

# A study on a Comprehensive Image Map of Seoul for the Promotion of Contents Developed over Individual Zones

Analysis of contents developed for each zone with 4 types of content shapes

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**Abstract:** The image map of Seoul is a visual representation of information (infographic) based on a diameter which provides information of Seoul through four different types of shapes. The image map of Seoul is designed to develop the regional contents equally and is made to monitor the overall situation of the city contents. The main purpose is showing the dynamic image of Seoul by visualizing the organic connection of the city contents.

**Key words:** *City data visualization, City Contents, Information design, Dynamic Seoul map*

## 1. Introduction

In the 21st century, cities have been developed as aggregates of contents and Seoul is not an exception. Just like any other modern city, Seoul has been formed as a collection of various contents developed through a long history as well as new needs. It is no surprise that these contents reflect an image of Seoul as well. In other words, if there is a map showing the contents of Seoul, it should be composed in a totally new structure which allows the interpretation of its contents in various aspects upon needs of users.

### 1.1 Purpose

The primary aim of this study is to understand the unique features of each zone of Seoul and how these features could be translated into a map by considering Seoul as an enormous living organism of contents and how this map could be beneficial. Its second goal is to produce a Seoul image map which can be continuously changed and evolved over the development of contents for each zone in order to support the anticipation of direction of the development of contents for each zone. The third goal is to adjust the aforementioned study results to make them differentiated within the same frame and to be a symbolic icon for each zone.

### 1.2 Study Method

Through preceding studies on the formation of urban images, the current status of the image of Seoul as a tourist spot should be analyzed. In particular a hypothesis should be made based on the literature study of organic relationships between contents and it should be studied how these contents are developed. Moreover, a study of visual perception in configurationism, executed in Germany, should be referred for the visualization of contents. With the hypothesis built upon these studies, a Seoul comprehensive image map should be designed and it should be compared with other maps to see how it is differentiated from conventional maps.

## 2. Background Study

### 2.1 Visualization of an Organic Relation of Contents

A city is a group of communication factors and a map is one way to express this group. Marshall McLuhan [5] claimed that various communication tools in the media are equipped with unique frequencies for conveying its own language. He also insisted that a modern city might be shown as a 'shape of a media organization' deliberately formed to collect live data, understand movements and actions and to deliver complicated media channels and data to users. If such claim is true, it would be possible to interpret, that the image of a city is formed by close relation of contents, because media is one way of making the visualization of contents possible and an extended concept of the visualization of contents. Christopher Kirwan and Sven Travis took the idea of Marshall McLuhan one step further and said that a modern city is in a shape of a media organism, which is built for collecting live data and supporting advertising activities and numerous information flows.[4,pp236] Contents could be considered as a collection of various media so a city also could be assumed to be an organic form of contents if 21st century contents are interpreted as an extended concept of media. With such preceding study results, it would be possible to interpret a city as an organic organization of numerous contents in which contents react to each other with unique features and frequencies and evolve or degenerate.

### 2.2 Contents Expression Techniques from the Aspect of Gestalt psychology

Gestalt psychology[1] seeks to understand organizations of cognitive processes contrary to the associationism approach to understand the elements of cognitive processes and M. Wertheimer is one of the representative gestalt psychologists. Since the contents map of this study aims to represent a zone as 'symbolic icon' which can be transformed upon contents rather than just describe its geographical feature, it is essential to conduct the background study from the aspect of Gestalt psychology. 'Symbolic icon' is a symbol mark representing a specific zone. The symbol mark is a representation of how one zone is differentiated from others.[12, pp22] If differences between contents developed for each zone could be expressed as a symbolic icon, this icon might one that represents that zone. Gestalt psychology is roughly comprised of 3 laws- Law of Figure & Ground, Law of Grouping, and Law of Pragnanz. Among these three laws, law of grouping has 5 principles- similarity, proximity, continuation, completeness, and commonality, and these laws provide basic information about the arrangement of objects within a specified area. Out of these 5 principles, proximity, similarity, continuation and commonality are within the scope of this study and they are as follows.[11]

- ① *Proximity* - The principle of proximity states that stimuli that are close together are likely to be grouped together, and it applies to not only shapes, but also color, texture and brightness. If this principle can be applied to the visualization of contents as well, it might be beneficial to use textures, colors and brightness for developing the map. .
- ② *Similarity* - The principle of similarity states that stimuli that physically resemble each other are likely to be grouped together. So even if similar contents are scattered, it is possible to form a group of these similar contents if there are any representative features.
- ③ *Continuation* - The principle of continuation states that similar arrangements are likely to be grouped together. In other words, a study on the grouping direction and arrangement of contents is required for this study.
- ④ *Commonality* - The principle of commonality states that stimuli that are either arranged in a similar way or physically resemble each other are likely to be grouped together. In other words, if the shape of contents of one zone is similar to another, these two zones could be considered as one community.

It is possible to conclude that Gestalt psychology understanding of the grouping could be a logical group for the grouping of contents for the development of the contents map.

### 2.3 Contents Expression Techniques from the Aspect of Balance

In this study, the primary purpose of this Seoul image map is not for the provision of location-based services. Therefore, an additional study, designed from the aspect of visual perception, is required to find the visually balanced composition of contents. Visual perception allows understanding of not only unique features of shapes but also of properties of shapes exerted within a specific system.[2] For creating the Seoul image map, these contents, which would be expressed in icons, should be arranged in balance. What matters is that the balance cannot be made arbitrarily, but it requires additional research on previous studies about the arrangement and composition of objects. In Art & Visual Perception, Rudolf Arnheim[6] states the principles of the balance as follows.

- a. *Objects, which are larger, are heavier than lighter objects.*
- b. *If two objects have the same size, the object located above is heavier.*
- c. *Red is heavier than blue.*
- d. *Dark colors are heavier than murky colors.*
- e. *Objects located at the center of perspective have more weight.*
- f. *Structures with directional natures move in two opposite directions.*

These principles of the balance help to find the best arrangement of objects within one specific area. Moreover, it would be applied as the standard for the arrangement of contents, which would be expressed in visual symbols, for this study.

## 3. Development of the Seoul Image Map

### 3.1. Development Standard

#### 3.1-1. Selection of Representative Contents of Each Zone (+-10)

For the development of the Seoul Image Map (Hereinafter ‘Seoul Map’), 11 Gu(s) in Gangnam and 14 Gu(s) in Gangbuk select 10 tourism contents for each Gu and these contents would be divided upon the purpose of tourism. The reason that tourism contents have been selected for this study is that ‘tourism’ is a highly emphasized concept and one of the main events that activate city contents. For the selection of factors of the Seoul Map with ‘tourism’ as the standard, a study of Crompton.J on the reason of travel was reviewed in advance. Crompton.J claimed that ‘People like to travel since people always seek for something different and new’ and classified the motivations of the selection of travel and tourist spots as in table 1.[9] However, his classification mainly emphasizes the benefits of traveling. As for this study, 11 reasons for traveling have been chosen by reflecting the features of Seoul- Traditional, Modern, Nature, Art/culture, Food, Experience, Entertainment, Education, History, Shopping, Night view. What differentiates these 11 reasons from of Crompton.J is that they are selected as ‘the purpose of traveling’ rather than the benefit of traveling’. (Table 1)

Table 1. Comparison of the reasons of traveling of Crompton.J and of the Seoul Map

| Crompton,J (benefit)      | Seoul Map (object)               |
|---------------------------|----------------------------------|
| Getaway from a daily life | Traditional, Nature, Experience, |

|                               |                                       |
|-------------------------------|---------------------------------------|
| Adventure and Self-Assessment | Experience, Education, Modern         |
| Rest                          | Nature, Entertainment, Night View     |
| Boasting                      | Entertainment, Shopping, Food         |
| Nostalgia                     | Nature, Experience, Night View        |
| Strengthening of fellowship   | Modern, Experience, Entertainment     |
| Social interchange            | Traditional, Art/Culture, Modern      |
| New                           | Traditional, Experience, Art/Culture, |
| Education                     | Traditional, Education, History       |

### 3.1-2. ‘Seoul Colors’

‘Seoul Colors’[10] have been selected by Seoul in order to raise its unique charm and brand value and is composed of 600 ‘Seoul recommended colors’ and 250 ‘Seoul phenomenal colors’, and out of 250 ‘Seoul phenomenal colors’, 50 colors have been selected and named as ‘Seoul regional colors’ and 10 colors have been additionally selected from the Seoul regional colors and named as ‘Seoul representative colors.’ The Seoul representative colors were selected after extensive research on the representative factors of Seoul and the current trend of colors and survey on public opinions with expert advice. Since the Seoul Color is closely related with the environment, atmosphere, history and custom of Seoul and fitted to an image of Seoul, it should be properly reflected on the Seoul Image Map in order to support the understanding of Seoul in depth.

### 3.1-3. Color Bar, the Minimum Unit of the Seoul Image Map

As explained above, 11 tour content categories would be expressed in color bars, expressed in the Seoul Color. Thus, a simple survey was conducted for assigning 11 color bars. 10 experts with at least a 10 year working experience as an art director, advertising agent, photographer and additional creative industries had an in depth interview and selected 11 colors suitable for the 11 tour content categories with the provided Seoul Regional Color Table. At the interview, it was agreed that green would be proper for traditional and nature and blue for experience and history as well as red for art/culture, food and entertainment and dark colors for education. Also, as for modern and night view, it was decided that new colors other than Seoul regional colors would be proper. Finally, for 6 colors for Traditional, Art/Culture, Food, Experience, Entertainment, and Education were selected. The Seoul representative colors were chosen and 3 colors for Nature, History and Shopping were selected from the range of ‘Seoul Regional Colors.’ For the Modern category and the night view category, black and violet SLC243 of the Seoul Regional Color were selected, respectively. (Table2)

Table 2. Color System fo Seoul Image Map

| Categories  | Colors                        | Categories    | Colors                       |
|-------------|-------------------------------|---------------|------------------------------|
| Traditional | Seoul Green (C83 M40 Y62 K20) | Entertainment | Seoul Red (C4 M100 Y71 K20)  |
| Modern      | *Black(C0 M0 Y0 K100)         | Education     | Seoul Blue (C53 M66 Y63 K30) |
| Nature      | SLC012(C0 M0 Y68 K25)         | History       | SLC186 (C37 M7 Y17 K0)       |
| Art/Culture | Seoul Orange(C0 M57 Y100 K0)  | Shopping      | SLC125 (C13 M4 Y16 K0)       |
| Food        | Seoul Yellow(C0 M23 Y67 K0)   | Night view    | *SLC243 (C59 M85 Y0 K0)      |
| Experience  | Seoul Blue(C37 M7 Y17 K0)     |               |                              |

Color bar is not only the minimum unit of the Seoul image map, but a composition factor of content, and the combination of 10 color bars develops an image of a single ‘Gu’.

### 3.1-4. Symbolization of ‘Gu’

Unlike the conventional location-based service provision map, location, distribution and activation degree of contents are represented in infography. Therefore, in order to maximize the given space, the name of 25 Gu-s would be represented in alphabetical order. Moreover, for Gu-s in Gangbuk would be colored in red and blue for Gangnam to provide basic location information. (Table 3)

Table 3. Alphabet Symbols for 25 Gu-s

|         |   | Name of Gu    |   | Name of Gu  |   | Name of Gu   |   | Name of Gu  |   | Name of Gu      |
|---------|---|---------------|---|-------------|---|--------------|---|-------------|---|-----------------|
| Gangbuk | A | Mapo-Gu       | B | Eunpyung-Gu | C | Seodaemun-Gu | D | Yongsan-Gu  | E | Jung-Gu         |
|         | F | Jongro-Gu     | G | Sungdong-Gu | H | Seongbuk-Gu  | I | Gangbuk-Gu  | J | Dobong-Gu       |
|         | K | Dongdaemun-Gu | L | Gwangjin-Gu | M | Nochun-Gu    | N | Jungyang-Gu |   |                 |
| Gangnam | O | OGangseo-Gu   | P | Guro-Gu     | Q | Geumchon-Gu  | R | Yangchun-Gu | S | Youngdeongpo-Gu |
|         | T | TGwanak-Gu    | U | Dongjak-Gu  | V | Gangnam-Gu   | W | Seocho-Gu   | X | Songpa-Gu       |
|         | Y | Gangdong-Gu   |   |             |   |              |   |             |   |                 |

### 3.1-5. Definition of a Manufacturing Process

From the 25-Gu’s composing of Seoul-si, 10 contents have been selected for each Gu. For some Gu-(s) including Jung-Gu and Jongro-Gu, the number of contents are much more than 10, and for others, it is less than 10. Thus, even though the standard number is 10, a +/-5 contents were allowed. By referring to VISIT SEOUL (visitseoul.net), an official tourist information site of Seoul, WOW SEOUL (wow.seoul.go.kr), and a website of the Seoul Culture, Sports and Tourism (sculture.seoul.go.kr), a total of 239 contents (144 contents and 95 contents in Gangbuk and Gangnam, respectively) would be newly represented with 11 factors of the Seoul Image Map. Over the method of mapping, a final stage of a manufacturing process of the Seoul Image Map, it could have various purposes of usage and can be modified for each type of use, but for this study, color bars would be arranged with the diameter as a standard.

### 3.2. Seoul Image Map with a Diameter Standard for Representing Degrees of Activation

It is very interesting to express the degree of activation of a tour content as ‘an area.’If the degree of activation of a tour content is the diameter of a circle, it is possible to easily understand the activation level at one glance. For instance, 24 sizes of circles should be chosen to represent the activation degree. Such map should be called the Seoul image map with a diameter standard for representing degrees of activation (Hereinafter Diameter Seoul Map). By drawing circles in various colors and sizes, it is easy to represent features and activation degree of the Gu-s.

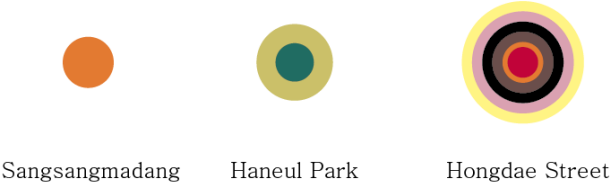
#### 3.2-1. Color Circle, the Minimum Unit of the Diameter Seoul Map

The minimum unit of the Diameter Seoul Map is in a shape of circle. One circle represents one content and its color and activation degree are expressed with its color and size, respectively.(Figure1)



<Figure1. Content Activation Unit, Represented in the Diameter>

It is possible that one content contains more than one feature. If there is one content with more than one feature, such they could be expressed in layers. For instance, figure 2 shows 3 contents for Mapo-Gu. The very left icon is for "Sangsangmadang" and the center and the right are for "Haneul Park" a "Hongdae Street", respectively. Since "Sangsangmadang" is highly artistic, it is colored in single color, but "Haneul Park" has two features of nature and traditional and "Hongdae Street" has more than 3 features so they are composed of multiple layers. (Figure2)



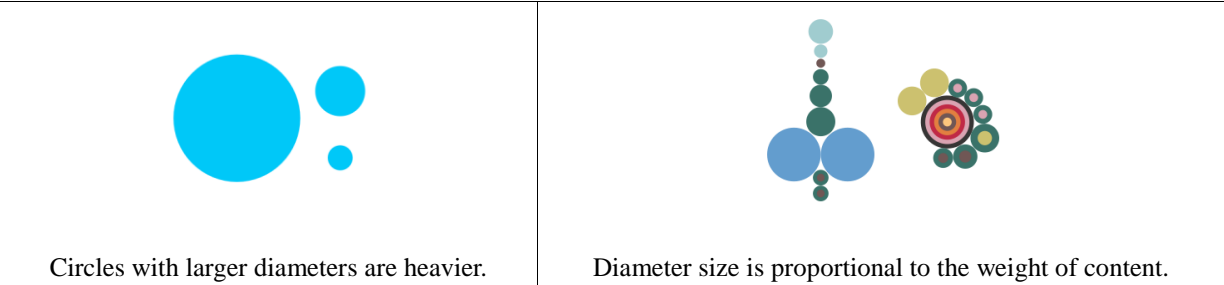
<Figure2. Contents Expressed in the Diameter Seoul Map >

Contents of each Gu are visualized as the aforementioned and assembled to represent the corresponding Gu, and consequently, each Gu would be expressed in a unique shape built upon various contents.

**3.2-2. Diameter Seoul Image Map Over Activation Degrees**

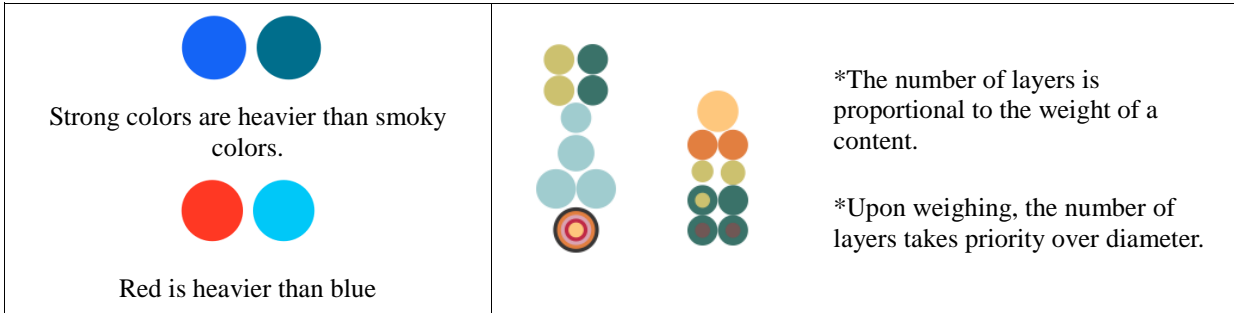
Shapes of circles for the Diameter Seoul Map could be varied upon the content assembly method and tendency of an officer in charge. In order to establish the most proper assembly standard, it is important to properly understand the principle of balance. As the aforementioned, in Art and Visual Perception by Rudolf Arnheim[9], it is stated that the weight balance is affected by the location within the frame. For instance, an object placed either on the center of a frame or the central vertical axis has a lower pulling force than adjacent objects. Thus, it has to be bigger than the other objects to make it more balanced and stabilized. However, in case of the Seoul Map, it should aim to balance out contents, not the overall map. Thus, basic principles for the arrangement of contents would be as follows.

- ① The diameter size is proportional to the content weight.
- ② The increase in the number of features ( layers) is proportional to the content weight.
- ③ For weighting, a feature takes the priority than the diameter.
- ④ Heavier contents are placed at the lower side.
- ⑤ Heavier contents should be located at the center.
- ⑥ Contents should be located up and bottom for the balance.
- ⑦ These conditions should be complied and contents should be arranged plastically.



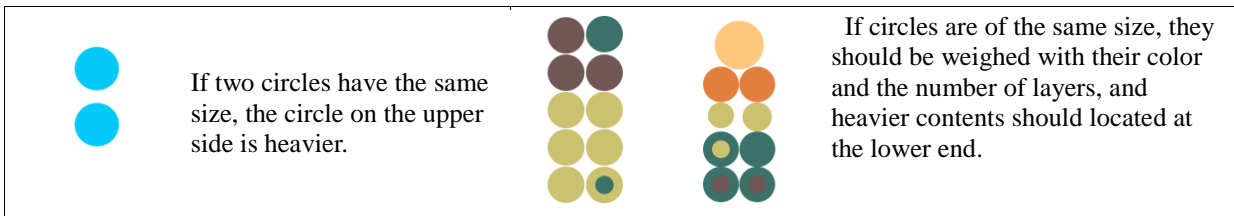
<Figure3. Weighting Standard>

As shown in the figure 8, it is a basic principle that the diameter size is proportional to the weight of content in the Diameter Seoul Map. (Figure4)



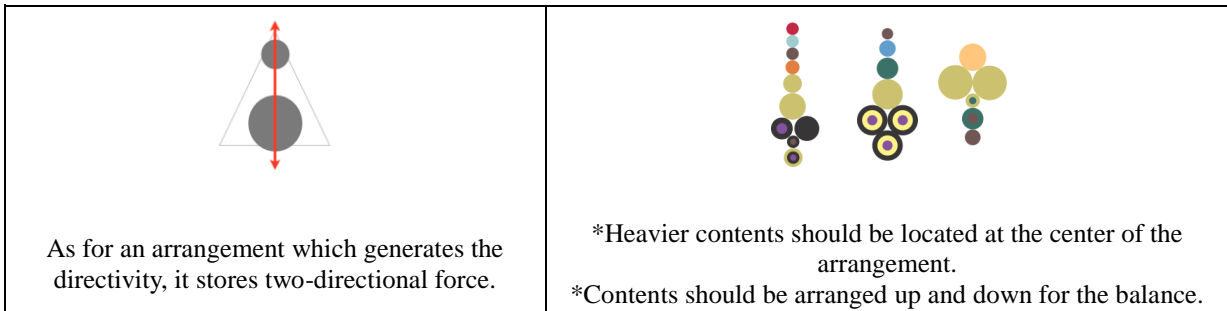
<Figure4. Weighting Standard of Diameter, Color and Number of Layers >

However, just because it has a larger diameter, it does not mean that it is heavy. If there are two circles of the same size, their weight should be compared with their colors. (Figure4) Contents should be arranged inconsideration of their colors.



<Figure5. Weighting Standard for Circles of Same sizes>

Even if circles have the same size, a circle with more layers is considered to be heavier and heavier contents should be located at the lower end. If the sizes of circles are varied, the number of layers takes the priority over diameter size. (Figure5) In accordance with the study result of Rudolf Arnheim, 'if two circles have the same size, a circle on the upper side is heavier', heavier content should be located at the lower side as well.

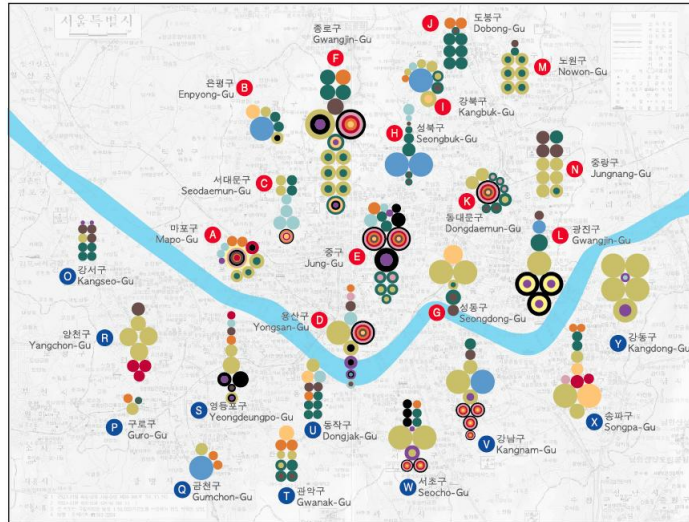


<Figure6. Arrangement and Directivity of Contents>

With heavy contents at the center, contents should be arranged up and down in consideration of the center of weight. (Figure6) Therefore, it should be concluded that heavier contents are located at lower sides. Also, contents with layers should be located under contents with no layers since they are heavier despite of their diameter. These are principles for the Diameter Seoul Map. (Figure7)

### 3.2-3. Grouping of Single ‘Gu’ with the Contents Arrangement Shape as Standard

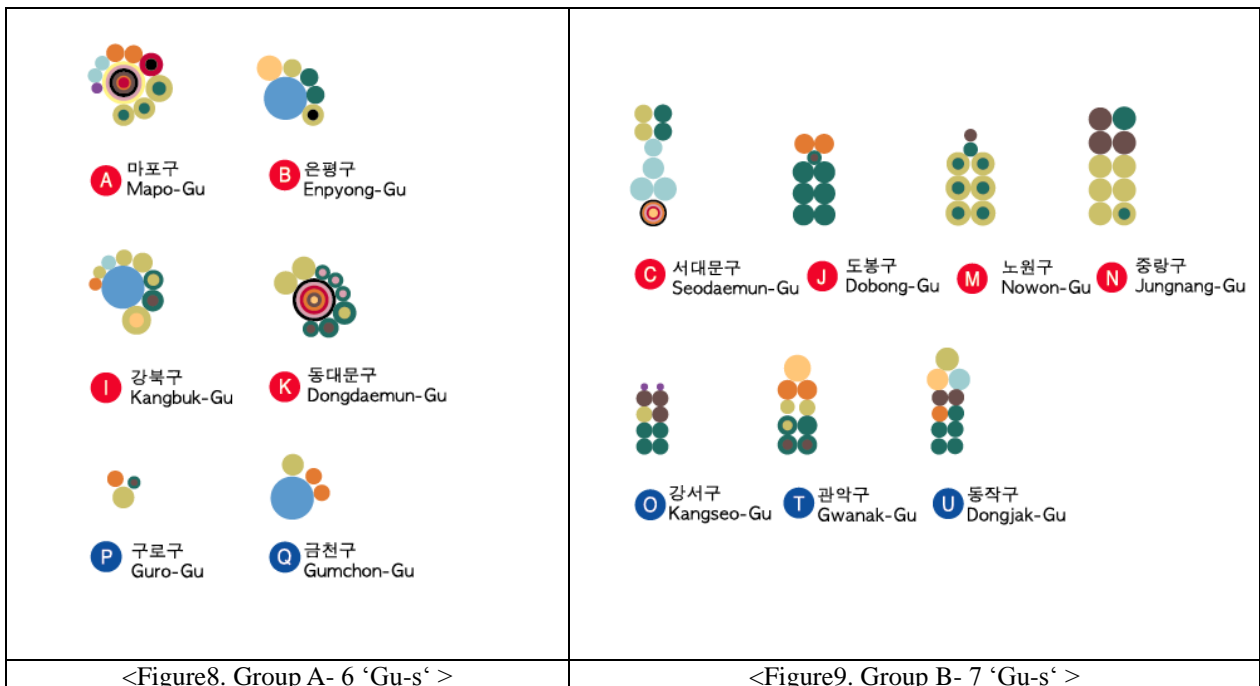
Images of ‘Gu’ developed over the arrangement principles of the Diameter Seoul Map could be roughly classified into 4 shapes. Therefore, Gu-s have been classified by their shapes and the meanings of these shapes have been studied.



<Figure7. Diameter Seoul Map >

#### (1) Group A (Round)

Mapo-Gu, Eunpyung-Gu, Gangbuk-Gu, and Dongdaemun-Gu in Gangbuk and Guro-Gu and Geumchon-Gu in Gangnam are grouped as group A since they all have a round shape which resembles the foot. The morphological feature of group A is that there is one content with a large diameter and its weight is relatively heavier than the other contents. In case of Mapo-Gu and Eunpyung-Gu, ‘Front of Hongik University’ and ‘Temple Stay of Jingwan-sa’ are emphasized. So the unique feature of this shape is that one specific content is strong. (Figure8)





**(2) Group B (Rectangle)**

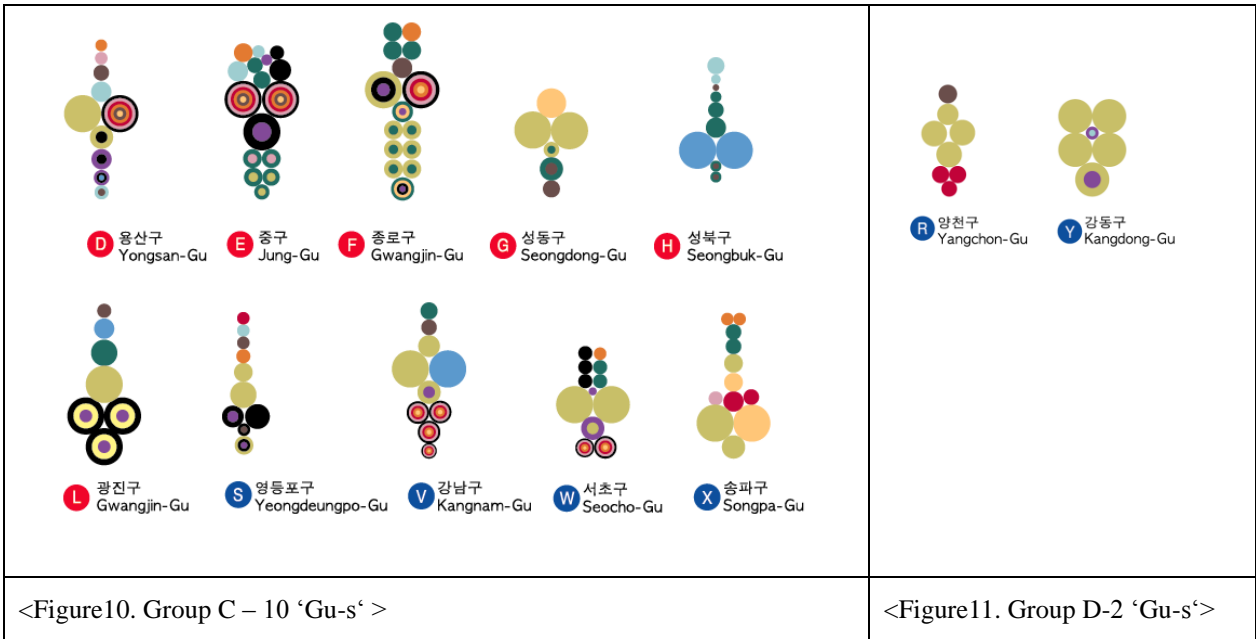
Group B contains Seodaemun-Gu, Dobong-Gu, Nowon-Gu, and Jungyang-Gu in Gangbuk and Gangseo-Gu, Gwanak-Gu, and Dongjak-Gu in Gangnam, and its morphological feature is that their contents are arranged in the shape of rectangle and all the diameters of contents are relatively small and similar. No significantly heavy contents are found in the group B, and it means that no specific content is developed strongly and various contents are developed evenly. In the group B, contents emphasizing nature, tradition and education are dominant and daytime contents are more likely to be developed and shopping and/or entertainment factors are relatively insignificant in the group B. (Figure9)

**(3)Group C (Diamond)**

In the group C, Yongsan-Gu, Jung-Gu, Jongro-Gu, Sungdong-Gu, Seongbuk-Gu, and Gwangjin-Gu in Gangbuk and Youngdeongpo-Gu, Gangnam-Gu, Seocho-Gu, and Songpa-Gu in Gangnam are included. Out of 25 Gu-s in Seoul, 10 Gu-s are corresponding to this type. The overall shape of the content arrangement is diamond with at least 2 or more large contents (24 hour type).Which means that this diamond shape is shown in ‘Gu’with many activated contents. However, there is a limitation since Jung-Gu, Jongro-Gu, Gangnam-Gu and Seocho-Gu possess the most culturally complex contents in Seoul and they should be interpreted additionally. (Figure10)

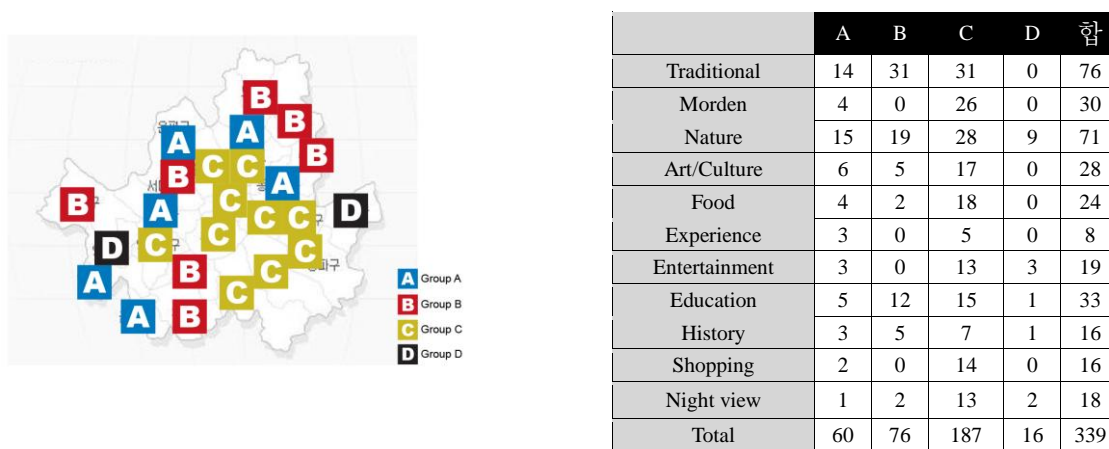
**(4)Group D (Atypical)**

The shape of the contents arrangement of the Group D is only exhibited in Gangnam. The morphological feature of this group, which only Yangchun-Gu and Gangdong-Gu are included, is that the diameter and color of contents are rather dull compared to other groups. Contents of Yangchun-Gu and Gangdong-Gu are most likely parks for residents. Compared to group B, the number of contents is less and its color is very dull as well. In other words, Group D has the most options for the development of tourism compared to others. (Figure11)



### 3.2-4. Analysis of Features of ‘Gu’ with the Contents Arrangement Shape as Standard

Table 4 shows the current status of tourism factors of each group in Seoul. Even though 239 contents have been selected from 25 Gu-s to make the SeoupMap, the actual number of tourism factors which have been handled is 339 since there are a few contents with more than one factor. From a quantitative aspect, Traditional and Nature are dominant tourism factors of Seoul and are followed by Modern and Education as well as Art/Culture and Food. The interesting point is that Experience (temple stay) has the lowest quantitative figure but the largest tourism factors are Traditional and Nature. Even with the quantitative assessment of each group, Traditional and Nature are found to be the largest in the group A, B, and C, and Nature in group C. For group A and group B, when two groups with similar numbers of tourism factors were compared, it was revealed that the distribution difference of group B is larger than group A. It was also found that Modern is focused in group C.



<Figure12. Distribution Chart of Diameter Seoul Map Grouping >

Table4. Current Status of Tours Factors of Individual Group in Seoul

The distribution chart of grouping (Figure12) shows that group C has a clumped over the central area of Seoul and group D over the outskirts of Seoul in the East and West. On the other hand, group A and B are evenly distributed throughout Seoul. Therefore, it is reasonable to assume that the group C has the contents arrangement shape for ‘Gu’ located at the center of the city. Also, the reason that Modern is concentrated in the Group C is that Group C is close to the central area of the city. Moreover, from the fact that the group D is located at the west-end and east-end of the city, it could be suspected that contents of Seoul are developed vertically rather than horizontally.

## 4. Final Seoul Map Image and Study Result

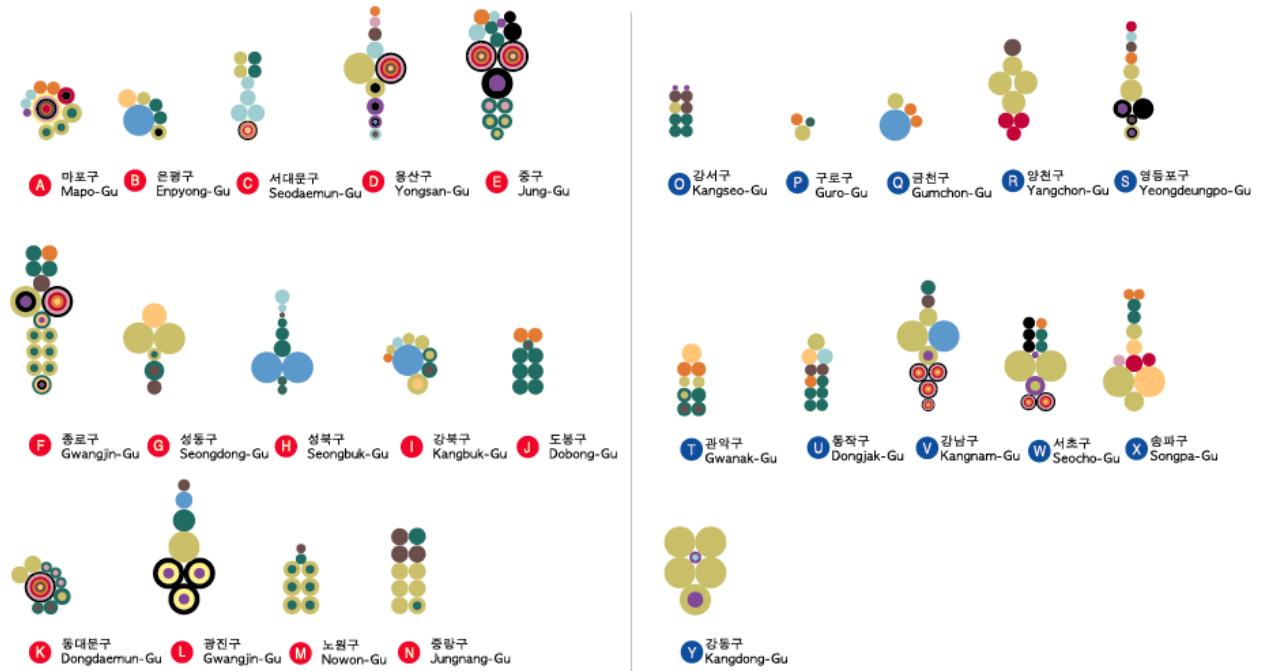
In this study, activation degrees of contents have been represented by varying diameters of icons which symbolize contents, and these content icons have been arranged for 25 Gu-s in Seoul. Also, in consideration of Gestalt psychological aspect and principles of the balance, icons have been designed in all different shapes and arranged for the corresponding Gu. The arrangement shapes of content icons were roughly divided into four groups and Gu-s were categorized into these 4 groups, and from this study, the followings were revealed.

- ① Group A represents a zone which is developing over one representative tour content.
- ② Group B represents a zone which day-tour contents are dominant over night-tour contents.

- ③ Group C represents a zone with 2 or more contents which could be activated for 20 hours or more, and zones with the most typical image of Seoul are likely to be classified into group C and which tends to be located at the central area of a city.
- ④ Group D represents a zone with relatively poor tour contents.

Such zone can be interpreted as a zone which is suitable for other city purposes rather than tourism or a zone with high developmental potential. Moreover, from the fact that the group D is located at the west-end and east-end of the city, it could be suspected that contents of Seoul are developed vertically rather than horizontally. Through these processes, it was possible to develop the image of figure 13.

<Figure 13. 25 Gu-s Represented in the Diameter Seoul Map>



This Diameter Seoul Map supports the validation of the aforementioned founding of the study, and since it is possible to understand any changes in contents and/or development of contents, it is very useful for the management and observation of contents. In case of Seoul, tourism factors of Nature and Traditional have been developed further than Modern. In order to fully reflect the meaning of UNESCO SEOUL when modern and tradition come together, it is necessary to deliberately plan out the development of currently unexplored areas with only Nature and Traditional related tour contents. Also, despite of the fact that the largest tour factors are Nature and Tradition, only few temple stay tour products have been offered. Thus, it would be necessary to find a zone where it is suitable for the development of such products.

## 5. Conclusion & Limitation

It is not possible to conclude that making icons of the tour contents of Seoul is more efficient than the conventional tour map. Also, it has limitations as well since it is not possible to apply general mapping methods. However, it should not be underestimated as well, because it can effectively deliver information that conventional location-based map could not convey. The usage of the Seoul Map could be varied over its manufacturing method, and it is possible to use it to observe tour contents with large potential and to represent an organic identity (since the shape can be varied over the development of a zone) of a zone. By visualizing organic relations of tour contents which can be either developed or degraded over a period of time, it would be possible to reflect the dynamic and vivid image of Seoul onto the map. It should be concluded that the Diameter Seoul Map visualizes features of individual zones not only to provide information of specific contents but to control the development of the contents of each zone.

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