Measuring the implementation of the design thinking concept in the creative industry: Study on the Culinary Subsector in Bandung City

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ABSTRACT

Bandung is one of the cities with a high culinary appeal. However, there are several problems found such as a decrease in sales due to Covid-19, not conducting the market surveys, and tight competition in the culinary industry. One of the concepts that can solve these problems is a human-centered approach called Design Thinking. Hence, it is needed to measure whether the concept is already implemented or not. The result of this measurement can define the further plan to solve the problems stated. Design thinking is the rationale for the process of transforming a creative mindset into an innovation. This study measures the implementation of the Design Thinking concept in the culinary subsector in Bandung which includes five stages, namely: empathize, define, ideation, prototype, and test. The data collection is conducted by distributing questionnaires to 92 dine-in and 92 takeaway culinary businesses. The data gathered is then processed by using the descriptive statistical analysis technique and a two-tailed t-test. The result of the study indicates that the culinary business actors in Bandung city have implemented the Design Thinking concept well, although the empathize and define stages are still included in the bad category. There is also a difference in implementing the Design Thinking concept between dine-in and takeaway culinary businesses. Further study is expected to measure the impact of the Design Thinking concept’s implementation on culinary businesses’ sales performance.

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Introduction

Creative industries represent the sector of the global economy with the most dynamic development (Savchenko, 2018). Three sub-sectors have a major contribution to the Gross Domestic Product (GDP) of Indonesia’s creative economy, they are Culinary (41.5 percent), Fashion (17.7 percent), and Crafts (15 percent). The potential of the culinary as one of the sub-sectors of the creative economy that contributes the most to the GDP indicates that the quality of culinary products must be maintained. The Creative Economy is one of the drivers of economic activity in West Java Province, as indicated by the Gross Regional Domestic Product (GRDP) of the Creative Economy which contributes an average of 11.14 percent to the regional economy during the 2010-2016 period. Because of this potential, the creative economy has become one of the priorities of economic development in West Java (Hatammimi et al., 2022).

In 2015, Bandung as the capital city of West Java was listed as a member of UNESCO’s creative cities network. Bandung is a pioneer city where the creative economy grows and develops as one of the main pillars of the regional economy. The advancement of the creative economy in the city of Bandung is mainly due to the significant role of the communities (Hatammimi, 2019). More specifically, Bandung is one of the cities with a high culinary appeal. The high level of competition in the culinary business requires business actors to think creatively in creating product innovations to be able to excel in market competition. Furthermore, they are expected to be able to outperform the global culinary business competition (Irianto et al., 2021).
According to a study conducted by Bustomi & Avianto (2021), it is mentioned that the factor that threatens Bandung’s potential as a culinary city is the lack of human resource capabilities in managing culinary businesses. Therefore, it is needed to have the owners or personnel that have expertise in creative thinking as well as high abilities in managing their culinary businesses. In addition to the threat in terms of human resources, there is also tight competition in the culinary market and difficulties to market the culinary products in the current market situation (Kurniawan et al., 2014). In 2020, there was a 37 percent decline in sales in the restaurant and culinary category. This causes almost 90 percent of restaurants that have a dine-in system to close. On the other hand, during the COVID-19 outbreak, culinary businesses that are included in the takeaway category experienced an increase in sales and became the pillar of the current culinary business. In addition, it is also found that one of the failure factors in establishing a restaurant business is the lack of surveying determining the type of product to be sold (Mekari, 2021).

From these problems, it is necessary to apply a relevant approach that centered its attention on human or people’s needs. One concept that can be applied is the concept of Design Thinking. Design thinking is not a new concept, but it is a concept that has become popular in many industries around the world in recent years. For innovators, design thinking is an approach that reduces uncertainty and the risk of innovation (Hacioglu, 2019). Focusing on a rapid iteration of ideas and actively engaging customers in open dialogues throughout the process can identify the root cause of their true need for a solution and the capabilities of the products or services they offer (Savchenko, 2018). Therefore, the purpose of this study is to measure the implementation of the Design Thinking concept by the culinary business actors in Bandung and to compare the implementation of the Design Thinking concept between the dine-in and takeaway culinary businesses.

**Literature and Conceptual Review**

**Theoretical and Conceptual Review**

In today's knowledge, creativity is currently a decisive competitive advantage. Creativity provides the potential for developing methods, markets, and new opportunities. In a community, these benefits can distinguish community pass from people (Yudiarti & Lantu, 2015). In a business, creativity can be the most important factor that identifies competitiveness. It must be exploited to succeed and achieve the main goals of the business. In the best-case scenario, without creativity, businesses will suffer the inevitable decline

Design Thinking is an approach to creative problem-solving. Through the Design Thinking process, several solutions will be formed in the form of products, processes, or services that will be implemented by a person or a group of people. Human-centered design is a mindset that underlies Design Thinking to ensure that solutions are relevant and useful for those in need (IDEO.org, 2015:9). Human-centered design is used to understand what solutions are needed. Starting from the people’s hopes, fears, and needs. After determining the solutions that can attract people’s interest (desirable), then the solutions are determined in their technical feasibility and implementation easiness (feasible). Lastly, the solutions are confirmed that they can generate business benefits (viable). These three main elements become the balancer in Design Thinking toward designing successful and sustainable solutions (IDEO.org, 2015:14).

The main feature of design thinking is not critical analysis, but the creative process in which the most unexpected ideas can lead to better solutions to a particular problem. Design Thinking embraces the way designers think and work to drive innovation and balance the spirit of business analytic thinking with visualization (Savchenko, 2018). Design Thinking consists of five stages, namely Empathize, Define, Ideate, Prototype, and Test (IDEO.org, 2015). The details about each stage are explained below.

**Empathize**

Empathize is the ability to be able to feel and understand the feelings that other people are experiencing, and then to be able to start solving problems from their point of view. A business actor needs to empathize, understand people, and bring them into the design process. Human-centered design is based on empathy. In this case, prospective customers become a road map to innovative solutions (Vianna et al., 2012:15). By empathizing, the business actor can see the world, and all the opportunities to improve it. Through their lenses and perspectives, business actors can find new creative ideas, and leave behind old ideas and ways of thinking. Empathize is the best route to truly understanding the context and its complexity from the point of view of the party that needs problem-solving.

**Define**

After carrying out the empathize stage, a business actor needs to describe the situation faced by the user and start looking at the problems that will then become the basis for making a product or application. Things that can be done such as making a list of user needs and using knowledge about current conditions. This step involves using the insights gained in the previous step to combine the party, the thing, the place, the time, as well as the reason why the problem or opportunity happens. This step also includes filtering insights into one clear statement that the team wants to solve. Establishing design principles before generating the idea is important so that the team can later sift through the ideas generated and choose which ideas to be converted into a prototype (Boisvenue-Fox & Meyer, 2019).
Ideate

If the business actor has made a list of user requirements, then he/she needs to describe the solutions that users need. Next, a business actor needs to evaluate the design team and combine the creativity of each team member. Ideation is different from and more effective than traditional brainstorming. The purpose of this step is to explore various ways to solve the problem statement and then distill those ideas down to one or two ideas for a prototype (Boisvenue-Fox & Meyer, 2019).

Prototype

The prototype is a representation of the solution idea from the point of view of the user and the project team which consists of three levels of accuracy according to Vianna et al. (2012:143):

1) low fidelity: conceptual representation of ideas.
2) Middle fidelity: representation of the aspects in the idea.
3) High fidelity: detailed representation in the form of a visualized “mock-up”.

At the end of prototyping, the team usually has three options: (1) to implement the idea as it is; (2) to make improvements based on user feedback; or (3) to reject the idea and return to the original idea (Boisvenue-Fox & Meyer, 2019). After making the prototype, the next step is testing the prototype for the potential users. It is carried out as a validation of the prototype that has been made (Vianna et al., 2012:144).

Test

From the prototype that has been made, then an experiment will be carried out with the user. At this stage, the user will get experience in using the product or trial application, and later the business actor’s team will get feedback to make improvements to the existing products or applications. When the team has implemented an idea, the first thing to do is map out how the idea will impact the user experience. Once the idea is implemented, the team needs to evaluate its success based on the design principles established earlier in the process. After implementation, the team still must figure out how to update the idea. Sometimes, implementing a single solution allows the team to identify the new user problems by iterating over them (Boisvenue-Fox & Meyer, 2019).

There are two studies on Design Thinking conducted by Liedtka (2017) and Boisvenue-Fox & Meyer (2019) that gathered the data by using the observation method. According to Boisvenue-Fox & Meyer (2019), the results of implementing Design Thinking can be applied as leadership practices that can benefit the profession and the community by giving the leaders a common language to use when learning from and sharing one another in the conversations about innovation (Sevgilioglu & Hacioglu, 2019). According to Liedtka (2017), it is found that the power of Design Thinking does not only lie in the individual and the processes he goes through, but in the patterns that are formed systematically from the processes involved. From these two studies, Design Thinking is observed as an appropriate way to increase the ability to innovate. However, the studies have only been carried out by gathering the data from observation. Therefore, there is an opportunity to enrich the insight regarding the design thinking concept implementation by conducting a study by distributing questionnaires to a lot more respondents within a scope of a city.

Furthermore, according to Savchenko (2018), the application of Design Thinking can help an organization design better products, services, processes, strategies, and experiences. Design Thinking helps develop practical and innovative solutions for decision-making. It is a human-focused, prototype-driven, and innovative design process. The advantages of Design Thinking as an approach to the product’s design development are also supported by Herawan (2019). It is found that the Design Thinking process is very appropriate to be used and sharing during the early stages of product development. Studies that measured the implementation of the Design Thinking concept have been carried out by Tu et al. (2018) and Pratomo et. al (2021). However, these two studies focused on the students’ learning effectiveness to increase their interest in entrepreneurship, foster efficient communication, increase sensitivity to problems, generate unique ideas, and improve creative thinking skills. Hence, a study that focuses on another field of business can give a wider perspective on Design Thinking implementation.

Research and Methodology

This study applies a descriptive quantitative research method with the primary data gathered by distributing questionnaires to 184 creative culinary business actors in the city of Bandung which is divided into two categories, namely culinary businesses with the dine-in concept and the takeaway concept. Design Thinking is the only variable in this study and is considered the single variable. Table 1 below shows Design Thinking as the variable and its indicators.
This study uses an interval scale using a Likert scale model. The Likert scale is used to measure the attitudes, opinions, and perceptions of respondents, in this case, the culinary business actors, regarding the Design Thinking indicators. In this study, a Likert scale with four levels of assessment points was used. The purpose of modifying the Likert scale using four levels of assessment is to avoid undecided middle answers or the respondents that have not been able to decide in giving answers.

The population in this study are the culinary business actors in the city of Bandung who are listed in Patrakomala. Patrakomala is a creative industry’s actors database owned by the Bandung City Government. The number of creative economy business actors registered to the Culture and Tourism Office of the Bandung City Government is 338 actors (Patrakomala, 2021). Patrakomala does not provide all the data on the culinary businesses. Because not all culinary businesses fall into the creative industry category. According to the Indonesian Ministry of Tourism and Creative Economy (2014), the culinary business in the context of the creative economy has the following criteria:

1. Using the element of creativity when preparing, processing, and serving food and beverage products.
2. Emphasize the aesthetic aspect in the presentation of food and beverage products.
3. Food and beverage products uphold local traditions and wisdom typical of the local area.

It is known that the number of creative industry actors in the culinary sub-sector in the city of Bandung is 338 people. So the minimum number of samples taken by authors by using the Slovin formula with the five percent of margin of error is 184 people. It consists of 92 respondents from the dine-in-based business and 92 respondents from the takeaway-based business. For finding the respondents, this study uses non-probability sampling and utilizes the purposive sampling. The link to the online questionnaire is distributed to the creative culinary business actors through email and text message.

To get a valid and reliable research result, the authors conducted a validity and reliability test for the questionnaire. A validity test is obtained by correlating each indicator score with the total score of the variable indicator. The measurement of the validity test in this study uses Pearson’s Product Moment formula. While testing the reliability, this study uses the Alpha Cronbach formula. The result of these two tests indicates that the questionnaire for this study is valid and reliable. Furthermore, to analyze the data gathered, this study utilizes the descriptive data analysis and hypothesis test by using a two-tailed t-test. A normality test is also conducted before the hypothesis test. According to Sugiyono (2019: 234), the normality test was carried out to see whether the data obtained from the questionnaire have a normal distribution or not.

Findings and Discussion

The data analysis begins with the presentation of the respondents’ characteristics. Of the 184 respondents, they are whose age is less than and equal to 20 years are recorded as 6 people (3 percent), between 21-29 years are 101 people (55 percent), between 30-39 years are 58 people (32 percent), and more than and equal to 40 years are 19 people (10 percent). 98 people or 53 percent of them...
are women and 86 people (47 percent) are men. Of the 184 respondents, 108 businesses sell food products (59 percent), 22 businesses sell beverage products (12 percent), and 54 businesses provide both food and beverage products (29 percent).

Furthermore, the data analysis is continued to measure the 184 respondents’ responses to the 15 statements on the questionnaire that represents the indicators of Design Thinking. This part shows each Design Thinking indicator’s percentage of criteria and the category of each indicator. From the calculated cumulative value and range value, the measurement score interpretation criteria will be obtained as shown in the following Table 2.

**Table 2: Percentage of Criteria**

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.00% - 43.75%</td>
<td>Very Bad</td>
</tr>
<tr>
<td>43.76% - 62.50%</td>
<td>Bad</td>
</tr>
<tr>
<td>62.60% - 81.25%</td>
<td>Good</td>
</tr>
<tr>
<td>81.26% - 100%</td>
<td>Very Good</td>
</tr>
</tbody>
</table>

Source: Own elaboration

The first analysis is conducted in the Empathize stage which has three statements. Table 3 below shows the respondents’ responses to the Empathize statements.

**Table 3: Response to Empathize**

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>Total Score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Approach the potential customers before making products.</td>
<td>55.29%</td>
<td>Bad</td>
</tr>
<tr>
<td>2</td>
<td>Observe problems and obstacles from the point of view of potential consumers.</td>
<td>51.90%</td>
<td>Bad</td>
</tr>
<tr>
<td>3</td>
<td>Able to understand the potential consumers’ needs of culinary products.</td>
<td>55.29%</td>
<td>Bad</td>
</tr>
<tr>
<td></td>
<td><strong>Average Score of Empathize</strong></td>
<td><strong>54.16%</strong></td>
<td><strong>Bad</strong></td>
</tr>
</tbody>
</table>

Source: Own elaboration

Table 3 shows that Empathize stage is included in the bad category. All the three statements in this stage are in a bad category as well. The second analysis is then conducted at the Define stage. The Define stage has three statements too. Table 4 below shows the respondents’ responses to the Define statements.

**Table 4: Response to Define**

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>Total Score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Consider the existing problems as the basis for making the culinary products.</td>
<td>58.42%</td>
<td>Bad</td>
</tr>
<tr>
<td>2</td>
<td>Create a list of problems or opportunities possessed by potential consumers related to the culinary products that will be made.</td>
<td>55.00%</td>
<td>Bad</td>
</tr>
<tr>
<td>3</td>
<td>Define problems or opportunities of the potential consumers that must be prioritized.</td>
<td>56.50%</td>
<td>Bad</td>
</tr>
<tr>
<td></td>
<td><strong>Average Score of Define</strong></td>
<td><strong>56.65%</strong></td>
<td><strong>Bad</strong></td>
</tr>
</tbody>
</table>

Source: Own elaboration

Table 4 shows that the Define stage is included in the bad category. All the three statements in this stage are in a bad category as well. Furthermore, the third analysis is then conducted in the Ideate stage. The Ideate stage has three statements. Table 5 below shows the respondents’ responses to the Ideate statements.

**Table 5: Response to Ideate**

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>Total Score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Identify solutions to produce and modify the culinary products according to the needs of potential consumers.</td>
<td>76.90%</td>
<td>Good</td>
</tr>
<tr>
<td>2</td>
<td>Gather ideas to determine the culinary products that will be made.</td>
<td>78.80%</td>
<td>Good</td>
</tr>
<tr>
<td>3</td>
<td>Choose the idea to be implemented in the form of a product sample.</td>
<td>80.29%</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td><strong>Average Score of Ideate</strong></td>
<td><strong>78.66%</strong></td>
<td><strong>Good</strong></td>
</tr>
</tbody>
</table>
Table 5 shows that all three statements in this stage are in a good category. Therefore, the Ideate stage as one of the sub-variables of Design Thinking is included in the good category too. Furthermore, the fourth analysis is then conducted in the Prototype stage that has three statements. Table 6 below shows the respondents’ responses to the Prototype statements.

**Table 6: Response to Prototype**

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>Total Score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prepare the equipment and materials needed to create the sample or product sample</td>
<td>88.72%</td>
<td>Very Good</td>
</tr>
<tr>
<td>2</td>
<td>Conduct a trial on the recipe or formula for the culinary products that will be produced.</td>
<td>89.67%</td>
<td>Very Good</td>
</tr>
<tr>
<td>3</td>
<td>Create a sample of culinary products to be distributed to potential customers.</td>
<td>83.28%</td>
<td>Very Good</td>
</tr>
</tbody>
</table>

*Average Score of Prototype: 87.22% Very Good*

Source: Own elaboration

Table 6 shows that all three statements in this stage are in the very good category. Therefore, the Prototype stage as one of the sub-variables of Design Thinking is included in the very good category too. Moreover, the fifth analysis, as the last analysis for the Design Thinking stages, is then conducted in the Test stage that has three statements as well. Table 7 below shows the respondents’ responses to the Test statements.

**Table 7: Response to Test**

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>Total Score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Distribute samples of culinary products that have been made.</td>
<td>78.66%</td>
<td>Good</td>
</tr>
<tr>
<td>2</td>
<td>Ask for input and comments from the potential consumers who receive the sample of the products.</td>
<td>79.48%</td>
<td>Good</td>
</tr>
<tr>
<td>3</td>
<td>Address the feedback received from the potential customers as the material for improving the culinary products.</td>
<td>80.84%</td>
<td>Good</td>
</tr>
</tbody>
</table>

*Average Score of Test: 79.66% Good*

Source: Own elaboration

Table 7 shows that all three statements in this stage are in a good category. Therefore, the Test stage as one of the sub-variables of Design Thinking is included in the good category too. After analyzing all the five stages’ data descriptively, it can be observed that the implementation of the Design Thinking concept that has been carried out by the creative industry actors in the culinary sub-sector in the city of Bandung is in a good category. Table 8 shows the overall average score of the Design Thinking concept that has been applied is 71.27 percent.

**Table 8: Design Thinking Concept Implementation**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Total Score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empathize</td>
<td>54.16%</td>
<td>Bad</td>
</tr>
<tr>
<td>Define</td>
<td>56.65%</td>
<td>Bad</td>
</tr>
<tr>
<td>Ideate</td>
<td>78.66%</td>
<td>Good</td>
</tr>
<tr>
<td>Prototype</td>
<td>87.22%</td>
<td>Very Good</td>
</tr>
<tr>
<td>Test</td>
<td>79.66%</td>
<td>Good</td>
</tr>
<tr>
<td>Average</td>
<td>71.27%</td>
<td>Good</td>
</tr>
</tbody>
</table>

Source: Own elaboration

From the results that have been found, even though the overall scores indicate that the implementation of the Design Thinking concept is in a good category, two stages are included in the bad category, namely the Empathize and Define stages. This result shows that the implementation of Design Thinking is still not done thoroughly and still needs to be developed further. The stage that indicates the successful implementation of Design Thinking is the Prototype stage which is included in the very good category.

Furthermore, to find out whether there is a difference in applying the concept of Design Thinking between the dine-in and the takeaway concept, a test was conducted by using an independent sample t-test. However, a normality test is needed to be done before the t-test. The result of the normality test is that the data has been normally distributed for both the dine-in and the takeaway culinary businesses. Next, Table 9 below shows the difference in the implementation of the Design Thinking concept that is carried out by the dine-in and takeaway culinary businesses. By using the t-test for Equality of Means, it is found that the two-tailed significance of the Design Thinking implementation value (0.099) is greater than 0.05. The next step is done by utilizing the independent sample t-test. This test shows that the t value of the Design Thinking implementation (1.660) is greater than the t table (1.653). From these two tests, it can be concluded that there is a difference in the implementation of the Design Thinking concept between the dine-in and takeaway culinary businesses, but the difference is not significant. The total score for the implementation of the Design Thinking concept carried out by the dine-in culinary businesses is 73.07 percent and included in the good category, which is greater than the
implementation of the Design Thinking concept carried out by the takeaway ones which has the total score of 69.5 percent. The total score difference between the two concepts is 3.57 percent.

Table 9: Results of independent sample t-test on implementation of Design Thinking

<table>
<thead>
<tr>
<th></th>
<th>F</th>
<th>Sig.</th>
<th>T</th>
<th>Sig. (2 tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Thinking</td>
<td>3.842</td>
<td>0.52</td>
<td>1.660</td>
<td>0.099</td>
</tr>
</tbody>
</table>

Source: Own elaboration

The result of this study is relevant to a study conducted by Bustomi and Avianto (2021) that found the threats that hinder the potential of Bandung City to become a culinary city are the lack of competence in managing culinary businesses and the lack of human resources ability to think creatively. The bad category of Empathize and Define stages found in this study is related to the lack of competence and creative thinking. To follow what has been suggested by Pratomo et al. (2021), more effort due to the result of this study is urgently needed. By developing further implementation of the Design Thinking concept, there will be a higher sensitivity to the problems faced and push the culinary business actors to create a creative product idea based on these problems as emphasized by Tu et al. (2018).

Conclusion

From the analysis that has been carried out, it can be concluded that the implementation of the Design Thinking concept by the culinary business actors in Bandung has been implemented well, but not comprehensively. Of the five Design Thinking stages, there are two stages namely Empathize and Define which are still included in the bad category. While Ideate and Test stages are in a good category, the Prototype stage is considered the most promising stage because it is the only stage included in the very good category. From the comparison of the Design Thinking concept’s implementation between the dine-in and takeaway culinary businesses, there is a difference between both of them, although the difference is not significant. Both culinary business concepts are in a good category. However, the implementation of the Design Thinking concept carried out by the dine-in culinary businesses is slightly better than the implementation of the Design Thinking concept carried out by the takeaway ones.

From the result of this study, it is suggested for the culinary business’s stakeholders to improve the Empathize and Define stages of the Design Thinking concept. Capturing the prospective customers’ needs from the early phase of the creation of the culinary products will result in better acceptance as well as sales performance. For further studies, it is recommended to conduct a study that examines the impact of the implementation of the Design Thinking concept on the business performance of the culinary businesses in Bandung City.

All authors have read and agreed to the published version of the manuscript.

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Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to restrictions.

Conflicts of Interest: The authors declare no conflict of interest.

References


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