

Sensibility Image Scales for Korean Traditional Motifs

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Abstract

The objectives of this study are to develop sensibility image scales for Korean traditional motifs by quantitatively measuring their images and preference and to classify them into clusters. Data were collected via a questionnaire from seven hundred twenty five Korean undergraduate students. The experimental materials were forty eight stimuli of Korean traditional motifs with different categories, interpretation types, composition types, and application objects. The instruments consisted of 7-point polar semantic differential scales of twenty three bipolar adjectives including preference. Data were analyzed by correspondence analysis, cluster analysis, ANOVA and Duncan's multiple range test.

The major results are as follows; First, sensibility image scales for textile patterns and dress designs using Korean traditional motifs were constructed. The axes of sensibility image scales for both textile patterns and dress designs were defined by quality level and degree of simplicity. Second, four clusters on the scale of textile patterns and two clusters on the scale of dress designs were identified. Third, in the case of textile patterns, the preferred cluster had high-quality and classical images, while the cluster that was not preferred had a complex image. In the case of dress designs, the preferred cluster had simple and high-quality images, while the cluster that was not preferred had complex and low-quality images.

Key words: sensibility image scale, Korean traditional motifs.

I. Introduction

Ethnic look which has been presented every season as one of the major fashion themes is a good instance that cultural elements are valuable tools to present uniqueness in the world fashion market. Korean look can be shown by applying to textile or apparel designs, Korean traditional design elements such as form, silhouette, details, color, material, pattern etc. Korean traditional motifs are frequently employed for decorating the surface of clothing to present Korean ima-

ges. To utilize Korean traditional motifs in developing new designs which can satisfy contemporary customers, it is very important that sensibility and preference to Korean traditional motifs have to be systematically quantified. The approach of sensibility engineering makes this task possible. It is useful for systematically manipulating and assessing sensibility and preference to Korean traditional motifs. Also visual presentation of motifs, and sensibility and preference data is necessary in a practical design process. The sensibility image scale for Korean traditional motifs can be the best way of visual

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presentation to create customer-centered designs. It demonstrates similarities and contrasts among Korean traditional motifs, sensibility, and preference on a two-dimensional map. It will provide designers with a tool to understand and satisfy customer's sensibility wants. For customers, it will help to choose designs that satisfies their needs. The objectives of this study are to develop sensibility image scales for Korean traditional motifs, to identify clusters on the sensibility image scales, and to identify sensibility images to Korean traditional motifs in each cluster.

II. Theoretical Background

1. Researches on Sensibility Images in Textile Design Field

In the past, a designer's ideas were very important in developing new designs. Still, a designer's role in design process is quite significant, but customers' personality and sensibility are getting increasingly important in developing new designs. For enhancing customer's satisfaction and successfulness of products in the market, the approach of sensibility engineering in developing new designs has been playing an important role. It is the main factor in deciding the direction of technology development.¹⁾ In the design field in general, systematical database

systems have been being established with quantifying sensibility and finding out the relationship between sensibility and design. There has been this type of efforts in textile design area also. Shibata²⁾ developed TDIDS(Textile Design Image Database System) which is a human-centered interface based on the concept of sensibility link. Park³⁾ identified the structure of adjectives for sensibility of visual design elements in textile. Choi⁴⁾ collected sensibility vocabularies and elements of textile design, and established a hierarchical system from them. And she compared the total sensibility level with the sensibility level calculated by employing weight factors according to the relative importance of each element. Cho⁵⁾ developed an analysis system for textile pattern design elements. Kim⁶⁾ constructed a texture vocabulary image scale and a fabric image scale which can be used to understand and identify the movement of fashion trend. Cho^{5,7)} developed the analysis system for textile pattern design.

2. Sensibility Images and Preference to Korean Traditional Motifs

Many Korean designers have tried to create designs using traditional design elements to present Korean images. However, there have been only few systematical research efforts.

Chang and Kim⁸⁾ extracted a classification

¹ N. S. Lee, Seven sensibility engineering- high quality, (Science Dong-A, 1995), 47.

² Y. Shibata and M. Fukuda, A Hypermedia-based design image database system using a perceptual link method, *Journal of Management Information System*(1996), 13(3), 25-45.

³ Y. Park and D. Lee, A study on the cognitive scientific explanation for design ideation, *Journal of Korean Society of Design Studies* 21(1997), 1-12.

⁴ J. Y. Choi, H. J. Lee, D. W. Oh and C. S. Leem, An analytical methodology of human sensibility ergonomics for textile design, *Proceeding of the Korean Society for Emotion and Society Conference*, 224-229.

⁵ H. Cho and J. H. Lee, A presentation of guidelines for layout techniques in design of floral-patterned scarves based on an analysis of consumer emotion: Part I, *Korean Society for Emotion and Sensibility* 1(2)(1998), 23-33.

⁶ M. J. J. Kim, A study on the human sensibility measurement technology of texture and colour coordination, Doctoral dissertation, Hanyang University (1996).

⁷ H. Cho and J. H. Lee, A presentation of guidelines for layout techniques in design of floral-patterned scarves based on an analysis of consumer emotion: Part II, *Korean Society for Emotion and Sensibility* 3(1)(2000), 53-62.

prototype for Korean traditional patterns using qualitative and quantitative approaches. Chang⁹⁾ studied the images and characteristic formative elements of Korean traditional patterns and their relationships to construct a perception map. And the perception map which had the poles of soft-hard and plain-gorgeous was constructed. Chang and Kim¹⁰⁾ investigated sensibility images of Korean traditional motifs including lotus, crane, and cloud according to category, interpretation type, composition type and application object. Four factors were emerged; 'simplicity', 'quality', 'interest', 'modernity' and among them 'simplicity' and 'quality' were found to be the major factors. The application object to which Korean traditional motifs were applied had significant effects on 'simplicity' and 'modernity', and the composition type on 'quality' and 'interest'. Chang and Kim¹¹⁾ identified the relationship between preference and sensibility images of Korean traditional motifs. Category, composition type and application object for Korean traditional motifs had a significant effect on preference. Especially, composition type had a greater effect on preference than the others. Preference on textile pattern was affected mainly by 'quality' followed by 'simplicity', 'interest' and 'modernity' in order, while the preference on dress was affected by 'quality', 'interest', 'simplicity', and 'modernity' in order. 'Quality' was the most influential factor in determining the

preference to a motif. These research results showed that the images of designs involving Korean traditional motifs could be presented differently according to category, interpretation type, composition type, and application object. To apply these results in developing new designs, the construction of image scales is necessary.

III. Procedures

1. Subject

Seven hundred eighty male and female undergraduate students in Taejon and Chungcheong District participated in the assessment of sensibility images and preference to Korean traditional motifs. The survey was executed in the period of the 23rd of Nov. 1998 to the 4th of Dec. 1998. Seven hundred twenty five questionnaires were collected and fifty five insincere responses were eliminated.

2. Stimuli

According to three levels of categories, four levels of interpretation types, two levels of composition types, and two levels of application objects, twenty four textile pattern stimuli and twenty four dress design stimuli were simulated on a CAD(Computer Aided Design) system. Eight hundred thirty one Korean traditional motifs were collected from the literature^{12,13,14)}:

⁸ S. K. Chang and J. S. Kim, Prototype extraction for the categorization of lotus and crane patterns using qualitative and quantitative approaches, *Journal of the Korean Society of Clothing and Textiles* 20(6)(1996), 1016-1026

⁹ S. K. Chang, A study on the figuration of Korean traditional pattern images, *Journal of the Korean Society of Clothing and Textiles* 22(8)(1998), 1001-1010.

¹⁰ S. K. Chang and J. S. Kim, Images of Korean traditional patterns according to category, interpretation type, composition type, and application object, *Journal of the Korean Society of Clothing and Textiles* 24(2)(2000), 214-225.

¹¹ S. K. Chang and J. S. Kim, The preference on Korean traditional motifs and its relationship with motif images, *The International Journal of Costume Culture* 2(2)(1999), 154-164.

¹² Y. J. Lim, *History of traditional patterns*. Seoul: Mijinsa(1983).

¹³ Y. J. Lim, *Traditional motifs*. Seoul: Mijinsa(1991)

¹⁴ H. H. Seo, *Korean's patterns*

564 lotus, 140 crane, and 127 cloud motifs. Twelve representative motifs were selected from them by a professional group of two professors and three graduate students. They were simulated as repeated patterns with a 1/2 drop or brick repeat method. Horizontally longer motifs were repeated with a brick repeat method and vertically longer ones with a 1/2 drop repeat method. The ratio between figure and ground was around 5:3, and the number of repeat was from twelve to eighteen. These single-motif and repeated-motif textile patterns were applied on a simple one-piece dress. The color was controlled to black and white. The size of pattern stimuli was 14×9.5cm and the size of dress ones was 6.3×13.5cm.

3. Instrument

The instrument was developed on the basis of previous researches. The questionnaire included two sections, one on sensibilities and the other on preference. The former included twenty two adjectives and the latter included one adjective. Responses of the subjects were measured by using a series of 7-point semantic differential scales in which they were asked to indicate their degree of agreement. The reliability of the measuring instrument was tested by calculating Cronbach α in a pre-test and calculating reliability between a pre-test and a retest. Cronbach α was .85 and the level of reliability between two tests was .80 so that the reliability of instrument was verified. The validity was examined by a judge group. The judge group was the same one who selected the representative motifs.

4. Data Analysis

SAS was used for statistical analysis of the data. To construct image scales for the textile patterns and dress designs with Korean traditional motifs, a correspondence analysis was performed. The data measured by using a series of 7-point semantic differential scales were transformed to be suitable for correspondence analysis. By using the data from the correspondence analysis, a cluster analysis(Ward method)

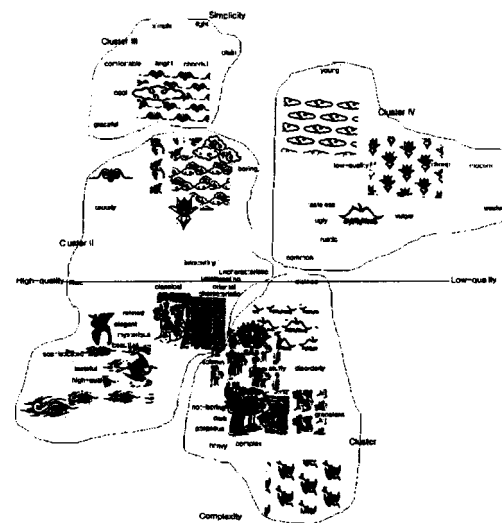
was performed. To determine the relationship between clusters and sensibilities, ANOVA and Duncan's multiple range test were performed.

IV. Results and Discussion

1. Sensibility Image Scale for Textile Patterns using Korean Traditional Motifs

Correspondence analysis was performed to construct an image scale for textile patterns with image adjectives. As a result, the inertia of the first axis was 0.027, and its explanation-percent was 44.62%. The inertia of the second one was 0.014 and its explanation-percent was 22.74%. The explanation-percent by both axes was 67.36%. Quality value of a pattern or adjective is the explanation value for it by the two axes. The quality values of adjectives which belonged to 'simplicity' and 'quality' factors were higher than the other factors.(Table 1)

On the basis of quality values of adjectives and the location of textile patterns, the horizontal axis represents 'quality level' with a polarization of the high-quality and low-quality. (Fig. 1) The adjectives such as graceful, elegant and high-quality appeared to be clearly separated from graceless, cheap and low-quality on



(Fig. 1) Sensibility Image Scale for Textile Patterns.

〈Table 1〉 Quality Values of Stimuli and Adjectives

Textile pattern stimuli	Quality	Dress stimuli	Quality	Textile Pattern Adjectives	Quality	Dress Adjectives	Quality
L3R	0.88	K3S	0.94	Light, heavy	0.93	Simple, complex	0.97
C2S	0.87	C2R	0.94	Plain, gorgeous	0.90	Graceful, graceless	0.97
C2R	0.87	K2S	0.93	Simple, complex	0.88	Orderly, disorderly	0.96
K1R	0.82	C1R	0.93	Comfortable, uncomfortable	0.84	Tasteful, tasteless	0.93
C4S	0.82	C4S	0.93	Graceful, graceless	0.78	Plain, gorgeous	0.92
L4S	0.79	C2S	0.92	Elegant, cheap	0.77	High-quality, low-quality	0.92
L4R	0.74	L4R	0.91	Refined, vulgar	0.76	Liked, disliked	0.92
C4R	0.72	K1S	0.91	Cheerful, solemn	0.76	Sophisticated, rustic	0.91
K3S	0.70	C4R	0.91	High-quality, low-quality	0.76	Beautiful, ugly	0.91
K1S	0.68	L2S	0.90	Beautiful, ugly	0.71	Refined, vulgar	0.88
K2R	0.68	L2R	0.90	Bright, dark	0.70	Cool, stuffy	0.89
C1R	0.68	L4S	0.90	Cool, stuffy	0.69	Light, heavy	0.88
C3R	0.68	C1S	0.90	Liked, disliked	0.68	Elegant, cheap	0.87
L2R	0.67	L3R	0.89	Tasteful, tasteless	0.67	Comfortable, uncomfortable	0.83
K2S	0.65	C3S	0.88	Sophisticated, rustic	0.65	Young, aged	0.82
C3S	0.60	L3S	0.87	Orderly, disorderly	0.64	Mysterious, common	0.81
C1S	0.54	L1R	0.86	Not-boring, boring	0.51	Not-boring, boring	0.79
L1S	0.53	K3R	0.85	Western, oriental	0.41	Bright, dark	0.74
K4S	0.53	K4R	0.84	Modern, classical	0.35	Cheerful, solemn	0.66
L1R	0.40	K2R	0.80	Mysterious, common	0.35	Interesting, uninteresting	0.41
L3S	0.34	K4S	0.74	Young, aged	0.33	Western, oriental	0.35
L2S	0.27	L1S	0.66	Interesting, uninteresting	0.05	Characteristic, uncharacteristic	0.34
K3R	0.27	K1R	0.35	Characteristic, uncharacteristic	0.03	Modern, classical	0.23
K4R	0.13	C3R	0.18				

L : lotus, K : crane, C : cloud.

1 : realistic type, 2 : stylized type, 3 : abstract type, 4 : decorative type.

S : single-motif, R : repeated-motif.

this axis The vertical axis represents 'degree of simplicity' with a polarization of simplicity and complexity. The adjectives such as simple, light and plain appeared to be clearly separated from heavy, complex and dark on this axis.

Cluster analysis was performed to group textile patterns and adjectives into homogeneous clusters; in each cluster, the members have similar characteristics. Hierarchical clustering technique suggested by Ward was used. It was performed with X, Y coordinate values on the image scale. As a result of cluster analysis, four groups were identified. (Fig. 1)

Cluster I had eight textile patterns; realistic type and decorative type of lotus, stylized type

of lotus with repeated-motif, decorative type of crain with single-motif, realistic and abstract type of crain with repeated-motif, and eleven adjectives; heavy, gorgeous, complex, dark, uncomfortable, solemn, graceless, stuffy, not-boring, disorderly and disliked. Most of those adjectives had a negative meaning in 'simplicity' factor, and Cluster I was not preferred. According to quality values of the adjectives, it was characterized a cluster of heaviness and complexity'. The characteristics of this cluster were that it was composed of only lotus and crain motifs, and that realistic and decorative types were dominant.

Cluster II had eleven textile patterns; stylized

and abstract type of lotus with single-motif, realistic and stylized type of crain with single-motif, realistic and decorative type of crain with repeated-motif, realistic, abstract, and decorative type of cloud with single-motif, realistic and decorative type of cloud with repeated-motif, and seventeen adjectives; elegant, high-quality, refined, oriental, classical, sophisticated, tasteful, mysterious, beautiful, orderly, aged, characteristic, uncharacteristic, interesting, uninteresting, boring and liked. Most of those adjectives in this cluster had a positive meaning in 'quality and modernity' factors, and Cluster II was preferred. According to the quality values of the adjectives, it was characterized 'a cluster of high-quality and classic'. In this cluster, cloud motifs were dominant.

Cluster III had two textile patterns; stylized type of cloud with single-motif and abstract type of cloud with repeated-motif, and eight adjectives; light, plain, simple, comfortable, plain, cheerful, graceful and cool. Most of those adjectives were in 'simplicity' factor. It was characterized 'a cluster of lightness and simplicity'. This cluster had only cloud motifs.

Cluster IV had three textile patterns; abstract type of crain with single-motif, abstract type of lotus with repeated-motif, stylized type of cloud with repeated-motif, and ten adjectives; cheap, low-quality, vulgar, tasteless, western, ugly, rustic, common, young and modern. Most of those adjectives were in 'quality' factor. According to the quality values of the adjectives, it was characterized 'a cluster of low-quality'.

Consequently, these four clusters appeared to be distinct from one another in terms of degree of simplicity and quality level: Cluster I is characterized by complexity, Cluster II by high-quality, Cluster III by simplicity and Cluster IV by low-quality. Elegance and high-quality were the major sensibilities of the most preferred cluster. Heavy and complex image were not preferred. It was also found that oriental and classical images were preferred when Korean motifs were used as textile patterns. The cloud motif was cognized as presenting high-quality or

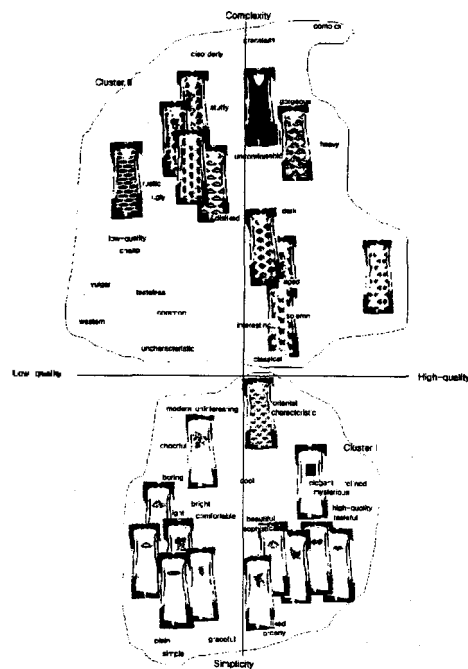
simple image in textile patterns.

2. Sensibility Image Scale for Dress Designs using Korean Traditional Motifs

As a result of the correspondence analysis performed with the data of dress designs and adjectives, the inertia of the first axis was 0.082, and its explanation-percent was 77.30%. the inertia of the second one was 0.011 and its explanation-percent was 9.95%. The explanation-percent by both axes was 87.25%. The explanation-percent of the first axis was greater than the second one. The quality values of adjectives which belonged to 'simplicity' and 'quality' factors were higher than the other factors.(Table 1)

On the basis of the quality values of adjectives, the location of dresses, the horizontal axis represents 'a quality level' with a polarization of the high-quality and low-quality. The vertical axis represents a 'degree of simplicity' with a polarization of simplicity and complexity.

To group dresses and adjectives into homogeneous clusters, cluster analysis was used. As a



〈Fig. 2〉 Sensibility Image Scale for Dress Designs.

result of cluster analysis, two clusters were identified. (Fig. 2)

Cluster I had thirteen dresses which were applied with all of the single-motif composition type and with the abstract type of cloud motif with repeated-motif, and twenty three adjectives; simple, orderly, sophisticated, high-quality, young, light, boring, cool, comfortable, bright, plain, graceful, cheerful, uninteresting, modern, characteristic, oriental, beautiful, mysterious, elegant, refined, tasteful and liked. Most of those adjectives had a positive meaning in 'simplicity and quality' factors, and the Cluster I was preferred. According to the quality values of the adjectives, it was characterized 'a group of simplicity and high-quality'. The characteristics of this cluster were that it was composed of dresses applied with single-motif.

Cluster II had eleven dresses applied with the repeated-motif composition type and twenty three adjectives; complex, disorderly, gorgeous, low-quality, rustic, ugly, cheap, vulgar, tasteless, common, western, uncharacteristic, dark, not-boring, graceless, aged, solemn, interesting, uncomfortable, stuffy, heavy, classical and disliked. Most of those adjectives had a negative meaning in 'simplicity and quality' factors, and Cluster II was not preferred. According to the quality values of the adjectives, it was characterized 'a group of complex and low-quality'.

The characteristics of this cluster was that it was composed of dresses applied with repeated-motif.

Consequently, these two clusters appeared to be distinct from each other in terms of degree of simplicity and quality level: Cluster I is characterized by simplicity and high-quality, Cluster II by complexity and low-quality. Especially, the clusters were divided into two in terms of the composition type of motif. It was found that the composition type of motif effected on the subject's cognition greatly when textile pattern applied on dress. Dress designs with single-motif, and simple and high-quality images were preferred, but dress designs with repeated-motif, and complex and low-quality images were not preferred. Modern and oriental images were clustered with adjectives of high-quality, and were preferred, which was different from the case of textile patterns. This result might be from the effect of the modern dress. It demonstrates the good potential of design development using Korean traditional motifs and their application on modern dresses.

3. Sensibility Images of Each Cluster

To identify the sensibility images of each cluster in more detail, ANOVA and Duncan's multiple range test were performed by using the cluster analysis data and factor scores obtained in our previous study(Chang and Kim, 2000).

<Table 2> Comparison of the Textile Pattern Cluster's Image

	Cluster I	Cluster II	Cluster III	Cluster IV	F-value
Factor I (Simplicity)	0.806 ^a A ^b	0.259 B	-0.309 D	0.061 C	*** 87.65
Factor II (High-quality)	-0.079 B	-0.282 B	-0.053 B	0.311 A	*** 18.83
Factor III (Interest)	-0.024 A	0.084 A	0.046 A	0.068 A	N.S. 1.08
Factor IV (Modernity)	0.347 A	0.543 A	0.453 A	0.082 B	*** 17.02

*** p<.001, N.S.: not significant.

^a mean factor score.

^b Duncan multiple Range significance.

〈Table 3〉 Comparison of the Dress Design Cluster's Image

	Cluster I	Cluster II	F-value
Factor I (Simplicity)	-0.864 ^a B ^b	0.202 A	*** 563.12
Factor II (High-quality)	-0.154 B	0.451 A	*** 133.37
Factor III (Interest)	0.140 A	-0.259 B	*** 58.86
Factor IV (Modernity)	-0.404	-0.430	N.S. 0.23

*** p<.001, N.S.: not significant.

^a mean factor score.

^b Duncan multiple Range significance.

In the case of textile pattern, sensibility images were significantly different in terms of three factors except 'interest' factor; 'simplicity', 'quality', and 'modernity' factors.(Table 2) Especially, image difference among the clusters in 'simplicity' factor was most significant. Cluster I was more complex, Cluster II was of higher-quality and more classical, Cluster III was simpler, and Cluster IV was of lower-quality than the others.

In the case of dress designs, sensibility images were significantly different in terms of three factors except 'modernity' factor; 'simplicity', 'quality', and 'interest' factors.(Table 3) Image difference among clusters in 'simplicity' factor was most significant. Cluster I was simpler, of higher-quality and less interesting than Cluster II, and Cluster II was more complex, of lower-quality and more interesting than Cluster I.

V. Conclusions

In this study, sensibility image scales for textile patterns and dress designs using Korean traditional motifs were constructed. The axes of sensibility image scales for both textile patterns and dress designs were for quality level and degree of simplicity, respectively. The X-axis

was defined by a polarization of high-quality and low-quality and the Y-axis with a polarization of simplicity and complexity. Clusters distinct from one another in terms of simplicity and quality were grouped on the image scales. Textile patterns were grouped into four clusters; clusters of 'heaviness and complexity', 'high-quality', 'lightness and simplicity', and 'low-quality'. Dress designs were grouped into two clusters; one of 'simplicity and high-quality', and the other of 'complexity and low-quality'.

In the case of textile patterns, the preferred cluster had high-quality and classical images, while the cluster that was not preferred had a complex image. In the case of dress designs, the preferred cluster had simple and high-quality images, while the cluster that was not preferred had complex and low-quality images. The common aspect in both cases was that a high-quality image was preferred, but a complex image was not preferred. Especially, dress designs using a single-motif composition type was cognized simple and high-quality suggesting a good potential of Korean traditional motif applications on modern dress design. However, in the case of textile patterns, some patterns with a single-motif composition type were not preferred. This result might have been caused by the Gestaltic image perception. In other words, dresses with textile patterns were perceived as a whole, but not the sum of parts.

The sensibility image scales constructed in this study can be a good guideline for textile or clothing designers in design development with understanding consumers' sensibility. However, there are limitations in generalizing the results from this study since a convenience sampling rather than a random sampling was employed and the number of motifs used was limited. For future study, it is recommended to have more diverse groups, for example, different cultural groups and age groups.

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