

# AN IDEA GENERATION TOOL HARNESSING CULTURAL HERITAGE FOR DESIGN-DRIVEN ENTREPRENEURS

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## ABSTRACT

*The purpose of this paper is to propose an idea generation method for the concept development of cultural products by harnessing cultural heritage as source of inspiration. The ideation technique combines Morphological Analysis (MA) technique with Cultural Design Model theory. This paper begins with a review of related work, followed by a description of the proposed technique. To illustrate the applicability and validity of the proposed ideation technique, a concept generation support system was developed and ten case studies on the concept development are presented. The generated concepts of the case studies were evaluated in terms of quality and quantity. The experimental result reveals that the proposed ideation method assists design-driven entrepreneurs to generate more concepts and higher quality concepts than those generated by the traditional method they currently employ. Finally, the paper concludes with implications and limitations of current research from both managerial and academic perspectives.*

**Keywords:** Cultural Heritage, Idea Generation, Morphological Analysis, Design-driven Entrepreneurs, Small and Medium-sized Enterprises.

## INTRODUCTION

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 has relied deeply on external markets, with the majority of businesses being Original Equipment Manufacturer (OEMs) producing electronic components and automotive parts for multi-national companies; however, Thailand has gradually lost the market to emerging countries with lower production cost, namely Vietnam, China, and Indonesia, among others (Maesincee et al., 2003, Pornpipat, 2010; OSMEP, 2011; Akaraseranee, 2010). Given these circumstances, in order to maintain economic growth, Thailand is in need of a new level of competitiveness, replacing labor-intensive and resource-based products and services with creativity-based products and services that are unique and which cannot be imitated by other countries (Pornpipat, 2010). Fortunately, Thailand possesses invaluable cultural assets that can be strategically harnessed for economic purposes; cultural heritage is a fit strategy for countries with profound history and for industries in which rational benefits or technological advancement are deemphasized (Abbott et al., 2009). In order to shift the nation's strategy to creative economy, the country primarily focuses on the Small and Medium-Sized Enterprises (SMEs) as the sector accounts for 99.60 percent of total Thai enterprises and contributes nearly half of the country's GDP. As a result, since 2012, the Thailand's Office of Small and Medium Enterprises Promotion has emphasized on nourishing

creativity, innovation, and cultural identity in products and services among Thai SMEs; yet, these enterprises are still struggling to adopt creative economy strategy due to lack of product development knowledge and systematic tool to harness the nation's cultural assets.

In academic perspective, several studies point out advantages of ingraining cultural heritage in the development process of products and services in order to capitalize on cultural assets or enhance competitiveness (Cayla and Eckhardt, 2007; Charters and Spielmann, 2013; Beverland and Luxton, 2005; Ko and Lee, 2011). While embodying cultural heritage in products and services yields various advantages, research in this field is still in its infancy (McKercher et al., 2004; Lin, 2007; Ko and Lee, 2011). Aligning the Thailand's economic strategy with the importance of cultural heritage as an ingredient for concept development, an area that is worth exploring, the objective of this research is to propose an idea generation method which harness cultural heritage as source of inspiration so as to assist design-driven Thai SMEs to develop product and service concepts that systematically ingrain cultural elements, elevating the value of those products and services in the minds of consumers.

## RELATED WORKS

### **Cultural Heritage and Value Creation in Products and Services: the Importance of Culture as a Source of Product and Service Value**

The notion of cultural heritage is intrinsically associated with inheritance; something transmitted from one generation to another. As a concept, culture is a transporter of historical values from the past (Jokilehto, 2005; Vecco, 2010). Cultural products are the result of a set of tactics to convert local knowledge into intangible values ready to harness for local development a concept called "*Culture Economy*" (Throsby, 2008; Vivant, 2013). Kneafsey (2001) states that "*Cultural products are different in their characteristics; They are unique in that they are Such knowledge can be identified through a range of cultural markers such as traditional foods, regional languages, crafts, folklore, local visual arts, and drama, literary references, historical and prehistoric sites, landscape systems, and their flora and fauna linked with heritage, culture, tradition, history, and regional identity of their locations*" (Guerrero et al., 2009). Shi and Chen (2011) define cultural products as artefacts presenting themselves dually as both merchandise to meet commercial purposes, and messengers of values and identity.

Harnessing cultural heritage in new product and service development has gained increasing interest due to rising demand for cultural heritage products and services. The reason for this consumption trend is that consumers are not satisfied with only adequate function and high quality anymore, as most manufacturers are able to meet consumers' expected standards. Instead, consumers are demanding additional value 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 and associated image and meaning, when making a buying decision (Utterback et al., 2006; Green, 2008; 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 in consumers' buying decision criteria, and to enhance the competitiveness of products and services (Zhou et al., 2013, Hakala et al., 2011; Urde et al., 2007). George (2010) and Lin (2007) state that cultural features possess unique characteristics that can be ingrained in products to strengthen the global identity and individual consumer experience of the goods. Cayla and Eckhardt (2007) and Charters and Spielmann (2013) suggest that cultural heritage contains profound cultural wisdom, and that

local brands should exploit local cultural capital to increase value in products and services. Beverland and Luxton (2005) stated that marketers have increasingly turned to cues with historical association to create differentiation among products in the minds of consumers. Ko and Lee (2011) assert that embodying cultural heritage in a brand is a tool to strengthen the brand's competitiveness and generate an image of authenticity that cannot be imitated by others in the global market, since cultural heritage is derived from, and shared only by, a certain culture.

### Idea Generation: A Morphological Analysis

Morphological Analysis (MA), a structured multidimensional idea generation technique developed to solve non-quantifiable problems, is one of the design tools regarded as being an effective technique for conceptual design (Huang and Mak, 1999; Lo et al., 2010). The technique is centered around decomposing ideas, stimulating forced associations among fragmented ideas, and regrouping fragments in new combinations to derive multiple creative solutions. Morphological analysis alleviates the chaotic and unstructured nature of the concept design activity by transforming complex problems into structured expression (Geum and Park, 2016; Li et al., 2010) and forces designers to release themselves from primary ideas and contemplate problems in multiple facets (Moon and Han, 2016).

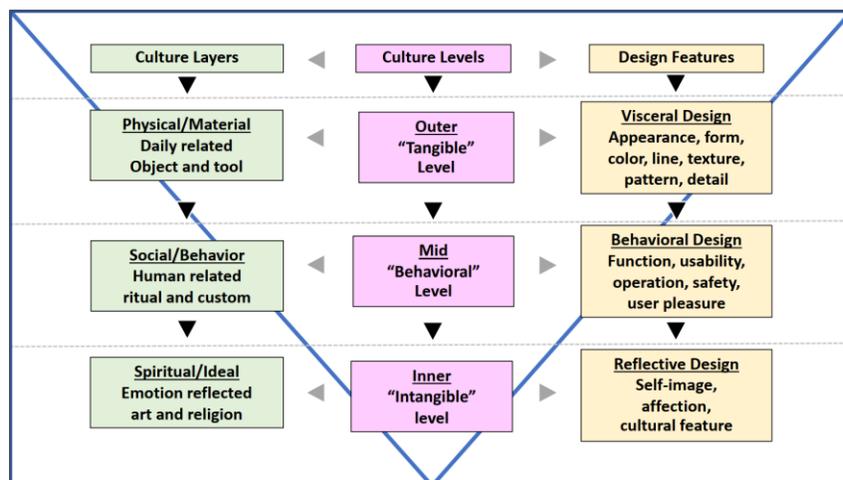
MA consists of three main steps. The first step is attribute listing, which is carried out by decomposing problems into subproblems, which eventually become variables. The second step is to build a morphological matrix by identifying dimensions and variables within dimensions obtained from the attribute listing phase. Creating a morphological matrix involves a group of five to seven experienced specialists to build dimensions and values (Im and Cho, 2013; Geum and Park, 2016). Finally, ideas are derived from creative combinations of consistent variables across dimensions through forced association technique (Chou, 2014; Moon and Han, 2016; Geum and Park, 2016; Waal and Ritchey, 2007; Geum et al., 2016; Kim et al., 2008). Table 1 shows example of a morphological matrix for restaurant services (Kim et al., 2008).

<b>Dimension parameters</b>					
	<b>Ingredient</b>	<b>Cook</b>	<b>Order</b>	<b>Food delivery</b>	<b>Payment</b>
Shape	Supply of standardized ingredients.	Make to order	Self-order	Self service	Payment during order.
parameters	Supply by the individual Restaurants.	Make to stock	Order by employee	Delivered by employee	Payment after dinner at table.
		Design to order			Payment after dinner at counter.
		Assemble to order			

Source: Kim et al., 2008.

## Cultural Design Model

Lin (2007) proposes a framework, called the Cultural Design model, for transforming aboriginal artifacts into modern products. Lin (2007) describes framework for studying cultural objects, which contains three special layers, tangible level, behavioral level, and intangible level for fully utilizing the product development model. The framework correlates with fundamental characteristic of culture as multi-layer construct (Wilhelms et al., 2009). According to Lin (2007), the tangible level includes colors, textures, shapes, patterns, lines, and so forth. The behavioral level includes human-related ritual and custom, process, and behavior. The intangible level includes emotions, ethics, beliefs, and values. At the beginning of the cultural design process, a cultural inspiration can be mapped based on the three layers of culture, extracting cultural features from the cultural artifact. This method allows designers to discover the hidden accumulated societal wisdom of cultural heritage, and explore more possible inspirations, resulting in a higher number of ideas and revealing intangible values of cultural inspiration (Figure 1).



Source: Lin 2007.

**FIGURE 1**  
**THREE LAYERS OF CULTURE AND DESIGN FEATURES**

## Building Idea Generation Tool for Cultural Products

### The integration of morphological analysis and the cultural design model

The cultural design model (Lin, 2007) and Morphological Analysis (MA) provide appropriate theories and techniques for idea generation for cultural products. As cultural inspiration contains multiple layers, which require extraction to reach every level, the cultural design model (Lin, 2007) assists in deep comprehension of a cultural inspiration. 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 the fusion of subcomponents.

## Selecting Cultural Inspirations for Building Morphological Matrix

To develop a concept generation tool for cultural products employing a morphological matrix as the backbone, the researcher selected 10 diverse aspects of Thai cultural heritage listed by the Department of Cultural Promotion as cultural inspirations. The inspirations were stratified by key domains of cultural heritage in Thailand. Those inspirations included Thai ikat silk, Thai oblation, Aranyik knives, Hoonkrabok, Khon, Krayasart, Kanom Buang, Thai kite, Loikrathong, and Songkran (Table 2).

<b>Category</b>	<b>Number</b>	<b>Thai Cultural Heritage</b>
Traditional Craftsmanship.	1	Thai Ikat Silk
	2	Thai Oblation
	3	Aranyik Knives
Performing Arts.	4	Hoonkra bok
	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

### CULTURAL EXTRACTION

The development of a morphological chart starts with building a morphological matrix by creating dimensions along the horizontal axis and developing values, a process that is generally completed by 5-6 experts (Geum and Park, 2016). In this study, the researcher collected inspirational adjectives from the selected Thai cultural inspirations based on the cultural design model proposed by Lin (2007). The adjectives were used as values in the morphological matrix.

To extract inspirational adjectives, the researcher conducted in-depth an interview with 10 Thai designers who have rich experience in cultural product design in prominent cultural industries of Thailand to extract inspirations from each layer, intangible, behavior, and tangible layer, following the cultural design model theory (Lin, 2007). Selected designers were stratified by key cultural Thai industries, namely ceramics, textiles, spa, jewelry, and furniture. At the beginning of the in-depth interview session, the designers were presented with knowledge regarding cultural inspiration in multiple formats, including text, pictures, and videos. Then, the designers were asked, “*What are the thought-provoking elements you see in each cultural inspiration that would spark creative ideas?*” Those elements were listed and categorized in 3 dimensions in text and picture formats (Table 3).

Pictures were obtained utilizing a search engine during the interview session. During the interview, a tape recorder and notes were used to collect data and insights from the interviewees. The information captured on the tape recorder was transcribed and consolidated with information from note-taking during the interview session. Each interview session took approximately 45-60 minutes per cultural inspiration.

The extraction activity resulted in thought-provoking text and visuals that could be used to stimulate the idea generation activity. Cheng (2016) suggests that “*words, images, and other*

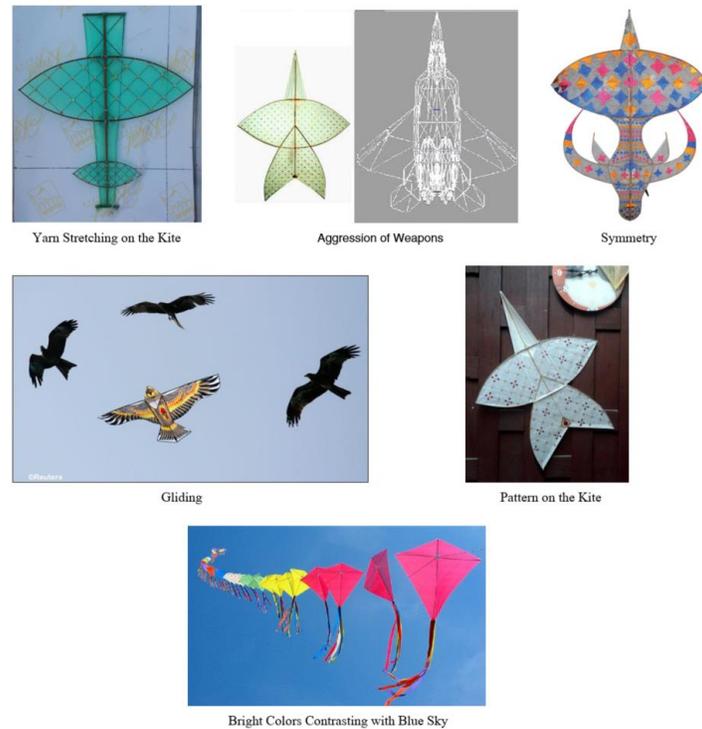
*symbols are critical triggers that can stimulate thought and association during the design process.”*

Category	Number	Thai Cultural Heritage	10 DESIGNERS		
			INTANGIBLE ELEMENTS	BEHAVI ORAL ELEMENTS	TANGIBLE ELEMENTS
Traditional Craftsmanship.	1	Thai Ikat Silk	INTANGIBLE ELEMENTS	BEHAVI ORAL ELEMENTS	TANGIBLE ELEMENTS
	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			

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. Examples of extracted adjectives and visuals from Thai kite, one of the 10 cultural inspirations, are presented in Tables 4 & 5 and Figure 2.

	TEXT			Image
	Intangible	Behavioral	Tangible	
<b>Total</b>	80	85	108	91
<b>Average per respondent</b>	8	8.5	10.8	9.1

Thai Kite		
Intangible	Behavior	Tangible
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



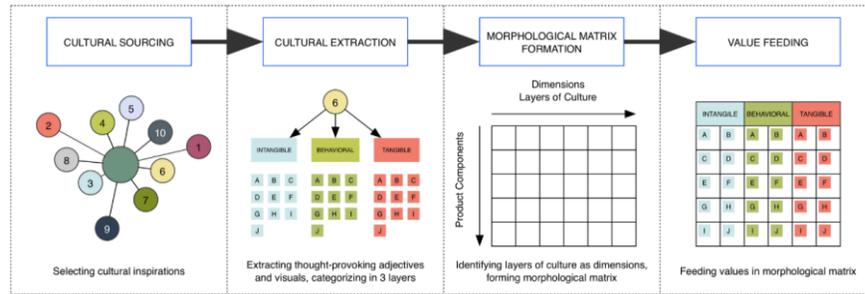
**FIGURE 2**  
**THOUGHT-PROVOKING VISUALS EXTRACTED FROM THAI KITE**

### **Developing Dimensions and Feeding Values**

The vertical axis of the morphological matrix is the list of product components, which users are required to break down into subcomponents (Lo et al., 2010). The horizontal axis, called dimensions (Geum and Park, 2016), identifies the 3 layers of culture, namely intangible, behavioral, and tangible (Lin, 2007). In each dimension, the extracted adjectives and images derived from in-depth interviews fill the matrix as values in order to complete the construction of the idea generation tool.

### **Concept Generation Support System for Cultural Products**

The idea generation technique for cultural products is developed into a web-based concept generation support system based on the morphological chart. Values in the matrix result from the 10 in-depth interviews conducted to extract cultural inspirations. The values are in both text and image formats, as they are crucial triggers provoking associations and ideas during the concept development process (Cheng, 2016; Gonçalves et al., 2014) (Figure 3).



**FIGURE 3**  
**THE DEVELOPMENT PROCESS OF IDEA GENERATION TOOL FOR CULTURAL PRODUCTS**

### Usage Procedure

The idea generation tool allows users to generate multiple ideas, employing the Thai cultural heritage as source of inspiration, which can be used as follows.

#### Step one: Choose a Thai cultural inspiration

This is the first phase of using the tool. Users are presented with list of domains of Thai cultural heritage. Once a domain is selected, users are presented with the Thai cultural heritage in that particular domain, classified by region. Images and text related to the chosen Thai cultural heritage will be displayed, describing the background of that particular cultural heritage so that users can gain some knowledge regarding the selected inspiration. After reading the background, users must click the confirm button to proceed to the next step.

#### Step two: Key in the type of product or service

In the second phase, users enter the concept generation phase and are presented with instructions for developing the conceptualization. The chosen inspiration is presented, and users are required to key in product or service name they wish to conceptualize.

#### Step three: 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. Users fill in the product or service component of the product or service they wish to conceptualize in the first column of the matrix. For instance, if the design project is a cellphone, the product components can be buttons, screen, or case

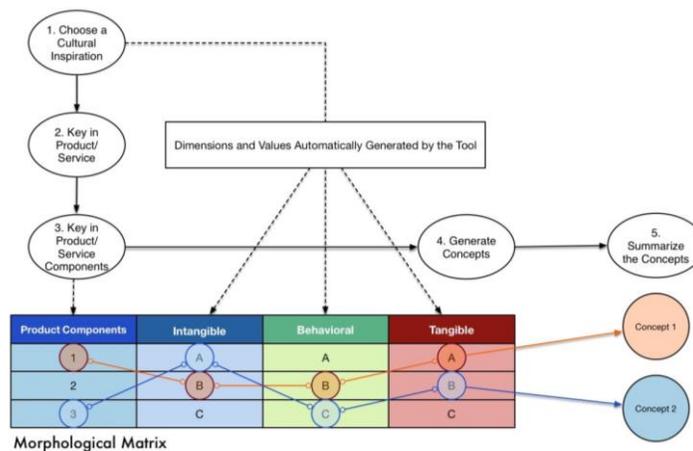
#### Step four: Generate concepts from the Morphological Matrix

Users select a product component and inspirational text, 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 components, and keywords of each layer, to derive at the concept through a forced association thinking method (Chou, 2014; Moon and Han, 2016; Geum and Park, 2016; Waal and Ritchey, 2007; Geum et al., 2016; Kim et al., 2008). The description of the concept needs to be entered into the box at the bottom of the matrix. In addition, users can upload an image they wish in order to help solidify the concept.

**Step five: Summarize the concepts and save**

Once finish describing the concept, the user can click the “save” button to record the generated ideas. Users can generate and save ideas as many times as they wish. The ideas are presented in a table format containing the product or service type, the component, the keywords with images, and the description of the concept (Figure 4).



**FIGURE 4  
USAGE DIAGRAM OF THE IDEA GENERATION TOOL**

Mobile Phone	Case		→	Use various techniques of banana leaf folding as inspiration for the design of outer case. The focus is on repetitive pattern.	
	Communicate Symbolic Meaning through Objects	+	Delicate 	+	Banana Leaf

**FIGURE 5  
EXAMPLE OF PRODUCT CONCEPT DERIVED FROM THE CONCEPT GENERATION SUPPORT SYSTEM:  
MOBILE PHONE CASE INSPIRED BY THAI OBLATION**

### CASE EXAMPLES

After completing the system development, the researcher tested and validated the developed tool with design-driven entrepreneurs, Thai designers who operate their small-scaled enterprises in creative industries. Ten case studies were conducted with design-driven entrepreneurs who have extensive experience with cultural design, and also those who had not had experience with cultural design before. The cases consisted of both product-based and service-based projects. In each case, a designer was asked to develop concepts using his or her own conventional method. After completion, the designer was shown how to use the idea generation tool and asked to develop concepts by using the tool. For each idea session, designers were given a total of 60 min to complete the workshop; that is, they were given 30 min for the conventional method, and another 30 min for the proposed method.

#### Design Projects and Cultural Inspirations

The ten case studies consisted of design projects, including three products (travel bag, mobile phone, and sports shoes) and two services (delivery service and medical service). For generalization and comparison, five cases were completed by cultural-based entrepreneurs, and the other five were completed by non-cultural-based entrepreneurs. For each project, each entrepreneur was asked to develop the concept of the particular product or service by harnessing one of ten Thai cultural heritage aspects as inspiration using, separately, both his or her conventional method, and the proposed method. Figure 6 summarizes details of each case study. An example of the concept generated from one of case studies is presented in Figure 5.

Category		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
		A	B	C	D	E	F	G	H	I	J
Traditional Craftsmanship	Thai Ikat Silk	1C			●						
		1M			●						
	Thai Oblation	2C	●								
Performing Arts		2M	●								
	Aranyik Knives	3C	●								
		3M	●								
Knowledge and Practices Concerning Nature and the Universe	Hoonkrabok	4C				●					
		4M				●					
	Khon	5C									●
Folk Games and Sports		5M									●
	Krayasart	6C									●
		6M									●
Social Practices, Rituals and Festive Events	Kanom Buang	7C		●							
		7M		●							
	Thai Kite	8C							●		
	8M							●			
	Loikrathong	9C						●			
	9M							●			
	Songkran	10C						●			
	10M							●			

C = Conventional Method  
M = Morphological Analysis  
CH-based = Cultural Heritage-based Designers  
NCH-based = Non Cultural Heritage-based Designers

**FIGURE 6**  
**CASE STUDIES OF IDEA GENERATION WORKSHOPS**

## Concept Evaluation

### Quantity evaluation

A total of 57 concepts were generated in the case studies. Among those concepts, 24 concepts were developed using conventional concept development methods, and 33 concepts were developed using the idea generation tool. Of these 57 concepts, the designers with no cultural-design experience generated 31 ideas, whereas designers with cultural-design experience generated 26 ideas. The number of ideas generated is one indicator of the effectiveness of the process, as a higher number of ideas are likely to lead to higher probability of yielding high-quality ideas (Diehl and Stroebe, 1987; Gallupe et al., 1992; Valacich et al., 1993; Campbell 1960). The research result proves that developing concepts using the tool is more effective than conventional methods, and the tool is beneficial for concept development activity (Table 6).

	DESIGNER TYPE										TOTAL	
	CH-BASED					NCH-BASED						
	A	B	C	D	E	F	G	H	I	J		
CASE STUDY												
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	

### Quality evaluation

Regarding concept quality, the ideas generated in the workshops were evaluated based on the Idea Quality Scales proposed by Dean et al. (2006). The scales consist of 4 key constructs to measure the quality of an idea, including Novelty, Workability, Relevance, and Specificity. Each construct includes 2 subconstructs. The Novelty Construct includes Originality and Paradigm Relatedness. Workability includes Acceptability and Implement ability. Relevance includes Applicability and Effectiveness. Specificity includes Completeness and Implicational Explicitness.

The concept ideas from the idea generation workshops were evaluated by judges who have experience in culture-driven product and service industries. Those judges included two senior designers with experience in culture-related design industries, and two entrepreneurs whose products or services involve culture. According to Dean et al. (2006), the number of rater for evaluating new concept, predominantly consist of two experts in the field. Nevertheless, several studies regarding new concept development include 4 judges in the idea assessment process (Chou, 2014; Moon and Han, 2016; Toubia 2006). In the context of this study, the researcher included 4 judges to rate the generated concepts. Prior to the evaluation, the raters were given the scales with explanations of each score. The total scores from the 10 workshops were calculated to find the average score of each dimension, calculated from the scores of conventional method and those of the proposed method.

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 an

average score of 2.62 for Novelty, 3.18 for Workability, 3.00 for Relevance, and 2.59 for Specificity.

Digging deeper into the subdimension level, ideas from conventional ideation methods were rated with the average score of 2.54 for Originality, 2.23 for Paradigm Relatedness, 3.19 for Acceptability, 3.00 for Implement ability, 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 Implement ability, 3.09 for Applicability, 2.91 for Effectiveness, 2.58 for Completeness, and 2.61 for Implicational Explicitness.

Analyzing the average scores given by the judges, it can be seen that the average score of concepts generated by the proposed ideation tool received a higher score in all dimensions of idea quality with a difference of 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 levels are, in turn, the results of higher scores at the subdimension level, where the score from ideas generated by the tool surpassed that of the conventional method by 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 idea generation tool is capable of assisting design-driven entrepreneurs in developing higher-quality ideas than using their traditional ideation methods in all aspects.

The discrepancy of the average score between the two methods 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 ideation 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 illuminate a 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 0.24 point higher score is the result of 0.11 points higher score in Originality and the striking 0.36 points higher score in Paradigm Relatedness, showing 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. Because 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 and Park, 2016; Kim et al., 2008; Moon and Han, 2016; Waal and Ritchey, 2007), the fusion of product attributes with inspirational text and images from the intangible, behavioral, and tangible layers of culture leads to radically creative ideas, differing from those normally encountered in the industry (Tables 7 & 8).

<b>SCORE COMPARISON</b>		
<b>SUBDIMENSION</b>	<b>C</b>	<b>MA</b>
Originality	2.54	2.65
Paradigm Relatedness	2.23	2.59
Acceptability	3.19	3.26
Implement ability	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

<b>SCORE COMPARISON</b>		
<b>DIMENSION</b>	<b>C</b>	<b>MA</b>
NOVELTY	2.39	2.62
WORKABILITY	3.09	3.18
RELEVANCE	2.54	3.00
SPECIFICITY	2.11	2.59

## CONCLUSION

Given the characteristics of cultural products, the Morphological Analysis (MA) (Zwicky, 1957) combining with Cultural Design Model (Lin, 2007) can be applied in the idea generation activity. MA is a structured thinking method which alleviates the fuzzy nature of idea generation process, validated as a reliable method for concept generation (Arnold et al., 2008; Geum et al., 2016; Huang and Mak, 1999), and commands fusion of ideas from users through forced association thinking method. The cultural design model requires users to extract cultural inspiration in three layers, allowing them to reach the untapped intangible elements of cultural heritage. Based on the result of ten case studies, ideas generated from the methodology surpass those from conventional thinking methods in terms of idea quantity and also idea quality as measured by the idea quality scale (Dean et al., 2006), validating the method as an improved process for cultural products comparing to tradition ones.

In terms of academic contribution, the proposed idea generation process would shed light on the domain of new product development, essentially for a cultural product paradigm, for which few studies exist. The proposed technique should be used as foundation for future empirical research on topics related to new product development of cultural products and services and creative-based entrepreneurship. In terms of managerial aspects, the developed idea generation technique and support system contribute to the design and innovation community. The technique and system can equip Thai design-driven entrepreneurs with a tool to leverage the nation's cultural assets. In addition, the ideation process can be a guideline for creative professionals to systematically create value through the country's cultural capital.

As the research was conducted only in the Kingdom of Thailand, the study output is exclusively applicable in the context of the country. It would be worthwhile to explore the

effectiveness of the proposed idea generation process in contexts with polarized culture. Furthermore, the case studies conducted include two key types of design-driven entrepreneurs, with experience in cultural heritage design and without cultural heritage design. Future research could conduct case studies with non-designer entrepreneurs and compare the results between each group. Such study would extend the applicability of the proposed process to other types of users.

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