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Tripartite model of fashion design process

Abstract

Fashion design process is a complex activity that most people believe that it is purely based on intuition. However, it is possible to break down the process into three components, namely meaning, trend and feeling. In execution, the process can start from the root block of "theme" and continue to the leaf blocks of "garments." It forms a tree structure. The author intends to define fashion design process rigorously and formally using a tripartite model which is graphically represented as the tree structure, with a supporting example.

Keywords: tripartite model, fashion design, wearer, consumer

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Introduction

Fashion design process is a complex activity that many people believed that a designer is capable of considering all elements concurrently through his/her talent to achieve a final design work. Such understanding hinders the possibility to teach the computer to learn how to design fashion by artificial intelligence. This paper presents a novel process model of fashion design that is based on three fundamental elements of a fashion garment, namely meaning, trend and feeling. Such approach is a unification of the artistic approach and the commercial approach. The logic is simple. As a creative work, it is possible to apply the artistic approach to create meaning for the artwork and to provoke the feeling of the audience or wearer, whereas, as a commercial design, it is required to apply the commercial approach to follow the trend and to match the expected feeling of the consumer. Hence, by working from two different directions, it is vital to reach the same meeting point, which is the feeling of the audience/wearer/consumer. Hence, a tripartite model is proposed.

In this article, the theoretical tripartite model will be defined and then, the executive steps will be presented which will be followed by the hermeneutic phase. Therefore, the starting point of the process is defined as the root of a tree, together each branching possible step can be used to define connecting arc. Consequently, the whole execution of the fashion design process is a tree-structure with root block of "theme" while the leaf blocks are the "garments." When all garment nodes and the unused nodes are collected back to the end node, the tree-structure becomes a lattice.

Tripartite model of fashion design process

The Tripartite Model of Fashion Design Process is defined by three components, namely meaning, feeling and trend. Each component will be defined in this section. The mathematical definition will be presented in the next section.

Meaning

The meaning creation process can be modelled by the linguistic fashion statement approach,[1] which maps a fashion statement (design theme) to the list of abstract elements, which is in turned to be mapped to the list of concrete elements via the use of signifier-signified principle of the semiotics. When the concrete elements are available, selected and arranged, the garment is created. The application of signifier-signified principle is the core tool to assign meaning to the concrete elements. Generally speaking, it is possible to adhere to the fashion grammar that is defined by Roland Barthes.[2] In practice, people tend to infer the meaning anyway without explicit reference to Roland's grammar. Such inference is possible according to the theory of deconstruction that was proposed by Derrida.[3] Anyhow, the concept of mythology by Barthes[4] is the key to the understanding of the meaning in a fashion collection.

A collection of garments can be described in four levels. The first level is the description of the physically observable items, such as fabric material, ornaments, silhouette, color, texture, etc. The second level is the photographic description of the highlight of the visual perception of the collections. The third level is the signified meaning of the visually perceived impression. The fourth level, if exists, is the higher level of signified meaning of the level three information. This fourth level can produce the myth that can explain the success or failure of the collection. So, what is the myth of fashion really?

Generally, it is possible to classify the meaning of any artwork into four categories of relationship, namely:

a. Relationship between a person and oneself
b. Relationship between a person and society
c. Relationship between a person and physical world
d. Relationship between a person and the ultimate reality.

i. **Relationship between a person and oneself:** A common question that one should ask is "who am I?" Different cultures and religions offer different answers, such as reincarnation (or rebirth) and creation by God the Almighty. The solution to this question can lead to concepts like revelation and redemption. "What is the purpose of my life?" "How should I face death?" "Is there eternal life?" There are so many questions that offer an infinitely possible answers or perhaps proposals.

ii. **Relationship between a person and the society:** The next question is "how do we live in the society?" When one reacts to another person, there is love; there is identify; there is Orientalism; there is post-colonialism; and more. There are conflicts among culture, gender, religion, and ideology. How could the conflicts be handled? "What is fairness?" "What is peace?" "Is democracy the solution to all political problems and conflicts?"

iii. **Relationship between a person and the physical world:** Ever since the ancient time, people knows that the world is ever changing. There are beauty and the power of the Mother Nature. The eternal conflict between the threats of existence of humanity. "What will the future of humanity be?" "Will human beings become android or cyborg (cybernetic organism)?" "Will there be space travelling or even encounter with E.T.?"

iv. **Relationship between a person and the ultimate reality:** In the story of cave, ancient Greek realized that what is perceived by human beings could not be the true reality. Buddha named one aspect of Buddhahood to be the realization of the ultimate reality which is beyond our sensory interpretation. "Is dream the ultimate reality?" "Are we living in a computer simulated reality?"

All these concepts can trigger meaning and lead to emotion. Emotion can be surfaced or deep, but it is emotion that is most fundamental and emotion drives the consumer to purchase. As time goes on, different groups or culture change their priority of meaning. It is because when the social structure changes, new problems are waiting to be tackled, hence new meanings are required. So, there is trend.

Feeling

So, what kind of feeling do people treasure? Historically, garments served as a social-political symbol for differentiating different social classes, such as the royal family, the civilians, and the different professions. Even today, garments served to differentiate the rich and the poor, but the boarder-line is very fuzzy, because of the middle class. Feeling such as prejudice, rich, royal, important, bossy, etc. can be derived from a social-political symbol. Furthermore, feeling such as acceptance, love, cared, or their antonyms can also be derived by garments: unisex clothes, wedding gowns and punk. Next, there are feeling there are related to the physical environment, such as the sense of protection, the love of the mother nature, the hope of future living and the sustainability of humanity. Finally, the spiritual feeling that may be coming from religion, or the purification of the soul. In practice, these feeling are usually summarized as a form of life style; the way people live; the attitude that people have; the values that people treasure; and the dreams that people pursue.

Trend

When trend is the signal of the success in the commercial fashion world, it must be captured in the design collection. Typically, it is done by the fashion designer during the evaluation stage of the rational design process; the appropriate and required feeling can be assured by using the technique in hermeneutics. The "meaning to feeling" process is highlighted.

That means, one must match the concrete design elements that are selected in the garment to the existing trendy elements. Such mapping is very straight forward. For example, by taking the set intersection of the set of concrete design elements and the set of trendy elements, one can reduce the possibility and quickly reach the final garment. Another approach is to add more trendy elements that do not affect the meaning of the design. Hence, meaning, feeling and trend are now interconnected. In practice, a fashion designer may concurrently take care of three legs in the tripartite or may sequentially handle each leg one by one. Yet, as long as the design is superb, the process itself is neglected by the consumers. Most importantly, such a tripartite model is suitable for the implementation of the computer with artificial intelligence when the mathematical definition is available.

Mathematical definition of the design process

The creation process can be articulated as a network of nodes, and each represent a step in the process. Mathematically, it is a tree structure. When the leaf nodes point to a terminal node, it becomes a finite lattice, which is a standard element in the abstract algebra. Graphically, the lattice structure can be visualized in Figure 1. Furthermore, it is vital to be able to check the grammar of the design to ensure it is consistent and coherence. Such grammar can be defined by a set grammar rules in the form of process algebra.

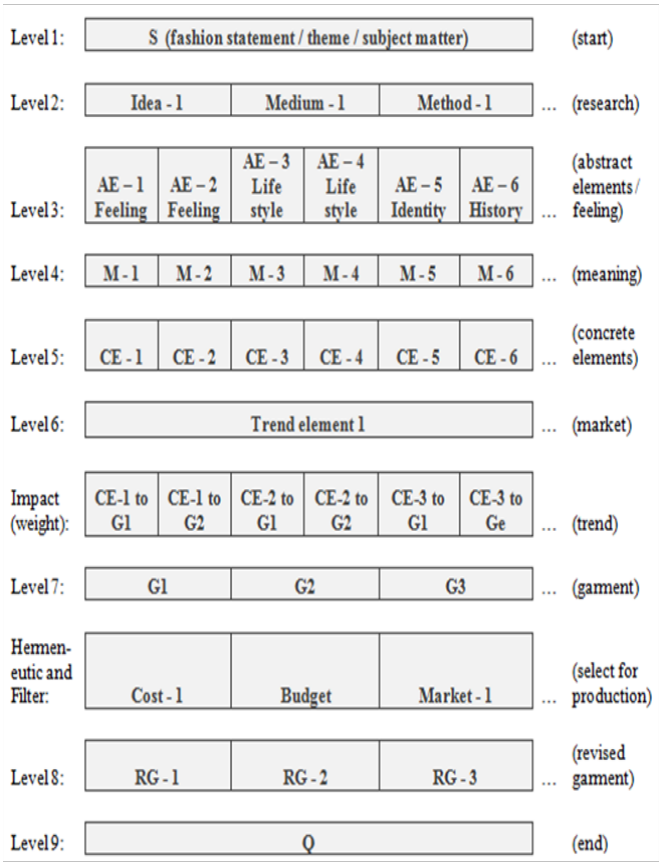

Figure 1 Level Structure of Fashion Design Progress (Note: the interconnecting lines among the nodes are omitted in this figure).

Lattice structure

Let S be the starting node. This is the confirmation of the theme. The next level of nodes corresponds to the research of idea, media, and method. The third level of nodes are generation of the descriptions that are related to the the theme. These nodes are abstract elements. The anticipated feeling of the design can be explicitly defined in this level. The fourth level of nodes is the mapping from the abstract elements to the meanings. Of course, the next level of nodes maps the meaning to the concrete elements. Based on the marketing research, the concrete elements can be grouped together according to the trend elements. Now, the impact of trend comes in, as a weighting factor to these nodes. Certainly these weighting factors are time dependent. Eventually, different combinations of nodes are the description of the garments in the collection. Furthermore, in practice, the final choice

of what to manufacture for the market has a few limiting factors, such as the actual cost of the manufacturing, the total amount of the budget, the anticipated market price, and other decision factors can be added to the existing mathematical model by changing the weighting factor, or by adding another level of nodes that explicitly describe the feasibility according to financial, marketing and other managerial considerations. This phase is the hermeneutic phase, in which the designs are once again revised. The final design will be used for production. Together with those unused nodes, every nodes point to the ending node Q.

Grammar rule

Using the Backus-Norma Form combined with process algebra; the set of grammar rules can be written as follow:

$$S: = (AE_i)^+ \mid ® (M_j)^+ \mid ® (CE_k)^+ \mid ® Q$$

Where ()+ is the closed set with at least one element; *i*, *j*, *k* are the subscripts for the Abstract Elements (*AE*), Meaning (*M*) and Concrete Elements (*CE*) respectively; and the symbol $\mid ®$ is the transition map.

Example

A very simple example is now presented. It serves to illustrate how a design can be achieved. It should be noted that even in a simple example, there are many possibilities and it is not possible to present all the possibilities in a simple, therefore, only selected items appear in the Table 1.

Table 1 The Translation of Action to Mathematical Expression

Action	Mathematical representation
Select theme to be "peace in pacifica"	**S = "peace in pacifica"**
Partial result of research:	$Idea_1$ = "ceremony",
Idea can be ceremony, road sign, etc.;	$Idea_2$ = "road sign",
Medium can be graphic image, color, etc.;	$Medium_1$ = "graphic image",
	$Medium_2$ = "color",
Method can be printing, embroidery, silhouette, etc.	$Method_1$ = "printing",
	$Method_2$ = "embroidery",
	$Method_3$ = "silhouette", etc.
Abstract elements include: "no war", "peace", "no conflict", "harmony", "living happily", etc.	AE_1 = "no war",
	AE_2 = "peace",
	AE_3 = "no conflict",
	AE_4 = "harmony",
	AE_5 = "living happily", etc.
Partial meaning mapping based on the symbol of peace. Peace = "dove" and "symbol by Gerald Holtom", "the broken riffle",	M_{11} = ("peace", "dove"),
Harmony = "many" and, etc.	M_{12} = ("peace", "symbol by Gerald Holtom"), M_{13} = ("peace", "the broken riffle"),
	M_{21} = "many", etc.
Selected concrete elements include: dove,	CE_1 = dove,
	CE_2 = symbol by Gerald Holtom,
	CE_3 = the broken riffle, etc.
Some trend elements with impact include:	$Trend_1$ = yellow,
Color: yellow (high),	$Trend_2$ = red,
red (medium),	$Trend_3$ = smooth etc.
white (medium), etc.;	
Texture: smooth (high), etc.;	
Draft of Garment: First garment:	G_1 = T-shirt + (1) (yellow + dove print),
T-shirt with a yellow dove print,	G_2 = T-shirt + (1) (red + dove print),

Table Continued..

Action	Mathematical representation
Select theme to be "peace in pacifica"	**S = "peace in pacifica"**
Second garment: T-shirt with a red dove print,	G_3 = T-shirt + (many) (yellow + dove print) + (many) (red + dove print), etc.
Third garment: T-shirt with many colorful dove print, etc.	
Filter stage: Cost of yellow print = 10 unit,	$Cost_1$ = (yellow, 10),
Cost of red print = 12 unit,	$Cost_2$ = (red, 12),
Cost of color print = 15 unit,	$Cost_3$ = (many color, 15),
MaximumPrice = 50,	Max Price = 50; $Matching_1$AE,
Matching 1 AE, Matching 2 AEs, etc	$Matching_2$AE, etc.
Revised garment:	$RG_1 = G_1$, $RG_2 = G_2$, $RG_3 = G_3$, etc.
No need to revise, as the total cost falls below the Maximum Price.	
At the final stage of Q, the design process ends.	Q

In this simple example, the final collection consists of the revised garments $\{RG_j\}$. It is clear that during the searching process, there are many possibilities. However, as the world is finite, and the trend elements are limited at any time frame, the possible number of revised garments is not a very large number. In practice, a men's collection can have up to 100-200 draft garments per season for a medium size brand, but at the end, only around 30-60 garments are actually put into production. The selection process is carried out by the design manager, who has design experience and production knowledge to eliminate those designs that may cause problem either in the production or too expensive. As the technology of Artificial Intelligence is evolving to more mature and the computing power increases tremendously under the cloud environment, these kinds of decisions will be handled by the computer software experts in the foreseeable future.

Conclusion

The author presents the tripartite model of design process using two mathematical tools of the lattice structure (abstract algebra) and the process algebra. Consequently, the concept can be precisely and mathematically defined and presented. This model takes into account of the relationship among abstract elements, signifier-signified principle and the concrete elements in creating the meaning, the feeling and the trend. Although today, this process is carried out by designers and design managers, it is a matter of time that the whole process can be handled by an intelligent software expert.

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Conflict of interest

Author declares there is no conflict of interest in publishing the article.

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