early management review activity resulting in design concept

and design criteria for designers to execute the detailed design in later phases (Postma, Broekhuizen, & van den Bosch, 2012). The front-end stage is the most critical phase of new product development; the success of products or services is primarily the result of front-end process (Ho & Tsai, 2011; Oliveira & Rozenfeld, 2010; Tzortzopoulos, Cooper, Chan, & Kagioglou, 2006; Verworn, 2009). As a result, it is worthwhile to investigate the Front-end phase of NPD process harnessing cultural heritage since the phase predominantly determines success or failure of the products.

The researcher believes that the outcome would yield benefit to academic and also business domain. The result would shed light on the academic domain in new product development area concerning cultural heritage as augmented value and would contribute significantly to Thai entrepreneurs seeking to harness the kingdom's cultural capital to enrich value in cultural products and services.

The systematic process derived from the study will be developed into computerized idea generation support system for concept development of cultural products and services, facilitating small businesses to follow through each stage with the ability to collect cultural inspirations and conceptualize product ideas. Such tool would contribute a great deal to Thai SMEs in creative industries seeking to exploit Thai cultural capital in their commercialization and would help foster Thai creative economy as a whole.

Research Objectives

The objectives of the study are as follows:

1. To investigate the Front-end of Innovation activities for culture-driven products.

2. To develop idea generation support system assisting the Front-end of Innovation activities for culture-driven products.

3. To test the usability and acceptance of the idea generation support system.

Research Scope

The scope of this study in multiple dimensions is presented below:

Geographical Dimension
This research is confined to the Kingdom of Thailand only.

Technological Dimension
The commercialization of the study is a computerized idea generation support system for concept development of culture-driven products. As such, in terms of technology, this study is limited to only information communication technology.

Research Limitation

The study possesses a number limitations as follows:

1. Secondary Data: The secondary research is conducted in English and Thai-written literatures, limiting the knowledge from other sources of language.

2. Source of Evidence: Due to the fact that the research is conducted within the Kingdom of Thailand, the majority of source of evidence

for the research is that of Thai. As a result, the research outcome might not be fully applicable in contexts with cultural differences.

Definition of Keywords

Given the abstract nature of the research contents, there are a number of keywords which the researcher would like to clarify for better understanding and for defining the boundary and direction of the study.

1. Culture-driven Products: Culture-driven products and services refers to products and services that contain cultural elements either in tangible or intangible forms or both as a mean to create value in consumers' mind, following the Soft Innovation strategy.

2. Cultural Entrepreneurs: the term refers to entrepreneurs who develop culture-driven products and services.

Expected Outcome

The study would shed light on the new product development domain, essentially in relation to the cultural heritage aspect, which studies are still scarce. The obtained knowledge would be a guideline for organizations seeking to systematically create value through cultural capital. In addition, the idea generation support system developed from the core knowledge would equip Thai designers and entrepreneurs with a tool to leverage the nation's invaluable cultural heritage, assisting the overall economic growth of the country and putting Thai cultural products and services in distinctive position in global landscape.

The expected outcome can be described by following Technology, Innovation, and Management dimensions as follows:

- Contribution to Technology Aspect
  The process derived from the study is developed into idea generation support system guiding idea generation process for culture-driven products to develop product concept. The idea generation support system would be the first tool of its kind.

- Contribution to Innovation Aspect
  The model would contribute to the realm of process innovation, particularly in the Front-end of Innovation (FEI) domain. The model would be the first idea generation process suitable for developing concept of culture-driven products, referring to products and services that contain cultural elements either in tangible or intangible forms or both as a mean to create value in consumers' mind, following Soft Innovation strategy.

- Contribution to Management Aspect
  In terms of management, the outcome of the study would contribute to the domain of product planning and development. The idea generation support system would help designers, managers, and marketers to systematically generate product concept enriched with cultural contents as source of product values.

Chapter 2
LITERATURE REVIEW

Creative Economy and Creative Industries

Background and Definition

To begin with, the concept of creative economy and creative industries surfaced around the end of twentieth century; firstly introduced in the Creative Industries Mapping Documents published by the United Kingdom's Department for Culture, Media, and Sport (DCMS) in 1998, creative industries is defined as "those industries which have their origin in individual creativity, skill, and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property" (BritishCouncil, 2010; Throsby, 2008; Vivant, 2013). Howkins (2002) introduces the term "creative economy" in his book *"The Creative Economy: How people make money from ideas".* He illustrates the dramatic shift in the key economic driver with an observation that the people who own ideas have become more powerful than people who work machines and people who own machines. The statement signifies the underlying nature of the end of industrial era and the dawn of creative economy era, which will be the dominant form of economy of the twenty-first century. According to Howkins, creative economy is the relationship between creativity and economics which generates explosive wealth. It is the product of individuals harnessing economic value of creativity and imaginations. Creative goods and services, which are high value by their nature, are created and traded, thereby creating the economy. Howkins describes that creative economy is formed by four key industries involving intellectual property, namely copyrights, patents, trademarks, and designs and that creative economy includes 15 key creative industries.

From the origination of the term by Howkins, Florida (2003) adds the socioeconomic perspective to creative economy domain by introducing the term *"Creative Class".* Creative Class is the group of workers consisting of artists, designers, scientists, engineers, entrepreneurs, and professionals

utilizing intensive creativity in their work to create new technology and new creative contents; Along the similar vein of that of Howkins, Florida asserts that creativity is the new driver for economic growth, and societies around the world have begun to gradually shift towards creative economy. As a result, Creative Class, bringing about creative energy and diversity, is the group of professionals leading societies to prosperity.

Given drastic attention in the creative economy and creative industries, academicians and organizations have attempted to define the term, resulting in various versions as the following examples:

The creation of value as a result of ideas.
(Howkins, 2002)

The "creative economy" is an evolving concept based on creative assets potentially generating economic growth and development.
(UNDP & UNCTAD, 2010)

Another international organization that develops the definition of creative industries in its own term is World Intellectual Property Organization (WIPO). Greffe (2006) states in his book "Managing Creative Enterprises" published by WIPO that creative industries can be defined as industries producing and distributing goods and services centered on texts, symbols, images and software. They constitute a specific cluster of knowledge-based activities that usually combine creative talent with advanced technology and whose output maybe protected by a wide range of Intellectual Property rights.

In the context of Thailand, the Kingdom defines definition of creative economy by applying that of UNESCO and UNCTAD as follows:

The concept of mobilizing economy based on knowledge, creativity, and intellectual property linked with cultural capital, technology, and innovation.
(OSMEP, 2012; Pitdumrong, 2010; Pornpipat, 2010).

Thailand Creative and Design Center (TCDC) summarizes the meaning of creative economy from various sources as given below:

The meaning of the creative economy has common elements of driving the economy forward based on utilization of knowledge, education, creation, and intellectual property in relation to cultural foundation, wisdom accumulation of the society and modern technology and innovation.
(TCDC)

While the notion of creative economy and creative industries is still argumentative and vary, and evolves through time (Apivantanaporn & Walsh, 2012; Howkins, 2002; Kalanje, 2008; Pratt, 2010; UNDP & UNCTAD, 2010), the internationally accepted definition of creative economy is that of UNESCO, describing Creative Economy as follows:

Creative economy is the industries which combine the creation, production and commercialization of creative contents which are intangible and cultural in nature.
(UNESCO).
It can be seen that global organizations define the term in relationship to their expertise and responsibilities. UNESCO put more emphasis on the intangible cultural content aspect of creative economy, while WIPO highlights the intellectual property rights, and UNCTAD focuses on trade and economic growth aspect.

Classification of Creative Industries

Depending on the origins, the classification of creative industries tends to vary. The initial classification was introduced by the United Kingdom's Department for Culture, Media, and Sport (DCMS) in 1998, consisting of thirteen creative industry sectors. The list of creative industries is as follows:
Advertising
Architecture
Art and Antiques Market
Craft

Design
Designer Fashion
Film and Video
Interactive Leisure Software
Music
Performing Arts
Publishing
Software and Computer Services
Television and Radio

Apart from the initial classification by DCMS, Howkins (2002) identifies fifteen sectors of creative industries as follows:

Advertising
Architecture
Art
Crafts
Design
Fashion
Film
Music
Performing Arts (Theatre, Opera, Dance, Ballet)
Publishing
Research and Development
Software
Toys and Games
TV and Radio
Video Games

Another widely accepted classification of creative industries is that of United Nations Educational, Scientific, and Cultural Organization (UNESCO). The organization categorizes creative industries into groups with its Framework for Cultural Statistics (FIS) in 1986. The classification of creative industries includes:

(0) Cultural Heritage
(1) Printed Matter and Literature
(2 & 3) Music and the Performing Arts
(4) Visual Arts
(5 & 6) Audiovisual Media (5 Cinema and Photography; 6 Radio and Television)
(7) Socio Cultural Activities
(8) Sports and Games
(9) Environment and Nature

United Nations Conference on Trade and Development (UNCTAD) is another organization classifying creative industries; the organization reveals its classification of creative industries with four main categories consisting of nine sub-categories as the following table:

Table 2-1 Classification of Creative Industries by UNCTAD

HERITAGE	ARTS	MEDIA	FUNCTIONAL CREATIONS
Cultural Sites: Archeological sites, museums, libraries, exhibitions, and so forth	Visual Arts: Paintings, sculptures, photography, and antiques	Publishing and printed media: Books, press, and other publications	Design: Interior, graphics, fashion, jewellery, and toys
Traditional Cultural Expressions: Art & crafts, festivals, and celebrations	Performing arts: Live music, theatre, dance, opera, circus, puppetry, etc.	Audiovisual: Film, television, radio, other broadcasting	Creative services: Architectural, advertising, creative R&D, cultural & recreational
		New media: Software, video games, digitized creative content	

Source Creative Economy Report 2010 by UNDP and UNCTAD

While most models separates industries into groups and sub-groups based on type of industries, Throsby (2001) proposes classification of creative industries based on intensity of cultural content. Throsby asserts that different industries tend to have different level of cultural intensity in products and services, which can be classified into multiple layers, ranging from industries with the highest cultural concentration such as literature and music to industries with diluted cultural content such as architecture and design. The classification model of Throsby is regarded as Concentric Circles model in Creative Economy Report 2013 by UNESCO. The model is presented below:

Figure 2-1 Concentric Circles Model

Source Creative Economy Report 2013, (UNDP & UNESCO, 2013)

In the perspective of Thailand, adapting from the classification of UNCTAD, the Office of the National Economic and Social Development Board, Thailand (NESDB) reveals the classification of creative industries in the context of Thailand, assimilating the heritage and functional creations areas further. The classification is given below:

Table 2-2 Classification of Creative Industries by NESDB, Thailand

HERITAGE	ARTS	MEDIA	FUNCTIONAL CREATIONS
Crafts	Performing Arts	Publishing	Design
Cultural and Heritage Tourism	Visual Arts	Broadcasting	Fashion
Thai Traditional Medicine		Film & Video	Advertising
Thai Food		Music	Architecture
			Software

Source NESDB, Thailand (Termpittayapaisith, 2008)

Regardless of the contentious terminologies and classification models, the definitions and classifications from organizations share similar traits and contents. The selection of definition and classification model rests in the context of usage. As for the facet of this study, which is conducted primarily in the Kingdom of Thailand, the researcher embraces the definition from the Office of Small and Medium Enterprises Promotion (OSMEP), Ministry of Industry, Thailand, which gears towards boosting economy by cultural capital, creativity, and innovation and adopts the classification model of that of the Office of the National Economic and Social Development Board (NESDB), Thailand.

Characteristics of Creative Industries

Given that creative industries involve the utilization of creativity, culture, and intangible values in products and services, the industries hold unique characteristics that differs from other industries. According to Throsby (2008), creative industries is dissimilar in four main facets as follows:

1. The output yields both private and public goods: While creative products in some forms such as musical performance and high-design objects are private goods, obtaining return by admission fee and purchase, respectively, some types of creative products are

public goods in nature. An example is a work of literature, which is turned into public good once published.

2. The mix of industry structure: Businesses in creative industries are mix of four key genres of organizations. Creative Small and Medium Enterprises (SMEs) is the principal group, consisting of creative professionals such as architects, designers, individual artists, and so forth. The second group is non-profit organizations, including unions and performing arts companies. The third type is public cultural institutions, namely museums of multiple types, art galleries, and heritage sites, among others. The last kind is multi-national organizations in media, publishing, and audiovisual-making companies. Throsby (2008) stresses that the mix of these four kinds follows the long-tail theory in that the significant few of multi-national organizations produce large proportion of industry output whereas the rest are that of abundant number of SMEs.

3. The objectives and motivations businesses in creative industries are not solely economic: the drive of creative organizations and individuals is the blend between economic return and cultural value. These creative professionals consider the profit of the work on one hand and the success in terms of artistic and cultural outcome on the other.

4. The proportion of employment of creative workers, referring to Creative Class by Florida (2003), tends to depend on intensity of cultural content of the industries: Throsby (2008) proclaims that different industries in creative economy have different concentration level of cultural content, which can be categorize in the form of layers known as Concentric Circles model. In each organization, employment includes both creative workers and non-creative workers, and the industries with high concentration level of cultural content tends to have higher proportion of creative workers.

Soft Innovation: The Innovation of Creative Economy

The dramatic emergence of creative economy and creative industries results in the quest to explore deeper in the prime component of the economy, creative products and services of creative economy, which are traded and exchanged thereby creating the economy. In particular, characteristics of the products and the innovation behind them have been in attention of academic scholars in recent years due to minimal number of studies (Green, 2008; Jaw et al., 2012; NESTA, 2009; Stoneman, 2010). Firstly surfaced in the book called "Soft Innovation: Economics, Design, and the Creative Industries" by Paul Stoneman in 2010, Soft Innovation refers to changes in products and process of an aesthetic and intellectual nature as opposed to more widely used definitions of innovation referring to changes in functionality of products and process (Stoneman, 2010).

To lay background of innovation literature, the term innovation stems from the Latin word "nova" meaning "new" and "innovare" meaning "to make something new" (Smith, 2009; Tidd & Bessant, 2009). Joseph Schumpeter, an Austrian economist regarded as the godfather of innovation studies, stated the process of Creative Destruction, describing the constant search to create something new and destroys the old rules in search for profit (Tidd & Bessant, 2009). The process is considered the foundation of innovation research. Ever since, studies of innovation have progressed dramatically; nevertheless, the studies of innovation, until recently, are centered primarily around science and technology domain. This fact results in innovation theories and studies that are product-oriented and science and technology-centered. The prominent ones include Architectural Innovation (R. M. Henderson & Clark, 1990), Technological Paradigms and Technological Tragectories (Dosi, 1982), Technology S-curve (Foster, 1986), Punctuated Equilibrium (Abernathy & Utterback, 1978), Fifth-generation Innovation Process (Rothwell, 1994), among others.

Given numerous studies gearing innovation in science and technology (S&T) aspect, it is no doubt that definitions of innovation by the world's leading organizations are S&T-driven. For instance, definition of product innovation and process innovation created by The Organisation for

Economic Co-operation and Development (OECD) emphasizes on improvements in functionality; thus, according to OECD, a product or process is not considered an innovation unless it has improvement in terms of function. The definition of product innovation and process innovation by OECD is given below:

Product Innovation
A product innovation is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics.

Process Innovation
A process innovation is the implantation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/ or software.
(OECD & Eurostat, 2005)

It can be noticed that the definition provided by OECD do not apply with innovation activities in creative industries; essentially creative products and services do not hold improved functionality. Yet creative goods, generating high economic value and transactions, lead creative economy to be the prominent economic form. As a result of such contradiction, Stoneman (2010) argues that the definition of innovation, according to OECD, is limited and does not reflect totally current innovation activities and proposes the concept of Soft Innovation, which is common kind of innovation in creative industries (UNDP & UNCTAD, 2010).

The concept of Soft Innovation overlaps with many fields including the arts, economics and culture, the knowledge economy, the copyright industries, intangible investments, design, creativity, and the creative industries. Green (2008) and Stoneman (2010) assert that the quintessence of Soft Innovation lies in three tactics circling around intangible values:

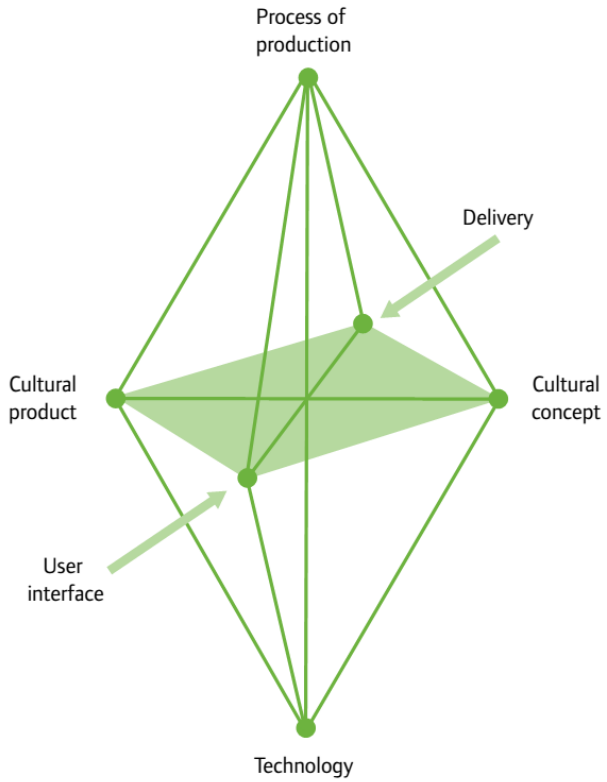
1. Sensory, Aesthetic, and Intellect
   While functions of products and services do not necessarily improve, creative goods employed soft innovation strategy contains aesthetic appeal in many senses, attracting consumers to purchase. In addition, in many forms of creative goods such as work of literature, intellect plays critical role in creating intangible value in goods.

2. Product Differentiation
   Soft Innovation strategy does not obligatorily focus on improvement in goods as that of traditional innovation. On contrary, creative goods can degrade functionality and quality to derive at more competitive price for consumers. A good example is low-cost airline, which can be regarded as Soft Innovation but not as traditional innovation.

3. Meaning
   Creative goods are largely ingrained with associated meanings while leaving functionality untouched, basing on premise that products and services propose functions and also embedded meaning to users (Florek, Insch, & Gnoth, 2006; Fontes & Fan, 2006; Padgett & Allen, 1997; Sung & Tinkham, 2005; Venkatesh & Meamber, 2006; Verganti, 2009). Soft Innovation stresses on altering meaning of goods. A great example would be the case of Alessi, an Italian manufacturer of household products. Alessi radically changes the meaning of kitchenware from seriously intimidating tools to objects of affection with playful plastic materials and fun shape. Essentially, Alessi design touches the inner child of target users analogous to teddy bears for adults. As a result of the radical change in product meaning, Alessi has enjoyed double-digit annual growth (Verganti, 2009).

Soft Innovation or innovation in creative industries can be described by the Model of Innovation in Creative Industries developed by Green (2008). The model is presented below:

Figure 2-2 The Model of Innovation in Creative Industries



Source Hidden Innovation in the Creative Industries (Green, 2008)

Describing the model, Green (2008) affirms that four dimensions along horizontal axis, namely Cultural Product, Cultural Concept, User Interface, and Delivery, are where soft innovation occurs. The detail of each dimension is given below:

1. Cultural Product
   Cultural product is the carrier of cultural content, meaning, and information. Basically, cultural product is physical carrier.

2. Cultural Concept
   Cultural concept is the content of the product, such as story, narratives, meaning, and so forth.

3. Delivery

Delivery is the methodology to deliver products or services to consumers.

4. User Interface
   User interface is the interaction point that consumers experience products or services.

Characteristics of Creative Products and Services in Creative Industries

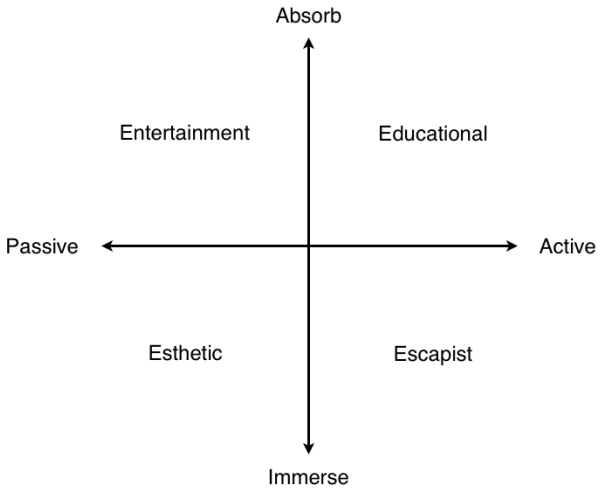
Creative goods hold their uniqueness setting them apart from goods in other industries. The characteristics can be summarized as follows:

Intangible Values
The products of creative industries are embodied with intangible values. According to Howkins (2002), creative goods consist of two values, the value of the artefacts or physical carriers and the value of intangible, including intellectual property, including cultural content, cultural meaning, or the experiences they help create (Green, 2008).

Experience
The consumption of products and services in creative industries rely heavily on consumers' past knowledge and changing tastes and preferences. The past consumers' knowledge and experience affect the interpretation of products and services. In addition, experience is created by consumers when interacting with products and services (Green, 2008). The notion of experience in relation to the nature of creative products and services is well substantiated by Pine and Gilmore (1999) in the book called "The Experience Economy". Experiences are inherently personal; no two people can have the same experience (Pine & Gilmore, 1999; Tan, Kung, & Luh, 2013). Pine and Gilmore (1999) classified experience into four categories along the two continuums, level of guest participation and kind of connection. On the level-of-guest-participation axis, one end of continuum is Passive. Guest do not actively influence the performance. On the other end, Active, guest affects the performance. The other axis

involving kind of connection lies Absorb and Immerse on each end. Absorb concerns consumer bringing the experience into the mind from a distance, while Immerse means consumer goes into the experience. The two axis create four realms of experience, namely Entertainment, Educational, Esthetic, and Escapist. The illustration of the four experience categories is as follows:

Figure 2-3 Experience Realms



Source Experience Economy (Pine & Gilmore, 1999)

Service

Many products in creative industries are services. A property of service is that staffs help create consumer experience. In addition, the production and consumption of service occur simultaneously at the same time and in the same place. Another feature of service is that the idea is easy to imitate. Once the concept of service is proven successful, one can imitate and implement without barriers, unlike technological innovation which contains complexity (Green, 2008).

Culture

Definition and Characteristics of Culture

The word “culture” is a highly contentious term; there is no universally accepted definition in general. (Taras, Rowney, & Steel, 2009; Wilhelms, Shaki, & Hsiao, 2009). In fact, the term is conceptualized in almost hundred versions (Ketmanee, 2012). Examples of definition of culture include:

Culture or Civilization, taken in its wide ethnographic sense, is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society
(Tyler, 1871).

Culture has been called “the way of life for an entire society”. It generally refers to patterns of human activity and the symbolic structures that give such activity significance. (P. W. Henderson, Cote, Leong, & Schmitt, 2003).

Culture has been described as the result of the evolutionary process in human civilization; it is a process that involves language, customs, religion, arts, thought and behavior (Lin, 2007).

Culture is a system that inform behaviors that are mutually accepted in a society. (Ketmanee, 2012)

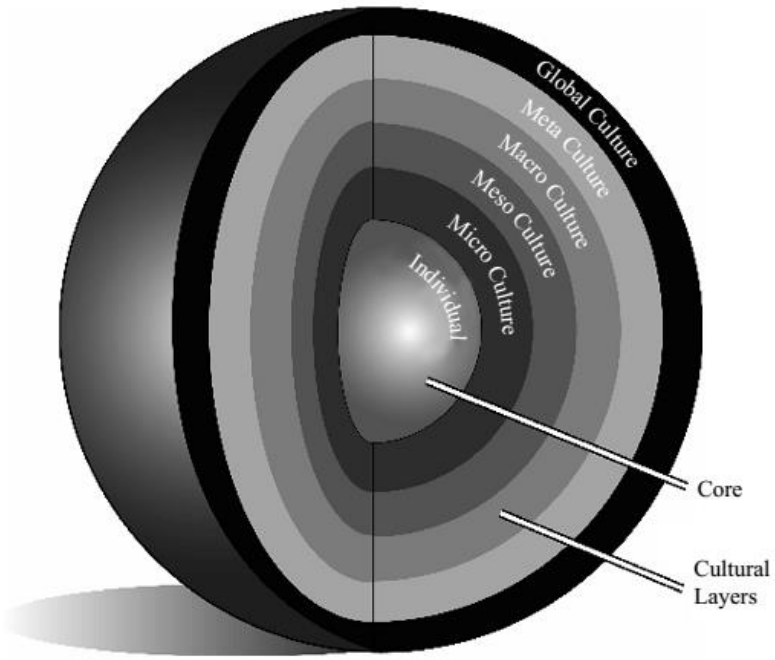
Department of Cultural Promotion, Thailand defines culture as:

The way of life resulted from interaction between human and human, human and society, and human and nature (DCP, 2012).

While the definition of culture is debatable, there are shared characteristics of cultures among several studies. The traits of culture is as follows:

1. Culture can be depicted as layers. It is generally accepted that culture is complex, containing multi-level construct. Extracting culture into layers is an accustomed methodology to classify culture. Levels can represent different aspects, depending on literature, for instance, participants of culture (Wilhelms et al., 2009) or level of tangibility (Lin, 2007).

Figure 2-4 Sphere of Cultural Layers



Source Wilhelms et al. (2009)

2. Individuals create culture and is the smallest element in the assembly of culture (Ketmanee, 2012; Wilhelms et al., 2009).
3. Culture is a shared set of distinct basic assumptions, values, practices, and artifacts among individuals in society. The creation of culture is consensual process, which individuals in society agree upon (Ketmanee, 2012; Taras et al., 2009).

4. Culture is created and learned based on attitudes, norms, and believes (Ketmanee, 2012).

5. Culture is holistic, deriving from integration of multi-disciplinary (Ketmanee, 2012).

6. Culture is dynamic. It evolves as time passes, and every generation has contributed to alteration of culture in such a way that is accepted in society at that particular time. A great example is fashion culture, which change almost every five years. The fact that culture is dynamic is ordinary. If a culture is to survive, it needs evolution (Ketmanee, 2012).

Cultural Heritage

The notion of cultural heritage has long history. It can be traced back since the Rome era, 6th AD, in the realm of Theoderic the Great (Jokilehto, 2005).

The significant milestone of definition of cultural heritage has begun with the term "Patrimoine" in 1790, legally referring to artefacts inherited from father or mother. During the time, the concept indicates the personal heritage aspect (Vecco, 2010). Not until 1972 that the widely-accepted definition and concept of cultural heritage is solidified with international perspective. Originated by collaboration of expert groups from International Council on Monuments and Sites (ICOMOS), the International Union for Conservation of Nature (ICUN), and United Nations Educational, Scientific, and Cultural Organization (UNESCO), the UNESCO's "Convention Concerning the Protection of the World Cultural and Natural Heritage" is adopted in 1972 to protect the world's outstanding cultural and natural sites from deterioration. According to UNESCO (1972), world heritage can be divided into two categories, cultural heritage and natural heritage. The detail of cultural heritage is as follows:

Cultural heritage refers to three main types of tangible artefacts: monuments, groups of buildings and sites.

1. Monuments

Monuments include architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of outstanding universal value from the point of view of history, art or science.

2. Group of Buildings
   Groups of buildings refers to groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding universal value from the point of view of history, art or science.

3. Sites
   Sites include works of man or the combined works of nature and man, and areas including archaeological sites which are of outstanding universal value from the historical, aesthetic, ethnological or anthropological point of view.

From the starting point, the concept of cultural heritage has evolved and branches out to include other areas overtime, including cultural landscapes and intangible cultural heritage (Vecco, 2010).

4. Cultural Landscape
   In 1992, the cultural landscapes category representing the "combined works of nature and of man" is adopted by the World Heritage Committee. The term "cultural landscape" embraces a diversity of manifestations of the interaction between humankind and its natural environment. Cultural landscapes often reflect specific techniques of sustainable land-use, considering the characteristics and limits of the natural environment they are established in, and a specific spiritual relation to nature.

5. Intangible Cultural Heritage
   Cultural heritage does not end only at tangible artefacts but also include traditions and living expressions that are inherited from our

ancestors, including expressions inherited from our ancestors and passed on to our descendants, such as oral traditions, performing arts, social practices, rituals, festive events, and so forth. UNESCO is among the first organizations to introduce the concept of intangible cultural heritage (ICH). The UNESCO's Convention on the Safeguarding of Intangible Cultural Heritage in 2003 describes intangible cultural heritage as follows:

The "intangible cultural heritage" means the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity (UNESCO, 2003).

According to the convention, the intangible cultural heritage is manifested in the following domains:

a. oral traditions and expressions, including language as a vehicle of the intangible cultural heritage;
b. performing arts;
c. social practices, rituals and festive events;
d. knowledge and practices concerning nature and the universe;
e. traditional craftsmanship.

It can be noted that the notion of cultural heritage is inherently associated with inheritance; something transferred from one generation to another. Thus, as a concept, it works as a carrier of historical values from the past.

Culture-driven Products

Culture-driven products are the result of the term called “Culture Economy”, a set of strategies to transform local knowledge into intangible values ready to harness for local development. The knowledge includes cultural heritage such as traditional wisdom, regional languages, crafts, folklore, local visual arts, drama, literary references, historical and prehistoric sites, and landscape systems (Kneafsey, 2001). Culture-driven products are different in their characteristics; the uniqueness is by their own nature in that they are linked with heritage, culture, tradition, history, and regional identity of their locations (Guerrero et al., 2009). Shi and Chen (2011) define culture-driven products as artefacts presenting themselves dually as merchandise to meet commercial purpose and messenger of values and identity.

In the scope of this research culture-driven products refer to products and services that harness cultural heritage, regardless of its forms, to create intangible values, following Soft Innovation strategy.

The Integrative View: Cultural Heritage, Creative Economy, and Soft Innovation

Previous literatures demonstrate that Soft Innovation is the predominant type of innovation in creative industries and that most creative goods employ soft-innovation strategy, leading to commercial success. The heart of Soft Innovation lies in the embedded intangible values, namely aesthetic, content, intellect, and meaning, while physical artefacts perform as the carriers of those intangible values (Green, 2008; Stoneman, 2010; Venkatesh & Meamber, 2006).

Cultural heritage, the accumulated source of societal wisdom, is irreplaceable source of inspiration since it contains precious intangible values (UNESCO, 2008). As a result, cultural heritage has increasingly called attention from organizations and academicians to explore cultural heritage in relation to business and management endeavor.

Examples of studied subjects include cultural capital and regional brand (Cayla & Eckhardt, 2007), characteristics of territorial brand (Charters & Spielmann, 2013), brand and historical association (Beverland & Luxton, 2005), cultural heritage branding (Ko & Lee, 2011), cultural heritage and brand heritage (Hakala et al., 2011), nostalgic products (Zhou et al., 2013), brands with heritage (Hudson, 2011; Jackson, 2002; Urde et al., 2007), retro branding and heritage marketing (Urde et al., 2007), among others.

Among the management studies in relation to cultural heritage, the study of new product development process to embody cultural heritage in products and services so as to infuse intangible values is still in its infancy; Lin (2007) notes that the study of embedding culture in product development has so far been scarce. McKercher et al. (2004) state that studies regarding successful product development in relation to cultural heritage have not been widely discussed despite their great potential. Thus, it can be noticed that studies in the particular field is in need of further exploration.

New Product Development Process

New Product Development Process (NPD)

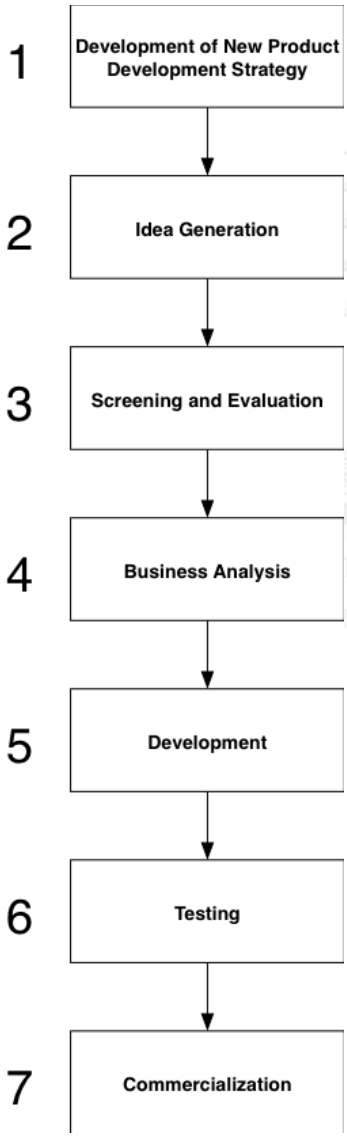
The innovation process can be divided into 3 key phases, Front-end of Innovation (FEI), new product development (NPD), and commercialization (P. A. Koen, Bertels, & Kleinschmidt, 2014).
New product development process is the cornerstone of commercial success of firms. For companies striving to be innovative, the initial step is to start employing product development process or revise the old one (Stamm, 2008).

The origin of new product development process is a concept developed by NASA in the 1960s. The process called Phased Project Planning is sequential process, containing four key phases including:

1. preliminary analysis
2. definition
3. design
4. operation

The next milestone of the process is that of Booz Allen Hamilton in 1982. The process is depicted as follows:

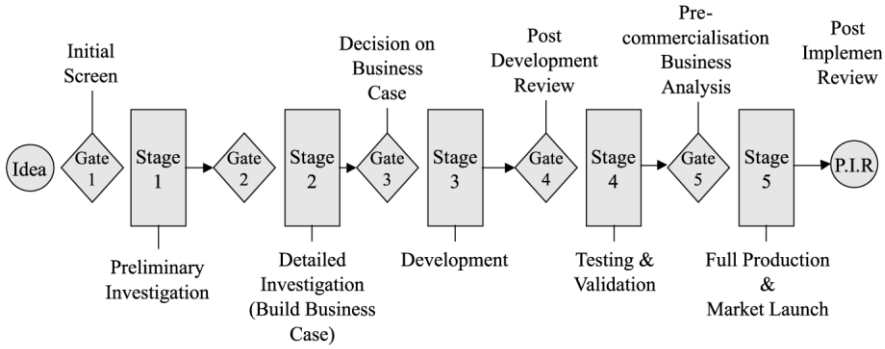
Figure 2-5 New Product Development Process by Booz Allen Hamilton



Source Reproduced from Booz Allen Hamilton, 1982

A well-known model evolved from that of NASA and Booz Allen Hamilton, which is still used in businesses nowadays, is the Stage-Gate process developed by Robert G. Cooper. The process requires that a project must be reviewed at each stage for go/ no go decision in order to move the next stage.
The Stage-Gate process is displayed as follows:

Figure 2-6 The Stage-Gate Model

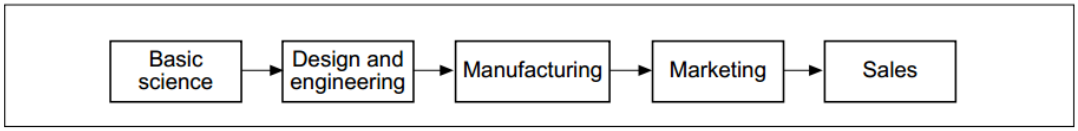


Source Cooper 1994

Rothwell (1994) summarizes the evolution of new product development process in five generations, leaning towards collaboration and integration with external parties. These generations are described in chronological as follows:

1. First Generation (1950s – Mid-1960s)
   During the period, numerous companies merged as a result of new technological opportunities. Scientific advance and technological revolution excited society at large and was regarded as solution to solve societal problems. As a result, organizations developed products by employing Technology-push strategy, pushing technological breakthrough to consumers regardless of what consumers want.

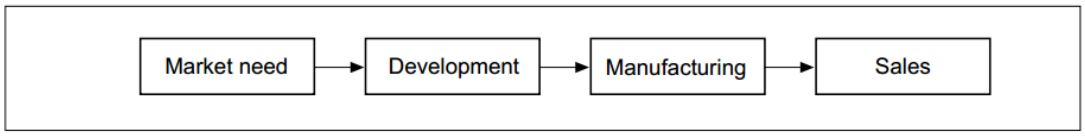
Figure 2-7 First Generation New Product Development Process



Source Rothwell (1994)

2. Second Generation (Mid-1960s – Early-1970s)
   During the period, as competition intensified, and supplies in the market were becoming saturated, organizations seek the new way to compete for market shares. Thus, firms turned their attention to consumers' demand. Principally, firms focused on what consumers wanted as the premise of their product development. As a result, the process during the period is regarded as Demand-pull Strategy.

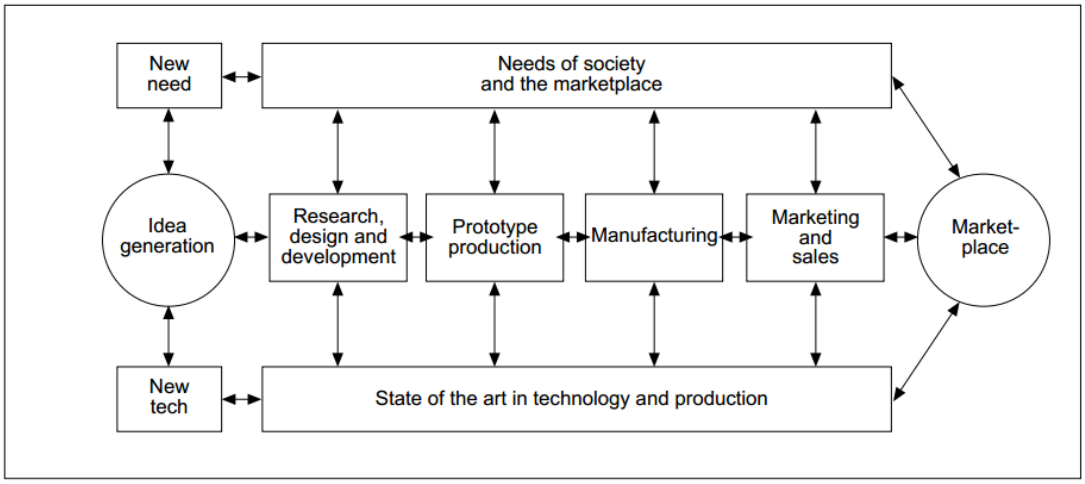
Figure 2-8 Second Generation New Product Development Process



Source Rothwell (1994)

3. Third Generation (Early-1970s – Mid-1980s)
   It was the period that organizations started to come to realization that Technology-push and Demand-pull strategies are too extreme on each end. Rather, the process should integrate both aspects, technology and also marketing. Thus, the process of this generation combines the two perspectives, which is regarded as the Coupling model. Distinguished characteristic of Coupling model is the feedback loop, linking marketing and R&D activities (Stamm, 2008)

Figure 2-9 Third Generation New Product Development Process



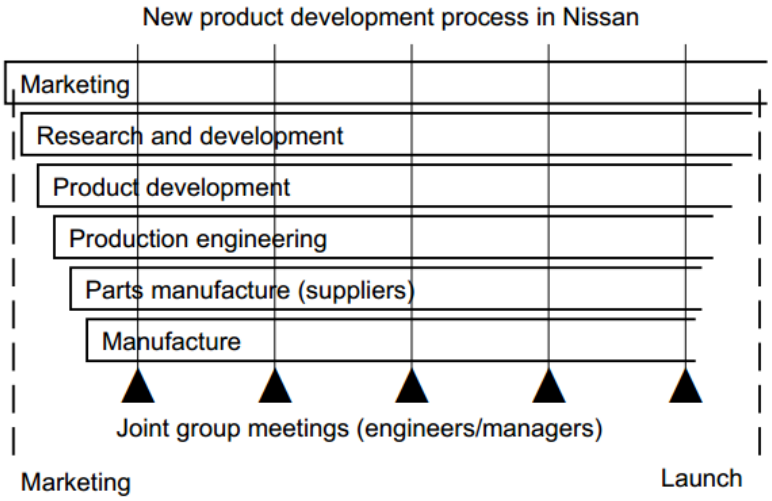
Source Rothwell (1994)

4. Fourth Generation (Early-1080s – Early-1990s)

The fourth generation of NPD process concerns with speed and accumulation of knowledge since product life cycle was generally shorter. The concept from Japanese firms, including Just In Time model, was popularized and adopted by organizations around the world. The model requires each team of multiple departments working in parallel.

According to Rothwell (1994), example of fourth-generation model is presented below:

Figure 2-10 Fourth Generation New Product Development Process



Source Rothwell (1994)

5. Fifth Generation (1990s and beyond)

During the time of the Rothwell's study, the process is considered the fifth generation of NPD model. The process has focused on speed of innovation, interrelated innovation network, and technology accumulation. Fundamentally, fifth generation model is the upgrade of the fourth generation model with the focus on time-to-market aspect. The model is inherently network form.

While there are various models of new product development process, versions of new product development process usually share similar traits.

1. The process requires cross-functional team or even outside stakeholders to work together on a product or service and involves multiple departments in organizations, namely marketing, design, and manufacturing, among others.

2. The process is in sequential steps. According to Ulrich and Eppinger (2011), new product development process is sequence of steps that transforms a set of inputs into a set of outputs. One way to think

about product development process is as an information-processing system. In the beginning of the process, development team gathers information related to product development issues, including corporate objectives, strategic opportunities, materials and production technology, competitors, and so forth. The process ends when all required information has been processed, created, and communicated with the output (Ulrich & Eppinger, 2011).

3. The process is primarily based on traditional innovation assumptions; most models focus on science and technological aspect of innovation and are physical product-based and engineering-driven.

4. The process starts with the early stages commonly known as Fuzzy Front End (FFE) of the development process. These early stages are considered the most critical phases in new product development process.

Front-end of Innovation

Front-end of innovation, usually known as Fuzzy Front End (FFE) or Front End of Innovation (FEI) or concept development phase, is the early phase of new product development process. It precedes the formal well-constructed NPD process, namely new product development and commercialization phase (P. Koen, Ajamian, Burkart, Allen, & et al., 2001). Firms generate product concept as the output of the Front-end process in order to develop further into products in formal NPD process, which the product concept needs to be clear and aligned with customer needs (Elmquist & Segrestin, 2007; Ho & Tsai, 2011; Khurana & Rosenthal, 1997; P. Koen et al., 2001).

FEI receives a great deal of attention from researchers since the front-end stage is the most critical phase of new product development; the success of products or services is primarily the result of front-end process (R. G. Cooper, 1988; Ho & Tsai, 2011; P. Koen et al., 2001; Oliveira & Rozenfeld, 2010; Terwiesch & Ulrich, 2009; Tzortzopoulos et al., 2006; Verworn, 2009). Given its importance, massive proportion of product

development cost, up to 80%, on average, is invested in the Fuzzy Front End phase (Stamm, 2008). The reason why FEI is critical and consumes the majority of product development cost and time is due to its characteristics, clarifying the reason for the name "Fuzzy Front End" (Dahl & Moreau, 2002). Examples of Studies reveals the nature of FEI as follows:

- Fuzzy Front-end is unpredictable, experimental, and chaotic (Elmquist & Segrestin, 2007; P. Koen et al., 2001)
- It is difficult to predict the duration and timespan of the Front-end phase. Also, the process is somewhat ambiguous in nature; the required resource and the output are inherently unknown. (Stamm, 2008; Ulrich & Eppinger, 2011).
- Front-end process is iterative, experimental-based, and ill-defined (Frishammar, Lichtenthaler, & Kurkkio, 2012).

While Front-end process is unconstructed and obscure, if synthesized, the process can be systematized and formalized in order to decrease the fuzziness (Ho & Tsai, 2011; Terwiesch & Ulrich, 2009).

R. G. Cooper (1988) proposes that the FEI phases or the predevelopment stages include three main steps, idea, preliminary assessment, and concept. Idea stage consists of idea generation and tentative evaluation of ideas. Preliminary assessment is the refined idea screening phase considering multiple aspects related to the project, such as market assessment and technological assessment, to define the feasibility of the ideas. Concept is the final stage wherein final decisions are made regarding the Go/ No Go of the project and also the formulation of concept strategy.

Khurana and Rosenthal (1998) indicates that FEI process contains pre-phase zero (idea generation), phase zero (assessment of market, technology and competition) and phase one (product definition, project justification and action plan).

P. Koen et al. (2001) affirms that Front-end process consists of five key elements, Opportunity Identification, Opportunity Analysis, Idea Genesis, Idea Selection, and Concept and Technology Development. The detail of each element is given below:

1. Opportunity Identification
   Opportunity identification is the step that organizations seek for opportunities that can create values. Inherently, opportunities are business-driven and can be in many forms, such as new production technology that can drastically reduce cost, new product line, new distribution method, breakthroughs in science, and so forth. For Opportunity Identification stage, source and methods to identify opportunities is critical. In addition, creative-thinking methods are used extensively in this phase.

2. Opportunity Analysis
   During this stage, opportunities are analyzed and evaluated based on criteria suitable for the particular organization. For instance, the criteria can include fit with corporate culture, firm's capability, estimated cost, and so forth. The Opportunity Analysis stage is not one-way rigid process. Rather, development team can switching between Opportunity Identification and Opportunity Analysis phases. In addition, the process can be iterative.

3. Idea Genesis
   Idea genesis is the session to generate new ideas that capture opportunities. It is the phase to solidify ideas and concepts by using creative-thinking tools and techniques such as brainstorming and lateral thinking. The process involves cross-functional team and even external parties outside organizations.

4. Idea Selection
   The idea selection step is to screen out undesirable ideas so as to derive at promising ones. The selection method varies, depending on

organizations. According to P. Koen et al. (2001), idea selection process in Front-end process should be less stringent than that of NPD process so that all good ideas are not ruled out and have a chance to shine later on.

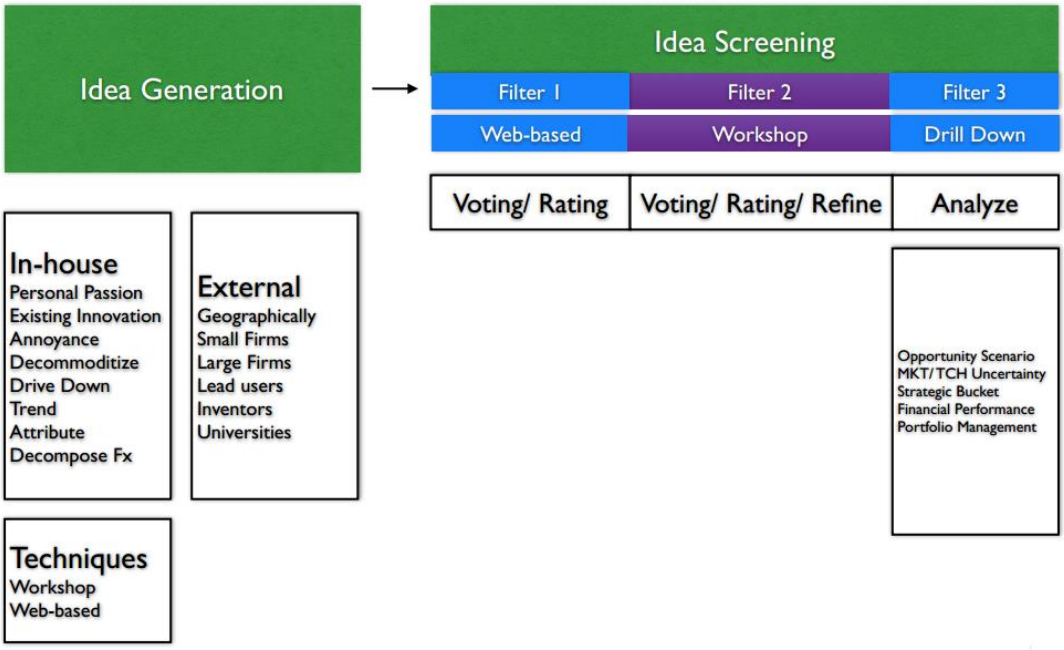
5. Concept and Technology Development
   Concept and Technology Development is the phase to build new business proposition or new product concept by basing judgment on managerial aspects such as marketing, production, finance, and so forth. The result of the phase is new business plan or new product concept, which will be developed further in formal NPD process.

Terwiesch and Ulrich (2009) propose the Front-end of Innovation model to create, select, and develop business opportunities. The process consists of two key phases, Idea Generation and Idea Screening.

According to Terwiesch and Ulrich (2009), the Idea Generation phase can be implemented through several sources and techniques. In terms of source, the idea can be from inside the organizations or from outsiders such as related suppliers and customers along the supply chain. The network of the firms play critical role in generating ideas. In addition, the external source can be from Lead Users, the forward-thinking users who modify products in their own ways in order to satisfy their functional and emotional needs (Herstatt & von Hippel, 1992). Similar to other Front-end models, Idea Generation phases require multiple stakeholders collaborating together to generate as many ideas as possible. The Idea Screening session consists of many rounds of evaluation referred as filters. Terwiesch and Ulrich (2009) state that Idea Screening phase should start with rough evaluation; the method such as voting and rating scores through website is recommended. Criteria for evaluation depend on multiple factors associated with products such as firm types, product types, strategic fit, and so forth. The second round of Idea Screening is face-to-face workshop. The objective is to vote and refine ideas that pass the first filter. Lastly, the third round of Idea Screening is another session of face-to-face workshop to select exceptional idea from shortlisted ideas. During this phase, ideas are

solidified and evaluated based on actual business context by using multiple analytical techniques such as Opportunity Scenario, Portfolio Management, Strategic Bucket, and so on.

Figure 2-11 Front-end of Innovation Model



Source Adapted from Innovation Tournaments: Creating and Selecting Exceptional Opportunities by (Terwiesch & Ulrich, 2009)

Cultural Design Model

Lin (2007) proposes a framework for utilizing design elements from aboriginal artefacts in modern products. The model called Cultural Design consists of three main phases including Identification, Translation, and Implementation phases. Essentially, the framework yields methodology to transform traditional cultural artefacts into modern design products. The detail of each stage is as follows:

1. Identification: the cultural elements in the design of original cultural objects are identified. Those cultural elements include both tangible and intangible levels namely color schemes, motives, patterns, inner-level emotion, cultural meaning, and storytelling element. In

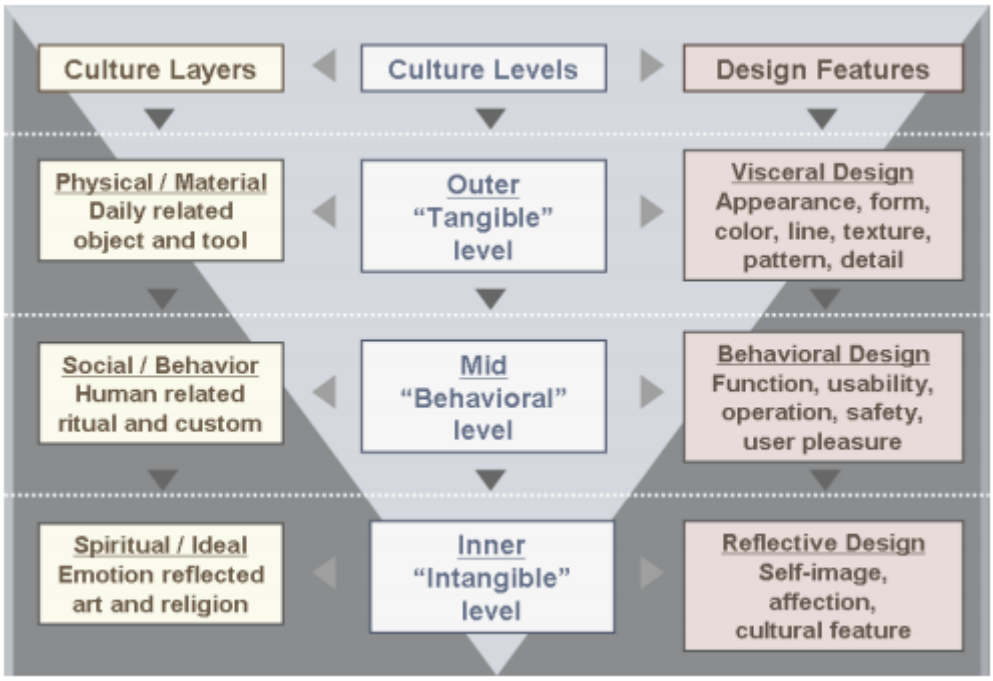
the identification phase, designer employs scientific and inquiry methods to derive at design information for the next phase.

2. Translation: in the translation phase, the design elements of original cultural artefacts are translated into design knowledge. During the phase, designer gains experience with design knowledge and relates the obtained knowledge with design problem of the current societal issue.

3. Implementation: the implementation stage involves in the integration of design knowledge, the cultural meaning understood by designer, the sense of aesthetic and design, and the design issues to design a cultural product.

For the product development model to be fully utilized, Lin (2007) describes framework for studying cultural objects, which contains three special layers, tangible level, behavioral level, and intangible level; the framework correlates with fundamental characteristic of culture as multi-layer construct (Wilhelms et al., 2009). Tangible level includes colors, textures. Shapes, patterns, line, and so forth. Behavioral level includes human-related ritual and custom, process, and behavior. Intangible level includes emotions, ethics, beliefs, and values. The framework portraying cultural layers linked with design elements is presented below:

Figure 2-12 Three Layers of Culture and Design Features



Source Lin (2007)

Idea Generation and Morphological Analysis

Within the Front End of Innovation (FEI), idea generation is the key element, occurring at the early stage of the process (Cheng, 2016; Chou, 2014; Postma et al., 2012; Riel, Neumann, & Tichkiewitch, 2013; Toubia, 2006).

Research on creativity has identified as many as 172 techniques for idea generation (Gonçalves, Cardoso, & Badke-Schaub, 2014) with the goal to increase the number of ideas generated and the quality of ideas through guidance (Chou, 2014). Examples of idea generation techniques include benchmarking (Ulrich & Eppinger, 2011), user observation (Leonard & Rayport, 1997), lead user (Von Hippel, 1986), and analogical thinking (Srinivasan, Lovejoy, & Beach, 1997) Several studies aim at classifying idea production techniques. Terwiesch and Ulrich (2009) suggest that idea generation techniques can be divided into two main sources, internal and external sources (Ulrich & Eppinger, 2011). Internal techniques include following personal passion, de-commoditizing a commodity, taking an annoyance-driven innovation tactic, driving an innovation down market,

creating new product attributes, and decomposing the functions of business in a novel way. External techniques include importing geographically isolated innovation, identifying lead users and study their innovation activities (Herstatt & von Hippel, 1992; Hippel, 2005). Collecting 70 idea generation techniques, Moon and Han (2016) classifies idea generation into four approaches, namely Procedural approach: creative problem solving, Ergonomic approach: prospective scenarios, Cognitive approach: creative cognition, Pragmatic approach: idea generation techniques. Tantãu and Mateesescu (2012) classifies idea generation techniques into three key categories, Group Approach Systems, such as Brainstorming, Individual Approaches, and the Schematic Approaches. Given numerous techniques and classifications, designers should choose the most appropriate technique depending on type of project (Moon & Han, 2016).

Regarding concept generation of new product and service, Ulrich and Eppinger (2011) suggest a process called Five-step Method, which guides that designers decompose complex problem into subproblems, generate ideas, and explore and synthesize all possible combinations of ideas to derive at solutions. This idea production process is along the similar line as Morphological Analysis (MA), a structured multidimensional idea generation technique developed to solve non-quantifiable problems. Pioneered by Fritz Zwicky, a Swiss-national astrophysicist and aerospace scientist, MA was initially developed for structuring and investigating the total set of relationships in complex problems, particularly in scientific disciplines. Nevertheless, the technique has been applied in wide array of domains, including scenario development and strategy planning (Ritchey, 2006), industry analysis of mobile telecommunications sector (Bloch-Morhange & Fontela, 2003), new business model development (Im & Cho, 2013), technology forecasting (Yoon & Park, 2005), technology opportunities analysis (Li, Wang, Huang, Jiang, & Li, 2010), new service development (Geum, Jeon, & Lee, 2016; C. Kim, Choe, Choi, & Park, 2008), and product and service concept development (Arnold, Stone, & McAdams, 2008; Geum & Park, 2016). MA is one of the design tools regarded as an effective technique for conceptual design (Huang & Mak, 1999). The technique centers around decomposing ideas, stimulating

forced associations among fragment of ideas, and regrouping fragments in new combinations to derive at multiple creative solutions. Morphological analysis alleviates the chaotic and unstructured nature of the FEI by transforming complex problems into structuring expression (Geum & Park, 2016; Li et al., 2010) and forces designers to unlock themselves from initial ideas and contemplate problems in multiple facets (Moon & Han, 2016). The nature of MA thinking technique is consistent with the notion of creativity that researchers in cognitive psychology generally agreed upon; creativity consists of reassembling elements from existing knowledge bases in a novel fashion to produce a new idea (Dahl & Moreau, 2002). MA consists of three main steps. The first step is attribute listing by decomposing problems into subproblems, which eventually become variables. The second step is to build morphological matrix by identifying dimensions and variables within dimensions obtained from attribute listing phase. Building morphological matrix requires a group of five to seven experienced experts to build dimensions and values (Geum & Park, 2016; Im & Cho, 2013). Finally, ideas are derived from creative combinations of consistent variables across dimensions through forced association technique (Chou, 2014; Geum et al., 2016; Geum & Park, 2016; C. Kim et al., 2008; Moon & Han, 2016; Waal & Ritchey, 2007). Table 2-3 shows an example of a morphological matrix for restaurant services (C. Kim et al., 2008)

Table 2-3 Example of morphological matrix for restaurant services (C. Kim et al., 2008)

	Dimension parameters				
	Ingredient	Cook	Order	Food delivery	Payment
Shape parameters	Supply of standardized ingredients Supply by the individual restaurants	Make to order Make to stock Design to order Assemble to order	Self order Order by employee	Self service Delivered by employee	Payment during order Payment after dinners at table Payment after dinner at counter

Table 2-4 Example of morphological matrix for smart office (Dragomir, Banyai, Dragomir, Popescu, & Criste, 2016)

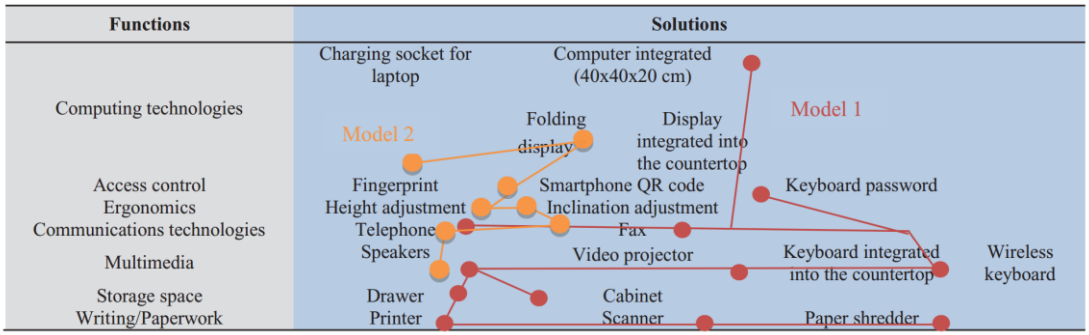
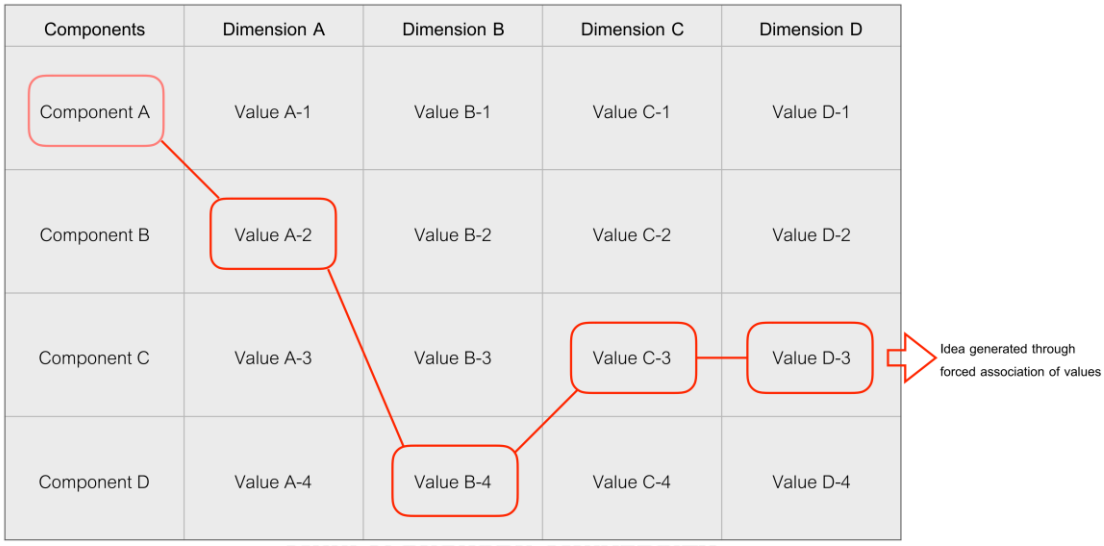


Table 2-5 The Structure of morphological matrix



Idea Screening and Consumer Values

Idea screening is the stage following idea generation. Several aspects, including marketing, manufacturing, technical, and so on, are considered to make decision whether a particular idea is worth to be developed further(R. G. Cooper, 1988). Frishammar et al. (2012) affirms that idea screening take place in two domains, business analysis and feasibility analysis. Business analysis screens ideas in terms of the viability as business proposition whereas feasibility analysis determines whether an organization has sufficient resources to support subsequent development. Regarding business analysis, it is critical that firms understand consumer needs and target market in order to judge the generated ideas. In fact,

customer and market information should be incorporated early in the front-end process. (Khurana & Rosenthal, 1997).

In the domain of cultural products, consumer values are critical element that can be used as criteria to select ideas. As the foundation of cultural products lays in the intangible elements, which are communicated to consumers through physical artefacts (Green, 2008; Stoneman, 2010; Venkatesh & Meamber, 2006), understanding consumer values and how product attributes lead to certain values that consumers hold contributes to idea screening activity.

Marketing and consumer studies yield consensus regarding characteristics of consumer values collected by Cheng-Chieh, Hsiu Ju Rebecca, and Li (2012) as follows:

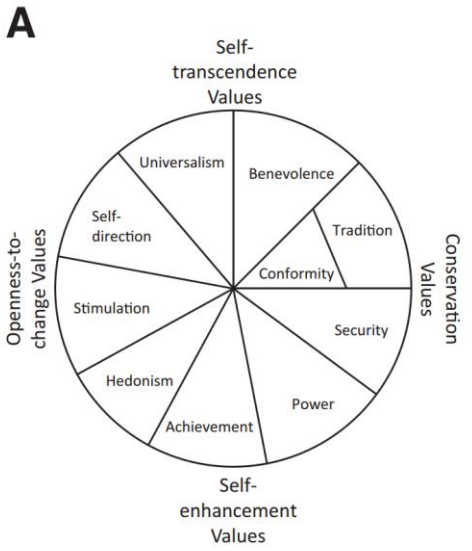
1. Perceived by consumers subjectively
2. Related to products, services and contexts
3. A trade-off between benefits and costs
4. A preference that lies in the heart of consumption experience

Among theories regarding values, Schwartz's universal human values is widely accepted and has been used in several domains, particularly in consumer behavior (Marcelo Vinhal & Juliana Barreiros, 2010; Plangmarn, Mujtaba, & Pirani, 2012; Steenkamp & de Jong, 2010). The description of the Schwartz's human values is in the following section:

Schwartz's Universal Human Values

Schwartz (1992) defines values as desirable, trans-situational goals that serve as guiding principles in human life. According to the Schwartz's universal human values (Schwartz, 1992), human across the globe possess values which can be categorized into 10 types, power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, and security. These 10 values are organized in circular structure. The related values are adjacent to each other, while the contrasting values are situated in the opposite pole along the continuum. The illustration of the structure of universal human values is given below:

Figure 2-13 The Schwartz's Universal Human Values (Boer & Fischer, 2013)



Adjacent values can be formed in into four key groups, namely self-transcendence values, self-enhancement values, openness-to-change values, and conservation values. Openness to change includes self-direction, hedonism, and stimulation values. Conservation includes security, conformity, and tradition values. Self-transcendence includes universalism and benevolence values. Self-enhancement includes power, achievement, and hedonism values.

The explanation of each value is presented in the following table.

Table 2-6 Schwartz's Value Types (Cieciuch, Doring, & Harasimczuk, 2013)

TABLE 1
Schwartz's (1992) value types

Value types, sorted by higher order value types, under which they are subsumed	*Definition*
Self-transcendence	
Universalism (UN)	Understanding, appreciation, tolerance, and protection for the welfare of *all* people and for nature
Benevolence (BE)	Preservation and enhancement of the welfare of people with whom one is in frequent personal contact
Conservation	
Tradition (TR)	Respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide
Conformity (CO)	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms
Security (SE)	Safety, harmony, and stability of society, of relationships, and of self
Self-enhancement	
Power (PO)	Social status and prestige, control or dominance over people and resources
Achievement (AC)	Personal success through demonstrating competence according to social standards
Openness to change	
Hedonism (HE)	Pleasure and sensuous gratification for oneself
Stimulation (ST)	Excitement, novelty, and challenge in life
Self-direction (SD)	Independent thought and action—choosing, creating, exploring

To establish the link between product attributes and consumer values, means-end chain is proven to be an effective theory. According to the Means-end chain theory (MEC), consumer values can be depicted in hierarchical nature. The theory denotes an approach to investigate the hierarchy of consumer values by revealing how consumers organize their knowledge and content of product attributes, benefits, and values for a specific consumption context.

Means-end Chain Theory and Hierarchical Value Map

Means-end Chain (MEC) theory signifies that a product's attribute lead to particular consequences, and ultimately fulfill values that consumers hold, starting from low to high level of abstraction (Cheng-Chieh et al., 2012; Chin-Feng & Chen-Su, 2005). The theory facilitates the understanding of buying motives and buying behavior of consumers. Essentially, product attributes are a means through which consumers obtain valued ends (W.-I. Lee & Lin, 2011).

MEC consists of three main levels, attributes, consequences, and values (ACV). Each level contains sub elements. Attribute level consists of concrete and abstract attributes. Consequence level includes functional and psychological consequences. Value level contains instrumental and terminal values. The MEC model is presented below:

Figure 2-14 Means-end Chain Theory Model (Olson, 1989)

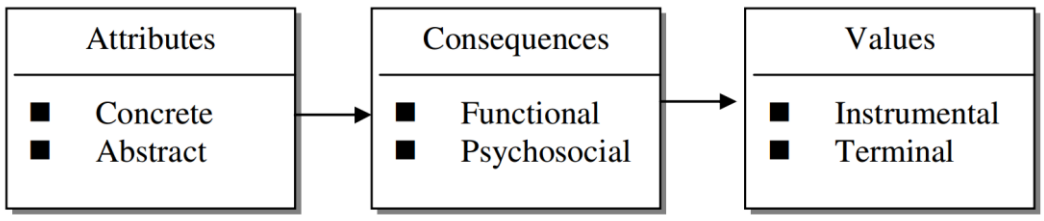
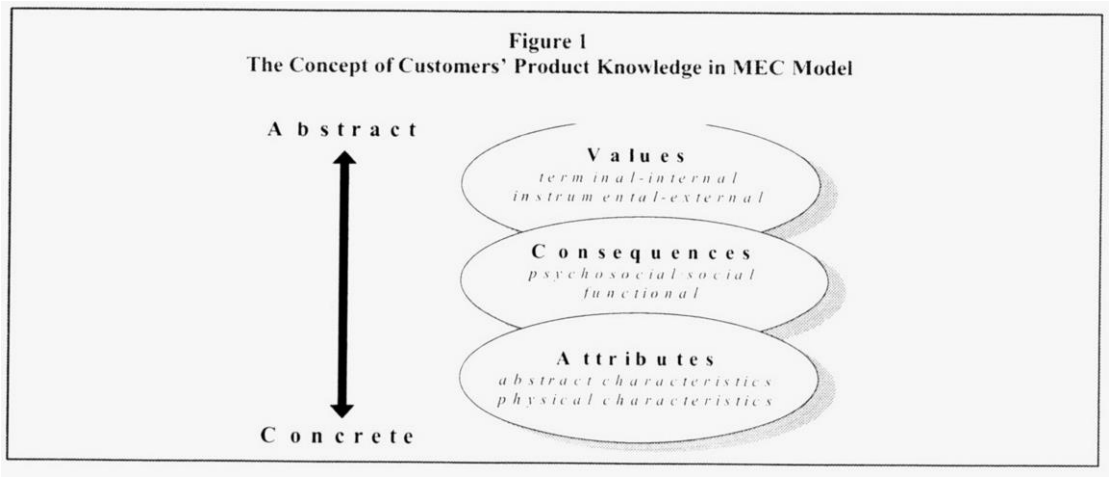


Figure 2-15 Means-end Chain Theory and Level of Abstraction (Chin-Feng & Chen-Su, 2005)



To discover MEC, the research technique widely used is the laddering interview proposed by T.J. Reynolds and Gutman (1988). Referring to the laddering technique, consumers are continuously probed with the questions such as "Why is that important to you?" to force consumers reveal insights up the level of abstraction from product attributes to terminal values. The data obtained from the laddering interview can be presented by graphical technique called hierarchical value map (HVM). HVM is generally used to analyze the laddering data, revealing the linkages among product attributes, consequences, and values through graphical representation. The HVM can be constructed by following the method proposed by T.J. Reynolds and Gutman (1988). The steps are as follows:

1. Identify the means-end elements
2. Construct an implication matrix
3. Develop hierarchical value map
4. Determine the dominant value chains

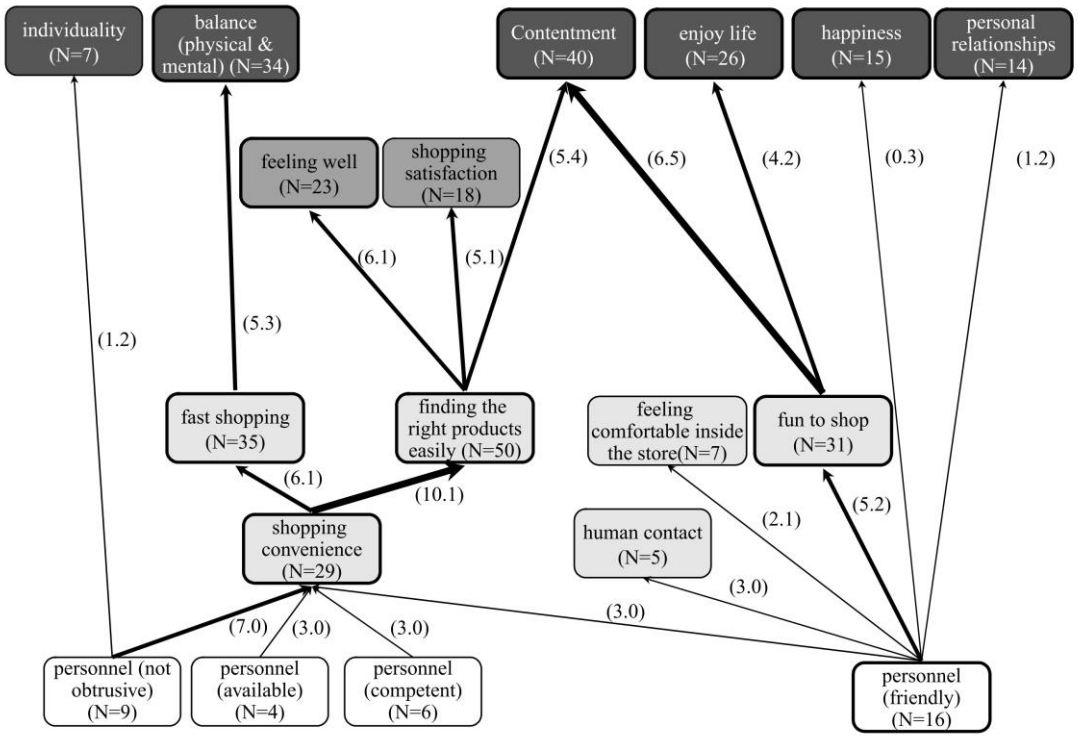
The result from HVM provides invaluable insights to effective product differentiation and market segmentation strategies (Chin-Feng & Chen-Su, 2005).

The examples of implication matrix and hierarchical value map are presented below:

Table 2-7 Example of Implication Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1					8.00	5.00	3.01		2.00	1.00	32.08	2.09	.01	2.00	1.00	.01	1.00	.03	1.05	1.09	.09	3.02	3.07	2.08	1.05	.02	.03	1.05	.11	1.06	2.10	.06	.04
2	1.00				2.00			2.00			8.01	3.02	.02		.01	.01			.01		.01			.01	1.03	.01	.01	1.03	.01	.02	.02	.01	.01
3					3.00	3.00	3.00				1.02	.06	.02				5.00	3.00	.01	.02	.01				.01	1.01		1.04	.04			.01	
4					8.00						1.03	1.02	.01	3.06	1.01	2.02			.05			.02	.01				.01	.01		.01			.02
5											5.03	17.01	.04	5.00	2.00	2.01	2.00	3.00	2.07	1.04	.03	3.02	1.03	.01	.01	2.02	.04	3.08	.03	.02	.01		.03
6					4.00		1.00				6.01	7.03	.03				2.00	2.00	.05	1.01	.02	1.02	.01		1.00	2.01	.03	.04	.01	.03	.01	1.00	
7					2.00						3.02	19.02	1.06		1.00		2.00		.04	1.06	.07		.03		.01			.07	.03	.03			
8					2.01	2.00	2.00				4.03	2.06	1.01		4.02	4.01		.01	.02		.03	1.01		.02		2.01	.02	1.05	1.03	.05			.01
9						1.00					2.00	1.00								1.01		1.00		.01	1.01	.01	.01	.02	1.01	.01	3.01		.01
10											1.00		2.00								.01	3.00		.01						.01			1.02
11												3.00	.01						3.00	1.01	6.04	2.00	9.00	9.00	8.00	.01	1.02	.01	6.04	1.06	7.00	2.02	.01
12													11.00						7.00	10.01	.01			1.00		2.00		8.05	2.02	1.05			
13																				1.00								3.00		2.00			
14											2.01					1.00			4.00			.01					.01			.02		1.01	
15											1.01	3.00		1.00		1.00			.01									.01		.01			
16											2.00	1.00							2.00			3.00					.01	1.00		.01			
17											4.00								1.00						1.00			1.00					
18																			1.00			1.00	1.00										.01
19																					3.00									1.01		1.00	
20																					1.00							7.00	1.01	3.01		.01	
21																													1.00	6.00			
22																								1.00			1.00		.01	1.00	3.00		7.01
23																					5.01			1.00					.01	1.00		1.01	
24																					2.00		1.00		1.00				2.01	.01		2.01	1.00
25																						1.00				1.00	2.01		1.00				2.00
26																											6.00	.01	2.00				
27																												1.00					
28																													1.00	3.00		2.00	
29																																	
30																																	
31																													2.00				
32																														1.00			
33																																	

Figure 2-16 Example of Hierarchical Value Map of Shopping Motivation (Wagner, 2007)



Identifying Research Gap: Cultural Heritage meets Front-end of Innovation

Front-end of innovation is the most critical process in the new product development model (Ho & Tsai, 2011; P. Koen et al., 2001; Oliveira & Rozenfeld, 2010; Terwiesch & Ulrich, 2009; Tzortzopoulos et al., 2006; Verworn, 2009). Previous literatures contribute a great deal to the knowledge of generic Front-end process. Nevertheless, several studies prove that generic Front-end model is not suitable for all circumstances.

Elmquist and Segrestin (2007) and (Elmquist & Segrestin, 2007)states that there is no Front-end process that is suitable for all situations. Frishammar et al. (2012) affirms that innovation of different kind of products follow different development process and paths. Each product category requires unique development process. The decision to choose which development

process to adopt depends on the context of industries, nature of products, decision-making style, operating culture, and challenges of the particular project (Khurana & Rosenthal, 1997; Ulrich & Eppinger, 2011).

Various aspects based on literature review verify that generic model of Front-end of Innovation is not applicable with the case of culture-driven products.

Different Paradigm of Innovation

First, as the notion of innovation originated from the realm of science and technology, the mainstream NPD model and Front-end process is derived from the trajectory of traditional concept of innovation (OECD & Eurostat, 2005; Rothwell, 1994). As a result, the process focuses on development of physical products and is based on science, engineering, and technological aspects; the process starts from identify user needs or existing problems, resulting in advancement of product functionality. (Frishammar et al., 2012; P. Koen et al., 2001; Terwiesch & Ulrich, 2009; Ulrich & Eppinger, 2011) Nevertheless, Soft Innovation, the recently introduced concept of innovation largely occurs in creative industries, is an utterly different paradigm of innovation. The foundation of Soft Innovation involves intangible values as a result of stylistic change, meanings, emotive benefits, and intellect (Green, 2008; Stoneman, 2010; Verganti, 2009). The discrepancies between mainstream innovation and Soft Innovation signifies that generic Front-end process would not be fit with the case of Soft Innovation.

Different Nature of Source of Opportunities

Second, the traditional Front-end process starts with identifying business opportunities from various sources, including new technology, new market segment, breakthrough in science, personal passion, and so forth (P. Koen et al., 2001; Terwiesch & Ulrich, 2009). Most of the opportunities are ready-to-use ones as the traditional Front-end process basically passes identified opportunities to Opportunity Analysis phase. Nevertheless, the Front-end process for developing culture-driven products exploiting cultural heritage as source of opportunities and inspiration would require

additional steps given the complex nature of culture; while cultural heritage is an invaluable source for opportunities and inspiration (UNESCO, 2008), it consists of multiple layers and contains profound cultural wisdom (Cayla & Eckhardt, 2007; Charters & Spielmann, 2013; Wilhelms et al., 2009).

Fusion

Finally, while mainstream Front-end process focuses on generating ideas, nourishing a number of ideas further and screening it, premise of successful culture-driven products is about fusion, hybridizing cultural inspiration across era, countries, continents, styles, and so forth (Cayla & Eckhardt, 2007; Jaw et al., 2012; Ko & Lee, 2011).

The table summarizing differences between traditional Front-end model and that of Culture-driven products is presented below:

Figure 2-17 Differences between Traditional Front-end Model and Culture-driven Front-end Model

ISSUES	MAINSTREAM FRONT-END MODEL	CULTURE-DRIVEN FRONT-END MODEL
Paradigm of Innovation	Science and Technology	Soft Innovation: Aesthetic, Symbolic, Meaning, Intellectual
Product Characteristics	Physical Artifacts	Intangible Values
Source of Opportunities	Ready-to-use Business-driven Opportunities	Multi-layered Cultural Heritage
Idea Generation Methodology	Develop a few Promising Ideas Separately	Fusion of Several Inspirations

Source Researcher

Given the mentioned discrepancies, to the best of the researcher's knowledge, Front-end of innovation process model to develop culture-driven products harnessing cultural heritage as source of intangible values

does not exist. Thus, it is worthwhile to conduct the study to derive at Front-end process of culture-driven products.

The Front-end of Innovation Process Model for Culture-driven Products

Based on literature review on the Front-end of Innovation, the process includes two imperative phases, idea generation and idea selection (R. G. Cooper, 1988; P. Koen et al., 2001; Terwiesch & Ulrich, 2009).

Each step is described in relation to culture-driven products detail as follows:

Idea Generation

Analogously to generic Front-end model, which starts the process from opportunities identification (P. Koen et al., 2001; Stamm, 2008; Terwiesch & Ulrich, 2009; Ulrich & Eppinger, 2011), the Front-end process for culture-driven products starts with the stage of sourcing for core cultural inspiration. The source is limitless; it can be from parties in cultural production, including cultural organizations, sociologists, anthropologists, marketers, media, retailers, delivery firms, designers, firms in other industries, firms along supply chain, and so forth (Verganti, 2009), or from national heritage in previous era (Ko & Lee, 2011), national sub-culture (McGray, 2002), or local cultural heritage (Werly, 2013). According to Office of Small and Medium Enterprises Promotion, Ministry of Industry, Thailand (OSMEP), the Kingdom of Thailand holds at least 800 local cultural heritage across the country that can be harnessed for commercial purpose (OSMEP, 2012).

Given the fact that culture is inherently in multi-layered structure (Wilhelms et al., 2009) and that cultural heritage contains rich history and wisdom as it is passed on from generation to generation, dissecting cultural heritage into layers similar to peeling onion helps reveal hidden inspiration. Lin (2007) proposes that cultural heritage can be divided into three layers,

namely tangible level, behavioral level, and intangible level. The extraction contributes to idea generation process in terms of number of ideas generated.

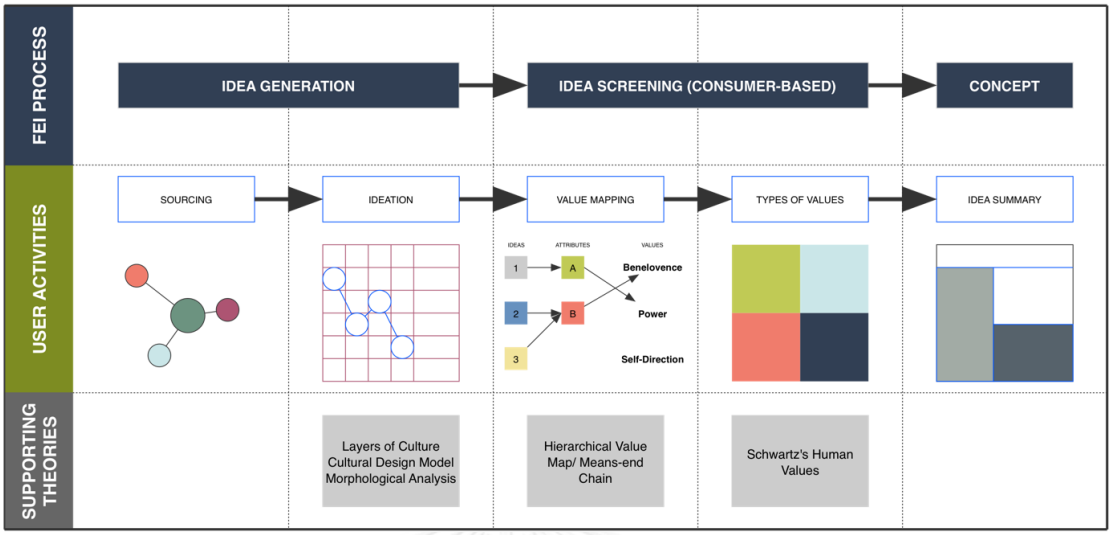
The idea generation phase of Front-end process for culture-driven products appears in the form of fusion. Several studies point out that the premise of successful culture-driven products is about fusion, hybridizing cultural inspiration across era, countries, continents, styles, and so forth (Cayla & Eckhardt, 2007; Jaw et al., 2012; Ko & Lee, 2011). As a result, Front-end process for culture-driven products, particularly in idea generation phase, should be performed in mix-and-match manner. Given its nature, morphological analysis (MA) and cultural design model (Lin, 2007) are appropriate theories and techniques for idea generation of culture-driven products. Morphological analysis (MA), a structured concept generation technique, is a comprehensive method as MA produces ideas from decomposing and combining combinations of elements, resulting creative solutions through fusion of subcomponents. As cultural inspiration contains multiple layers, which requires extraction to reach every level, cultural design model (Lin, 2007) assists in deep comprehension of a cultural inspiration.

Idea Screening

As the central value of culture-driven products is the intangible values embedded (Cunningham, 2011; Green, 2008; Throsby, 2001), in terms of idea screening in the consumer aspect, understanding the relationships between physical product attributes and consumer values yield great advantages for selecting and screening the most promising cultural-product ideas. To perform such task, means-end chain theory and hierarchical value map are great tools to investigate the product attributes – values linkages. In terms of consumer values, the Schwartz's universal human values can be employed to categorize human values into groups.

The Front-end of Innovation Process Model for Culture-driven Products is presented in the following page

Figure 2-18 Conceptual Process of Front-end of Innovation for Culture-driven Products



Source Researcher's own Illustration

Chapter 3

RESEARCH METHODOLOGY

Research Outline

As the ultimate objective of the research is to develop the idea generation tool for the concept generation of culture-driven products, two studies are conducted for the tool development and one study are conducted for usage and acceptance test. For the sake of clarity, the researcher divides the research based on the two modules of the tool, namely idea generation and idea screening. The table listing research based on the tool modules are listed below:

Table 3-1 List of Research in Relation to the Idea Generation Tool Module

IDEA GENERATION MODULE	RESEARCH	OBJECTIVE
Idea Generation	1	Support Idea Generation Module
Idea Screening	2	Support Idea Screening Module
	3	Test usability and Acceptance of Users

Brief explanation of each research is given below:

Research 1: Evaluation of Idea Generation Technique for Concept Generation of Culture-driven Products

Research 1 contains 3 sub phases, including cultural extraction, ideation workshops, and idea evaluation. The researcher employs case study research as the methodology. Case study is appropriate method for a particular process, such as new product development process (D. R. Cooper & Schindler, 2010), and for complex social phenomena and for

managerial processes that are not well-defined (Yin, 2008). The detail is each phase is as follows:

Cultural Extraction

The first session of the research 1 is to extract inspirational adjectives from Thai cultural inspirations. The researcher conducts in-depth interview with 10 Thai designers who have rich experience in cultural product design in prominent cultural industries of Thailand to extract inspirations of each layer, intangible, behavior, and tangible layer, following the cultural design model theory (Lin, 2007). The adjectives are used later on as values to formulate the morphological matrix, the backbone of idea generation tool.

Ideation Workshops

The researcher further conducts idea generation workshops by having designers use the developed idea generation tool to produce concepts of products versus their conventional idea generation method.

Idea Evaluation

The concept ideas from both the tool and traditional method are evaluated in terms of quality of concepts by judges who have experience in the field so as to validate the effectiveness of the ideation tool.

Research 2: Hierarchical Value Map of Consumers Purchasing Cultural Products

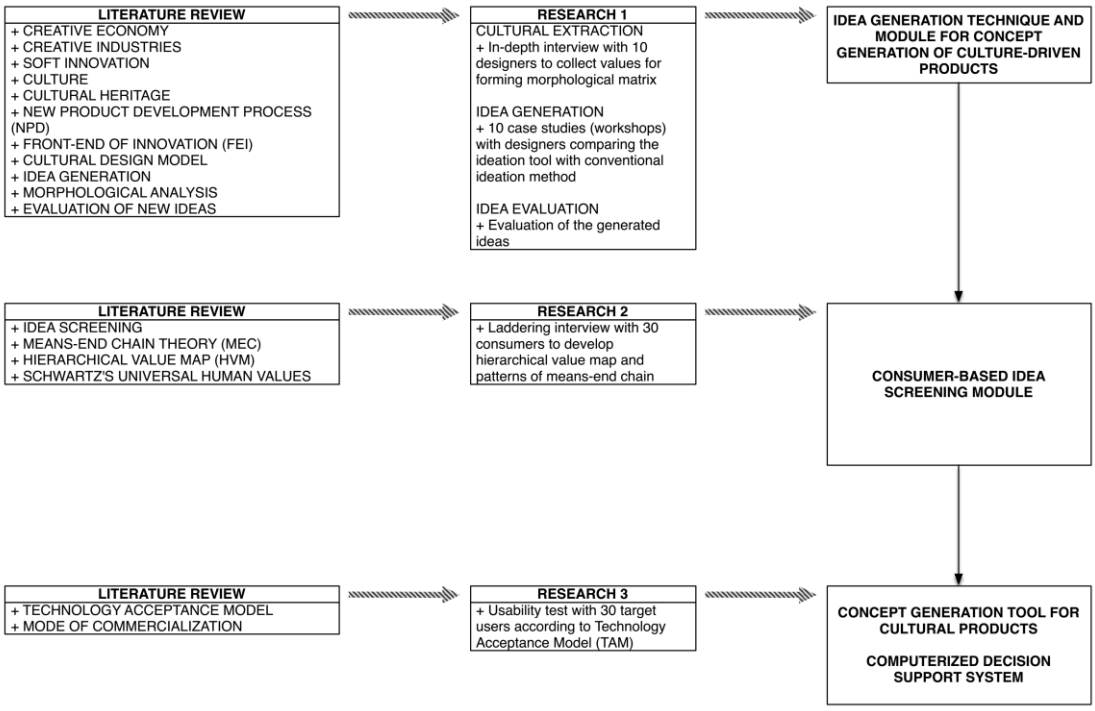
The objective of the second research is to identify attributes-consequences-values linkages chains of consumers purchasing cultural products, which will be incorporated in the idea screening module of the idea generation support system. The researcher conducts in-depth interview with 30 cultural consumers by employing laddering interview method so as to derive at hierarchical value maps. The research yields types of values of consumers regarding culture-driven product consumptions and the product attributes-values relationships which can be used for idea-screening judgement.

Research 3: Technology Acceptance Model

Prior to the third study, the idea generation support system is developed and is ready to be used by target users. The study in this phase is for testing the validity of the idea generation support system in terms of usage, acceptance, and potential for commercialization. The researcher collects feedback from users during the study to perfect the tool, resulting in a complete product.

The illustration of research methodology is presented in the following page:

Figure 3-1 Summary of Research Methodology



Source Researcher's own illustration

The table summarizing research methodology is given below:

Table 3-2 Research Methodology

RESEARCH OBJECTIVES	RESEARCH PHASE	RESEARCH METHODOLOGY	EXPECTED OUTCOME
To develop and validate the idea generation tool derived from morphological analysis technique and cultural design model theory	Phase 1	+ Literature review + In-depth interviews + Workshops	Validated idea generation module for concept generation of culture-driven products
To identify hierarchical value maps and patterns of values of consumers purchasing culture-driven products	Phase 2	+ Literature review + Laddering interviews	Hierarchical value maps and patterns of consumers purchasing culture-driven products, which will contribute to identifying types of values
To test the usability and acceptance of the idea generation support system	Phase 3	+ Action research	Validated idea generation support system – The concept generation tool for cultural products

Source Researcher

Research Methodology

Research 1: Evaluation of Idea Generation Technique for Concept Generation of Culture-driven Products

The first research aims at developing and testing idea generation technique of FEI for culture-driven products. Cultural design model theory and morphological analysis are employed to construct the technique. To derive at the research objectives, the researcher employs multiple case study research to obtain research output. Given the research goals of the study, case study research is well fit with the research nature; case study is appropriate method for particular process, such as new product

development process (D. R. Cooper & Schindler, 2010) and for complex social phenomena and managerial processes that are not well-defined (Yin, 2008).

Research Design

To gain empirical data of the study, multiple-case design is selected as research methodology. The results from multiple-case studies is generally more compelling; analytic conclusion arising from each independent case provides strong support for proposed theory (Yin, 2008). As such, the study employed multiple-case design

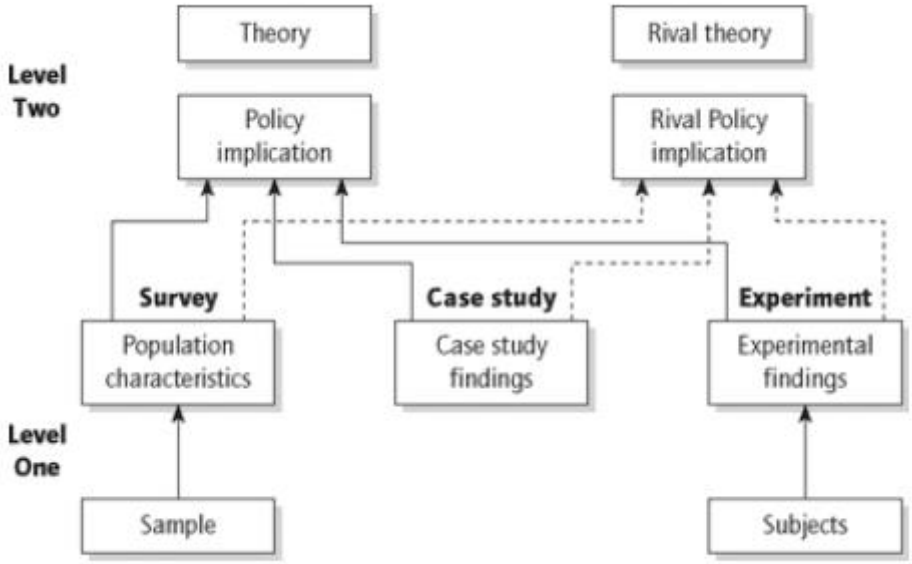
Unit of Analysis

In order to conduct sound case study research, a major component that should be set in the Research Design phase is the unit of analysis. According to Yin (2008), unit of analysis refers to the unit of subject that researchers intend to study. In the case of this research, the unit of analysis is an individual or group of creative professionals in creative industries referred to as Creative Class (Florida, 2003). The unit of analysis can be divided into 2 main groups, cultural heritage-based designers and non-cultural heritage-based designers.

Analytic Generalization and Rival Theory

In order to generalize from case study research, the methodology is unlike that of quantitative research called statistical generalization. On contrary, the generalize methodology of case study research is analytic generalization, in which a previously developed theory is compared with the result from empirical results (Yin, 2008). If the result from two or more cases support the proposed theory, the theory is considered valid. Furthermore, to make the theory more potent, the use of rival theory would significantly substantiate the proposed theory. Yin (2008) states that rival theory is the used alongside proposed theory to prove the validity of proposed theory; a theory is solidly valid if results from two or more cases support proposed theory and do not support rival theory. The figure illustrating analytic generalization using rival theory is presented below:

Figure 3-2 Analytic Generalization using Rival Theory



Source Yin (2008)

In the context of this study, the proposed theory and rival theory is presented below:

1. Proposed Theory: Idea generation technique of culture-driven products
2. Rival Theory: Traditional idea generation technique

To begin the study, the researcher selected 10 types of Thai cultural heritage listed by the Department of Cultural Promotion as cultural inspirations. The inspirations are stratified by domains of cultural heritage in Thailand. The selected cultural inspirations are listed below:

Table 3-3 Selected Cultural Inspiration for Cultural Extraction

Category	Number	Thai Cultural Heritage
Traditional Craftsmanship	1	Thai Ikat Silk
	2	Thai Oblation
	3	Aranyik Knives
Performing Arts	4	Hoonkrabok
	5	Khon
Knowledge and Practices Concerning Nature and the Universe	6	Krayasart
	7	Kanom Buang
Folk Games and Sports	8	Thai Kite
Social Practices, Rituals and Festive Events	9	Loikrathong
	10	Songkran

According to morphological analysis, the process starts with building morphological matrix by creating dimensions along the horizontal axis and develop values, which is generally completed by 5-6 experts (Geum & Park, 2016). The dimensions are developed by employing the Cultural Design Model (CDM) proposed Lin (2007), creating 3 dimensions, intangible, behavior, and tangible dimension.

Cultural Extraction

Values in each dimension are extracted from selected cultural inspirations by 10 Thai designers who have rich experience in culture-related design. Selected designers are stratified by key cultural industries of Thailand, namely ceramics, textiles, spa, jewelry, and furniture. In the beginning of the in-depth interview session, the designers were presented with knowledge regarding the cultural inspiration in multiple formats, including texts, pictures, and videos. Then, the designers were asked “What are the though-provoking elements you see in each cultural inspiration that would spark creative ideas?” Those elements were listed and categorized in 3 dimensions and in text and picture formats. Pictures were obtained from search engine during the interview session. During the interview, tape recorder and notes are used to collect data and insights from the interviewees. The obtained information from tape recorder is written down and is consolidated with information from note-taking during the interview session. Each interview session was approximately 45-60 minutes per cultural inspiration. Figure illustrating the selected inspirations and dimensions is presented below:

Table 3-4 Selected Cultural Inspiration and Dimensions of Morphological Analysis

Category	Number	Thai Cultural Heritage	10 DESIGNERS		
			INTANGIBLE ELEMENTS	BEHAVIORAL ELEMENTS	TANGIBLE ELEMENTS
Traditional Craftsmanship	1	Thai Ikat Silk			
	2	Thai Oblation			
	3	Aranyik Knives			
Performing Arts	4	Hoonkrabok			
	5	Khon			
Knowledge and Practices Concerning Nature and the Universe	6	Krayasart			
	7	Kanom Buang			
Folk Games and Sports	8	Thai Kite			
Social Practices, Rituals and Festive Events	9	Loikrathong			
	10	Songkran			

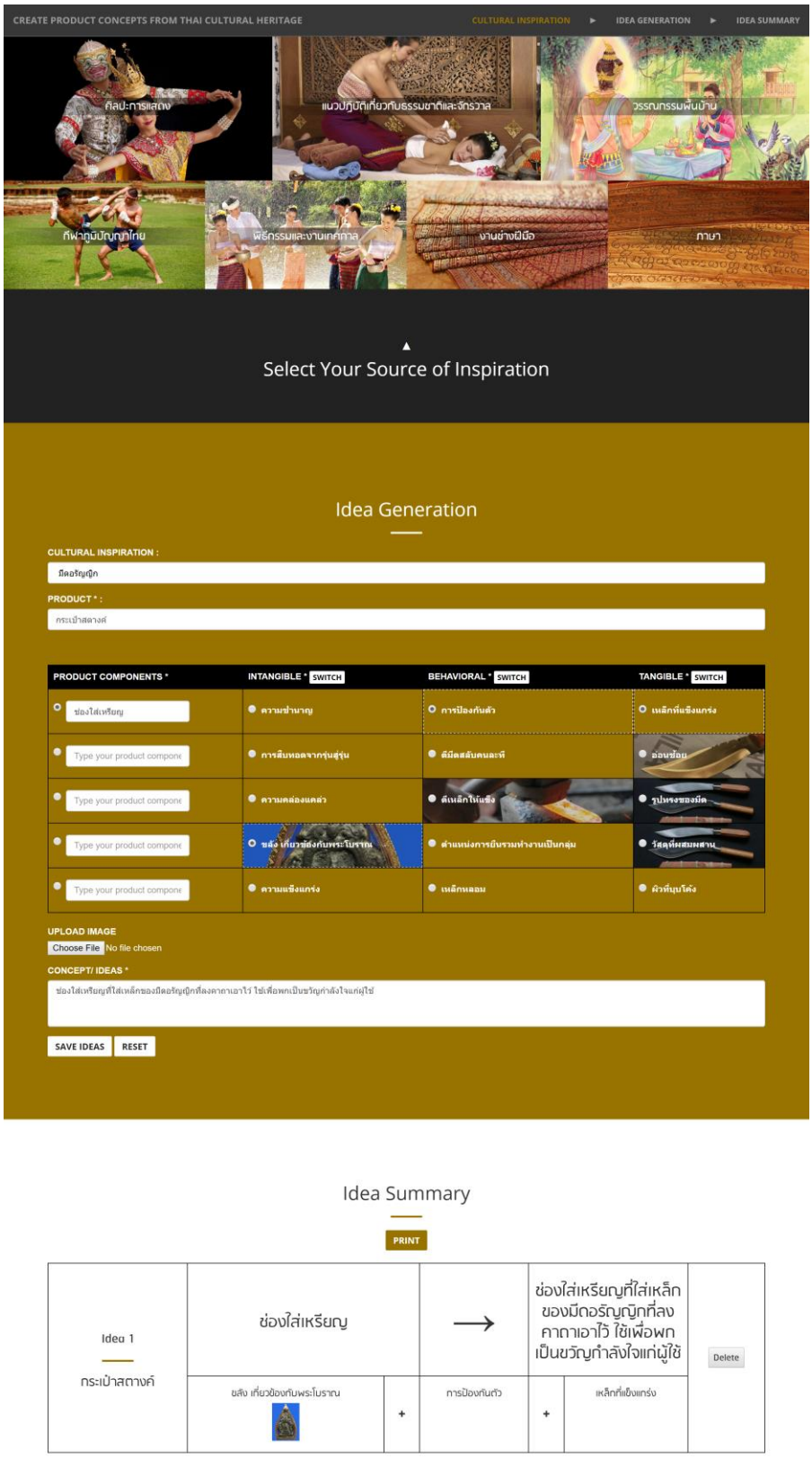
Idea Generation Workshops

After obtaining values for morphological analysis of the idea generation tool, the researcher developed a web-based ideation module based on the morphological matrix. The module includes values from cultural extraction of each cultural heritage. The matrix consists of 3 dimensions, according to the cultural design model (Lin, 2007).

Regarding the idea generation session, the respondents start the workshop by creating concepts using their own conventional method within 30 minutes. They were asked to write down concepts as many as possible, each concept separately. Once completed, the respondents enter the next session, idea generation workshop using the ideation tool, which the respondents were given another 30 minutes to conceptualize ideas. The respondents start the second ideation session by selecting a cultural inspiration from 7 domains of Thai cultural heritage. Once selected, users are presented with knowledge regarding the cultural heritage in picture and text formats. The next step is the idea generation activity, which users are required to fill in the product or service that they would like to generate concept ideas and decompose their chosen product or service into components. Then the respondents generate ideas by associating product or service components with values across dimensions, resulting ideas derived from the fusion of cultural inspirations.

The interface of the web-based idea generation module is presented as follows:

Figure 3-3 Interface of the Idea Generation Module



To test the idea generation module, the researcher developed 10 design projects requiring cultural heritage as sources of inspiration. According to Yin (2008), the appropriate number of multiple-case studies is six to ten cases. The design projects are stratified by types of cultural heritage, types of project, product or service-based projects, and types of designer, designers who regularly design culture-related products and those who do not design culture-related products. The objective of such stratification is to test the generalization of the idea generation tool across those discrepancies. List of the design projects are as follows:

Table 3-5 Case Studies of Idea Generation Workshops

				10 DESIGNERS									
				CH-BASED					NCH-BASED				
				DESIGN PROJECTS									
				PRODUCT			SERVICE		PRODUCT			SERVICE	
				Travel Bag	Mobile Phone	Sports Shoes	Delivery Service	Medical Service	Travel Bag	Mobile Phone	Sports Shoes	Delivery Service	Medical Service
Category		**Thai Cultural Heritage**		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Traditional Craftsmanship	CULTURAL INSPIRATION	Thai Ikat Silk	1C				●						
			1M				●						
		Thai Oblation	2C		●								
			2M		●								
		Aranyik Knives	3C	●									
			3M	●									
Performing Arts		Hoonkrabok	4C					●					
			4M					●					
		Khon	5C										●
			5M										●
Knowledge and Practices Concerning Nature and the Universe		Krayasart	6C									●	
			6M									●	
		Kanom Buang	7C			●							
			7M			●							
Folk Games and Sports		Thai Kite	8C								●		
			8M								●		
Social Practices, Rituals and Festive Events		Loikrathong	9C							●			
			9M							●			
		Songkran	10C						●				
			10M						●				

C = Conventional Method
M = Morphological Analysis

Evaluation of new ideas.

The concept ideas from the idea generation phase were collected and evaluated by judges who have experience in culture-driven product and service industries. Those judges include 2 senior designers who have experience in culture-related design industry, and 2 entrepreneurs whose products or services involve culture. According to Dean, Hender, Rodgers, and Santanen (2006), the number of raters for evaluating new concepts predominantly consist of 2 experts in the field; the number is consistent with many other studies (Dennis, Aronson, Heninger, & Walker, 1999; Santanen, Briggs, & De Vreede, 2000; Satzinger, Garfield, & Nagasundaram, 1999). Nevertheless, several studies regarding new concept development include 4 judges in the idea assessment process (Chou, 2014; Moon & Han, 2016; Toubia, 2006). In the context of this study, the researcher included 4 judges to rate the generated concepts.

The evaluation criteria were based on the idea evaluation scales proposed by Dean et al. (2006). The scales consist of 4 key constructs to measure quality of an idea, including novelty, workability, relevance, and specificity. Each construct includes 2 subconstructs. Prior to the evaluation, the raters were given the scales with explanations of each score. Following the standard of assessing creative products, the raters scored ideas independently (Amabile, 1996). The collected scores were computed the average score for further analysis (Litchfield, Fan, & Brown, 2011).

The table showing the 4 dimensions measuring idea quality is given below:

Table 3-6 4 Dimensions for Measuring Quality of Ideas (Dean et al., 2006)

Table 11. Derivations of General Constructs[4]		
Construct	**Range**	**Formula**
Novelty	2-8	Originality + Paradigm relatedness
Workability	2-8	Acceptability + Implementability
Relevance	2-8	Applicability + Effectiveness
Specificity*	2-6	Completeness + Implicational explicitness

The scales of each subconstruct is presented below:

Table 3-7 Originality Scale (Dean et al., 2006)

Table 21. Originality: The degree to which the idea is not only rare but is also ingenious, imaginative, or surprising.			
Score	**Level Description**	**Restaurant Examples**	**Tourism Examples**
4	Not expressed before (rare, unusual) **And** Ingenious, imaginative or surprising; may be humorous	Buy out other surrounding restaurants. Have someone feed you the food while relaxing in a lawn chair by the pool. Play music that psychologically makes people hungry or thirsty.	Say that we have a religious relic like the Holy Grail
3	Unusual, interesting; shows some imagination	Have a roller derby night	Offer a special weekend visit to Rocky Point or Grand Canyon if you spend a week in Tucson
		Have individuals on campus passing out flyers and telling people about it, maybe have him/her wear something flashy	
2	Interesting	Use more spices, herbs and fresh ingredients to improve taste	Have more golf courses in town
		Entertainment that ranges from jazz to blues	
1	Common, mundane, boring	All-u-can eat salad bar for a nominal fee with the purchase of an entrée	Advertise

Table 3-8 Paradigm Relatedness Scale (Dean et al., 2006)

Table 29. Paradigm relatedness: The degree to which an idea preserves or modifies a paradigm. PM ideas are sometimes radical or transformational.

Score	Restaurant Problem	Tourism Problem
4	Paradigm Breaking. Introduces new elements and changes the relationship with the customer. Also includes any ideas that focus on the larger problem for the restaurant—staying in business (e.g., different way to make money, selling the restaurant, etc.). Examples: Spread nasty rumors about the other restaurants in the area. Put roaches in other restaurants' kitchens and make sure customers find them.	Paradigm Breaking. Introduces new elements and changes the relationship with the tourists. Includes more radical reasons for visiting Tucson, such as anything that would make Tucson famous. Example: Advertise that California will fall into the ocean—"Get beach-front properties."
3	Paradigm Stretching. Changes the relationship with the customers (i.e., gives them something other than food to attract them to the restaurant.) Also includes research. Examples: Have a roller derby night. Put a full-court basketball facility in the back.	Paradigm Stretching. Changes the relationship with the tourists. Includes other reasons for visiting Tucson, such as health, education, business, etc., and changes to Tucson itself. Also includes research. Example: Advertise that Tucson helps health problems like arthritis.
2	Slightly Paradigm Stretching. Introduces new elements (e.g., different food, different hours, different decor, different ways of advertising, etc.) but still focuses on serving food. Examples: Use more spices, herbs, and fresh ingredients to improve taste. Stay open late during finals and offer cheap coffee.	Slightly Paradigm Stretching. Introduces new elements (e.g., different ways of advertising, new attractions, etc.), but still focuses on vacations. Example: Use Internet for advertising.
1	Paradigm Preserving. Serving food to students. Example: Hand out flyers on campus.	Paradigm Preserving. Usual ways of attracting tourists to Tucson for vacations. Example: Advertise.

Table 3-9 Acceptability Scale (Dean et al., 2006)

Table 22. Acceptability: The degree to which the idea is socially, legally, or politically acceptable.			
Score	**Level Description**	**Restaurant Example**	**Tourism Example**
4	Common strategies that violate no norms or sensibilities	Hand out flyers on campus	Advertise
		Offer healthy menu	
3	Somewhat uncommon or unusual strategies that don't offend sensibilities	Offer cool stories or jokes on the menu so it can be read while waiting	
		Telephones at each table, so you can talk from table to table	Give free watches to everyone
2	Offends sensibilities somewhat but is not totally unacceptable	Have crazy events through the night such as times when the bar tenders stand on the bar with a bottle of booze and walk down pouring it into different mouths	Make a brochure with the "Wild Men"
		Allow patrons to dance on the tables	
1	Radically violates laws or sensibilities or Totally unacceptable business practice.	Put some addictive substance in the food and milk the students for everything they have	Burn the town down and start again
		Use the same grease for the next month to cook fries, chicken nuggets, and other health foods	

Table 3-10 Implementability Scale (Dean et al., 2006)

Table 23. Implementability: The degree to which the idea can be easily implemented.			
Score	**Level Description**	**Restaurant Example**	**Tourism Example**
4	Easy to implement at low cost or non-radical changes	Have different varieties of music on certain nights	Have a list of things to do under $15
		Sometimes have people selling your food on the mall or sponsoring stuff around campus	
3	Some changes or reasonably feasible promotions or events	Have a grand re-opening with a radio station, with free food, prizes and contests. Make sure there is lots of advertising in and around the university in conjunction with the community	Have a lot more advertising
		Make the restaurant honour all-aboard cards and make it so the students receive an extra 10% off food purchases if they use all aboard	
2	Significant change or expensive or difficult but not totally impossible to implement	Remodel the restaurant in an up to date style	Build a great art museum
		Pay beautiful people to eat there so others will want to as well	
1	Totally infeasible to implement or extremely financially nonviable	Free lunch on every Friday of the week	Create an ocean
		Convince the professors to give the students extra credit for going to the restaurant	

Table 3-11 Applicability Scale (Dean et al., 2006)

Table 24. Applicability: The degree to which the idea clearly applies to the stated problem.			
Score	**Level Description**	**Restaurant Example**	**Tourism Example**
4	Solves an identified problem that is directly related to the stated problem (do X to get Y, and Y is part of the stated problem)	Hire both English and Spanish speaking employees for a broader base for customers	Research to find target market for tourists
		Work with restaurants around you in order to jointly draw more customers to your area	
3	Solves an implied problem that is related to the stated problem (do X to get an implied Y, which applies to the stated problem)	Free lunch on every Friday of the week	Have a lot more advertising
		Increase variety of the drinks menu	
2	May have some benefit within a special situation and somehow relates to the stated problem (do X, which somehow relates to the stated problem)	Have an attendant in the bathroom to help with cologne and mouthwash	Build indoor skiing facilities
		Have the Christmas coloured mints from December to January	
1	Intervention is not stated or does not produce a useful outcome (no X) or (do X for useless Y)	Put the restaurant in a bad location and car theft will free up parking space	Tell tourists to bring bottled water
		Lobby congress for lower taxes to provide cheaper food	

Table 3-12 Effectiveness Scale (Dean et al., 2006)

Table 25. Effectiveness: The degree to which the idea will solve the problem.			
Score	**Level Description**	**Restaurant Example**	**Tourism Example**
4	Reasonable and will solve the stated problem without regard for workability (If you could do it, it would solve the main problem)	Buy out other surrounding restaurants so people will stay at your place	Say that we have a religious relic like the Holy Grail
		Put some addictive substance in the food and milk the students for everything they have	Research to find target market for tourists
3	Reasonable and will contribute to the solution of the problem (It helps, but it is only a partial solution)	Provide birthday specials. Perhaps a free meal for the birthday person.	Advertise the sunsets
		Use more spices, herbs and fresh ingredients to improve taste	
2	Unreasonable or unlikely to solve the problem (It probably will not work)	Have crazy events throughout the night such as times when the bar tenders stand on the bar with a bottle of booze and walk down pouring it into different mouths	Believe in Tucson - think of positive things
		Put a full court basketball facility in the back	
1	Solves an unrelated problem (It would not work, even if you could do it)	Have employees that can speak English	Tell tourists to bring bottled water
		Free fighting	Do not advertise - make them find their own entertainment
		Don't put the sign up 'Ketchup upon request'	

Table 3-13 Completeness Scale (Dean et al., 2006)

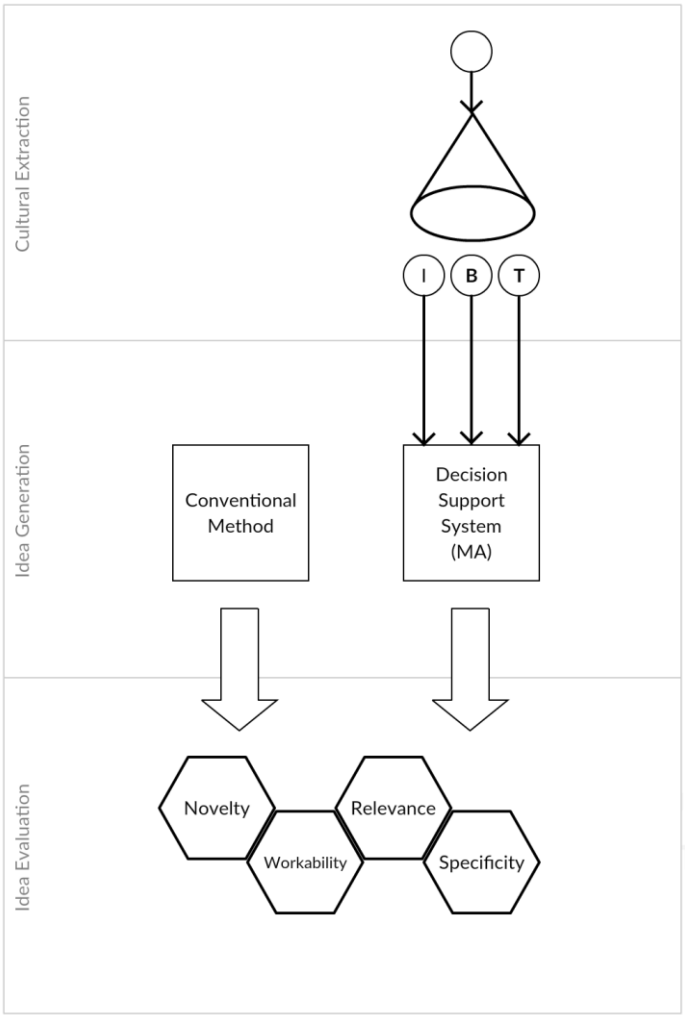
Table 26. Completeness: The number of independent subcomponents into which the idea can be decomposed, and the breadth of coverage with regard to who, what, where, when, why, and how.			
Score	**Level Description**	**Restaurant Example**	**Tourism Example**
3	Comprehensive, with three or more parts from at least two of the 5 Ws + H (who, what, why, when, where, how), e.g. (what + when + where) or (what + what + why)	Advertise that slow is better - results in more care taken and fresh food used	Have observatory on campus open July through September for free viewing at night
		Owner should ask people on campus what they've heard about the restaurant and improve on criticism	The city should get together with a hotel chain and an airline chain to put together a package deal for tourists
2	Contains two parts from different dimensions (5 Ws + H), such as, but not limited to (what + where), (what + why), (what + how), *or* three or more parts of only one of the 5 Ws + H (e.g., what + what + what)	Hand out flyers on campus	Have camping tour company - all you bring is yourself and they provide everything else
		Free lunch on every Friday of the week	
1	Contains one or two parts from the same dimension and usually the "what" (e.g., (what) or (what + what))	Create a breakfast menu	Advertise
		Provide free parking	

Table 3-14 Implicational Explicitness Scale (Dean et al., 2006)

Table 27. Implicational explicitness: The degree to which there is a clear relationship between the recommended action and the expected outcome.			
Score	**Level Description**	**Restaurant Example**	**Tourism Example**
3	Implication is clearly stated and makes sense (do X so that Y)	Fix up the place to attract more people, people don't like to go someplace that looks bad	Have creative attractions to make it easier to visit
		Decorate the place colourfully so it stands out from the rest so it catches the viewers' eyes as they drive by	
2	Implication is not generally accepted or is vaguely stated (do X, which solves a not-generally-accepted Y) *or* (do X which solves a vaguely stated Y)	Have a frequent meal plan where the more you come in the more free food you get	Promote health and fitness - build a health spa
		Advertise in an inventive way that will bring in better people	
1	Implication is not stated, even though relevant (do X without a stated Y)	Entertainment that ranges from jazz to blues	Advertise
		Add a buffet	

The process summary of research 1 is depicted below:

Figure 3-4 Procedure of Research 1



Research 2: Hierarchical Value Map of Consumers Purchasing Cultural Products

The objective of this research is to derive at hierarchical value map (HVM) of consumers purchasing cultural products based on the means-end chain theory (Olson, 1989). In particular, the linkages between product attributes and personal values were identified and later on used as idea selection and screening criteria in the idea screening module.

Means-end chain theory is adopted as the foundation of research methodology for this study as it is proven to be predominant approach to understand consumers' product knowledge and explains how a product or service purchase facilitates the fulfillment of consumer values. (Cheng-Chieh et al., 2012; Chin-Feng & Chen-Su, 2005; Gutman, 1984; W.-I. Lee & Lin, 2011). To gain the result, laddering is highly recommended technique in research that investigates personal values according to the models of the Means-end chain theory (Jewell & Crotts, 2002; Leão & de Mello, 2007; Lundgren & Lic, 2010; Sinha, 2011).

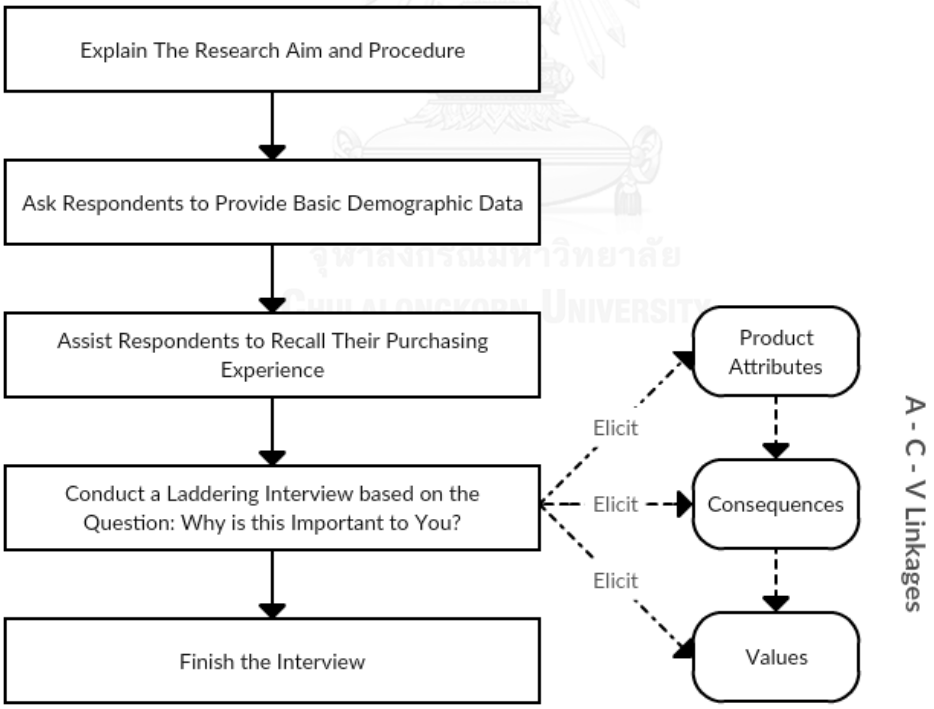
The researcher conducted soft laddering using in-depth interview (Cheng-Chieh et al., 2012), an in-depth interview method, based on the guidelines by Thomas J Reynolds and Gutman (2001) with 30 consumers who purchase cultural products and services; the sample size is consistent with other studies employing HVM methodology (Cheng-Chieh et al., 2012). In fact, research has shown that new insights are seldom elicited with more than 40 subjects (Jewell & Crotts, 2002).

Prior to the interview, the respondents were screened to select ones who frequently purchase culture-driven products and services. The interview session started with explanation of the research goal and procedure. The respondents were asked to provide basic demographic data and to recall their purchasing activities and experiences. Direct elicitation of the key attributes of culture-driven products was used; direct elicitation is believed to provide a stronger focus on relevant attributes (Kirchhoff, Smyth, Sanderson, Sultanbawa, & Gething, 2011). With this method, respondents

were asked to conceive the attributes that trigger their purchasing decision and to answer series of questions centered around the theme “Why is that important to you?” Each interview was audio recorded and transcribed for later analysis.

After the interview, a content analysis was conducted to extract and code the obtained information and create the implication matrix (Arsil, Li, Bruwer, & Lyons, 2014). The hierarchical value map was developed using the LadderUX processing software, which the multiple cut-off levels were tested to yield the optimum HVM. Suggested by T.J. Reynolds and Gutman (1988) and Gengler and Reynolds (1995), a cut-off level of 70 percent and above of active links is considered adequate.

Figure 3-5 The Procedure of the Laddering Interview



Research 3: Technology Acceptance Model

Prior to the third study, the idea generation support system is developed and is ready to be used by target users. The study in this phase is for testing the validity of the idea generation support system in terms of usage, acceptance, and potential for commercialization. The researcher collects feedback from users during the study to perfect the tool, resulting in a complete product. An ideal research method for the purposes is action research; the objective of employing action researcher is to try out a theory with practitioners in real contexts, gain feedback from experience, and refine theory based on feedback (Avison, Lau, Myers, & Nielsen, 1999).

Action research is an iterative process of hypothesis building, testing, and modification within organizational context (Cassell & Johnson, 2006). The research seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of a practical solutions to issues (Brydon-Miller, Greenwood, & Maguire, 2003). This particular qualitative research combines research and practice, requiring researchers and practitioners working together through cycle of activities, namely problem diagnosis, action intervention, and reflective learning; theories are developed, refined, and validated through practical implication (Avison et al., 1999; D. R. Cooper & Schindler, 2010).

User Selection

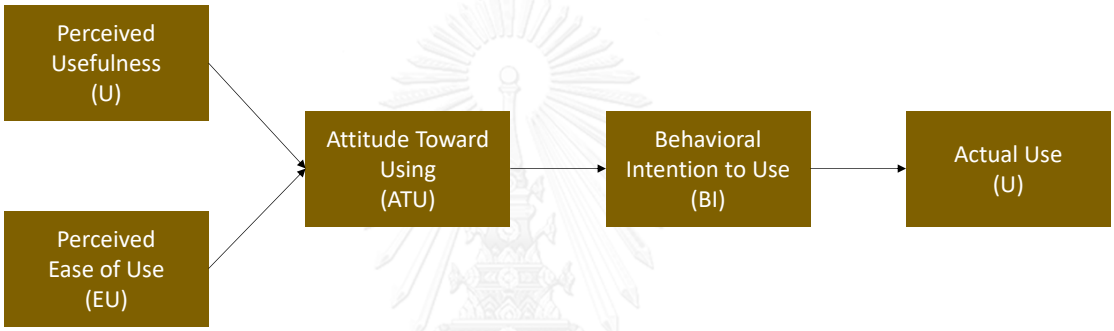
To conduct action research, the researcher aims at practitioners that comply with the following criteria:

- Thai Small and Medium Enterprises (SMEs)
- Practitioners who must be in charge of creative and product development projects, such as designers and creative professionals

Given the objective of testing the acceptance of the idea generation support system, Technology Acceptance Model (TAM) is an appropriate tool to validate the usability and diffusion of innovation.

Introduced in 1989, the Technology Acceptance Model (TAM) is developed to explain the potential user's behavioral intention to use a technological innovation (King & He, 2006; Y.-C. Lee, Li, Yen, & Huang, 2011). TAM consists of two key predictors, perceived ease of use (EU) and perceived usefulness (U). The two predictors lead to users' attitude towards using a particular technological innovation (ATU), which serially leads to behavioral intention to use (BI) and actual use (U), respectively (Polan\vci\vc, Heri\vcko, & Rozman, 2010).

Figure 3-6 Technology Acceptance Model



Source Adapted from Davis (1989)

Target population of the study are creative professionals referred to as Creative Class (Florida, 2003) and entrepreneurs. The researcher conducted action research employing Technology Acceptance Model by testing the idea generation support system with 30 target users. Anonymous questionnaires were used to gain quantitative data. The questions in the instrument are linked with variables in the Technological Acceptance Model for further statistical analysis. The data were collected face-to-face after finishing DSS trials or by online questionnaires, although face-to-face data collection is
preferable. The collected samples were analyzed by statistical software to validate based on the Technology Acceptance Model.

Chapter 4

RESEARCH OUTCOME

As mentioned in the previous chapters, this dissertation consists of 2 key studies for the development of the idea generation support system and 1 study for the test of acceptance. This chapter contains the results from first 2 studies, research 1 and research 2.

Research 1: Evaluation of the Idea Generation Technique

This section can be separated into 3 steps, Cultural Extraction, Idea Generation, and Idea Evaluation.

Cultural Extraction

Conducting in-depth interview with 10 designers, the researcher collected cultural adjectives, thought-provoking elements, from 10 types of Thai cultural heritage. Each type was extracted based on 3 main layers according to the cultural design model Lin (2007). Each interview was approximately 45-60 minutes. The interviewee had access to the internet, and audio tape and note were recorded. During the interview, the respondents were asked to type down words and select images associated with the chosen Thai cultural heritage that they consider inspiring and can be used to stimulate creative ideas further.

The extracted elements, both images and texts from each culture heritage, are consolidated and displayed in the following pages:

Table 4-1 Extracted Elements from Aranyik knives (*มีดอรัญญิก*)

Aranyik Knives								
INTANGINBLE			**BEHAVIOR**			**TANGINBLE**		
Identity	Skillful	Pass Down from Generation to Generation	Rank of Nobility	Team-effort Production	Being Heated Again and Again	Handle Shape	Hard Iron	Shape of Scabbard
Unity	Harmony	Agile	Self-defense	Fighting	Casted by a spell	Curvy Shape	Delicate Shape	Fingernail-like Shape
Joy of Supporting Others	Variety	Magical. Amulet associated.	Multi-functional	Strike the Iron to be Harder	Handicraft	Steel	Local Metal	Eclectic Materials
Strength	Delicate		Rhythm of Alternately Striking the Iron	Standing in Circle when Making the Knife	Cast Iron	Slim Shape	Strength	Shiny Surface
			Strike the Iron to be Hotter	Multi-purpose, Farming, Cooking, Fighting, etc.	Alternately Striking the Iron	Knife Shape	Motif on the Knife	Unique Texture from the forming Process
			Carefully Select Knife Maker			Shape	Colorful	Decoration of the Knife
						Bumpy Surface	Unique Hitting Mark	Color
						Pattern	Sharp Edge	

Figure 4-1 Thought-provoking Visuals Extracted from Aranyik knives (*มีดอรัญญิก*)

Magical. Amulet associated.

Decoration of the Knife

Carefully Select Knife Maker

Strike the Iron to be Harder

Delicate

ความสนุกสนานจากการช่วยเหลือกัน

ความหลากหลาย

Team-effort Production

Shiny Surface

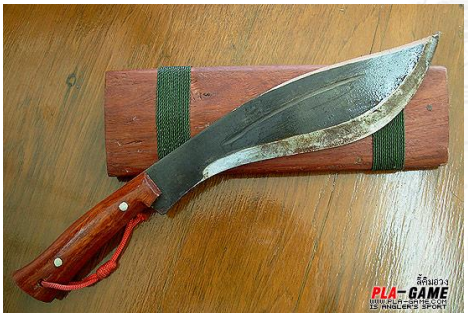
Figure 4-1 Thought-provoking Visuals Extracted from Aranyik knives (มีดอรัญญิก)

อ่อนช้อย

บ่งบอกบรรดาศักดิ์

Strike the Iron to be Hotter

Handicraft



Slim Shape

Knife Shape

Handle Shape

Fingernail-like Shape

Figure 4-1 Thought-provoking Visuals Extracted from Aranyik knives (มีดอรัญญิก)

Eclectic Materials

Multi-purpose, Farming, Cooking, Fighting, etc.

Shape of Scabbard

Motif on the Knife

Motif on the Knife

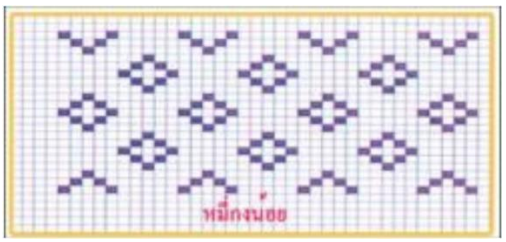
Motif on the Knife

Table 4-2 Extracted Elements from Thai Ikat Silk (*ผ้ามัดหมี่*)

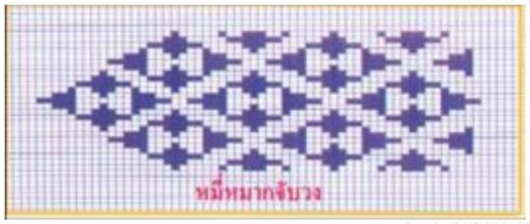
ผ้ามัดหมี่								
INTANGINBLE			**BEHAVIOR**			**TANGINBLE**		
Devotion	Preserving Thai Culture	Collection of Folk Wisdom as Scripture	Suitable for Wearing in Many Occasions	Suitable for All Ages	Experience of the Maker	Fabric Pattern	Thread Bundle before Dyeing	The Gradient from Light to Dark Color
The Worship of Buddhism	Women's Values	Tolerance	Status Indicator	The Finer the Pattern, The More Expensive of the Product	Dyeing Process	Cotton Clothes for the Locals	Silk for the Royals	Color Glimpse
			Apparel in the Ceremony	Job After Harvest Season	Skill to Control the Pattern	Pattern	Color	Bundled Fibers combined before Dyeing
			Delicacy of the Silk Thread	Weaving Process. Handicraft	Thread Bundling	Knitting Pattern	Rhythm and Proportions of the Pattern	Dyeing of Silk
						Traditional Motif	Pattern	Colors of Dyed Yarns
						Texture	Fabric Color	
						Overlapping Pattern		

Figure 4-2 Thought-provoking Visuals Extracted from Thai Ikat Silk (*ผ้ามัดหมี่*)

Knitting Pattern



Knitting Pattern



Knitting Pattern

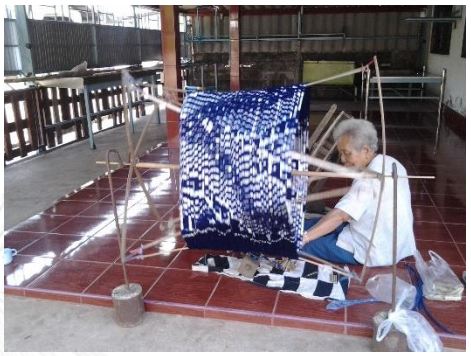
Weaving Process

Thread Bundling

Weaving Process

Figure 4-2 Thought-provoking Visuals Extracted from Thai Ikat Silk (ผ้ามัดหมี่)

Blur Edge: a Character of Thai Ikat Silk



The Skill to Control Pattern

The Skill to Control Pattern

Fabric Softness

Pattern

Devotion

Colors of Dyed Yarns

Colors of Dyed Yarns

Table 4-3 Extracted Elements from Thai Oblation (เครื่องบูชาอย่างไทย)

Thai Oblation								
INTANGINBLE			**BEHAVIOR**			**TANGINBLE**		
Hierarchical	Dedication	Religions in Southeast Asia	Elaborate	Work with Banana Leaf	Consecrate	Candle Yellow	Natural Materials	Bush Shape
Peaceful	Calm	Salute	Measure-ment of Faith	Delicate	Sewing Flowers Together	Valuable Object	Local Materials	Funnel Shape
Endurance	Intention	Pay Respect	Best Selection	Color Mix	Elaborately Install	Banana Leaf	Repetitive Pattern	Modular System
Metaphor	Worship	Appreciation	Craftsman-ship of Banana Leaf	Handicraft	Enlighten	Golden	Thai Tiered State Umbrella	Popped Rice
Communicate Symbolic Meaning through Objects	Wisdom	Faith	Worship Gods	Pay Respect	Pay Obeisance	Shape of Popped Rice	Lotus	Bush
Appreciation	Refinement	Ancient				The Scent of Flowers and Incense Candles	Skyrocket Shape	Shaped like a Head of Buddha
Peace of Mind	Purity	Grateful-ness				Motifs of Thai Temples and Palaces	Vivid Color	Tray with Pedestal
Light of Spirit	Pleasure	Luck						

Figure 4-3 Thought-provoking Visuals Extracted from Thai Oblation (*เครื่องบูชาอย่างไทย*)

Sewing Flowers Together

Sewing Flowers Together

Elaborate

Enlighten

Popped Rice

Ancient

Delicate

Peace

Figure 4-3 Thought-provoking Visuals Extracted from Thai Oblation (เครื่องบูชาอย่างไทย)

Work with Banana Leaf

Work with Banana Leaf

Consecrate

Thai Wisdom from Generation to Generation

Delicate

Worship

Modular System

Skyrocket Shape

Figure 4-3 Thought-provoking Visuals Extracted from Thai Oblation (เครื่องบูชาอย่างไทย)

Skyrocket Shape

Bush Shape

Shaped like a Head of Buddha

Repetitive Pattern

Vivid Color

Vivid Color

Table 4-4 Extracted Elements from Hoonkrabok (*หุ่นกระบอก*)

หุ่นกระบอก		
INTANGIBLE	**BEHAVIOR**	**TANGINBLE**
Exquisite	Puppetry	Human Shape
Lifeful	Used in Royal Ceremony	Thai Headdress
Resurrection	Royal Tale	Delicate Form
Neat	Dance	Hand Set of Thai Dance
Skillful	Compilation of Thai Arts	Sewing Kit
	Manipulation	Decorated with Gold Leaf
		Holding Weapons
		Thai-styled Sack Dress

Figure 4-4 Thought-provoking Visuals Extracted from Hoonkrabok (*หุ่นกระบอก*)

Puppetry

Neat

Hand Set of Thai Dance

Thai-styled Sack Dress

Holding Weapons

Table 4-5 Extracted Elements from Khon (โขน)

Khon		
INTANGINBLE	**BEHAVIOR**	**TANGINBLE**
Embellish	Face Covering	Glitter of Sequin
Thrilling	Emotional Expression Through Dancing	Shiny Gold
Discipline	Fight	Delicate Form
Tolerance	Worshipping Monarch	Color Mix
Training	Sacrifice	Sharp Fangs
	Inheritance	Exquisite Pattern
	Negotiation	
	Respecting Masters	

Figure 4-5 Thought-provoking Visuals Extracted from Khon (โขน)

Face Covering

Sharp Fangs

Fight

Thrilling

Tolerance

Shiny Gold

Training

Table 4-6 Extracted Elements from Krayasart (กระยาสารท)

Krayasart		
INTANGINBLE	**BEHAVIOR**	**TANGINBLE**
Fertile	Worship	Rough Surface
Merit	Pray	Various Size of Ingredients
Fruitful	God Worshipping	Golden Brown
Fortune	Teamwork	Waxy Surface
Harmony	Ancestor Worshipping	

Figure 4-6 Thought-provoking Visuals Extracted from Krayasart (กระยาสารท)

Rough Surface

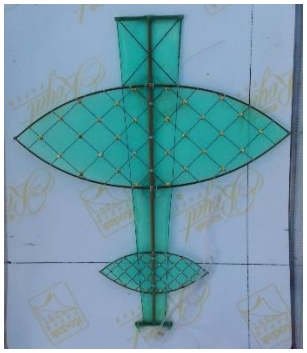
Various Size of Ingredients

Teamwork

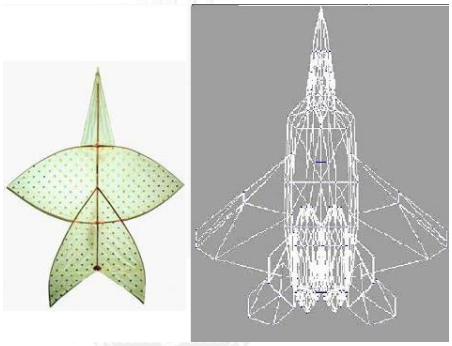
Table 4-7 Extracted Elements from Thai Kite (ว่าวไทย)

Thai Kite		
INTANGINBLE	**BEHAVIOR**	**TANGINBLE**
Fight	Pull the String	Sharp Barb
Harmony	Gliding	Bamboo Frame
Amulet	Yarn Stretching on the Kite	Symmetry
Magnificence	Sport in the Royal Ceremony	Bright Colors Contrasting with Blue Sky
Aggression of Weapons	Stab the Opponent	Sticky String
	Leisure	Rope Pattern
		Pattern on the Kite
		Ancient Paper

Figure 4-7 Thought-provoking Visuals Extracted from Thai Kite (ว่าวไทย)



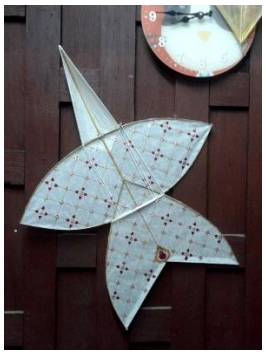
Yarn Stretching on the Kite



Aggression of Weapons

Symmetry

Gliding



Pattern on the Kite

Bright Colors Contrasting with Blue Sky

Table 4-8 Extracted Elements from Loikrathong (ลอยกระทง)

Loikrathong		
INTANGINBLE	**BEHAVIOR**	**TANGINBLE**
Apologize	Dispel bad luck	Shape of Blooming Lotus
Worship	Flowing by the River	Candle Light Reflection on the River
Cheerfulness	Floating Bad Things Away	Candle Light in the Sky
Discard of Sorrow	Make Merit	Moonlight on Full-moon Night
Buddhism	Preserve Religion	Shape of Vessel Made of Banana Leaf
Gratefulness		Repetitive Elements, Modular System
Supportive		Natural Materials
Peace		

Figure 4-8 Thought-provoking Visuals Extracted from Loikrathong (ลอยกระทง)

Supportive

Candle Light Reflection on the River

Candle Light in the Sky

Shape of Vessel Made of Banana Leaf

Table 4-9 Extracted Elements from Kanom Buang (ขนมเบื้อง)

Kanom Buang		
INTANGINBLE	**BEHAVIOR**	**TANGINBLE**
Lady Characteristics	The Art of Smearing Kanom Baung	Brown and White Colors
Buddhism	Fry Dough	Wrapping Shape
Turn Over a New Leaf	Inherited for Over 2,000 Years	Soft White Egg
Kindhearted	Folding dough to Cover the Filling	Overlapped Circular Form
Skill	Stir the Dough out of the Pan	Soft and Friendly Shape
	Insert the Filling	

Figure 4-9 Thought-provoking Visuals Extracted from Kanom Buang (ขนมเบื้อง)

Folding dough to Cover the Filling

Wrapping Shape

Overlapped Circular Form

Table 4-10 Extracted Elements from Songkran (สงกรานต์)

Songkran		
INTANGINBLE	**BEHAVIOR**	**TANGINBLE**
Moving on to Something New	Pour Water on the Hands of Revered Elders and Ask for Blessing	Colorful Apparel
Astronomy	Make Merit	Splash Water
Joyful	Sprinkle Water onto a Buddha	Colorful Flower Petals
Harmony	Water Splash	Garland
Gratefulness	Inheritance	Silver Bowl
Good Wishes	Bless	Silver and Gold Colors

Figure 4-10 Thought-provoking Visuals Extracted from Songkran (*สงกรานต์*)

Splash Water

Colorful Apparel

Colorful Flower Petals

Cultural Extraction – Data Analysis

The extraction activity results in thought-provoking texts and visuals that will stimulate idea generation activity; according to Cheng (2016) and Gonçalves et al. (2014), words and images are crucial triggers that stimulate thought and association during the design process. From the 10 in-depth interviews, 273 design adjectives were collected. Among those, 80 were in the intangible level, 85 were in the behavioral level, and 108 were in the tangible level. Regarding visuals, 91 thought-provoking images were collected. On average, the respondents extracted 27.3 words and 9.1 images per person.

During the interview, the respondents, designers with experience in culture-related design, thoroughly and naturally understand the process. They found no difficulties in conducting extraction of words and images from Thai cultural heritage. From observation and brief interview after the extraction activity, respondents stated that such extraction activity is the process they inherently conduct when developing concepts.

The table summarizing number of texts and images collected is given below:

Table 4-11 Number of Texts and Images collected from In-depth Interview

	TEXT			IMAGE
	INTANGIBLE	**BEHAVIORAL**	**TANGIBLE**	
TOTAL	80	85	108	91
AVERAGE PER RESPONDENT	8	8.5	10.8	9.1

It can be seen that, among the 3 levels, the highest number of extracted texts was from the tangible level, while the second highest number was from the behavioral level, and the lowest number was from intangible level, respectively. In essence, the deeper level, while yielding boundless advantages (Green, 2008; Stoneman, 2010), is not observable and more difficult to extract, resulting lower number of extracted texts.

The texts and images collected are put in the database of the idea generation support system so as to form the morphological matrix for the idea generation activity.

Idea Generation

After consolidating cultural elements from designers in both text and visual formats, the elements were input in the idea generation tool for conducting idea generation workshops with designers. 10 case studies were conducted with designers who have extensive experience with cultural design and also those who do not have experience with cultural design before. The cases consist of both product-based and service-based projects. In each case, designer was asked to develop concepts using his or her own conventional method. After completion, designer was informed regarding how to use the idea generation module and developed concepts by using the tool. For each idea session, designers were given a total of 60 minutes to complete the workshop, 30 minutes for conventional method and another 30 minutes for the proposed method. The results of idea generation activities are given below:

Case Study A: Develop concepts of Travel Bag using Aranyik Knives as Source of Inspiration

Within 2 sessions of 30 minutes, the designer was able to develop 3 concepts from conventional method and 3 concepts from the tool. The concepts idea derived from the workshop is as follows:

Table 4-12 Concepts derived from Case Study A using Conventional Method

CONCEPT	DESCRIPTION
1A-C	Material: Use the metaphor-thinking technique relating the strength property of Aranyik knives to the durability of the luggage; use alloy material for the shell.
2A-C	Pattern: Use the curvy shape of the Aranyik knives to reduce the feeling of heavy luggage and increase the feeling of mobility.
3A-C	Handle: Inspired by the handle of Aranyik knives, the handle is made of wood decorated with silver ornaments. The handle is shaped to fit the palm of users.

Figure 4-11 Concepts derived from Case Study A using the Tool

1A-M

<table>
<tr><td rowspan="2">Travel Bag</td><td colspan="2">Wheel</td><td>→</td><td colspan="2">Travel bag developed with mobility in mind. The body is light yet durable and shock resistant. The handle is comfortable to hold.</td></tr>
<tr><td>Agile</td><td>+</td><td>Fighting</td><td>+</td><td>Strength</td></tr>
</table>

2A-M

<table>
<tr><td rowspan="2">Travel Bag</td><td colspan="2">Case</td><td>→</td><td colspan="2">Luggage shell is able to handle shock force by using curvy shape to reduce the impact.</td></tr>
<tr><td>Strength</td><td>+</td><td>Self-defense</td><td>+</td><td>Curvy Shape</td></tr>
</table>

3A-M

<table>
<tr><td rowspan="2">Travel Bag</td><td colspan="2">Handle</td><td>→</td><td colspan="2">Handle that is made by wood carved to fit perfectly in the hand. Travelers use minimum effort to pull and operate the luggage with this handle.</td></tr>
<tr><td>Agile</td><td>+</td><td>Handicraft  </td><td>+</td><td>Handle Shape  </td></tr>
</table>

Case Study B: Develop concepts of Mobile phone using Thai Oblation as Source of Inspiration

Within 2 sessions of 30 minutes, the designer was able to develop 4 concepts from conventional method and 5 concepts from the tool. The concepts idea derived from the workshop is as follows:

Table 4-13 Concepts derived from Case Study B using Conventional Method

CONCEPT	DESCRIPTION
1B-C	Inspired by the hierarchical system of the Thai oblation, the device surface has hierarchical layers based on frequency of functions. The function used most often is on the top layer, while the least function is at the bottom.
2B-C	The device surface has bumpy surface to prevent the phone from slipping out of hand. The surface mimics the texture of banana leaf.
3B-C	The metal body of the cellphone is attached to the screen by adopting the detail of banana leaf folding technique.
4B-C	Adopting the truth of material concept, the cellphone uses natural material and shows genuine surface of each material without modification.

Figure 4-12 Concepts derived from Case Study B using the Tool

1B-M

<table>
<tr><td rowspan="2">Mobile Phone</td><td colspan="2">Case</td><td>→</td><td colspan="2">Use various techniques of banana leaf folding as inspiration for the design of outer case. The focus is on repetitive pattern.</td></tr>
<tr><td>Communicate Symbolic Meaning through Objects</td><td>+</td><td>Delicate
  </td><td>+</td><td>Banana Leaf</td></tr>
</table>

2B-M

<table>
<tr><td rowspan="2">Mobile Phone</td><td colspan="2">Home Buttons and Other Buttons</td><td>→</td><td colspan="2">The button sets are designed with modular system. Each model has different layouts yet use the same set of buttons to reduce production cost. The button scheme of each model is based on the colors of flowers.</td></tr>
<tr><td>Refinement
  </td><td>+</td><td>Color Mixing</td><td>+</td><td>Modular System
  </td></tr>
</table>

3B-M

<table>
<tr><td rowspan="2">Mobile Phone</td><td colspan="2">Flash and Flashlight</td><td>→</td><td colspan="2">The flash and flashlight of the cellphone mimics the yellow light from candle. The light color is gentle and peaceful suitable for respectful settings.</td></tr>
<tr><td>Peace of Mind</td><td>+</td><td>Enlighten
  </td><td>+</td><td>Candle Yellow</td></tr>
</table>

4B-M

<table>
<tr><td rowspan="2">Mobile Phone</td><td colspan="2">Layout of Buttons, Speakers, and Cameras</td><td>→</td><td colspan="2">Employs the pattern and shape of flowers to beautify the cellphone layout of elements on the device, including buttons, speakers, and cameras.</td></tr>
<tr><td>Pleasure</td><td>+</td><td>Sewing Flowers Together
  </td><td>+</td><td>Repetitive Pattern
  </td></tr>
</table>

5B-M

<table>
<tr><td rowspan="2">Mobile Phone</td><td colspan="2">Color</td><td>→</td><td colspan="2">Use the color schemes of the Thai oblation in the cellphone. Each device has one color. Yet, when displaying the devices together on the shelf, the color scheme is complete and attract consumers to stop by.</td></tr>
<tr><td>Pleasure</td><td>+</td><td>Color Mixing</td><td>+</td><td>Natural Materials</td></tr>
</table>

Case Study C: Develop concepts of Sports Shoes using Kanom Buang as Source of Inspiration

Within 2 sessions of 30 minutes, the designer was able to develop 1 concept from conventional method and 3 concepts from the tool. The concepts idea derived from the workshop is as follows:

Table 4-14 Concepts derived from Case Study C using Conventional Method

CONCEPT	DESCRIPTION
1C-C	Adopt the cushion property of the cream for shock resistant element.

Figure 4-13 Concepts derived from Case Study C using the Tool

1C-M

<table>
<tr><td rowspan="2">Sports Shoes</td><td colspan="2">Wearing the Shoes</td><td>→</td><td colspan="2">Sports shoes for women designed to fully support every type of foot shape by using the wrapping-shape characteristic of Kanom Buang.</td></tr>
<tr><td>Lady Characteristics</td><td>+</td><td>Folding dough to Cover the Filling
  </td><td>+</td><td>Wrapping Shape
  </td></tr>
</table>

2C-M

Sports Shoes	Shape and Show Soles		→	The sports shoes for rock climbing. The shoe soles are designed to stick with the rock by adopting the rough surface of the dough. Yet, the design of the shoes is soft and not intimidating, suitable for urban sport like rock climbing.	
	Skill	+	Stir the Dough out of the Pan	+	Soft and Friendly Form

3C-M

Sports Shoes	Material		→	Sports shoes for trekking or travelers designed by using soft and light material to protect the foot. In addition, the shoes have maximum comfort and the bubble-like shape helps protect the foot from swelling.	
	Skill	+	Fry Dough	+	Soft White Egg

Case Study D: Develop concepts of delivery service using Thai Ikat Silk as Source of Inspiration

Within 2 sessions of 30 minutes, the designer was able to develop 1 concept from conventional method and 3 concepts from the tool. The concepts idea derived from the workshop is as follows:

Table 4-15 Concepts derived from Case Study D using Conventional Method

CONCEPT	**DESCRIPTION**
1D-C	Use the animal pattern of Thai Ikat silk in the uniform of the messengers to create the image of speed.

Figure 4-14 Concepts derived from Case Study D using the Tool

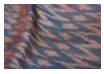
1D-M

<table>
<tr><td rowspan="2">Delivery Service</td><td colspan="2">Delivery things for Making Merit</td><td>→</td><td colspan="3">Delivery service to temples for customers who wish to make merit but do not have time to do it by themselves.</td></tr>
<tr><td>The Worship of Buddhism</td><td>+</td><td>Experience of the Maker</td><td>+</td><td>Color Glimpse</td></tr>
</table>

2D-M

<table>
<tr><td rowspan="2">Delivery Service</td><td colspan="2">Messenger</td><td>→</td><td colspan="3">Hire local people who wish to earn extra income to be messenger. They can do delivery service after their main working hours. By having local people do the delivery, clients would gain the feeling of friendliness as they know each other and live in the same city.</td></tr>
<tr><td>Collection of Folk Wisdom as Scripture</td><td>+</td><td>Job after Harvest Season</td><td>+</td><td>Color</td></tr>
</table>

3D-M

<table>
<tr><td rowspan="2">Delivery Service</td><td colspan="2">Wrapping the package</td><td>→</td><td colspan="3">Initiate the special wrapping service for fragile parcels. The package mimics the property of thread bundling for extra protection. The appearance of the package also needs to portray the sense of aesthetic and delicacy.</td></tr>
<tr><td>Tolerance</td><td>+</td><td>Thread Bundling  </td><td>+</td><td>Thread Bundle before Dyeing  </td></tr>
</table>

Case Study E: Develop concepts of medical service using Hoonkrabok as Source of Inspiration

Within 2 sessions of 30 minutes, the designer was able to develop 1 concept from conventional method and 2 concepts from the tool. The concepts idea derived from the workshop is as follows:

Table 4-16 Concepts derived from Case Study E using Conventional Method

CONCEPT	DESCRIPTION
1E-C	Create Hoonkrabok workshop for patients to practice. The workshop would help the patients' mental health and also physical health.

Figure 4-15 Concepts derived from Case Study E using the Tool

1E-M

<table>
<tr><td rowspan="2">Medical Service</td><td colspan="2">Explanation of Treatment</td><td>→</td><td colspan="2">Use Hoonkrabok and puppetry to help explain the anatomy and the treatment. Using the technique makes the patient understand the technical aspect better. In addition, using art instead of science to communicate with patients reduce pressure of the patients.</td></tr>
<tr><td>Skillful</td><td>+</td><td>Puppetry  </td><td>+</td><td>Human Shape</td></tr>
</table>

2E-M

<table>
<tr><td rowspan="2">Medical Service</td><td colspan="2">Perform Opration</td><td>→</td><td colspan="2">Use the puppetry connected with machines and video calling to allow doctors to perform operation remotely.</td></tr>
<tr><td>Resurrection</td><td>+</td><td>Puppetry</td><td>+</td><td>Human Shape</td></tr>
</table>

Case Study F: Develop concepts of Travel Bags using Songkran as Source of Inspiration

Within 2 sessions of 30 minutes, the designer was able to develop 1 concept from conventional method and 1 concept from the tool. The concepts idea derived from the workshop is as follows:

Table 4-17 Concepts derived from Case Study F using Conventional Method

CONCEPT	DESCRIPTION
1F-C	Travel bags with 5 pockets for each day of the week, Monday to Friday.

Figure 4-16 Concepts derived from Case Study F using the Tool

1F-M

<table>
<tr><td rowspan="2">Travel Bags</td><td colspan="2">Pockets</td><td>→</td><td colspan="2">Travel bags with multiple pockets for keeping many water guns and other accessories to have fun during Songkran festival.</td></tr>
<tr><td>Joyful</td><td>+</td><td>Water Splash</td><td>+</td><td>Colorful Apparel
  </td></tr>
</table>

Case Study G: Develop concepts of cellphones using Loikratong as Source of Inspiration

Within 2 sessions of 30 minutes, the designer was able to develop 3 concepts from conventional method and 5 concepts from the tool. The concepts idea derived from the workshop is as follows:

Table 4-18 Concepts derived from Case Study G using Conventional Method

CONCEPT	DESCRIPTION
1G-C	A cellphone that glows in the dark.
2G-C	A cellphone that is light, transparent, and has flexible material.
3G-C	A cellphone made of recyclable material. The shell can be discarded and change per consumers' wish.

Figure 4-17 Concepts derived from Case Study G using the Tool

1G-M

<table>
<tr><td rowspan="2">Mobile Phone</td><td colspan="2">Product Uniqueness</td><td>→</td><td colspan="2">Cheerful cellphone designed to be flow like river and free like candle light in the sky.</td></tr>
<tr><td>Cheerfulness</td><td>+</td><td>Flowing by the River</td><td>+</td><td>Candle Light Reflection on the River  </td></tr>
</table>

2G-M

Mobile Phone	Product Uniqueness		→	Use biodegradable material		
	Peace	+	Floating Bad Things Away	+	Natural Materials	

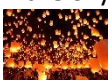
3G-M

Mobile Phone	Product Uniqueness		→	A cellphone that can glow like moonlight on the full-moon night.		
	Worship	+	Make Merit	+	Moonlight on Full-moon Night	

4G-M

Mobile Phone	Product Uniqeness		→	Allow consumers to co-develop the cellphone. If sold, the profit is shared with consumers who co-design the product.		
	Supportive 	+	Make Merit	+	Shape of Vessel Made of Banana Leaf 	

5G-M

<table>
<tr><td rowspan="2">Mobile Phone</td><td colspan="2">Product Uniqueness</td><td>→</td><td colspan="2">Get rid of all burden. Embrace change.</td><td rowspan="2"></td></tr>
<tr><td>Discard of Sorrow</td><td>+</td><td>Dispel Bad Luck</td><td>+</td><td>Candlelight in the Sky  </td></tr>
</table>

Case Study H: Develop concepts of sports shoes using Thai Kite as Source of Inspiration

Within 2 sessions of 30 minutes, the designer was able to develop 4 concepts from conventional method and 3 concepts from the tool. The concepts idea derived from the workshop is as follows:

Table 4-19 Concepts derived from Case Study H using Conventional Method

CONCEPT	DESCRIPTION
1H-C	Use unique structure and pattern of the Thai kite in the appearance design of sports shoes.
2H-C	A unique feature of the Thai kite is that it creates sound when gliding. The sound can be adapted to the sports shoes, creating sound when moving.
3H-C	Create collections based on the regions of Thailand, such as North, South, East, and West.
4H-C	The highlight model should use Chula kite as inspiration because it is well received as a famous Thai kite.

Figure 4-18 Concepts derived from Case Study H using the Tool

1H-M

Sports Shoes	Form		→	Use slim and sleek form in the sports shoes.	
	Magnificence	+	Stab the Opponent	+	Symmetry 

2H-M

Sports Shoes	Color and Pattern		→	Use the pattern of the kite as major design element, especially the yarn structure on the kite.	
	Amulet	+	Yarn Stretching on the Kite 	+	Pattern on the Kite 

3H-M

Sports Shoes	Shoelace		→	Design the new type of shoelace with inspiration from strings of Thai kite. The shoelace is the combination of many strings tie together to portray sense of harmony.	
	Harmony	+	Pull the String	+	Sticky String

Case Study I: Develop concepts of Delivery Service using Krayasart as Source of Inspiration

Within 2 sessions of 30 minutes, the designer was able to develop 1 concept from conventional method and 3 concepts from the tool. The concepts idea derived from the workshop is as follows:

Table 4-20 Concepts derived from Case Study I using Conventional Method

CONCEPT	DESCRIPTION
1I-C	Develop delivery service that focuses on delivering agricultural products, such as seed and processed food, for charity and religious festivals. The packaging is designed to reduce moisture.

Figure 4-19 Concepts derived from Case Study I using the Tool

1I-M

<table>
<tr><td rowspan="2">Delivery Service</td><td colspan="2">Fast Delivery</td><td>→</td><td colspan="2">Develop quick delivery service for consumers who wish to make merit. The service permits various sizes of parcel.</td></tr>
<tr><td>Fortune</td><td>+</td><td>Worship</td><td>+</td><td>Various Size of Ingredients
  </td></tr>
</table>

2I-M

Delivery Service	Parcel		→	The parcel is related to merit and god worshipping.		
	Merit	+	God Worshipping	+	Various Size of Ingredients	

3I-M

Delivery Service	Messenger Uniform		→	The uniform is designed with gold and brown color. The colors portrays the sense of fruition and harmony.	
	Fruitful	+	Teamwork 	+	Golden Brown

Case Study J: Develop concepts of Medical Service using Khon as Source of Inspiration

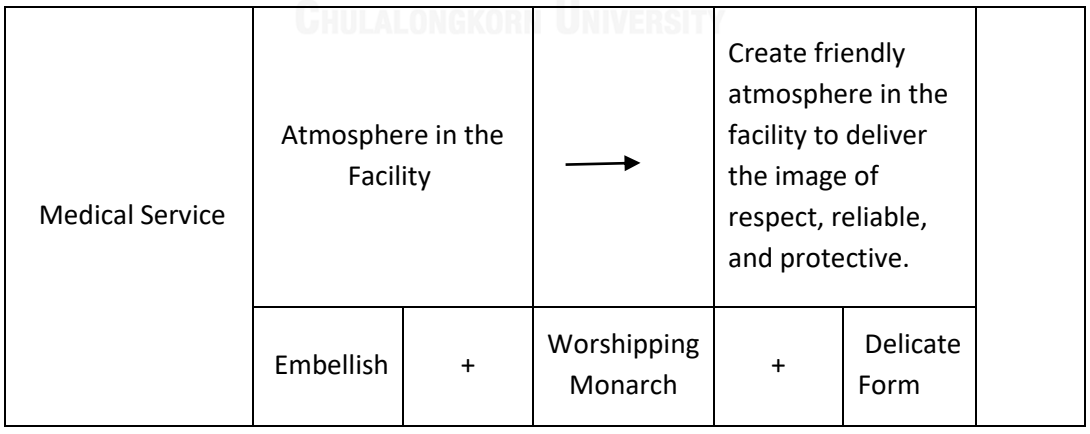
Within 2 sessions of 30 minutes, the designer was able to develop 4 concepts from conventional method and 5 concepts from the tool. The concepts idea derived from the workshop is as follows:

Table 4-21 Concepts derived from Case Study J using Conventional Method

CONCEPT	DESCRIPTION
1J-C	Changing fearful issues in the hospital into entertaining and pleasant ones.
2J-C	Training the staffs to have strict discipline just like practicing Khon.
3J-C	The coordination among divisions in the hospital should be synchronize just like music and rhythm in Khon.
4J-C	Install flower decoration in the facility to create beautiful image just like the scene in Khon.

Figure 4-20 Concepts derived from Case Study J using the Tool

1J-M



2J-M

Medical Service	Direction of Service		→	Train the staffs to respect and honor clients. The direction of service in every touchpoint should portray these images.	
	Training 	+	Sacrifice	+	Delicate Form

3J-M

Medical Service	Solving conflicts		→	Train the staffs to maintain pleasant attitude when conflicts emerge by developing negotiation skill.	
	Tolerance 	+	Negotiation	+	Color Mix

4J-M

Medical Service	Conceal Intimidating Space		→	Some areas in the hospital might not be pleasant. Also, some thrilling activities might scare patients. The interior design and zoning design can conceal those intimidating spaces with delicate and beautiful elements.	
	Thrilling 	+	Face Covering 	+	Delicate Form

5J-M

Medical Service	Sustainable Experience		→	Continuation of good experience. Maintain the excellent service with discipline and protocols. The next-generation staff should inherit the soul of service.		
	Discipline	+	Inheritance	+	Delicate Form	

Idea Generation – Data Analysis

The idea generation workshops result in ideas generated from both conventional method and also from employing the idea generation tool based on morphological analysis technique within 30 minutes for each session. For generalization and comparison, the research was designed to include 10 workshops, including 5 workshops with designers with cultural design experience and 5 workshops with designers who have no cultural design experience. The design projects also include product-based and service-based assignments, and the inspirations were selected from scattering 10 types of the listed Thai cultural heritage.

From the case studies, the total of 57 concepts were generated. Among those concepts, 24 concepts were from the conventional concept development method and 33 concepts were from the idea generation tool. As the number of ideas generated is one indicator of the effectiveness of the process, the higher number of ideas lead to higher probability of yielding high-quality ideas (Campbell, 1960; Diehl & Stroebe, 1987; Gallupe et al., 1992; Valacich, Mennecke, Wachter, & Wheeler, 1993), the research result proves that developing concept by using the tool is more effective than using the conventional method and that the tool is beneficial for concept development activity.

Regarding types of designer, the result shows that designers with no cultural-design experience generated 31 ideas whereas designers with cultural-design experience generated 26 ideas. The table displaying number of ideas generated is given below:

Table 4-22 Number of Ideas Generated

	DESIGNER TYPE										TOTAL
	CH-BASED					NCH-BASED					
CASE STUDY	A	B	C	D	E	F	G	H	I	J	
CONVENTIONAL METHOD	3	4	1	1	1	1	3	4	2	4	**24**
IDEA GENERATION TOOL	3	5	3	3	2	1	5	3	3	5	**33**
TOTAL NUMBER PER CASE	6	9	4	4	3	2	8	7	5	9	**57**
TOTAL NUMBER PER TYPE OF DESIGNER	26					31					**57**

In terms of format, it can be noticed that the ideas derived from conventional method were solely in paragraph format, while the ones derived from the tool were in combination of table, texts, paragraphs, and images. Such presentation assists designers to comprehend the ideas with minimum effort since the combination of texts and images are the medium that spark creativity and generally used in the design domain (Cheng, 2016; Gonçalves et al., 2014).

Idea Evaluation

The final phase of the research is the idea evaluation. The generated ideas from previous phase were evaluated based on the idea quality scales proposed by Dean et al. (2006). The scales consist of 4 key constructs to measure quality of an idea, including Novelty, Workability, Relevance, and Specificity. Each construct includes 2 subconstructs. Novelty construct includes Originality and Paradigm Relatedness. Workability includes Acceptability and Implementability. Relevance includes Applicability and Effectiveness. Specificity includes Completeness and Implicational Explicitness.

The judges rating each idea were combination of designers with rich experience in culture-related design and entrepreneurs in creative industries. Prior to the evaluation, the raters were given the scales with explanations of each score. The total of 57 concepts were evaluated. From the evaluation, the average score is presented below:

Table 4-23 Comparison of Average Scores (Subdimension Level) between Conventional Method (C) and Those of the Tool (MA)

SCORE COMPARISON		
SUBDIMENSION	**C**	**MA**
Originality	2.54	2.65
Paradigm Relatedness	2.23	2.59
Acceptability	3.19	3.26
Implementability	3.00	3.11
Applicability	2.75	3.09
Effectiveness	2.33	2.91
Completeness	2.00	2.58
Implicational Explicitness	2.23	2.61

Table 4-24 Comparison of Average Scores (Dimension Level) between Conventional Method (C) and Those of the Tool (MA)

SCORE COMPARISON		
DIMENSION	**C**	**MA**
NOVELTY	2.39	2.62
WORKABILITY	3.09	3.18
RELEVANCE	2.54	3.00
SPECIFICITY	2.11	2.59

Figure 4-21 Comparison of Average Scores (Dimension Level) between Conventional Method (C) and Those of the Tool (MA)

Comparing between the two idea generation methods based on idea evaluation criteria (Dean et al., 2006), in terms of dimension level, concepts derived from conventional ideation method received the average score of 2.39 for Novelty, 3.09 for workability, 2.54 for Relevance, and 2.11 for Specificity. On the other side, concepts generated from the ideation tool received the average score of 2.62 for Novelty, 3.18 for Workability, 3.00 for Relevance, and 2.59 for Specificity. Digging deeper in the subdimension level, ideas from conventional ideation method were rated with the average score of 2.54 for Originality, 2.23 for Paradigm Relatedness, 3.19 for Acceptability, 3.00 for Implementability, 2.75 for Applicability, 2.33 for Effectiveness, 2.00 for Completeness, and 2.23 for Implicational Explicitness. As for the score of ideas derived from the idea generation tool, the concepts were rated with the average score of 2.65 for Originality, 2.59 for Paradigm Relatedness, 3.26 for Acceptability, 3.11 for Implementability, 3.09 for Applicability, 2.91 for Effectiveness, 2.58 for Completeness, and 2.61 for Implicational Explicitness.

Idea Evaluation – Data Analysis

Analyzing the average score rated by judges, it can be seen that the average score of concepts generated by the proposed ideation tool received higher score in all dimensions of idea quality with 0.23 points higher in Novelty construct, 0.09 points in Workability Construct, 0.46 points in Relevance, and 0.48 points in Specificity Construct. The higher scores in the dimension level are the results of higher score in the subdimension level, which the score from ideas generated by the tool surpass that of the conventional method at 0.11 points in Originality, 0.36 points in Paradigm Relatedness, 0.07 points in Acceptability, 0.11 points in Implementability, 0.34 points in Applicability, 0.58 points in Effectiveness, 0.58 points in Completeness, and 0.38 points in Implicational Explicitness.

The results show that the proposed tool is capable of assisting designers and creative professionals in developing higher-quality ideas than using their traditional ideation methods in all aspects. The discrepancy in chronological order is Specificity, Relevance, Novelty, and Workability, respectively.

For the high discrepancy in Specificity and Relevance construct, this fact reveals that the outstanding strengths of the tool lay in the ability to help users develop ideas that are effective, complete, and are directly related to a given assignment. In essence, the concepts developed by the tool tend to illustrate clear path as to how the ideas reflect on a given project, how the ideas will yield the outcome, and what the context of the ideas will be like, as shown by 0.58 points difference in Completeness, 0.58 points difference in Effectiveness, and 0.38 points difference in Implicational Explicitness, respectively.

Regarding the Novelty construct, the higher score of 0.24 points is the result of 0.11 points higher score in Originality and the striking 0.36 points higher score in Paradigm Relatedness. The results show that ideas generated from the tool tend to be more radical and transformational and are uncommon in the industry. The reasons behind such outcome may reside in the forced-association thinking mode of morphological analysis

technique; as the technique requires users to find association between values along the dimensions in order to come up with ideas (Chou, 2014; Geum et al., 2016; Geum & Park, 2016; C. Kim et al., 2008; Moon & Han, 2016; Waal & Ritchey, 2007), the fusion of product attributes with inspirational texts and images from intangible, behavioral, and tangible layers of culture lead to radically creative ideas, differing from those normally encounter in the industry.

As for the Workability, the construct consists of 2 subdimension, Acceptability and Implementability. The ideas generated from the tool were rated with 0.07 points and 0.11 points higher than those obtained from conventional ideation method, respectively. This results in a flat 0.09 points improvement.

In conclusion, by evaluating ideas generated from the tool compared to those derived from traditional method, the proposed tool yields better results in terms of both quantity and also quality of ideas; employing the idea generation tool helps creative professionals to generate more ideas than using their conventional ideation method. In addition, in terms of idea quality, employing the tool results in higher-quality ideas, particularly in the Specificity, Relevance, and Novelty dimensions.

Research 2: Hierarchical Value Map of Consumers purchasing Culture-driven Products

Research 2 aims at identifying the attributes-consequences-values linkages of consumers purchasing culture-driven products. Data were collected from 30 interviewees by laddering interview method. Each interview ranged from 45-60 minutes. The interviewers were probed with the series of questions “Why is this important to you?” so as to reveal insights climbing up the abstraction level.

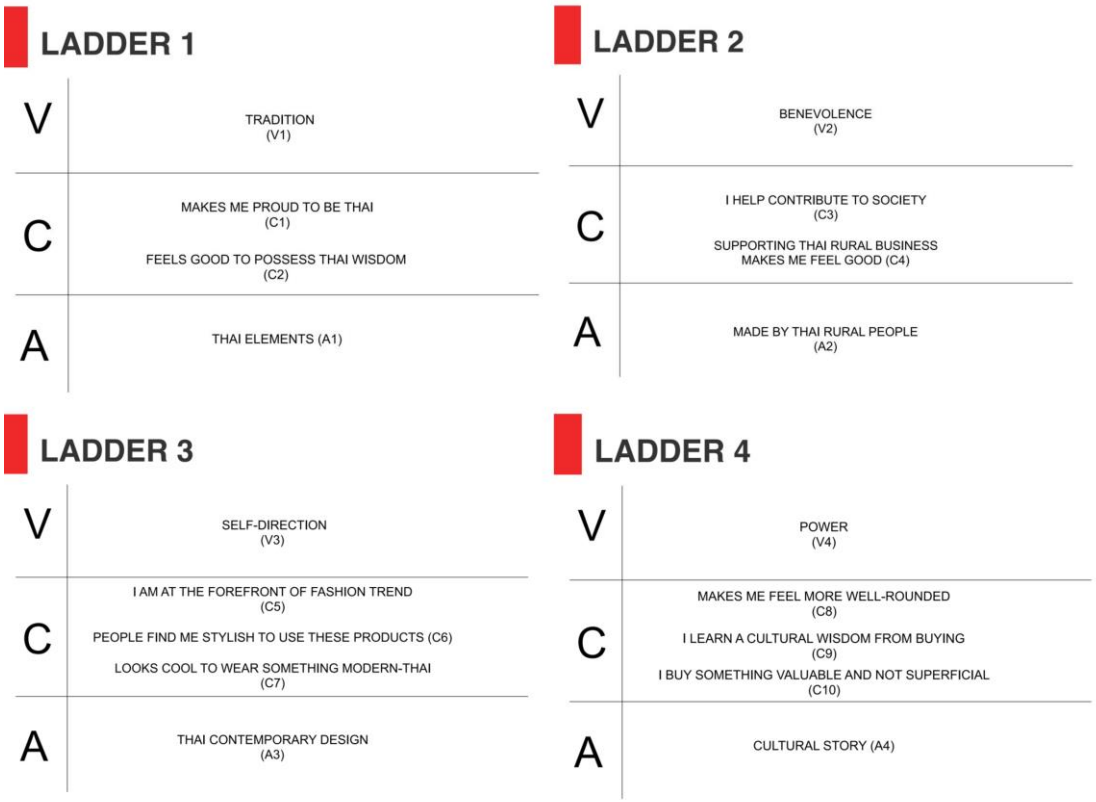
From the study, the researcher was able to collect 9 product attributes, 24 consequences, and 6 values from conducting content analysis and codification. 17 ladders were identified prior to applying cut-off values.

The summary of collected attributes, consequences, and values and the ladders are given in the following pages:

Table 4-25 Summary of Content Codes

CONCRETE ATTRIBUTES	FUNCTIONAL CONSEQUENCES	PSYCHO-SOCIAL CONSEQUENCES	INSTRUMENTAL VALUES
1 Thai Elements	10 I get Good Stuffs from the Region	21 Makes Me Feel Proud to be Thai	**TERMINAL VALUES**
2 Thai-contemporary Design	11 Makes Me Feel Healthy	22 Feels Good to Possess Thai Wisdom	34 Tradition
3 Location-specific Material & Production	12 I Want to Do It by Myself	23 I Help Contribute to Society	35 Benevolence
4 Natural Material	13 Looks Cool to Wear Something Thai Contemporary	24 Supporting Thai Rural Business Makes Me Feel Good	36 Self-direction
ABSTRACT ATTRIBUTES	14 Get to Experience New Things	25 People Find Me Stylish to Use These Products	37 Power
5 Made by Thai Rural People	15 I Take Selfies and Have Fun with Friends	26 I am at the Forefront of Fashion Trend	38 Hedonism
6 Cultural Story	16 I buy Something Valuable	27 Makes ME Feel Well-rounded	39 Stimulation
7 Local Wisdom	17 I Learn Cultural Wisdom from Buying	28 I feel Happy to use High-quality Products	
8 History Association	18 Reminds Me that I Visited the Place	29 I Help Nourish Thai Culture	
9 Authentic Local Experience	19 Reminds Me of the Historical Events	30 Makes Me Feel Excited	
	20 Reminds Me of Old Days (Nostalgia)	31 I feel Proud that I have been There	
		32 Immerse Myself in That Culture	
		33 It is Rare Item	

Figure 4-22 Ladders Obtained from Laddering Interview (Prior to Applying Cut-off Value)



LADDER 5

V	HEDONISM (V5)
C	I FEEL HAPPY TO USE HIGH-QUALITY PRODUCTS (C11) I GET GOOD STUFF FROM THE REGION (C12)
A	LOCATION-SPECIFIC MATERIAL & PRODUCTION (A5)

LADDER 6

V	TRADITION (V1)
C	MAKES ME PROUD TO BE THAI (C1) I HELP PROLONG/ NOURISH THAI CULTURE (C13)
A	LOCAL WISDOM (A6)

LADDER 7

V	HEDONISM (V5)
C	REMINDS ME THAT I VISITED THE PLACE (C14) REMINDS ME OF THE PLACE/ HISTORICAL EVENTS (C15)
A	HISTORY ASSOCIATION (A7)

LADDER 8

V	STIMULATION (V6)
C	MAKES ME FEEL EXCITED (C16) GET TO EXPERIENCE NEW THINGS (C17)
A	CULTURAL STORY (A4)

LADDER 9

V	STIMULATION (V6)
C	I TAKE SELFIES AND HAVE FUN WITH FRIENDS (C18) GET TO EXPERIENCE NEW THINGS (C17)
A	AUTHENTIC LOCAL EXPERIENCE (A8)

LADDER 10

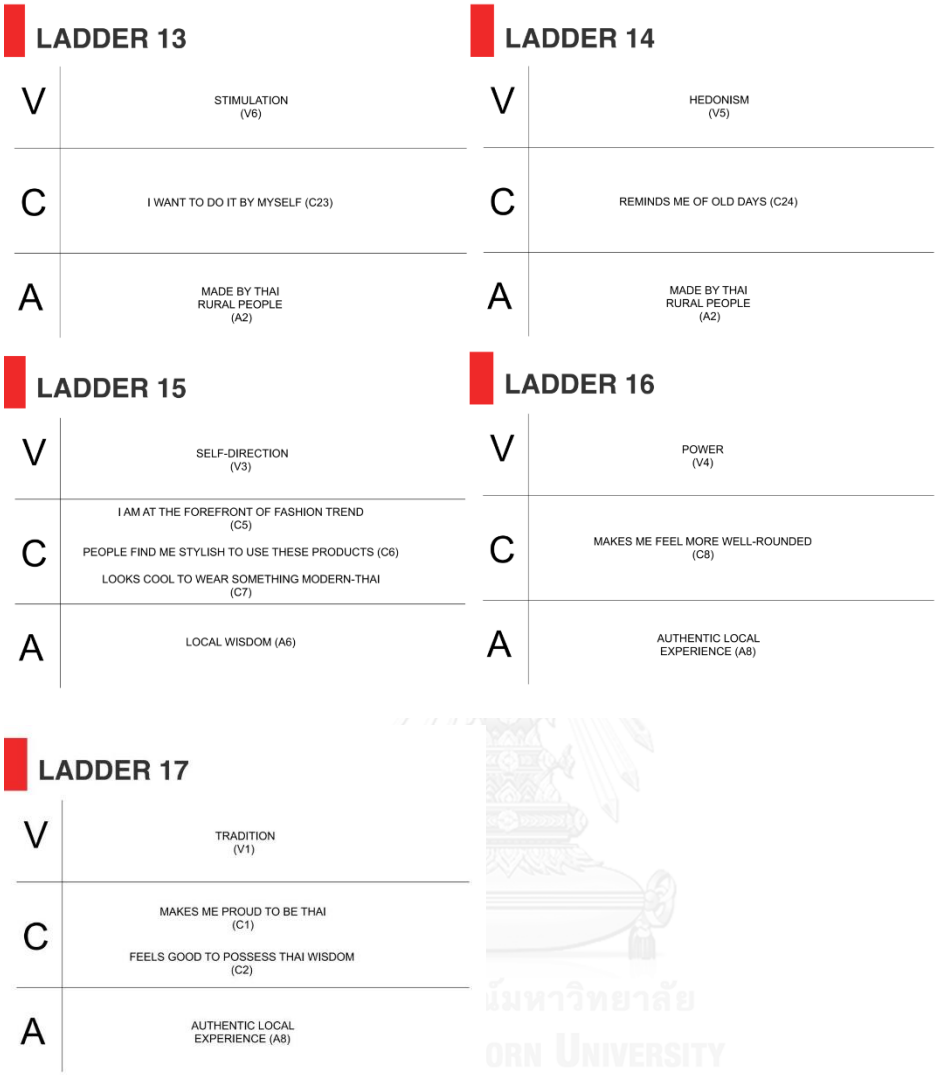
V	STIMULATION (V6)
C	I FEEL PROUD THAT I HAVE BEEN THERE (C19) IMMERSE MYSELF IN THAT (SUB) CULTURE (C20)
A	AUTHENTIC LOCAL EXPERIENCE (A8)

LADDER 11

V	HEDONISM (V5)
C	MAKES ME FEEL HEALTHY (C21)
A	NATURAL MATERIAL (A9)

LADDER 12

V	HEDONISM (V5)
C	FEELS GOOD TO POSSESS THAI WISDOM (C2) IT IS RARE ITEMS/ HARD TO FIND (22)
A	AUTHENTIC LOCAL EXPERIENCE (A8)



The second step of the analysis, the contruction of the implication matrix, represents the number of times each element leads to another. The number of relations is presented through numbers in a fractional form; the direct relations appear to the left of the decimal point and the indirect relations to the right. Multiple cut-off values were applied and the cut-off value of 2 was chosen as it represented between 60 and 70 percent of active links at or above the cut-off level (Arsil et al., 2014; Gengler & Reynolds, 1995; T.J. Reynolds & Gutman, 1988). The data were analyzed using Hierarchical Value Map software, LadderUX. Applying the cut-off value of 2, the overall result is as follows:

Table 4-26 Result Summary

INDICATORS	NUMBERS
Direct Links	170
Indirect Links	187
Total Links	357
Respondents	30
Ladders	55
Average Elements per Ladder	4.09
Average Ladders per Respondent	1.83
Direct Links above COV	158
Indirect Links above COV	176
Links above COV	334
Total Cells	91
Cells above COV	71
% Cells above COV	78.02%

The next step of analysis is the construction of hierarchical value map; the chains are built from the implication matrix. The implication matrix and the hierarchical value map is presented in the following pages.

Table 4-27 Implication Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																				
2													7|0							
3										3|0										
4											3|0									
5												1|0								1|0
6														6|0		4|0	0|4			
7													1|0							
8																		0|3	3|0	
9														2|0	0|2					
10																				
11																				
12																				
13																				
14															2|0					
15																				
16																	4|0			
17																				
18																			3|0	
19																				
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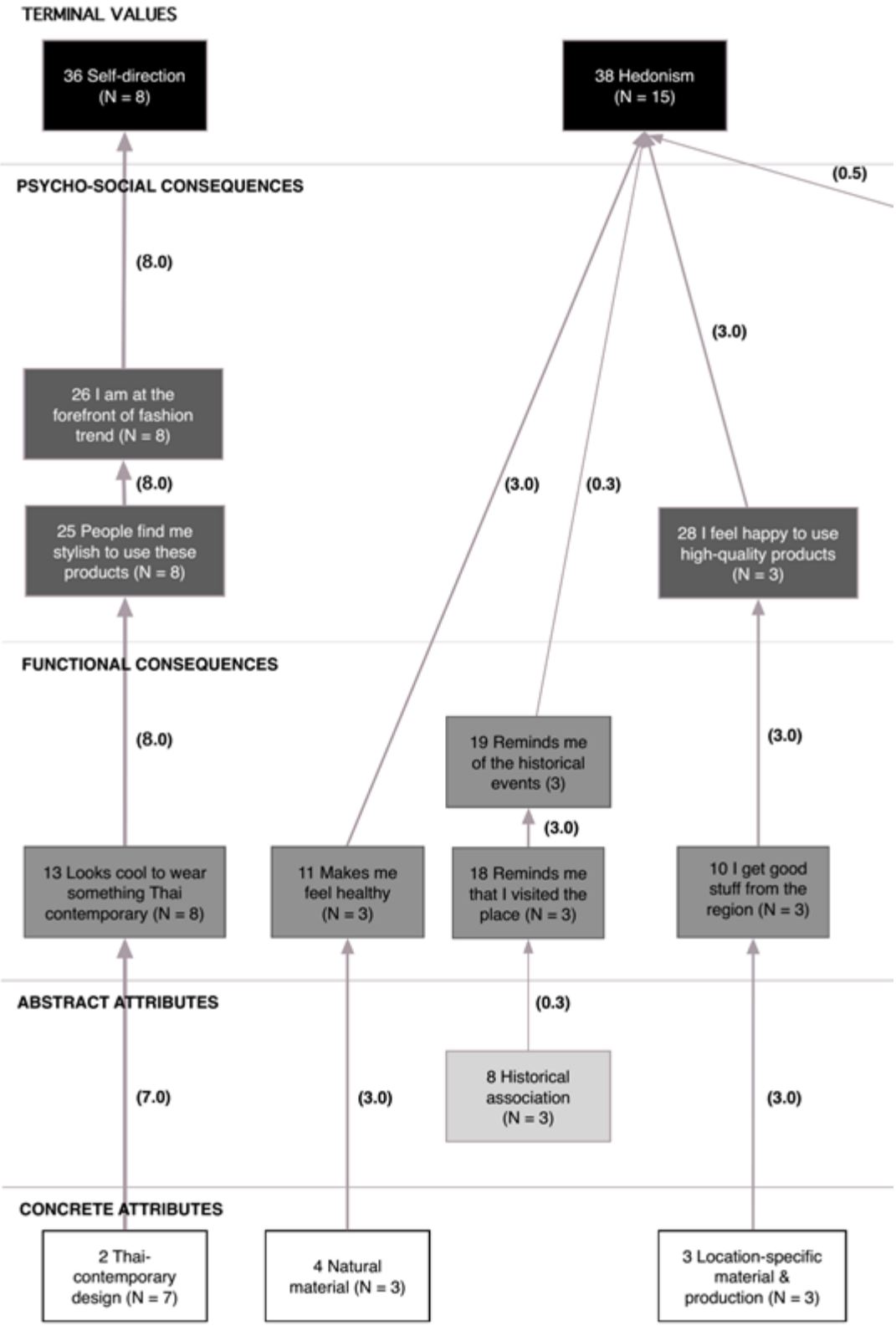
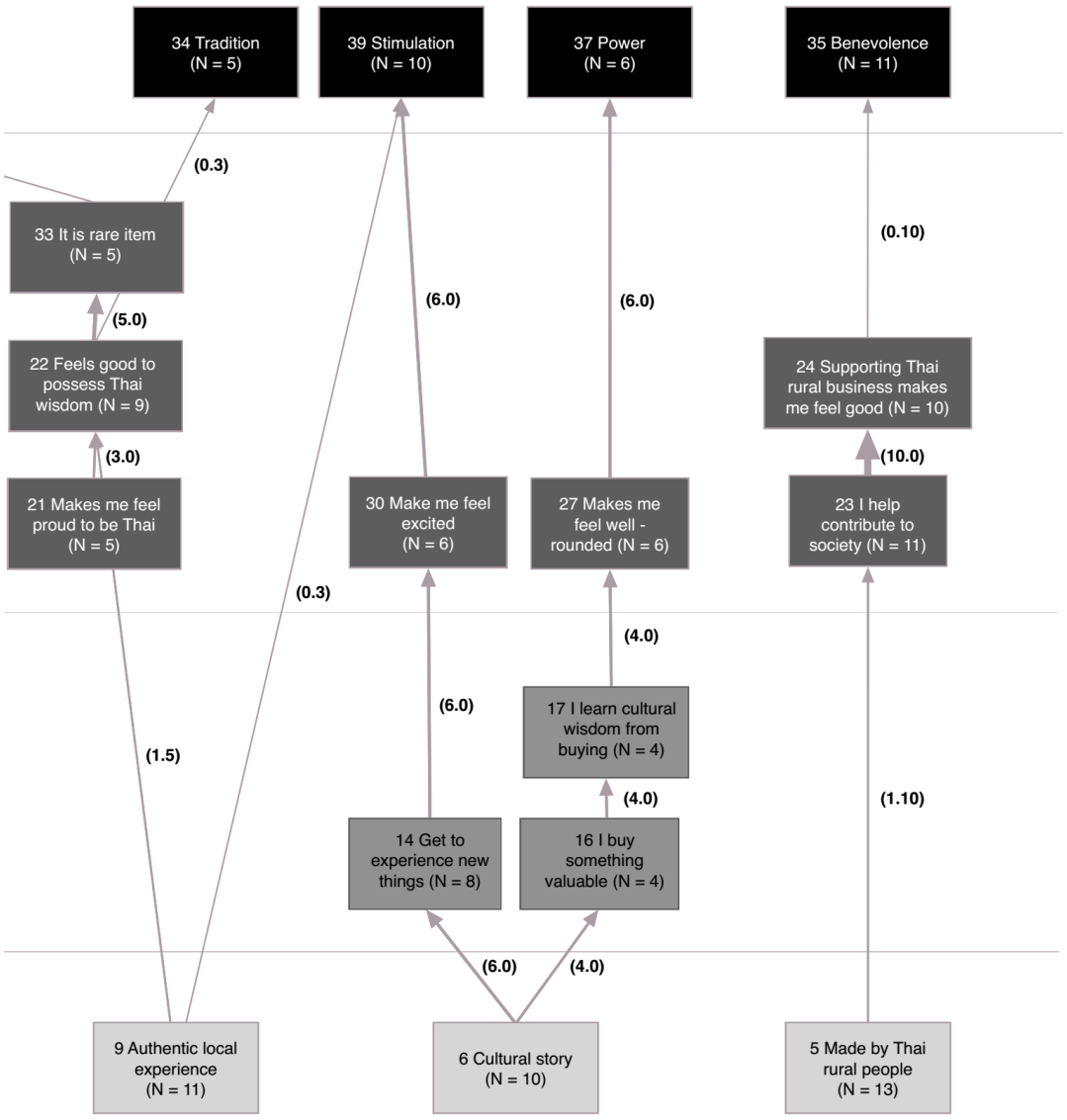
35																				
36																				
37																				
38																				
39																				
	0|0	0|0	0|0	0|0	0|0	0|0	0|0	0|0	0|0	3|0	3|0	1|0	8|0	8|0	2|2	4|0	4|4	0|3	6|0	1|0

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	
0|2	2|0												0|2						2|4
				0|7	0|7										0|7				7|21
							0|3										0|3		3|6
																	0|3		3|3
	0|1	1|10	10|0											0|11			0|1	0|1	13|24
						0|4			0|6							0|4		0|6	10|24
0|2				0|1	0|1			2|0					0|2		0|1				3|7
																	0|3		3|6
0|1	1|5					2|0				0|1	1|0	5|0	0|1			0|2	0|5	0|3	11|20
							3|0										0|3		3|3
																	3|0		3|0
																		1|0	1|0
				8|0	0|8										0|8				8|16
									6|0									0|8	8|8
																		2|0	2|0
						0|4										0|4			4|8
						4|0										0|4			4|4
																	3|0		6|0
																	0|3		0|3
																	1|0		1|0
	3|0							2|0					5|0						10|0
		1|0										5|0	0|3	1|0			5|0		12|3
			10|0											10|1					20|1
														0|10					0|10
					8|0										0|8				8|8
															8|0				8|0
																6|0			6|0
																	3|0		3|0
													0|2						0|2
																		6|0	6|0
											1|0							1|0	2|0
																		0|1	0|1
																	0|5		0|5
																			0|0
																			0|0
																			0|0
																			0|0
																			0|0
																			0|0
0|5	6|6	2|10	20|0	8|8	8|16	6|8	3|3	4|0	6|6	0|1	2|0	10|0	5|10	11|22	8|24	6|14	15|26	10|19	

Figure 4-23 The Hierarchical Value Map




34 Tradition (N = 5)
39 Stimulation (N = 10)
37 Power (N = 6)
35 Benevolence (N = 11)
(0.3)
33 It is rare item (N = 5)
(6.0)
(6.0)
(0.10)
(5.0)
22 Feels good to possess Thai wisdom (N = 9)
24 Supporting Thai rural business makes me feel good (N = 10)
(3.0)
(10.0)
21 Makes me feel proud to be Thai (N = 5)
30 Make me feel excited (N = 6)
27 Makes me feel well - rounded (N = 6)
23 I help contribute to society (N = 11)
(0.3)
(4.0)
(6.0)
17 I learn cultural wisdom from buying (N = 4)
(1.5)
(4.0)
(1.10)
14 Get to experience new things (N = 8)
16 I buy something valuable (N = 4)
(6.0)
(4.0)
9 Authentic local experience (N = 11)
6 Cultural story (N = 10)
5 Made by Thai rural people (N = 13)

Data Analysis

From the outcome of 30 respondents, the implication matrix consists of 170 direct links and 187 indirect links. After applying the cut-off value of 2, the direct links are reduced to 158, and indirect links are reduced to 176. The percent of cells above cut-off value is 78.02%, complying with guidelines by T.J. Reynolds and Gutman (1988). The total number of ladders is 55, and the average elements per ladder is 4.09. From 30 respondents, the average ladder per person is 1.83.

In terms of Centrality Index, Made by Thai Rural People, Authentic Local Experience, and Cultural Story, respectively, are the top 3 product attributes. This signifies that consumers regard those attributes as important ones when making buying decision. As for consequences, I help Contribute to Society, Supporting Thai Rural Business makes Me feel Good, and Feels Good to Possess Thai Wisdom are the top 3 consequences, respectively. These 3 consequences are the critical ones driven by product attributes. Lastly, in terms of values, Hedonism, Benevolence, and Stimulation are the key 3 values, respectively. Cultural products lead to these 3 values in the mind of consumers.

The table listing Centrality Index of the elements are displayed in the following table.

Table 4-28 Centrality Index

	CODE	ELEMENTS	CENTRALITY INDEX (CI)
ATTRIBUTES	1	Thai Elements	0.03
	2	Thai-Contemporary Design	0.08
	3	Location-specific Material & Production	0.04
	4	Natural Material	0.04
	5	Made by Thai Rural People	0.15
	6	Cultural Story	0.11
	7	Local Wisdom	0.04
	8	History Association	0.04
	9	Authentic Local Experience	0.12
CONSEQUENCES	10	I get good stuff from the region	0.07
	11	Makes me feel healthy	0.07
	12	I want to do it by myself	0.02
	13	Looks cool to wear something Thai contemporary	0.18
	14	Get to experience new things	0.18
	15	I take selfies and have fun with friends	0.05
	16	I buy something valuable	0.10
	17	I learn cultural wisdom from buying	0.10
	18	Reminds me that I visited the place	0.07
	19	Reminds me of the historical events	0.07
	20	Reminds me of old days (Nostalgia)	0.02
	21	Makes me feel proud to be Thai	0.12
	22	Feels Good to possess Thai wisdom	0.21
	23	I help contribute to society	0.24
	24	Supporting Thai rural business makes me feel good	0.22
	25	People find me stylish to use these products	0.19
	26	I am at the forefront of fashion trend	0.18
	27	Makes me feel well-rounded	0.14
	28	I feel happy to use high-quality products	0.07
	29	I help nourish Thai culture	0.05
	30	Makes me feel excited	0.14
	31	I feel proud that I have been there	0.02
	32	Immerse myself in that culture	0.02
	33	It is rare item	0.12
VALUES	34	Tradition	0.06
	35	Benevolence	0.12
	36	Self-direction	0.09
	37	Power	0.07
	38	Hedonism	0.17
	39	Stimulation	0.11

Based on the hierarchical value map analysis, 8 patterns of value emerge From product attributes-values linkages. The 8 dominant linkages include Thai Contemporary Design – Self-direction, Natural Material – Hedonism, Historical Association – Hedonism, Location-specific Material and Production – Hedonism, Authentic Local Experience – Tradition, Cultural Story – Stimulation, Cultural Story – Power, and Made by Thai Rural People – Benevolence.

The detail is discussed below:

1. Thai Contemporary Design – Self-direction

Consumers consider Thai contemporary design to be a critical attribute of culture-driven products. They feel that such style makes them look more stylish and leads to the personal value of self-direction; in essence, they develop their own lifestyle and reflect their personal tastes through consumption and usage of culture-driven products with the mix of Thai and modern image.

2. Natural Material – Hedonism

Consumers consider natural material to be a critical attribute of culture-driven products. In other words, cultural products should be made of natural material. Such attribute makes consumers feel healthy and consequently lead to the personal value of Hedonism, pleasure and sensuous gratification for oneself.

3. Historical Association – Hedonism

Consumers consider historical association to be a critical attribute of culture-driven products. Culture-driven products should be ingrained historical elements of the past, essentially of that particular place. The attribute reminds consumers that they visited the place and allow them to appreciate the heritage. The attribute ultimately leads to the personal value of hedonism.

4. Location-specific Material and Production – Hedonism

Consumers consider location-specific material and production to be a critical attribute of culture-driven products. Culture-driven products are made of material and production process found only in the particular region. Such attribute makes consumers feel that they acquire exclusive products and that products are high quality. Such feeling leads to personal values of Hedonism.

5. Authentic Local Experience – Tradition

Consumers consider authentic local experience production to be a critical attribute of culture-driven products. Culture-driven products should

provide such experience to consumers. The attribute makes consumers feel proud to be Thai and lead to the personal value of Tradition.

6. Cultural Story – Stimulation

Consumers consider cultural story to be a critical attribute of culture-driven products. Culture-driven products should incorporate cultural story as an element. Consumers feel that they have opportunity to experience new things through the element, generating excitement; the attribute ultimately link to personal value of stimulation.

7. Cultural Story – Power

Consumers consider cultural story to be a critical attribute of culture-driven products. Cultural story in culture-driven products create the sense that consumers obtain valuable products and that they learn cultural wisdom from purchasing activity, making them feel more knowledgeable. The ultimate personal value of this chain is Power.

8. Made by Thai Rural People – Benevolence

Consumers consider cultural products made by locals to be a critical. The attribute allows consumers to feel that they contribute something to society, consequently making them feel good about themselves. The personal value at the end of this chain is Benevolence, preservation and enhancement of the welfare of people with whom one is in frequent personal contact.

From the 8 linkages, Thai-Contemporary Design – Self-Direction, Cultural Story – Stimulation, and Cultural Story – Power show stronger linkages than the other. This fact Indicates that the 3 linkages are considered dominant ones and that the patterns are more apparent.

Reflecting on the Schwartz's values, it can be seen that consumers purchasing cultural products unconsciously link product attributes with Benevolence, Self-Direction, Stimulation, Hedonism, Power, and Tradition. Those values scatter across Conservation – Openness to Change and also Self-Transcendence – Self-Enhancement continuum. The fact suggests that consumers purchase cultural products to satisfy personal

values, which cover every quadrant of human value typology according to Schwartz.

The data obtained from this research are to incorporated into the decision support system, which will indicate the consequences and value that consumers hold once selecting a particular product attribute. Such information would help users in selecting and screening ideas so as to conclude the final concept.

Chapter 5
CONCEPT GENERATION TOOL
FOR CULTURE-DRIVEN PRODUCTS

The obtained results from Research 1 and Research 2 are the key information, which are incorporated in the web-based Concept Generation Tool for Culture-driven Products. The tool includes 2 main modules, Idea Generation and Idea Screening. Results from Research 1 is developed into Idea Generation Module while Research 2 is developed into Idea Screening Module. The description of each model is presented below:

Idea Generation Module

Developing from cultural design model theory and morphological analysis, the Idea Generation module allows users to generate multiple ideas, employing the Thai cultural heritage as source of inspiration. The process of usage is as follows:

1. Choose a Thai cultural inspiration
2. Key in product or service
3. Key in product or service components
4. Generate concepts from Morphological Matrix
5. Summarize the concepts and save

The detail description of each step is presented below:

Choose a Thai cultural inspiration

This step is the first phase of the tool. Users are presented with list of 7 domains of the Thai cultural heritage. When a domain is selected, users are presented with the Thai cultural heritage in that particular domain, classifying by region. The chosen Thai cultural heritage will display image and texts describing the background of that particular cultural heritage so that users can gain brief background regarding the selected inspiration.

Once reading the background, users must click the confirm button to proceed to the next step.

The step-by-step screenshots of the user interface are given below:

Figure 5-1 User Interface – Choose a Thai Cultural Inspiration

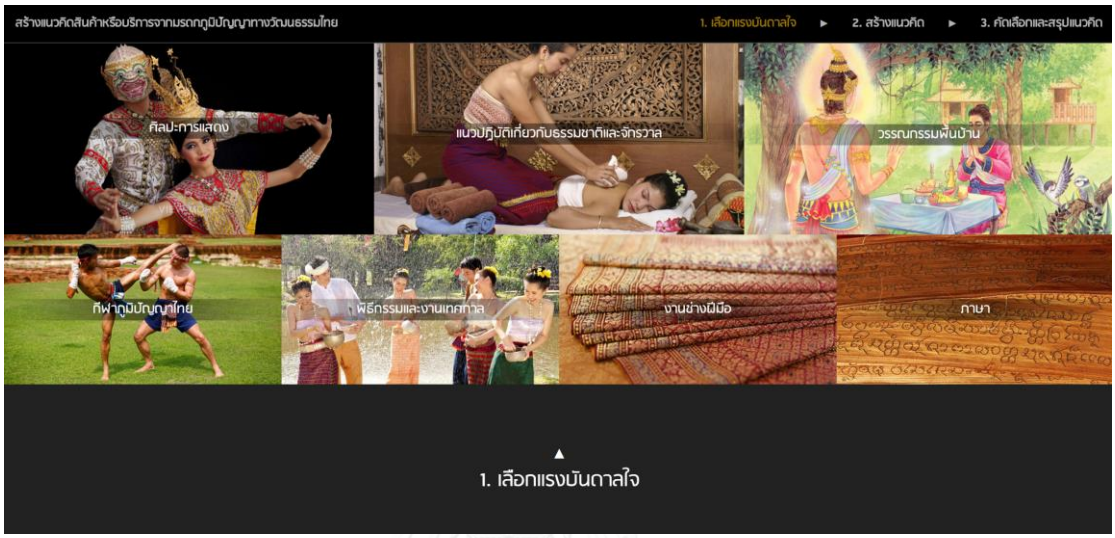


Figure 5-2 User Interface – Choose a Thai Cultural Inspiration

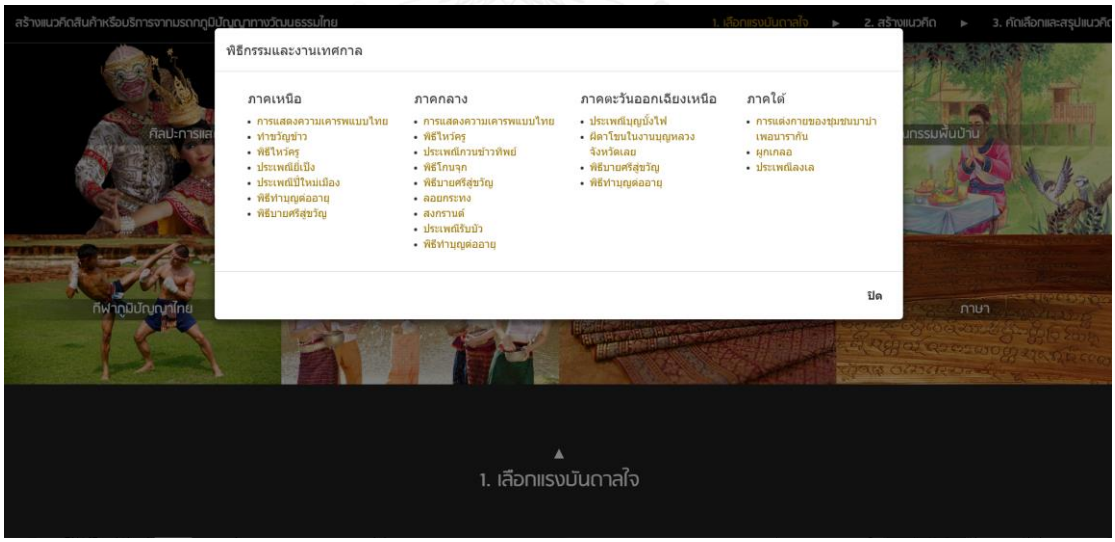
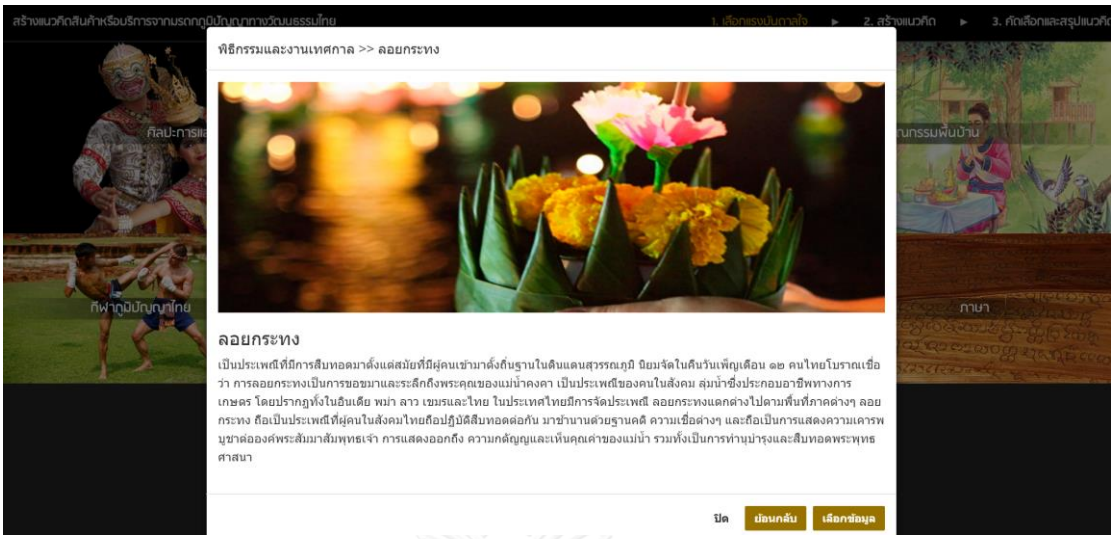


Figure 5-3 User Interface – Choose a Thai Cultural Inspiration



Key in product or service

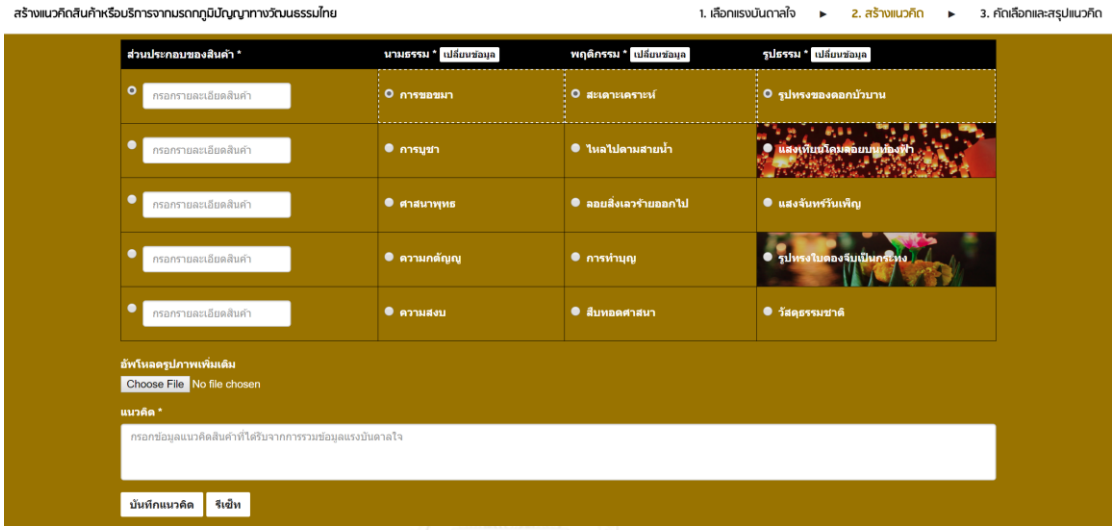
In the second phase, users enter the concept generation phase and are presented with instruction to do the conceptualization. The chosen inspiration is presented in the box, and, at the following box, users are required to key in product or service name they wish to conceptualize.

Figure 5-4 User Interface – Key in Product or Service

Key in product or service components

After filling in the product or service name, users move on to the morphological matrix, the ideation table to creatively come up with concepts based on the morphological analysis thinking method.

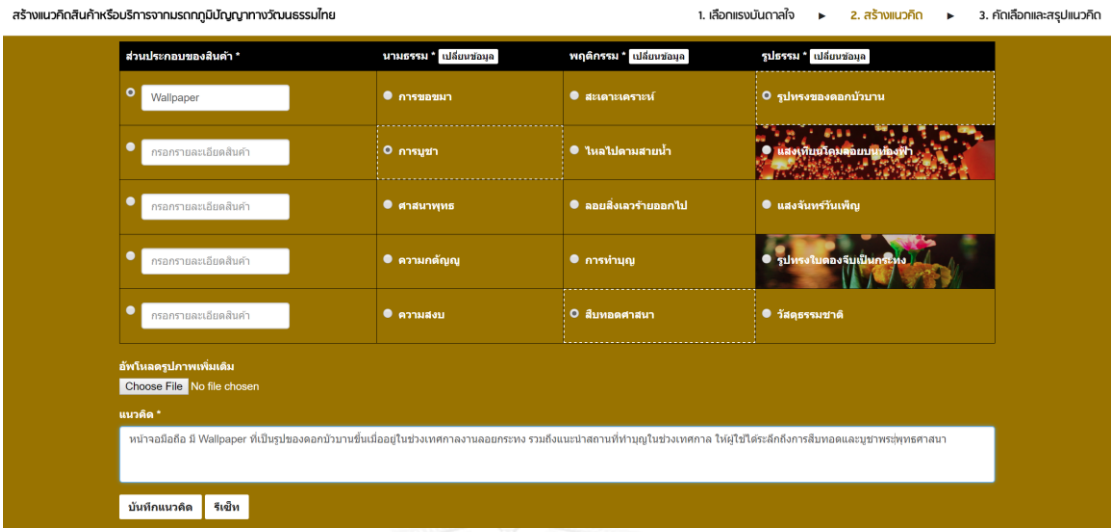
Figure 5-5 User Interface – Key in Product or Service Components



Generate concepts from Morphological Matrix

Users fill in product or service component of the product or service they wish to conceptualize on the first column of the matrix. For instance, if the design project is a cellphone, the product components can be buttons, screen, or case. Then users select inspiration texts, one from each column of intangible, behavioral, and tangible layers. Users can click the “change” button on the top of the column of each layer to randomly switch the keywords. While selecting keywords, users are required to find the association among the product or service component and keywords of each layer to derive at the concept. The description of the concept needs to be filled in the box at the bottom of the matrix. In addition, users can upload an image they wish in order to help solidify the concept.

Figure 5-6 User Interface – Generate concepts from Morphological Matrix



Summarize the concepts and save

Once finish describing the concept. Users can click the “save” button to record the generated ideas. Users can generate and save ideas as many as they wish. The ideas are presented in table format containing the product or service type, the component, the keywords with images, and the description of the concept.

Figure 5-7 User Interface – Summarize the concepts and save

Idea Screening Module

The Idea Screening Module assists users to select and screen ideas in terms of consumer aspect based on the premise of cultural products. In this module, users are required to link their generated ideas with a list of product attributes derived from research 2. The idea generation support system will display category of consumer values linked from the chosen product attributes, which users can judge each idea in the holistic view, including cultural elements, concept ideas, product attributes, and type of consumer values. The information will assist users in selecting, screening, or combining ideas so as to derive at the final concepts. The process is as follows:

1. Link the generated ideas with a list of product attributes
2. The tool displays the chosen product attributes linked to consumer values
3. Select, screen, or combine ideas
4. Derive at final concepts

The detail of each step is described in detail below:

Link the generated ideas with a list of product attributes

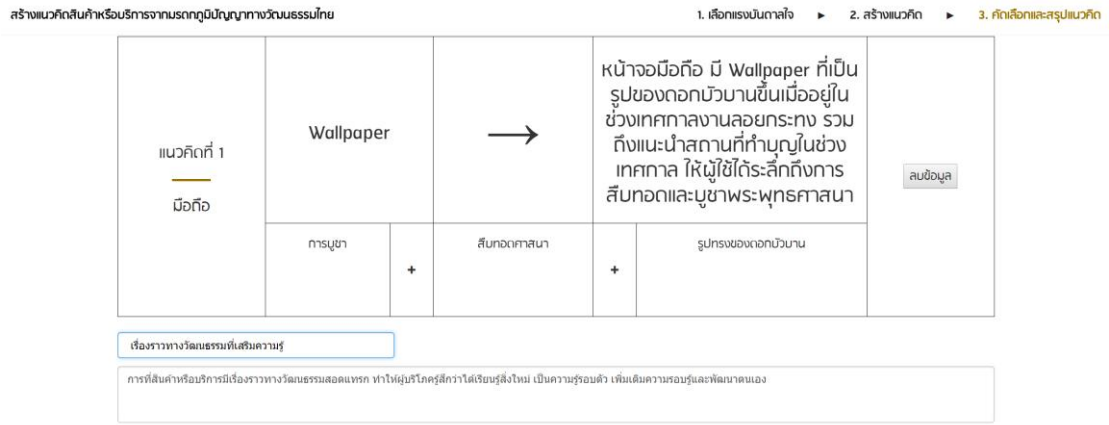
After generating ideas, each idea displays a dropdown box at the bottom of the presented table. Users are required to choose 1 from 8 product attributes obtained from the research 2, the means-end chain analysis that reveal 8 product attributes of cultural products that consumers prefer when making purchasing decision. Users should choose product attribute that their developed concept is likely to convey. Those product attributes include Thai Contemporary Design, Natural Material, Historical Association, Location-specific Material and Production, Authentic Local Experience, Cultural Story, and Made by Thai Rural People.

Figure 5-8 Link the generated ideas with a list of product attributes

The tool displays the chosen product attributes linked to consumer values

Once a product attribute is selected, the tool displays consumer values linked with that particular product attribute. From the result of research 2, the means-end chain analysis, 8 chains contain Thai Contemporary Design – Self-direction, Natural Material – Hedonism, Historical Association – Hedonism, Location-specific Material and Production – Hedonism, Authentic Local Experience – Tradition, Cultural Story – Stimulation, Cultural Story – Power, and Made by Thai Rural People – Benevolence.

Figure 5-9 Link the generated ideas with a list of product attributes



Select, screen, or combine ideas

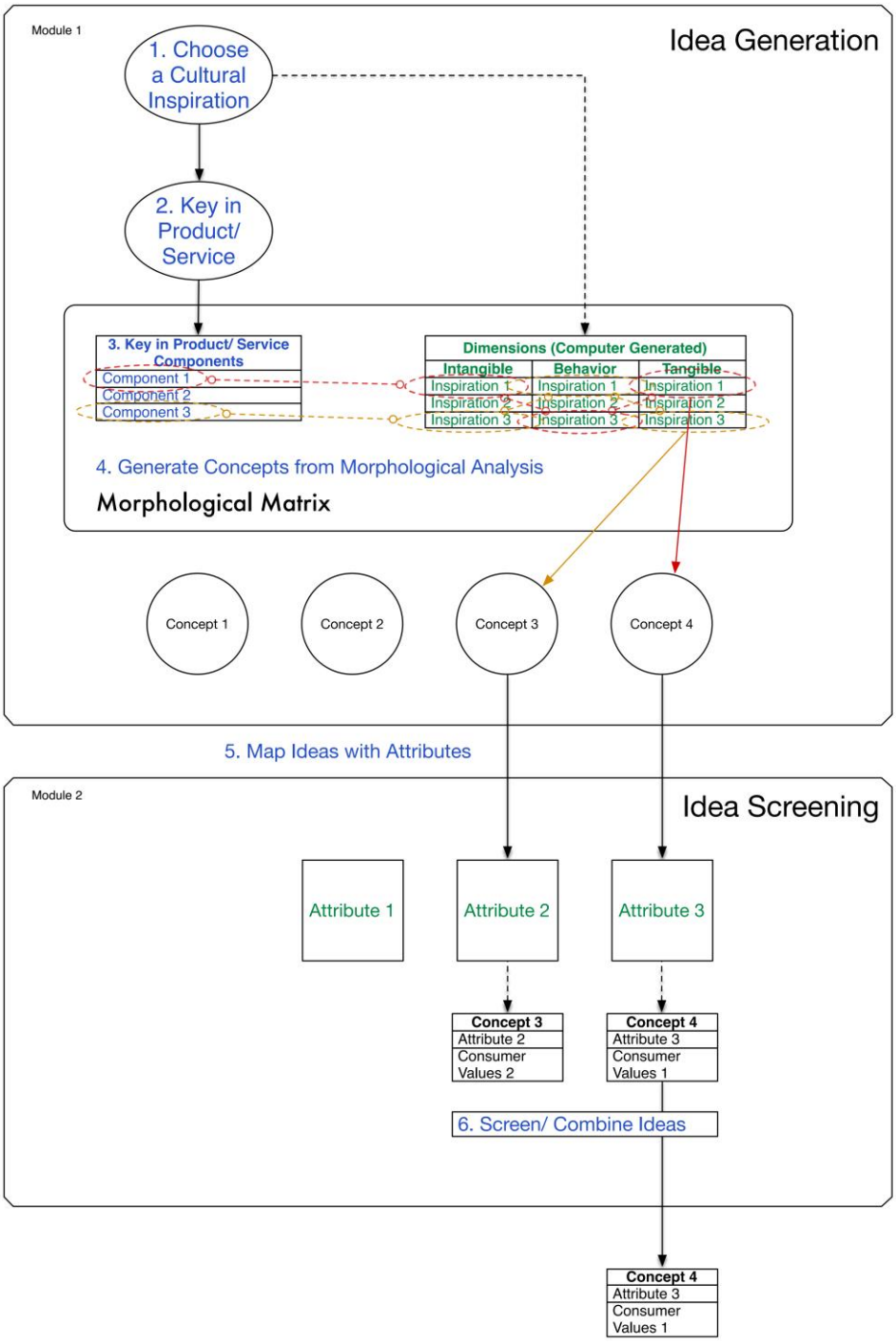
Once the ideas are generated, the list of ideas appear at the bottom of the page, which users can add, delete, or combine the ideas together. In essence, the module is designed to allow iterative process as idea screening activity should be conducted in such nature (Cao, Zhao, & Nagahira, 2011)

Derive at final concepts

In case users wish to add further description or combine multiple ideas together, users need to fill in the description in the “additional concept” box at the bottom of the page so as to summarize the final concept before printing out by clicking the “print” button.

From the above instruction on how to use the idea generation tool, the idea generation support system assisting creative professionals to conceptualize ideas, the process can be described in the usage diagram. The usage diagram of the Idea Generation Tool is presented below:

Figure 5-10 Usage diagram



Chapter 6
TEST OF USABILITY AND TECHNOLOGY COMMERCIALIZATION

Research 3: Usability Test by The Technology Acceptance Model

After the development of the idea generation support system, the researcher conducted action research employing Technology Acceptance Model to test the usability with at least 30 target users. Anonymous questionnaires were used to gain quantitative data. The questions in the instrument are linked with variables in the Technological Acceptance Model for further statistical analysis.

Demographic Data

In terms of demographic, the data were collected from 31 respondents. Of those, 51.6% were female and 48.4% were male. 9.7% of the respondents are in the age between 41-50, 25.8% are in the age between 20-30, and 64.5% are in the age of 31-40 years old. Regarding the education, 3.2% of the respondents did not have Bachelor's degree, 38.7% have completed their Bachelor's degree, and 58.1% of the respondents hold Master's degree.

Figure 6-1 Sex of Respondents

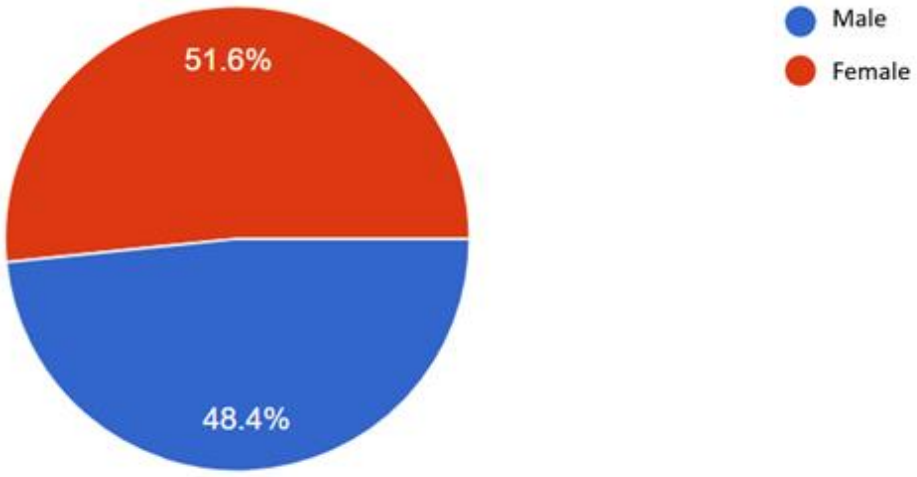


Figure 6-2 Age of Respondents

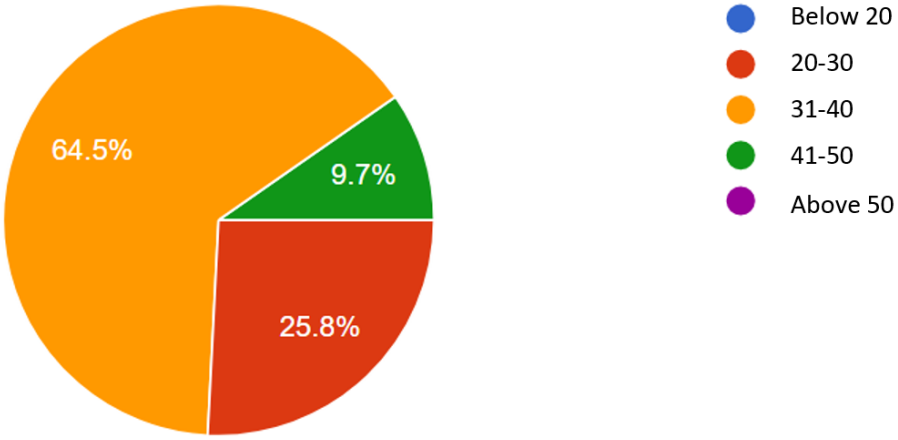
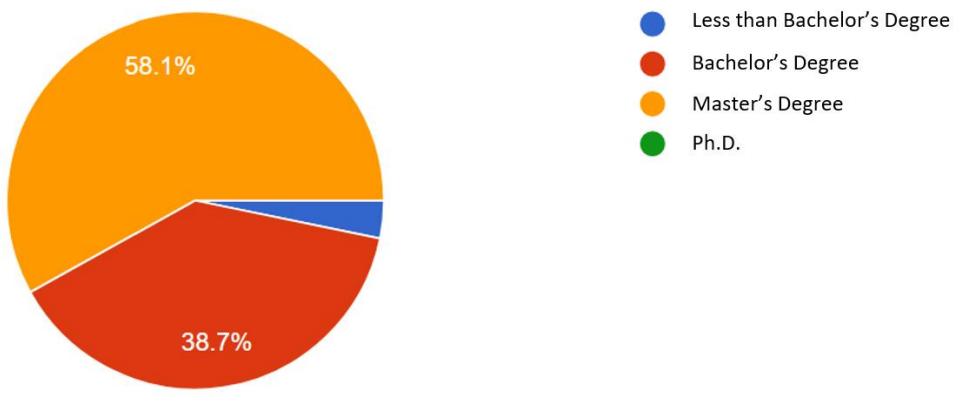


Figure 6-3 Education Level of Respondents



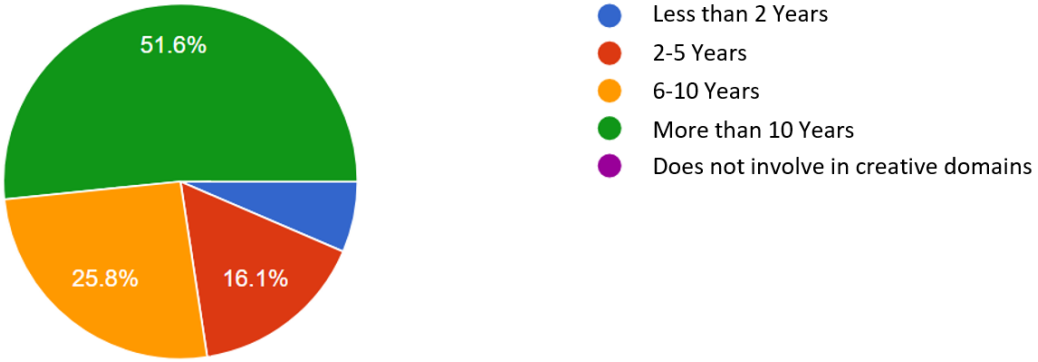
Regarding occupation and business type, 61.3% of the respondents are designers and creative professionals in organizations, while 38.7% are business owners. 25.81% are in production and manufacturing sector, 64.52% are in service sector, 6.45% are in retail business sector, and 3.23% are in wholesale business sector. Categorizing businesses in the domain of creative industries, 12.91% are in craft industry, 6.45% are in Thai food industry, 3.23% are in film and video, 35.48% are in design, 9.68% are in fashion, 12.91% are in advertising, 9.68% are in architecture, 3.23% are in software, and 6.45% are in non-creative industries.

Table 6-1 Percent of Respondents Classified by Type of Creative Industries

INDUSTRIES	PERCENT OF RESPONDENTS
Craft	12.90%
Thai Food	6.45%
Film and Video	3.23%
Design	35.48%
Fashion	9.68%
Advertising	12.90%
Architecture	9.68%
Software	3.23%
Other	6.45%
TOTAL	100.00%

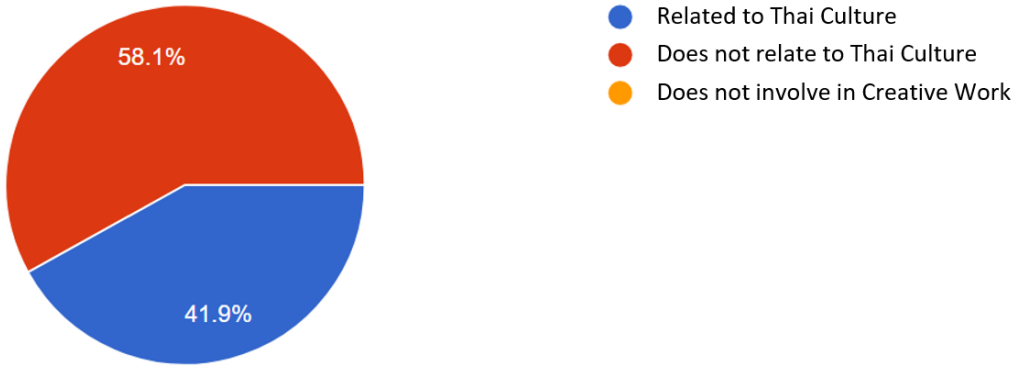
Majority of the respondents have work experience in creative areas more than 10 years, accounting for 51.6% of the total respondents. 25.8% of the respondents have 6-10 years of work experience in creative areas, 16.1% of the respondents have 2-5 years of experience, and 6.5% of the respondents have work experience in creative areas less than 2 years.

Figure 6-4 Work Experience in Creative Domains



Lastly, when asking about whether their creative work is related to the Thai culture or not, 58.1% of the respondents do not have their work related to the Thai culture, while 41.9% have their work related to the Thai culture.

Figure 6-5 Creative Work in Relation to the Thai Culture



Usability Test Data

In terms of usability test, the Technology Acceptance Model questionnaire was employed, which include 3 main sections, namely Perceived Usefulness statements, Perceived Ease of Use Statements, and Behavioral Intention to Use (Davis, 1989; Turner, Kitchenham, Brereton, Charters, & Budgen, 2010). The score ranged in 7-point Likert scale. The result detail is given below:

Perceived Ease of Use Statements

When asking if learning to operate the tool would be easy for them, the result shows the average score of 4.35. The statement of "I would find it easy to get the tool to do what I want it to do" received the average score of 4.00. The statement of "My interaction with the tool would be clear and understandable" received the average score of 4.48. The statement of "I would find the tool to be flexible to interact with" received the average score of 4.32. The statement of "It would be easy for me to become skillful at using the tool" received the average score of 4.68. Lastly, the statement of "I would find the tool easy to use" received the average score of 4.45.

The distribution of the scores for each question are illustrated as follows:

Figure 6-6 Learning to Operate the Tool would be Easy for Me

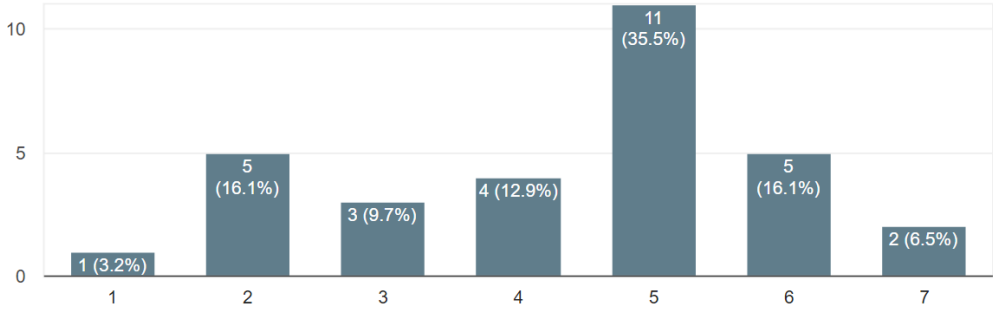


Figure 6-7 I would find it easy to get the tool to do what I want it to do

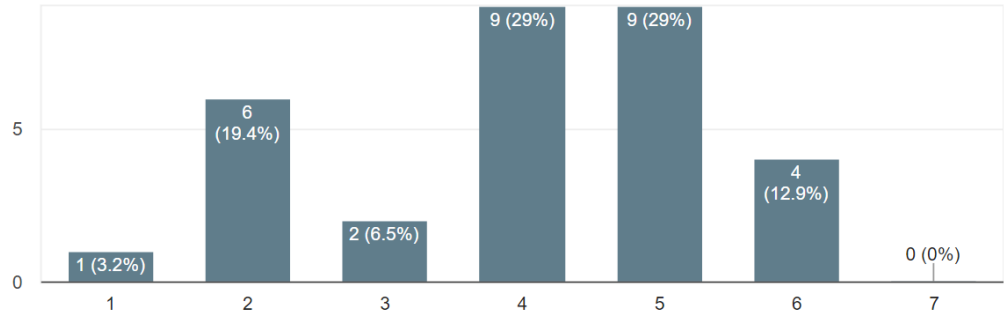


Figure 6-8 My interaction with the tool would be clear and understandable

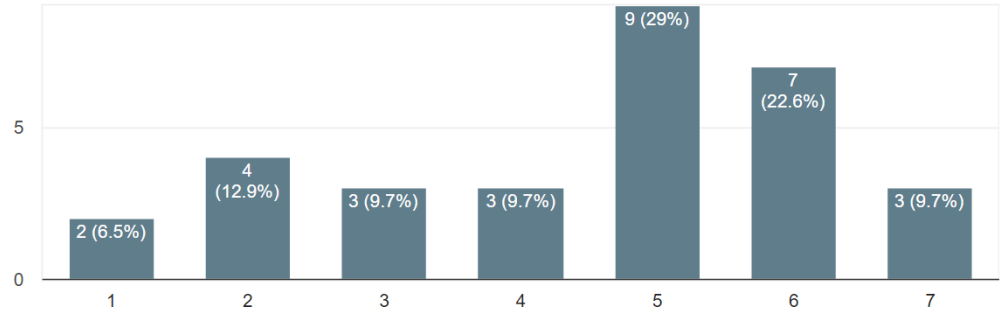


Figure 6-9 I would find the tool to be flexible to interact with

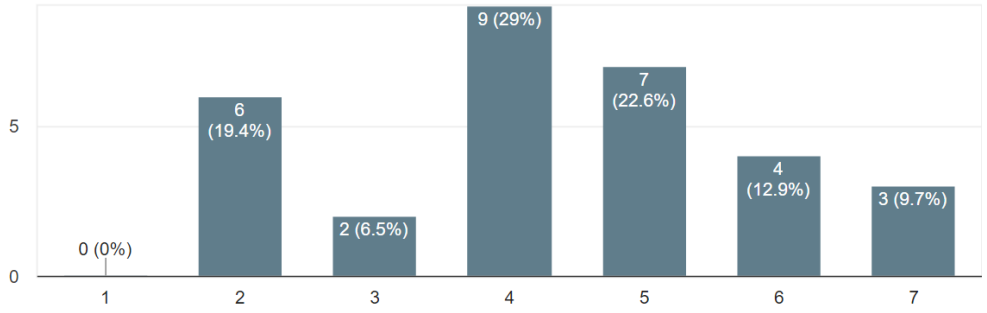


Figure 6-10 It would be easy for me to become skillful at using the tool

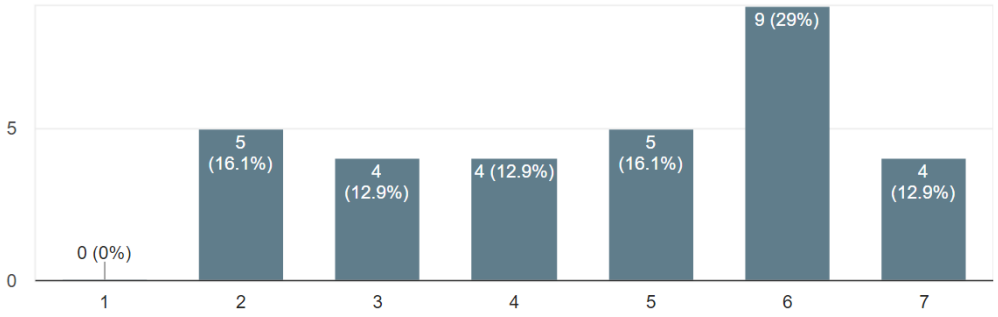
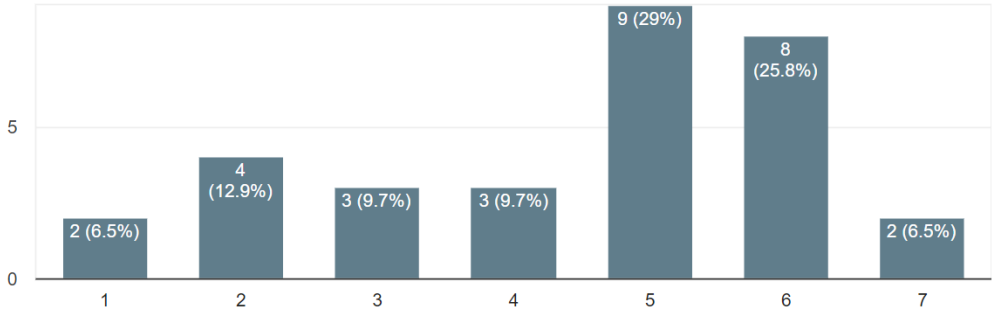


Figure 6-11 I would find the tool easy to use



Perceived Usefulness Statements

In terms of perceived usefulness, the statement of "Using the tool in my job would accomplish tasks more quickly" received the average score of 5.19. The statement of "Using the tool in my job would increase my productivity" received the average score of 4.94 in terms of quality and 5.26 in terms of quantity. The statement of "Using the tool in my job would enhance my effectiveness on the job" received the average score of 4.90. The statement of "Using the tool in my job would make it easier to do my job" received the average score of 5.13. Lastly, the statement of "I would find the tool useful in my job" received the average score of 5.10.

The distribution of the scores for each question are illustrated as follows:

Figure 6-12 Using the tool in my job would accomplish tasks more quickly

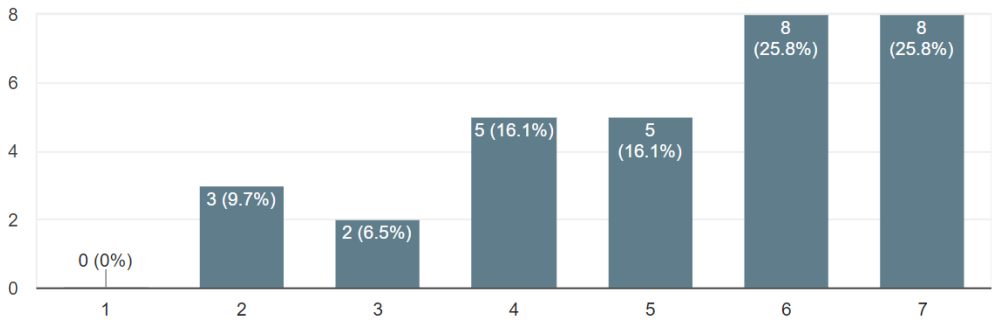


Figure 6-13 Using the tool in my job would increase my productivity (Quality)

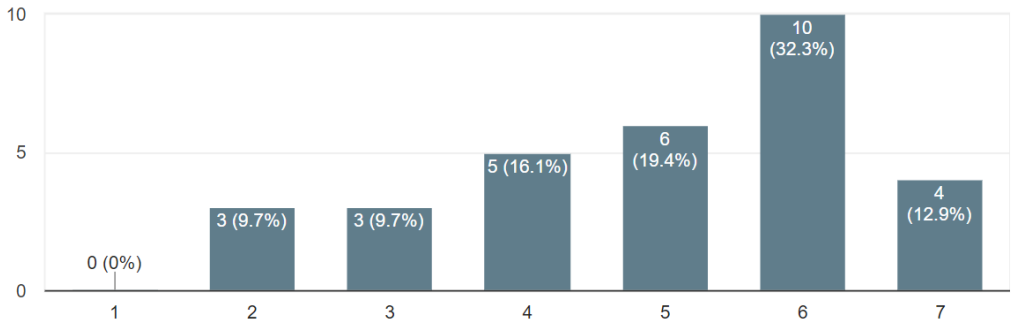


Figure 6-14 Using the tool in my job would increase my productivity (Quantity)

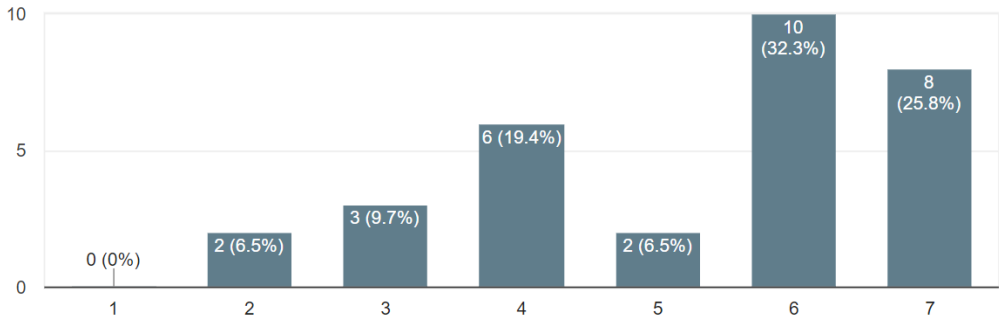


Figure 6-15 Using the tool in my job would enhance my effectiveness on the job

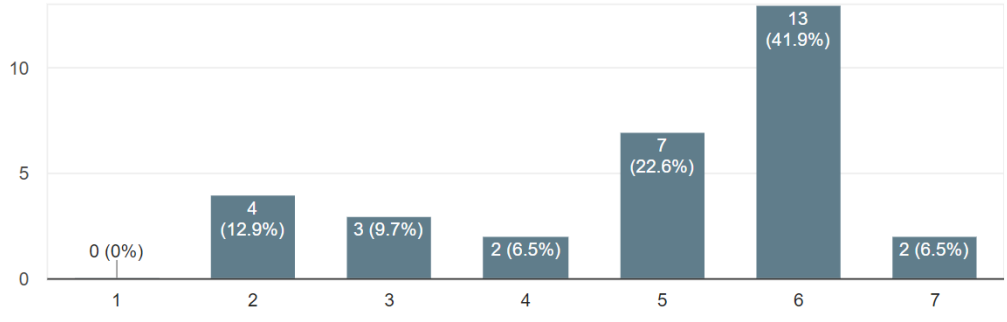


Figure 6-16 Using the tool in my job would make it easier to do my job

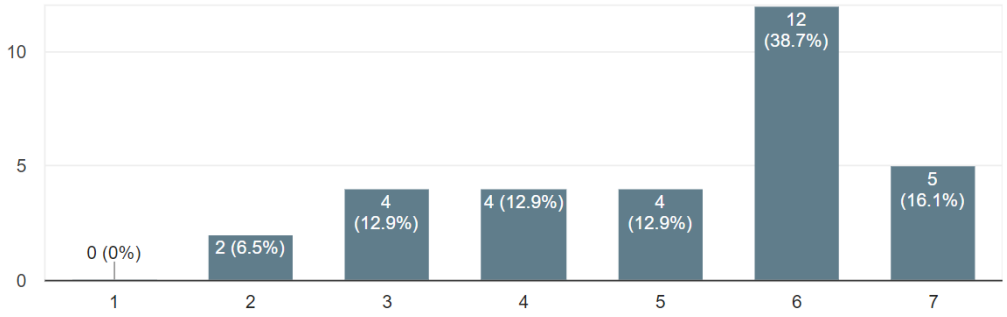
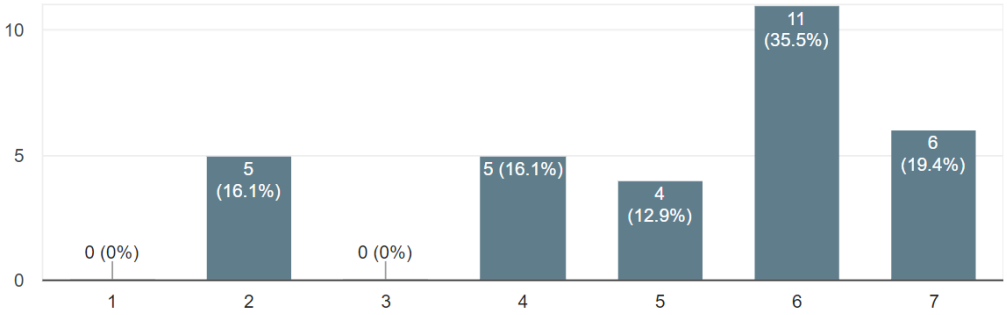


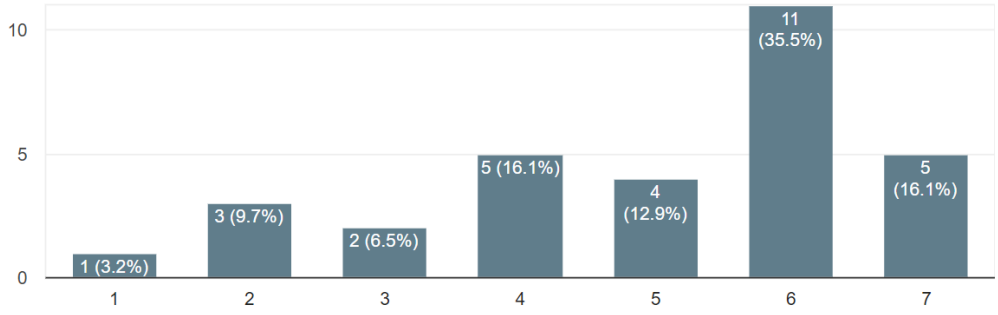
Figure 6-17 I would find the tool useful in my job



Behavioral Intention to Use

When asking if the respondents would use the tool once the system is 100% is ready to use, the average score received is 4.97. The score distribution is given below:

Figure 6-18 Behavioral Intention to Use



Apart from the survey regarding the Technology Acceptance Model, the researcher asked the respondents in terms of monthly subscription fee for the idea generation support system the respondents are willing to pay should the system is ready. 51.6% of the respondents replied that the fee should be below THB 450 per month, while 22.6% of the respondents believe that the fee should be THB 450-499 per month.

Data Analysis

From the research result, it can be seen that, in the perspective of creative professionals and entrepreneurs, the tool is considered useful with the average score of Perceived Usefulness of 5.09, which is well above the mid-point score of 4 in the 7-point Likert scale. Regarding Perceived Ease of Use, the average score is 4.38. This fact reflects in the Behavioral Intention to Use score of 4.97.

Table 6-2 Average Score – Perceived Usefulness

STATEMENTS	AVERAGE SCORE
Using the tool in my job would accomplish tasks more quickly	5.19
Using the tool in my job would increase my productivity - Quality	4.94
Using the tool in my job would increase my productivity - Quantity	5.26
Using the tool in my job would enhance my effectiveness on the job	4.90
Using the tool in my job would make it easier to do my job	5.13
I would find the tool useful in my job	5.10
TOTAL AVERAGE SCORE	**5.09**

Table 6-3 Average Score – Perceived Ease of Use

STATEMENTS	AVERAGE SCORE
Learning to operate the tool would be easy for me	4.35
I would find it easy to get the tool to do what I want it to do	4.00
My interaction with the tool would be clear and understandable	4.48
I would find the tool to be flexible to interact with	4.32
It would be easy for me to become skillful at using the tool	4.68
I would find the tool easy to use	4.45
TOTAL AVERAGE SCORE	**4.38**

Nevertheless, it can be noticed that the Perceived Ease of Use score is only slightly above the mid-point score, indicating that there is room for improvement in terms of ease of use. Such issue resonates in the additional comments obtained during the survey, which are summarized in the following table:

Table 6-4 Summary of Comments from the TAM Survey

NO.	COMMENTS
1	The website should allow users to export the ideas in Excel format so that users can utilize the generated concepts further.
2	The website should be more interactive.
3	The website should allow users to post their generated ideas so as to contribute to others. However, a screening measure needs to be in place.
4	The user interface should be revised to improve user experience, particularly on mobile device such as iPad.
5	If the website incorporates all Thai cultural heritage, it would be really great tool for designers and people looking for inspiration from the Thai cultural heritage.
6	The instruction should be in video or image format.

Technology Commercialization

To explore the potential for commercialization of the idea generation support system. The researcher follows the process, ranging from understanding the invention to formulating strategies to achieve the desired goal. The layout of the process is displayed below:

Technology Identification
Market Assessment
Technology Assessment
Strategy Formulation

Technology Identification

The starting point is to identify the invention and also the entity before entering the assessment phase. The table describing the invention and business entity following the technology identification guideline is given below:

Table 6-5 Technology Identification

RESEARCH INVENTION	
TOPIC	**DESCRIPTION**
Properties	A process for Front-end of Innovation of culture-driven products.
Potential/ Values/ Benefits	Assist creative professionals in concept generation activities that harness the Thai cultural heritage.
Advantages	The similar process rarely or does not exist.
State of Technology/ Invention	The invention is tested and ready for mass-scale diffusion.
Quality of Technology/ Invention	The invention is still limited to the Thai context.

RESEARCH INVENTION	
TOPIC	**DESCRIPTION**
Commercialization Ideas	Option A: Develop into a web-based idea generation support system.
	Option B: Setup a consultancy for commercializing the process
BUSINESS ENTITY	
Type of Organization	SMEs
Industry	Information Communication Technology
IP Management Possibility	Patent/ Copyright
Duty	Setting up the business entity and manage the venture
Size of Commercialize Capability	Limited to the Thai market for the initial stage.
Capabilities	Business Administration Design and Creativity Marketing
Resources	Entrepreneurial skill
Proportion of Technology/ Management	30%/ 70%

Market Assessment

External Factor Analysis

The market assessment starts with the external analysis, the industry-level assessment. As indicated in the Technology Identification phase, there are 2 options to commercialize the process. Option A is to develop the process into web-based idea generation support system which users can access online and use the tool to assist in idea generation activity. The domain of such tool is Computer-aided Design (CAD) industry. Another alternative, Option B, is to commercialize the process through consultancy and workshops to educate entrepreneurs and designers to use the method. The domain of Option B is the design consultancy industry. As the domain of

each option is indicated, the industry analysis can be conducted. Employing the 6-force model, the detail of the analysis is given below:

Option A: Computer-aided Design Industry

Industry rivalry

The computer-aided design (CAD) industry can be classified into 2 sub industries, the CAD software for the new product development process (NPD) such as 2-dimensional vector software or 3-dimensional software, and those for the Front-end of Innovation (FEI) process such as creative thinking software and idea generation software. For the NPD software, the industry has fierce competition due to the fact that there are only a few major players dominating the industry. On the other hand, the FEI software market, there are plenty of small-scale players in the market providing software for creative thinking method, such as brainstorming, mindmap, the Osborn's checklist, and so forth. Thus, with the scattered industry structure, the intensity of rivalry tends to be low. Furthermore, when considering that the FEI software is particularly for the Thai product with Thai cultural heritage as inspiration, to the best of the researcher's knowledge, such tool does not exist. As a result, it can be analyzed that the industry rivalry level is low.

Threat of New Entrants

Considering the FEI software in the Thai market, since the market is scattered with small players, mostly from abroad, the current threat of new entrants entering the market tends to be minimal. Nevertheless, the spiking trend of startups supported by the government's policy could induce new players developing FEI software for the Thai creative industry to enter the market in the near future. As a result, it can be analyzed that the threat of new entrants is in the middle level.

Threat of Substitute Products or Services

To generate ideas by harnessing the Thai cultural heritage, it is difficult to find the exact tool that assists such task. Nevertheless, when considering substitute products and services, there are many indirect software and mobile applications that can be used to achieve the task, although not

perfectly fit. As such, it can be seen that the threat of substitute products or services is high.

Bargaining Power of Buyers

In this context, the prospective buyers are designers, entrepreneurs, and professionals in creative industries. With multiple substitute products or services and extremely low switching cost, the bargaining power of buyers tend to be high. In addition, given the rise of social media, consumers have the power to judge and comment regarding the product publicly. Such power even strengthens the bargain power of buyers.

Bargaining Power of Suppliers

The idea generation support system can be produced by computer engineers, coders, and designers, and the raw material used is computer and server. Such technicians and devices are abundant in today's environment. In addition, there are many firms and freelances that provide such service. Thus, the bargaining power of suppliers is low.

Complementary Products

The complementary products for the tool include electronic devices with user interface. Those devices are, for instance, tablets, laptop computers, smartphones, and desktop computers. Nowadays, manufacturers are able to produce devices in multiple price ranges, and there are so many types of devices on the market. Such progress strongly supports the tool to widespread to consumers more easily. Given that there are multiple types of complementary products for the idea generation support system, the tool does not need to solely rely on a single complementary product. As a result, the reliance on complementary products is low.

Option B: Design Consultancy Industry

Industry rivalry

The design consultancy industry has relatively low level of rivalry. This is due to the fact that the market structure in this industry is scattered with small-scale players, and the demand is abundant. As such, the industry rivalry tends to be low.

Threat of New Entrants

In the design consultancy industry, many new players enter the market each year. This is due to the fact that the job can be perform on freelance-basis. Thus, the threat of entrants is high.

Threat of Substitute Products or Services

Regarding the threat of substitute products and services, there are many substitute firms and educators employing various types of thinking technique and method, which can be used to accomplish the task. As a result, the threat of substitute products and services is high.

Bargaining Power of Buyers

The design consultancy industry is a service industry that buyers have power over the service provider. The design field is subjective, and customer satisfaction relies heavily on sensitive issues, such as customer's design acumen, tastes and preferences. As a result, it is the domain that is hard to judge regarding the work quality. These factors lead to high bargaining power of buyers.

Bargaining Power of Suppliers

The suppliers of this industry are basic tools, which are abundant in the market. Those tools include computers, computer-aided software, multimedia tool, stationary, and so forth. Such supplies do not have high bargaining power over the entity.

Complementary Products

Regarding the complementary products, the service that goes hand in hand with the design consultancy service are other types of educational service. Nevertheless, the dependency on each other is low. Thus, it can be analyzed that the design consultancy does not need to heavily rely on complementary service.

The table summarizing the level of 6-force analysis is given below:

Table 6-6 6-force Analysis

	COMPARISON	
6-FORCE ANALYSIS	**OPTION A**	**OPTION B**
Industry Rivalry	Low	Low
Threat of New Entrants	Middle	High
Threat of Substitute Products or Services	High	High
Bargaining Power of Buyers	High	High
Bargaining Power of Suppliers	Low	Low
Complementary Products	Low	Low

External Factory Analysis

The researcher analyzes external factors effecting each option in terms of both opportunities and threats in Political, Economic, Social, and Technology aspects (PEST). The weighted score for each issue is displayed in the following table:

Table 6-7 External Factor Analysis Summary

ISSUES	ALTERNATIVES				
	WEIGHT	OPTION A		OPTION B	
		RATING	SCORE	RATING	SCORE
OPP					
The Thailand 4.0 policy supports Thai startups	0.30	4	1.20	3	0.90
Venture Capitalist sector starts to take shape in Thailand	0.20	4	0.80	2	0.40
AEC community	0.05	3	0.15	3	0.15
The emergence of sharing of economy and crowdsourcing	0.10	4	0.40	4	0.40
Advancement of Artificial Intelligence	0.10	4	0.40	2	0.20
The Internet of Things	0.10	3	0.30	3	0.30
THR					
Political unrest in Middle East and Europe	0.05	3	0.15	3	0.15
Conflict between powerful nations	0.05	3	0.15	3	0.15
The growing power of terrorists	0.05	3	0.15	3	0.15
TOTAL SCORE	**1.00**		**3.70**		**2.80**

Technology Assessment

In terms of technology assessment, several criteria need to be weighted in order to decide which option is the suitable one to pursue. The table summarizing the weighted score on the issues is given below:

Table 6-8 Technology Assessment

ISSUES	ALTERNATIVES				
	WEIGHT	OPTION A		OPTION B	
		RATING	SCORE	RATING	SCORE
OPP					
Uniqueness	0.10	4	0.40	3	0.30
Hard to Imitate	0.12	4	0.48	2	0.24
Importance of Technology	0.06	3	0.18	3	0.18
Ease of Technology Development	0.06	3	0.18	4	0.24
Stage of Technology	0.06	3	0.18	4	0.24
Scope of Application (Platform)	0.02	4	0.08	4	0.08
Substitute Technology	0.04	4	0.16	2	0.08
Compatability with Compliment Technology	0.04	4	0.16	3	0.12
Level of Investment	0.06	2	0.12	4	0.24
Resource Availability	0.02	4	0.08	2	0.04
Readiness	0.08	4	0.32	2	0.16
Social Impact	0.08	4	0.32	2	0.16
Freedom to Operate	0.02	3	0.06	3	0.06
Market Size	0.10	4	0.40	3	0.30
Profit Margin	0.10	1	0.10	4	0.40
Expected Product Lifespan	0.04	3	0.12	4	0.16
TOTAL SCORE	**1.00**		**3.34**		**3.00**

Analysis Summary

Consolidating market assessment and technology assessment, the total score in the decision matrix is as follows:

Table 6-9 Decision Matrix

ANALYSIS	OPTION A	OPTION B
	SCORE	SCORE
MARKET ASSESSMENT	3.70	2.80
TECHNOLOGY ASSESSMENT	3.34	3.00
TOTAL	7.04	5.80

From the weighted score of decision matrix and the 6-force analysis, it can be seen that Option A, commercializing the process by develop web-based idea generation support system is a better option.

Strategy Formulation

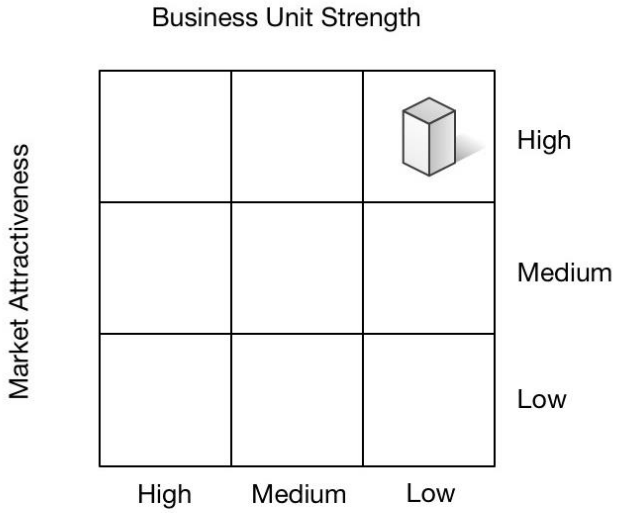
Mode of Commercialization

While there are several modes for commercialization the process, the researcher adopts the startup mode for harvesting the invested process. As the chosen commercialization idea is to develop web-based idea generation support system for designers, choosing the commercialization mode of startup fits the criteria due to following reasons. First, time to market is essential for the service; the nature of startups, doing things quickly, support such time-pressing requirement. Second, website is the medium that can be setup with minimum workforce, and forming startups does not require large workforce but dedicated and passionate personnel. Lastly, the idea generation support system is the beginning to establish the community of Thai designers and entrepreneurs who seek to harness the Thai cultural asset for their products and services. The community can be amplified to generate many more revenue models, apart from web service fee. Such long-term plan fits the character and culture of startups, growing as fast as possible to dominate a segment that no player has ever tapped before.

Corporate-level Strategy

To analyze and formulate corporate-level strategy, the GE's 9 cell matrix is adopted. From the analysis, the Computer-aided Design industry in Thailand is considered a promising one since the society as a whole increasingly values design. Enterprises regard design as one of their strategic tools to capture consumers. In addition, the flourishing of startup trend in the country lead to high demand for design tools to help generate design output. As for the business strength, since the business entity is a startup, the health of the firm is considered unstable and weak. The position can be mapped on the matrix as follows:

Figure 6-19 GE's 9 Cell

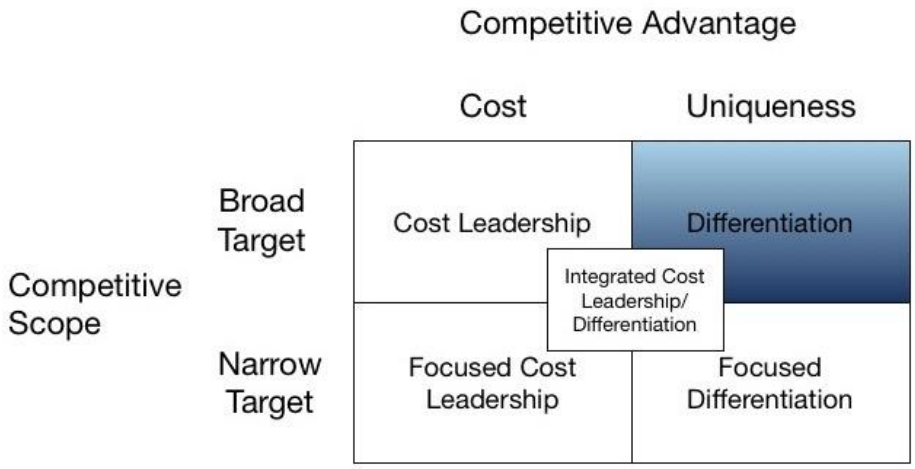


From the position of the firm in the GE's 9 cell matrix, the corporate strategy the firm should employ growth strategy to build up and improve the company rapidly in order to meet with demand from promising market.

Business-level Strategy

From the key selling point of new inventive process ingrained in the idea generation support system, the firm should capitalize on this uniqueness asset by adopting Differentiation strategy, capturing high margin. The strategy is also suitable for broad target market, which is the objective of the web-based system, to reach as many audience as possible.

Figure 6-20 Business-level Strategy



Functional-level Strategy

R&D Strategy

Research and Development is the cornerstone activity for companies adopting the Differentiation strategy. In this context, the startup should focus its R&D on improving user experience of the website. Furthermore, in the long run, the R&D should put efforts on turning the website into online community and idea-sharing platform so as to build up visitors and database for additional revenue streams.

Marketing Strategy

In terms of marketing strategy, the strategy can be classified as follows:

Service

For the initial stage, the service of the website is idea generation support system tool assisting designers in ideation process. The cultural inspirations are collected from contributors who are creative professionals. Several unique selling points are developed to enhance the tool's attractiveness:

Online Collaboration Platform

The website allows users to generate ideas using the ideation tool. However, the feature is limited for free use; users cannot printout or save the image of the generated concepts. To do so, users are required to subscribe for monthly fee. The regular account allows only one user to use the tool. However, there is also PRO account, which multiple users access the tool simultaneously to co-create concepts.

Accessibility

The website is able to open by any operating system and any kind of devices so as to provide convenience for users and increase the number of visitors.

Sharing Ideas, Building Community

Apart from ideation feature, the website allows users to post their generated ideas, sharing their concepts to the Thai design community and the world. This feature will increase web visitors and subscribers drastically, creating larger online community of Thai cultural design interests. Nevertheless, the access to pool of generated concepts is available to only PRO account.

Potential for Crowdfunding Activities

Allowing PRO-account users to access idea-sharing section of the website also attracts another type of target group, prospective investors who are seeking fresh business ideas. As a result, in the future, this section can be amplified into crowdfunding portal where investors can jointly invest in a business idea generated by the tool. The portal would be another revenue stream for the business.

Price and Revenue Model

From the service features, revenue can be generated from the commercialization of the tool in 4 ways, namely monthly subscription fee for regular account, monthly subscription fee for PRO account, campaign fee, and database fee.

Monthly subscription fee is collected when users gain access to the idea generation tool with printable report. The PRO account allows collaboration among users. Based on the survey with consumers, the study revealed that the majorities think that subscription fee should be below THB 450 per month.

Campaign fee is the revenue from firms and brands develop co-promotional campaign with the website. As the brand image of the website is associated with innovation, design, and thainess, firms seeking to gear their image towards such characteristics can co-develop campaigns with the website, which the firm can charge for such campaign.
Regarding database fee, once the website gains great numbers of subscribers and visitors, the data collected from the online community can be beneficial for large firms that aims at designers and SMEs, and the database fee can be another revenue stream for the startup.

In the future, the idea-sharing section for PRO account yields great potential for developing into crowdfunding portal. The additional service can be prospective revenue stream for the website.

The diagram and table summarizing revenue models gaining from the website is displayed below:

Figure 6-21 Revenue Model Diagram

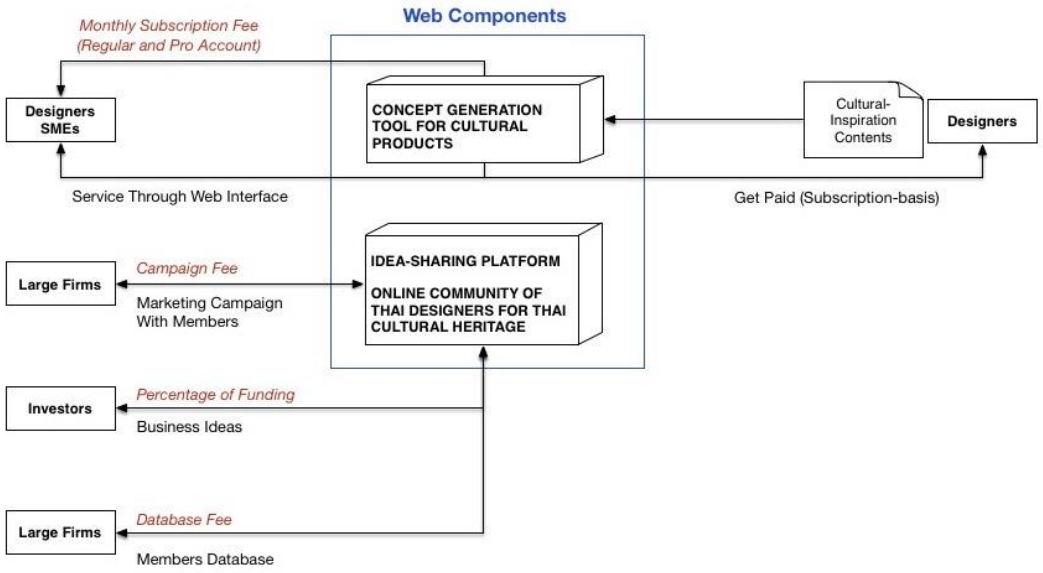


Table 6-10 Revenue Model

SERVICES	REVENUE MODEL	TARGET
Idea generation Tool (Regular Account)	Monthly Subscription Fee	Designers and SMEs
Online collaboration (PRO Account)	Monthly Subscription Fee	Designers and SMEs
Promotional Campaign	Campaign Fee	Large Firms
Database	Database Fee	Large Firms
Crowdfunding	Percent of the funded Investment	Investors

Promotion

In the initial stage of the startup, the firm needs to promote the website and the tool extensively. In order to do so, the firm will start with small number of influential creative professionals, approaching them to try the tool and building success cases. A section of the website will be dedicated to the story about success case of designers using the tool to develop concepts, which are produced or developed further into actual product or service. The

showcase would visualize the benefit of the ideation tool and inspire prospective users to explore the tool in detail.

In addition, the website will approach key organizations related to design and innovation, such as TCDC and OKMD, to provide the tool to their visitors free of charge for a limited time. The campaign will increase visibility of the tool in the design community in Thailand. Furthermore, those organizations can be a great source for funding the website since the objective of the website is aligned with one of theirs, promoting creativity in the country. Approaching the organizations to try the tool can lead to potential for funding as well.

On the homepage of the website and other touchpoints, the key tagline will describe the distinct benefits of the idea generation support system, which centers around unique selling points of the tool, including:

- One of a Kind: This is the only tool helping creative professionals to develop concepts by employing the Thai cultural heritage. There is no similar tool currently exists in Thailand.
- Faster Concept Generation: Designers tend to spend considerable amount of time searching for information to resolve design problem (Cheng, 2016). This tool shortens the time to gather and select relevant information; the tool accumulates years of experience and knowledge of multiple creative professionals for users so that they do not need to search from raw information.
- Thought-provoking Elements: The tool contains inspiring words and images that were gathered by designers. Those elements can spark fresh ideas and unlock users from their usual mode of thinking.

Intellectual Property Protection

The derived idea generation support system can be protected by copyright. When the process is developed into a tangible tool, such as website, copyright protection can be applied by recordation. The protection tool would allow the company to receive protection for lifetime period and also 50 years after death. All supporting evidence for the development of the intellectual property will be kept in case of infringement.

Chapter 7
CONCLUSION

Conclusion

Overview

This dissertation aims at developing the Front-end of Innovation for products and services by harnessing cultural heritage as central value. The study begins with literature review, ranging from macro-economic level theories to the Front-end of Innovation (FEI) techniques.

From the literature study, the generic FEI process is not applicable to every projects due to differences mainly in project and product types; each project requires unique type of development process unless the mentioned factors and context are exactly similar. Culture-driven products, products and services that contain embedded intangible values as their premise, possess unique characteristics that requires different process of that of generic FEI. The discrepancy is in multiple dimensions, namely paradigm of innovation (Science and Technology vs Soft Innovation), product emphasis (physical artifacts vs intangible values), source of opportunities (business-driven vs cultural heritage), idea generation method (separate multiple ideas vs fusion).

Given the characteristic of culture-driven products, the Morphological Analysis (MA) (Zwicky, 1957) combining with Cultural Design Model ((Lin, 2007) were applied in the idea generation phase of the FEI as those theories fit the nature of culture-driven products. MA is a structured thinking method which alleviates the fuzzy nature of FEI, validated as a reliable method for concept generation (Arnold et al., 2008; Geum et al., 2016; Huang & Mak, 1999), and commands fusion of ideas from users through forced association thinking method. Cultural design model requires users to extract cultural inspiration in 3 layers, allowing them to reach the untapped intangible elements of the cultural heritage.

The Studies

Research 1 was designed to validate the proposed methodology with 3 phases of cultural extraction, idea generation, and idea evaluation.
From the result of 10 case studies, ideas generated from the methodology surpass those from conventional thinking method in terms of idea quantity and also idea quality based on the idea quality scale (Dean et al., 2006), validating the method as an improved process for culture-driven products comparing to tradition one.

In the idea screening phase of FEI, the means-end chain theory (Olson, 1989) was applied to uncover the preferred product attributes of culture-driven products in consumers' mind and also how those attributes lead to universal human values (Schwartz, 1992). Research 2 unveils 8 typologies of consumer values regarding purchasing of culture-driven products, including Thai Contemporary Design – Self-direction, Natural Material – Hedonism,
Historical Association – Hedonism, Location-specific Material and Production
– Hedonism, Authentic Local Experience – Tradition, Cultural Story – Stimulation, Cultural Story – Power, and Made by Thai Rural People – Benevolence. The consumer-based result is invaluable when selecting ideas. Since the premise of culture-driven products is in the intangible aspect, understanding product attributes and values consumers hold contribute a great deal for idea selection activity.

Test of Usability

The process was developed into web-based idea generation support system assisting creative professionals for concept generation and screening activities. The tool was surveyed in terms of usability, following the Technology Acceptance Model as research 3. The research results reveal that users find the tool beneficial with the average score of 5.09 in 7-point Likert scale. Nevertheless, in terms of ease of use, the average score is 4.38 in 7-point Likert scale, only slightly above the mid-point score of 4. This

fact suggests that the tool can be improved in terms of ease of use as stated in the additional comments from users.

Technology Commercialization and Intellectual Property Protection

To commercialize, 2 options, web-based idea generation support system and design consultancy entity, were generated and compared employing market and technology assessment. Through the analysis, web-based idea generation support system is chosen as the appropriate commercialization strategy. The startup was selected as the mode of commercialization given the nature of the product and context of the industry. In terms of corporate strategy, through Ge's 9 cell analysis, growth strategy should be adopted to improve the startup's competency as quickly as possible since the company is in highly attractive market yet the strength of the startup is considered low. Business-level strategy that the startup should adopt is differentiation strategy as the firm possess unique service offering, which can be exploited in broad market.

The startup can protect its intellectual property main by invention patent or copyright. Nevertheless, as the key asset of the firm is the idea generation process, invention patent should be selected since copyright only protects the expression of the idea, which in this case, the website, but not the process itself.

Academic contribution

The dissertation yields multiple academic contributions. First, idea generation process for culture-driven products is proposed and validated through idea evaluation. The process would shed light on the domain of Front-end of Innovation, particularly for the Soft Innovation paradigm (Stoneman, 2010). Since its inception, the Front-end of Innovation has been dominated by the science and technology path. Several techniques and processes were developed to generate product and service concepts for such trajectory. Nevertheless, the Front-end of Innovation process for the Soft Innovation, including products and services that harness culture as their central value, has not been widely discussed despite their great potential. Therefore, the introduced process would contribute to the future

research regarding the Front-end of Innovation suitable for the soft kind of innovation and also culture-driven products and services.

Second, the ideation process, to the best of the researcher's knowledge, is the first attempt to apply morphological analysis with culture-driven products. As culture contains multiple layers of inspiration, employing morphological analysis technique unfolds the hidden inspiring elements that are great ingredients for the idea generation activity. In addition, the morphological analysis unlocks users from conventional mode of ideation to contemplate possibilities of new combinations through the forced-association way of thinking, which is a foundation of morphological analysis.

Third, the Cultural Design Model (Lin, 2007) is proven to be a method to unveil the hidden intangible assets of cultural heritage through cultural extraction process and contribute to the idea generation activity of the FEI. The model contributes to the domains of cultural studies and innovation alike. Lastly, the means-end chain analysis on consumers purchasing culture-driven products contributes to the domain of consumer behavior. The study uncovers preferred cultural product attributes in Thai consumers' mind and also the linkages of product attributes and personal values. The typology of values discovered can be the foundation for future studies regarding purchase and consumption of cultural products in Thailand.

Managerial contribution

The dissertation contributes in various aspects in terms of innovation and marketing. First, the developed web-based idea generation support system contributes to the design and innovation community. It would equip Thai designers and entrepreneurs with a tool to leverage the nation's cultural asset. Currently, such tool does not exist. In addition, the ideation process can be a guideline for creative professionals to systematically create value through the country's cultural capital. Second, the research result from the means-end chain analysis contributes a great deal for marketers. The

consumer insights allow marketing professionals to formulate strategies and develop campaigns that catch consumers' attention.

Limitation and Future Research

This study possesses limitations that can be approached in future research. First, the studies were conducted only in the Kingdom of Thailand. As a result, the research output is exclusively applicable in the context of the country. For research 1, it would be worthwhile to explore the idea generation process in contexts with polarizing culture. Second, the geographical limitation also applies to the means-end chain analysis; samples were exclusively collected in Thailand. The future research can be extended to other countries and regions to discover preferred product attributes and patterns of attributes-consequences-values ladder for that particular place. Finally, the case studies conducted include 2 key types of creative professionals, with experience in cultural heritage design and without cultural heritage design. Nevertheless, it would be worthwhile to conduct case studies with non-designer group and compare the results between each group. Such study would extend the applicability of the process to other types of user.

In terms of managerial aspect, the result from Technology Acceptance Model reveals that there is area for improvement regarding the usability of the tool. The user interface and user experience of the website can be improved by redesigning the layout and sequence of the interface, including the adjusting navigation pane and the sequence of the website to be aligned in the same direction so as to avoid users' confusion. Furthermore, changing color of the website and using color coding for each section can help users to navigate the website more easily. Finally, the instruction plays critical role in guiding users to use the tool effectively. The current instruction is described in texts. To guide users in more comprehensive way, the instruction should be in video and interactive formats.

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APPENDIX

VITA

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