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THE CATEGORIZATION OF AREA IN A SHOWCASE COOLER FOR BEVERAGE LAYOUT USING EYE TRACKER TECHNOLOGY

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ABSTRACT

The demand for beverages product is increasing every year, so the distribution center or retailer need to increase their sales to obtain more profits. This study will try to give a recommendation to retailers about the categorization of the area in a showcase for the beverage layout. The concept of implementing eye tracker to the showcase cooler need to be observed with several participants. 60 participants were included in this experiment, with 30 for the initial scenario, and other 30 for the advanced scenario. The participant is asked to observe physical images that are displayed in each scenario. During the experiment, the participant will be measured by its total fixation duration, average fixation duration, fixation count, time to first fixation, and first fixation duration. The result of this experiment shows that middle area of showcase cooler shows a high customer interest, compared to the other area. Also laying out beverage based on the price tag will significantly affect the customer interest. While placing a promo tag to leverage the least optimum area can make a significant difference in the customer interest rate. Based on the subjective choice, it is known that customer has their own preference if the laying out of the beverages is based on price and they have enough time to make a proper decision. However, if they are having a time constraint, the middle area would be likely to be chosen. Also, the effect of the promo tag would attract high customer interest and the area would likely to be chosen.

Key Words: showcase cooler, fixation, area, eye tracker, customer interest

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By the completion of this final project, the writer hopes that this will be helpful and beneficial for other parties who are going to continue this research. The writer realized that this report is far from excellent. Therefore, comments and advice needed for future improvements. The writer also apologizes if there are mistakes that exist in this report.

Surabaya, July 2019

Ammar

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CHAPTER 1
INTRODUCTION

This chapter will explain the general overview of this research, covers the background of the research, problem formulation, research objectives, research benefits, research scope, and the outline of this research proposal.

1.1 Background

Indonesia is considered as one of the most consumptive nations in the world, it ranked third on the overall consumption rate after India and Philippines (Lubis, 2016). Although the value of the household consumption rates still fluctuates, the percentage categorized as a high percentage based on the gross domestic product. Recently the household consumption rates reach the highest point after 2 years in the second quarter of 2018 with a value of 5.18%, and this number has drastically increased from the previous quarter. Figure 1.1 will show complete data given by Indonesian Statistical Center.

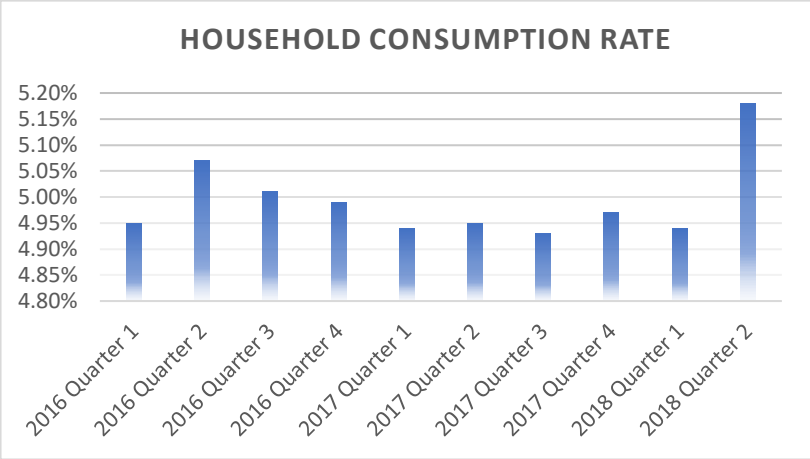
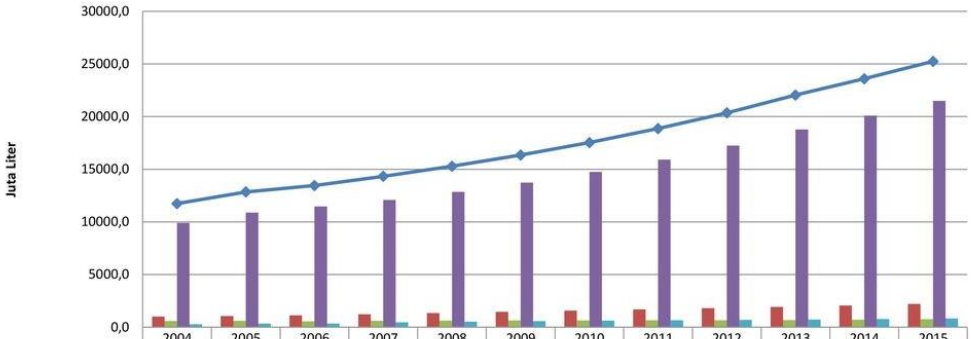


Figure 1. 1 Household Consumption Rate

(Source: http://www.tribunnews.com)

One of the product categories that Indonesian people like to buy is beverage products. Beverage product is considered as one of the FMCG (Fast Moving

Consumer Goods) products. FMCG are the products that are quickly be bought and sold, it usually a non-durable product and sold in large quantities (Sharma and Rani, 2014). This kind of product will result in a low profit for each product sold, but their cumulative profit can be very high. Figure 1.2 will shows how the growth of the beverages industry in Indonesia.



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
RTD Tea	995,2	1046,0	1110,0	1218,0	1327,0	1439,0	1554,0	1672,0	1792,0	1914,0	2048,0	2191,3
RTD Carbonates	571,7	588,6	546,7	587,1	611,3	625,7	634,8	642,1	647,9	652,5	698,2	747,0
RTD Water	9897,3	10879,2	11462,8	12073,0	12837,2	13717,3	14735,2	15901,8	17237,7	18769,5	20086,6	21496,2
Others	264,8	322,2	330,5	440,9	506,5	560,0	607,0	644,1	679,4	712,0	758,6	808,2
Total NARTD	11729	12836	13450	14319	15282	16342	17531	18860	20357	22048	23591	25243

Figure 1. 2 Instant Beverages Growth Rate

(Source: Euromonitor, Data is processed by Asosiasi Industri Minuman Ringan)

It can be seen in figure 1.2 that every year the growth of the beverages industry is significantly increasing. The most dominant beverages category is RTD (ready to drink) water since water is one of the most important liquids needed by human's body, about 55% - 60% from the weight of an adult or 70% from lean body mass. Based on the fact, it can be concluded that the consumption rate of beverages by Indonesian people is high and keep increasing. In order to satisfy the increasing needs, instant beverage industries need to sell their products that reachable all across Indonesia. Since instant beverage is a product that has large inventories and it is packaged goods then the best distribution network is by a complex supply chain that moves from growers, producers, grocery store distribution centers, and retailers.

The retailer is a business process that collects revenue from selling the finished product to the final customer and usually, they do not participate in any other primary business, and the product that is offered to the customers often to be

other company's product (Varley, 2001). Retailers offer a variety of products including the products from beverages industry itself. Usually, they separate the beverages into two categories, which are cold and not-cold beverages. Non-cold beverages are put in a room temperature shelf while the cold beverages are put inside a showcase cooler. A showcase cooler is a type of refrigerator that is created with a purpose for public view and can likewise be safely accessed by the public since the front surface is made of glass. The example of a showcase cooler can be seen in Figure 1.3.

Figure 1. 3 Showcase Cooler
(Source: https://www.bhinneka.com/modena-showcase-cooler-finestra-sc-2920-skusku06516504)

In the showcase cooler, the customer can easily see the product before opening the showcase. A preliminary study was conducted by the author by giving a questionnaire about beverage lay-outing system inside showcase cooler to five different retailers from five different companies in Surabaya during March 2019. The study concluded that retailers had the same way of arranging their cold

beverages inside the showcase. They only arrange the beverage layout based on the type of beverages itself. For example, instant milk beverages will be put together, although they are in different brands. Therefore, there is no consideration regarding which type of product giving the highest profit margin and where it should be placed.

The study also concluded that there are two tags that they usually put inside a showcase cooler, which are price tag and promo tag. The price tag is considered as an important factor since it is the easiest comparison of the product. The comparison to be used is based on economic value. So, the customer tends to do a comparison first with the price of the product. Also, the price tag is factors that give stimuli to the customer regarding the quality of the productThe promo tags are usually presented only for special occasions. The problem with the price tag is that some retailers did not immediately update the change of price for the products. In some case, there are products that do not have a price tag underneath it or there is a price tag underneath it but the font is too small. The unit price information appears at varying locations on the price labels, and inconsistent colors of the tags (Bogomolova et al., 2018), although at some point, using color on the tags can boost sales since it can influence the human's psychology (Patel, 2010). By those problems, retailers need a guideline about how they should arrange the beverage and what is the effective design of price tag and promo tag should they used to maximize the profit.

This study will try to give a suggestion for retailers how the instant beverages inside the showcase should be arranged. The research will be done using the eye tracking device because the equipment can give related data about the fixation time of an eye, movement of an eye, where the energy is spent the most (heat maps), and how many times an area of interest is visited (fixation count). The eye-tracking device will be used to see in which part of the showcase, eyes will take the longest fixation time inside the showcase cooler and observe whether the factors inside the showcase cooler significantly affects the way humans observing the showcase cooler.

1.2 Problem Formulation

This research is conducted to determine which part of the showcase cooler has the highest customer interest and determine if the factors are significantly affecting the dependent variable and optimum area.

1.3 Research Objectives

The objectives of this research are as follows:

1. Finding the optimum location in the showcase cooler to know which AOI (area of interest) have the highest customer interest.
2. Observe whether laying out beverages based on the price can significantly affect the customer interest
3. Observe whether placing a promo tag in a certain area inside the showcase cooler can significantly affect customer interest
4. Provide several points of recommendation based on this research that can be used for the related parties

1.4 Research Benefits

This research is expected to provide benefit in the form of theoretical and practical benefits for the development of knowledge, such as:

1. Theoretical Benefit

   The result of this research is expected to become a research contribution in the development of Ergonomic field, especially in ergonomic cognitive using the approach of the visual sensory register and eye movement analysis.

2. Practical Benefit

   Practically, this research is expected to give suggestion to all retailers that sell instant beverages in a showcase cooler about the perception of arranging the layout of instant beverages inside the showcase cooler so that it can be used as a reference for the retailers when arranging the layout of instant beverages.

1.5 Research Scope

The research scope will consist of two focuses, which are limitations and assumptions.

1.5.1 Limitations

Limitations of this research are:

1. The observation area is only inside of the showcase cooler not cover the background of showcase cooler.
2. Factors to be considered are the price tag and discount or promo tag.
3. The time of eye movement from one place to another (Saccade time) is not going to be a consideration in this research.

1.5.2 Assumptions

The assumptions of this research are that the higher the customer interest means that the intention to buy is higher.

1.6 Writing Systematics

Writing systematics contains the framework of writing this report, which is:

CHAPTER 1 INTRODUCTION

In this chapter, it will consist of the explanation about the background, problem formulation, research objectives, research benefit, limitations, and assumptions.

CHAPTER 2 LITERATURE REVIEW

In this chapter, it will be explained about basic theory in doing this research; the basic theory is obtained from previous research, books, journals, a trusted website, and other trusted sources. The basic theory that is used in this research are cognitive ergonomics, the human eye, eye tracker, Tobii Pro X2-30 eye tracker, the logistic system of the beverage industry, refrigeration, and layout display.

CHAPTER 3 RESEARCH METHODOLOGY

The research methodology is a process to obtain the data for the research and theoretical analysis about the method of the research itself, it will consist of initial hypothesis, data collection, data processing, result and analysis, conclusion, and suggestion.

CHAPTER 4 INITIAL SCENARIO DATA COLLECTION AND DATA PROCESSING

This chapter will discuss the process of collecting the data of the initial scenario. Then the data collection process and also how to process the da.ta that has been collected. The data is processed using the Ranking Method.

CHAPTER 5 ADVANCED SCENARIO DATA COLLECTION AND DATA PROCESSING

This chapter will discuss the process of collecting the data of the advanced scenario. There will be 3 advanced scenarios proposed in this chapter. This chapter will also talk about the data collection process and also how to process the data that has been collected. The data is processed using descriptive statistics, one-way ANOVA, and two-way ANOVA.

CHAPTER 6 ANALYSIS AND RECOMMENDATION

The analysis will consist of analysis for the initial scenario and each of the advanced scenarios. This chapter will also give several points of recommendation for related parties.

CHAPTER 7 CONCLUSION AND SUGGESTION

The conclusion taken from this research will be given in this chapter, and also the suggestion for future improvement of related research.

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CHAPTER 2
LITERATURE REVIEW

Literature review used to explain the basic theory of the experiment. Below will be explained several basic theory that is needed to conduct the experiment. The basic theory consists of cognitive ergonomics, the human eye, eye tracker, Tobii Pro X2-30 eye tracker, the logistic system of the beverages industry, refrigeration, and lay-outing display.

2.1 Cognitive Ergonomics

In this subchapter, the cognitive ergonomics is divided into two main topics which are the definition of cognitive ergonomics and principle of cognitive ergonomic design.

2.1.1 Definition

Cognitive ergonomics sometimes can refer as software ergonomics and it is a part of human/computer interaction study concerned with computers as support- or for that matter hindrance-of human thinking (Waern, 1988).

Cognitive ergonomics is important in the design of complex, high-tech, or automated systems (Budnick and Michael, 2001). A poorly designed cellular phone user-interface may not cause an accident, but it may well cause great frustration on the part of the consumer and result in a marketplace driven business failure. A poor interface design on industrial automated equipment, though, may result in decreased production and quality, or even life-threatening accident.

2.1.2 Principles of Cognitive Ergonomic Design

Sometimes everyone gets confused on a simple thing that needs more information in it. The inability of almost everyone to program household electronic equipment for example. A more serious problem is operating complex control panels in a nuclear plant. (Sustainable Ergonomics Systems, 2019)

These issues are the subject of *cognitive ergonomics* (or *cognitive human factors*). In essence, the goal of this branch of the field is to design things to be easy to understand and operate. The following is a brief overview of basic design principles for cognitive issues.

1. Standardize

   Many errors caused by inconsistencies in how things work, whether how information is displayed or how controls are activated. To prevent mistakes, a general rule is to ensure that similar devices work the same way. Agreeing upon a standard helps prevent errors.

   A trade association or industry group often deliberately decide standards. A good example is a reverse thread on gas fittings. These knobs turn the opposite direction of what we normally expect as a safety feature.

2. Use Stereotypes

   A stereotype is a commonly held expectation of what people think is supposed to happen when they recognize a signal or activate a control. Good design should take advantage of these perceptions and expectations.

   The concept of a stereotype is closely related to that of a standard, but much less consciously determined. Whereas a standard is a formal agreement to eliminate inconsistencies, a stereotype is an informal convention that has evolved through time. A good standard often follows a stereotype. Conversely, a standard that has become culturally ingrained through widespread use can become a stereotype

3. Match Controls to Equipment Layout

   Ideally, there should be a strong relationship between the perception of the need to take action and the action itself; that is, compatibility between a display of information and control. Good design means configuring items so that it is self-evident what one is supposed to do.

4. Simplify Presentation of Information

   Too much information is sometimes provided, or it is provided in too complex a fashion. In general, good designs provide simplified displays. The traditional gas or water meter dials (that alternate clockwise and

counterclockwise directions for each digit) are examples of complex presentation of information that is nearly impossible to read correctly without careful study and double-checking.

5. Present Information in Appropriate Detail

The design of signs, instruction manuals, and control panels all can benefit from an evaluation. What information does the user need to know? It is the job of the writer/designer to do all the hard work of thinking, organizing, and expressing. The reader/ user should have an easy time understanding. Good design leads to ease in use.

6. Present Clear Images

Make it visible; first, the message must be visible. The size and location should be appropriate at the distance from which it is to be observed and there should be no obstructions. Signs and labels should contrast with their background.

Make it distinguishable; the message should also be distinguishable from other surrounding and should be different to avoid signal similarity

Make it interpretable; finally, the message should be interpretable. An example of one type of issue is avoiding the use of similar characters and break up long strings.

7. Use Redundancies

Sometimes, one message is insufficient. Because mistakes are easy to make and humans have many limitations, it is important to provide the same information in more than one way. A simple example is a police car that uses both sirens and flashing lights is a common example. If someone misses the siren then he still can see the flashing lights.

8. Use Patterns

The human eye grasps patterns well. Information presented as a pattern can often be understood much more quickly and accurately than otherwise. In control panels for complex equipment, grouping appropriate controls can ease use. Similarly, placing controls in patterns or in a context can help indicate to the user what to do.

9. Provide Variable Stimuli

Humans detect a novel stimulus more readily than a constant one because our senses fatigue easily with continuous exposure. Written warnings are notorious for being ignored since they quickly become part of the background and simply are not read. Thus, it is important to avoid excessive use of a single way of presenting the information.

10. Provide Instantaneous Feedback

An additional principle that helps prevent errors is to provide feedback to the user on the course of action taken. Furthermore, the sooner the feedback is given, the easier it is to determine if an error has been made or not.

2.2 Human Eye

In this subchapter, the human eye will be divided into two main topics which are the anatomy of eye and visualizations.

2.2.1 Eye Anatomy

The eye is a sensory organ, it absorbs light rays from our environment and transforms them in such a way that the information in the brain can be processed further (Missfeldt, 2019). The eye and brain form a unit that has developed together in the course of evolution, which is the visual system.

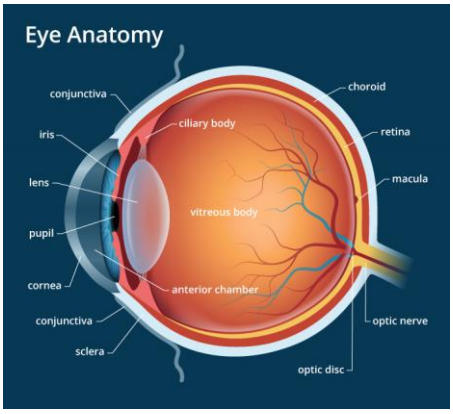

Figure 2. 1 Eye Anatomy

(Source: https://www.allaboutvision.com/resources/anatomy.htm)

The eye consists of several important parts that connect each other and helps human to have a vision.

1. Cornea

   This part of the eye has a function to refract the lights that enter the eye to the lens, and then focus it to the retina. The cornea is the transparent circular part of the front of the eyeball.

2. Iris

   This part of the eye has a function to control how much lights that enter the eye. It forms the colored, visible part of your eye in front of the lens.

3. Pupil

   The circular opening in the center of the iris through which light passes into the lens of the eye.

4. Lens

   A transparent structure situated behind your pupil. It enclosed in a thin transparent capsule and the function is to help to refract incoming light and focus it to the retina.

5. Choroid

   The middle layer of the eye between the retina and the sclera. It also contains a pigment that absorbs excess light so preventing blurring of vision.

6. Retina

   Light and sensitive layer that lies behind the eyes. The retina works pretty much the same with how films work in a camera.

7. Sclera

   A tough covering with which the cornea forms the external protective coat of the eye. The sclera is the white part of the eye.

2.2.2 Visualizations

A visualization's purpose is the communication of data, means that the data must come from something that is abstract or at least not immediately visible (Kosara, 2008). These rules out photography and image processing. Visualization

transforms from the invisible to the visible. Several data can be obtained through this transformation to help to answer research questions (Sauro, 2016).

1. Heat maps

   Heat maps are a view where one participant looked at in the map, it is similar to weather maps only the difference is the factor affecting it. If in the weather map, the factor that affects it is temperatures, in heat maps the factor that affects it is fixation time. The hotter the color in the heat maps means that the energy spent in that area is higher. One participant will result in quite unclear heat maps, however, multiple participants will result in clearer heat maps.

2. Focus Maps

   Focus maps also become one of the data that can be achieved from a human's eye. This data is the inverse of heat maps. If higher fixation time means a hotter color in heat maps, then in focus maps, a clearer image means higher fixation time. A spot in the maps will be darker if it did not interest the participant, while a clearer image on the maps means that spot is attracting the participant's eye.

3. Gaze Path

   The eye can also give data about the gaze path. Gaze path is the combination of eye movement and fixation time. So in this data, the researcher can understand where the attracting part of the maps which marked with a big circle, and the movement of the eye itself which marked by a path from point to another point.

4. Fixation Count

   The number of fixations within an area of interest also becomes another data that can be gathered from the human's eye. Fixations themselves can also be analyzed to help answer more precise research questions. For example, the average time until a participant's first fixation in an area of interest will give some idea about how quickly participants notice an element on a page.

2.3 Eye Tracker

Eye-tracking refers to the process of measuring where we look, also known as our point of gaze. These measurements are carried out by an eye tracker, which records the position of the eyes and the movements they make. Eye-tracking records our point of gaze and our eye movements in relation to the environment.

Eye-tracking is used across a range of different research fields, and for various different applications within the commercial realm (Farnsworth, 2018). Obtaining detailed information about where an individual or group of people look is useful in a range of contexts, from psychological research to medical diagnosis, neuromarketing applications and beyond.

1. Eye Tracking in Psychology

   Understanding when and how people look is essential for understanding how attention is distributed. Eye-tracking is widely used within psychological tests like the Stroop Test and the Iowa Gambling Task.

2. Eye Tracking in Healthcare

   Tracking an individual's gaze can also be important in medical settings. Studies have shown the potential predictive power of eye-tracking in diagnosing autism, as well as other neurological disorders. Future uses may see the application of eye-tracking data in providing optimal patient care in healthcare settings.

3. Eye Tracking in Neuromarketing

   Following gaze patterns while people shop has been a growing topic within neuromarketing for many years now. Being able to see what people attend to or ignore can be crucial for implementing optimal packaging design, store layout, and point-of-sale displays.

2.4 Tobii Pro X2-30 Eye Tracker

Tobii Pro X2-30 provides exceptional flexibility and accommodates for a wide array of human behavior research. It provides a compact and highly portable solution. The system enables the user to perform cost-efficient studies wherever the user participants are. This device can be used in a variety of device like screens-

laptops, PC monitors, TV, etc. According to Steve Mellor as the qualitative director of Tpoll has said that Tobii Pro X2 is as small as a Nintendo Wii bar and plugs into a laptop to power itself. It means that, for the first time, the user can conveniently study people in their own homes."

There are two main components of Tobii Pro X2-30, which are the eye tracker unit and an external processing unit. The eye tracker unit has 184 mm length and weighs about 200g. It attaches onto screens up to 25" (16:9) with supplied adhesive mounting brackets for monitors, laptops, and tablets. For the external processing unit, gaze data calculations are performed by the firmware on an external processing unit. This gives the user a controlled environment for running your tests with dedicated eye tracking processing, and the ability to use Mac or Linux, as well as computers with lower performance. Figure 2.2 will show the specification of the Tobii Pro X2-30.

Gaze sampling frequency	30 or 60 Hz (max. frequency depends on hardware version)
Accuracy	0.4°
Precision	0.32° (30 Hz version) 0.34° (60 Hz version)
Freedom of head movement	Width x height: 50 x 36 cm (20 x 14") @70 cm" operating distance: 40–90 cm (15.7–33.5")
Latency	Total system latency: 50-70 ms (30 Hz version), < 35 ms (60 Hz version)
Gaze recovery time	For blinks: immediate
Recommended screen size	Up to 25" (16:9)
Tracking technique	Binocular, automatic tracking optimization (optimal selection of dark and bright pupil tracking)
Data output (for each eye)	Timestamp Eye position Gaze point Pupil diameter Validity code

Figure 2. 2 Tobii Pro X2-30 Specifications

(Source: https://www.tobiipro.com/product-listing/tobii-pro-x2-30/)

2.5 Logistics System of Beverages Industry

In this subchapter, the logistic system of the beverages industry will use PT. Coca Cola Bottling Indonesia as an example. PT. Coca Cola Bottling Indonesia is a manufacturing company. The product that is produced by PT. CCBI is greatly demanded by their consumers. The branding of PT. CCBI is well-known as the biggest carbonated drinks in Indonesia. The high demand for PT. CCBI in a certain time like Christmas, ied al-Fitr, and others result in high demand for ready to drink product.

The objectives of this study are to understand the flow of the supply chain from the raw material supplier, production system, distribution, and the marketing product to the end-user.

There are several criteria to choose the supplier since it is one of the most important aspects of purchasing goods for the company. In choosing the supplier, the consideration should not only on the price; a company should consider all of the possible factors that affect it. There are several steps to do supplier selection.

1. Finding Supplier

   In this step, PT. CCBI try to identify the possible supplier. This step is done by listing all possible supplier.

2. Requesting Proposal Submission

   PT. CCBI will ask all of the suppliers that meet the criteria to request their proposal submission. The company then will evaluate all of the proposals and eliminating several suppliers. The chosen several suppliers are then invited to present their proposal.

3. Supplier Selection

   Before choosing the supplier, the purchasing department of the company will create several attributes and set the relative importance. Then the purchasing department will give a score based on the attributes and identify the most attractive supplier.

4. Specification of Order Routines

After deciding the supplier, then PT. CCBI negotiating the final order, detailing specification techniques, the amount needed, expected delivery time, return policy, and warranty.

5. Job Assessments

PT. CCBI will periodically evaluate the performance of the supplier. This is done by contacting the end-user and asking about the evaluation of the product or PT. CCBI will rank the supplier based on several criteria with the weighted scoring method.

In the warehousing process, a company can use its own facility or using an intermediary specialist. An intermediary specialist is a company that has profit objectives from the logistic process. A simple example is that a distribution warehouse and a truck is a logistic facility, but both can be an intermediary specialist if the warehouse is a public warehouse and the truck is operated by a public company. The combination of the facility and intermediary specialist is needed to obtain minimum logistic cost.

In transporting the product, a beverage industry can use several modes of transportation as listed below.

- Train

  This type of transportation can carry a large amount of product, but the fixed cost and equipment cost is high. There is also extra cost for road usage permission, station usage, etc.

- Highway

  The highway can always be passed through by a motor vehicle like a car, truck, container, etc. Compared with the train, using a motor vehicle will be less expensive although the capacity is not as big as a train.

- Waterways

  The benefit of using waterways, as the main transportation is the capacity that can be carried out is huge and have high flexibility compared with another mode of transportation.

- Airways

The advantage of using this mode of transportation is the quickness of it. Service between two places far enough can reduce the overall logistics cost with a big margin to equilibrate high air freight costs.

2.6 Refrigeration

A refrigerator is a machine that is work to produce a low temperature or cold temperature (Najamudin, 2014). According to the use of a refrigerator, the community often uses these several types of the refrigerator, which are:

1. Reach-in Refrigerators

   This type of refrigerator is the most commonly used type of refrigerator. It is accessible at arm's length and the size suitable with the household. This type of refrigerator usually placed at the kitchen or in the back of the store. It can be accessed by everyone in a house, else accessed by staff in the kitchen of a restaurant or store.

2. Merchandiser Refrigerators (Showcase)

   In other words, this refrigerator is called a showcase cooler. The front side of this refrigerator is made of glass with a purpose for public view. This type of refrigerator is great at enabling the product such as bottles and jugs to be stable while still being accessible. It is located inside the store to display what beverages that the store currently sell.

3. Undercounter Refrigerators

   Undercounter Refrigerators have a similar purpose with reach-in refrigerators, only the main difference is the size of it. This refrigerator size is almost half of the reach-in type. Therefore, it can be placed in a tight spot of the kitchen.

Figure 2.3 will show the detailed images of under-counter refrigerators that commonly used in the community.

Figure 2. 3 Undercounter Refrigerators

(Source: https://www.marvelrefrigeration.com/marvel/products/refrigeration-3/ml24ras1/)

4. Worktops

Figure 2.4 will show the detailed images of worktops refrigerators that are commonly used in the community.

Figure 2. 4 Worktops

(Source: https://www.restaurantsupply.com/true-twt-48-hc-48-two-door-worktop-refrigerator)

Worktop refrigerators allow you to prep and work of food product to be completed while also storing the necessary ingredients for the product. They come in a variety of forms making them versatile while remaining at a comfortable working height. This type of refrigerator is usually located in the mid kitchen or near front counter operation, and it is usually found in line operations.

5. Walk-in Refrigerators

Walk-in refrigerators are the type of refrigerator to store huge quantities amount of food. The huge size of this refrigerator makes a man can freely move inside this refrigerator. This refrigerator can be set as a freezer or refrigeration. This type of refrigerator usually can be found in mass storage facilities.

6. Bar Refrigeration

This type of refrigerator has a specific function and specific usage, which are storing and cooling alcoholic beverages. This refrigerator needs to be set at the proper temperature to control the quality and taste of what is being stored.

7. Display Cases

This display case refrigerator is created to display product that requires refrigeration to maintain its appearance. It cannot be used to store food that will be served. This type of refrigerator is located in a place where it is easy to be seen. Usually, the cake shop or restaurant uses this kind of refrigerator.

2.7 Layouting Display

In this subchapter, the layouting display will be divided into two main topics, which are the definition of display and display conditions.

2.7.1 Display Definition

The display is work or effort to arrange some product to attract customer and ended up buying the product. A good display will increase the possibility of customer buying it, will bad display will decrease the mood of the buyer. The good display means it already achieving these several conditions (Sopiah and Syihabudhin, 2008).

1. Creating a store image
2. Uplifting shopping feeling
3. Introducing a new product
4. Increasing profit

2.7.2 Display Conditions

There are several conditions in displaying the product to achieve a good display goal (Sopiah and Syihabudhin, 2008).

1. Clean and Neat

   The shelf of the store needs to be clean and neat for displaying the product since it will affect the customer moods and the willingness for the customer to look closer at the product.

2. Easy to be seen, reach, and found

   Feeling comfort in shopping is important for the customer to increase their mood. The store needs to be set to ease the customer. Easiness to find a product, easiness to grab the product from the shelf, etc.

3. Strategic location

   One of the display principles is to remind the buyer about their needs, so the location of a product need to be related to another product to guide the customer.

4. Safe

   When displaying a product, the safety for the product itself and the buyer need to be considered. A simple example is displaying a fragile product, it should not be placed on a high shelf to avoid the product to fall down and hit the customer.

5. Attracting

   Attracting means the color combination, product function, packaging shape, etc. all of those factors will lead to happy shopping mood and it will increase the intention to buy of the customer.

There are also several considerations needed to display a product on a shelf or in a showcase to achieve a good display goal (Sopiah and Syihabudhin, 2008), which are:

1. A product has to be displayed in a standing position if it is not possible then at least there should be one product that stands. The brand name or logo should face forward or facing the direction where the customer will pick it.

2. Placing the product should consider the maximum height of the shelf which ranges between 110-160 cm, so it is easy to be picked and safe.
3. Displaying products should consider the price and goods selling level, where placing high goods selling level should be in the eye level and low goods selling level in the side, upside, or downside of the eye level.
4. To be easily taken, products should be arranged not to close to each other and not stacked excessively.

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CHAPTER 3
RESEARCH METHODOLOGY

In this chapter, the research flow will be given in the form of a flowchart and there will be a brief explanation regarding each of the steps in the research flow.

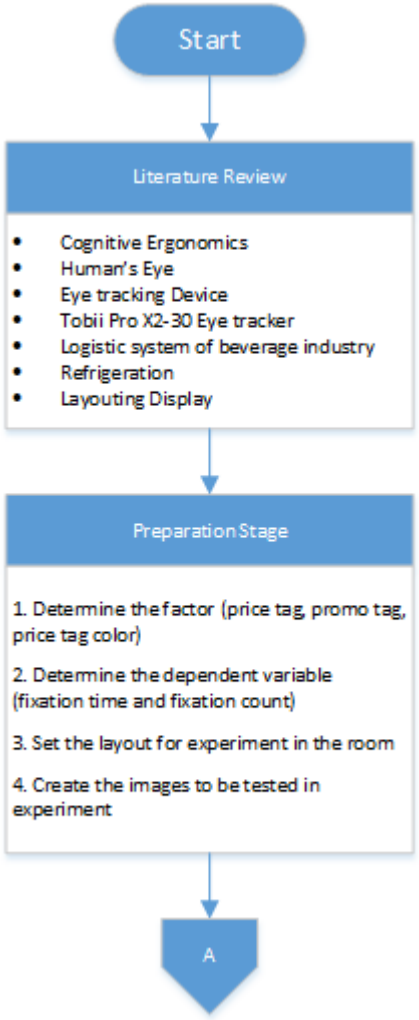

Figure 3. 1 Research Flowchart

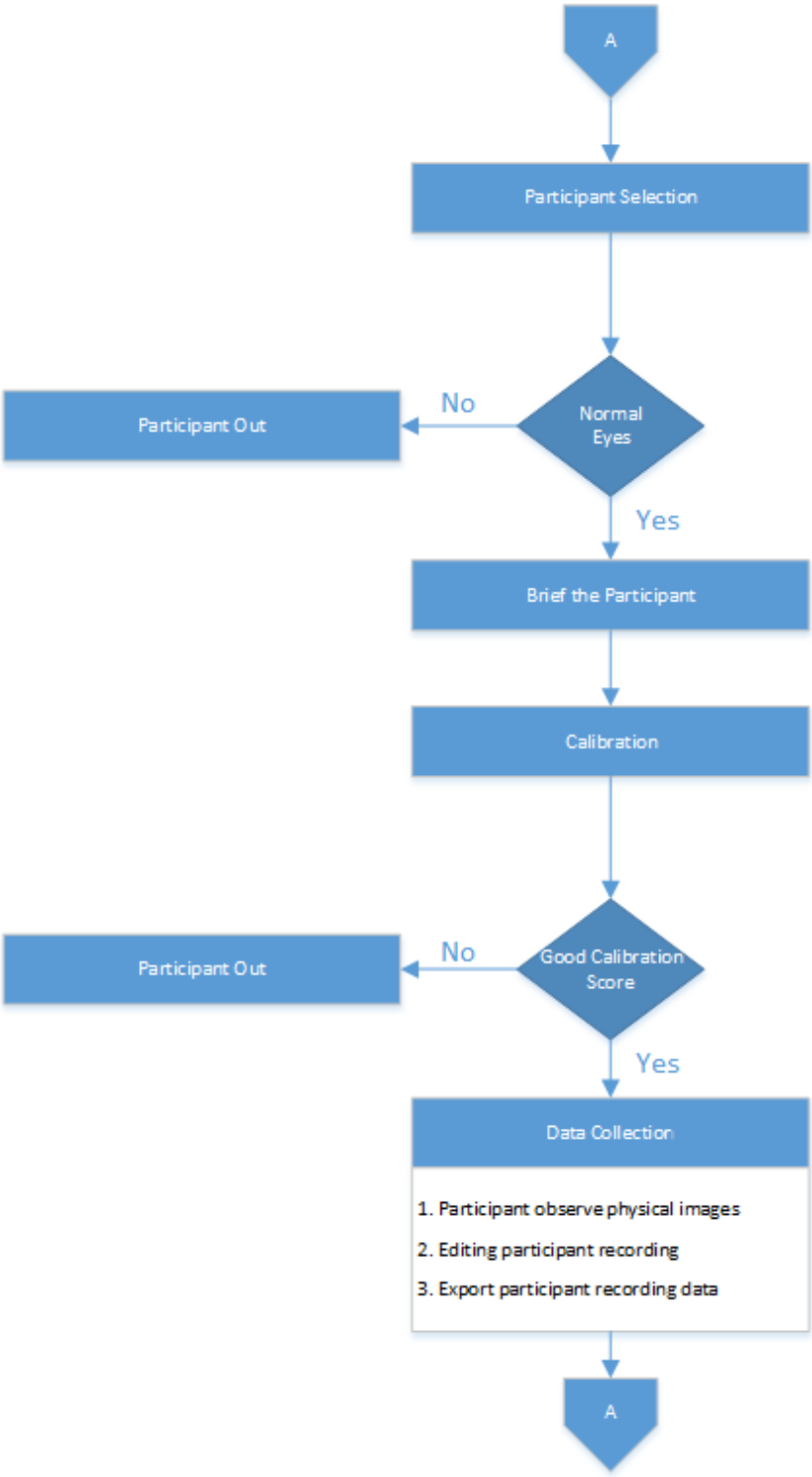

Figure 3. 1 Research Flowchart (con't)

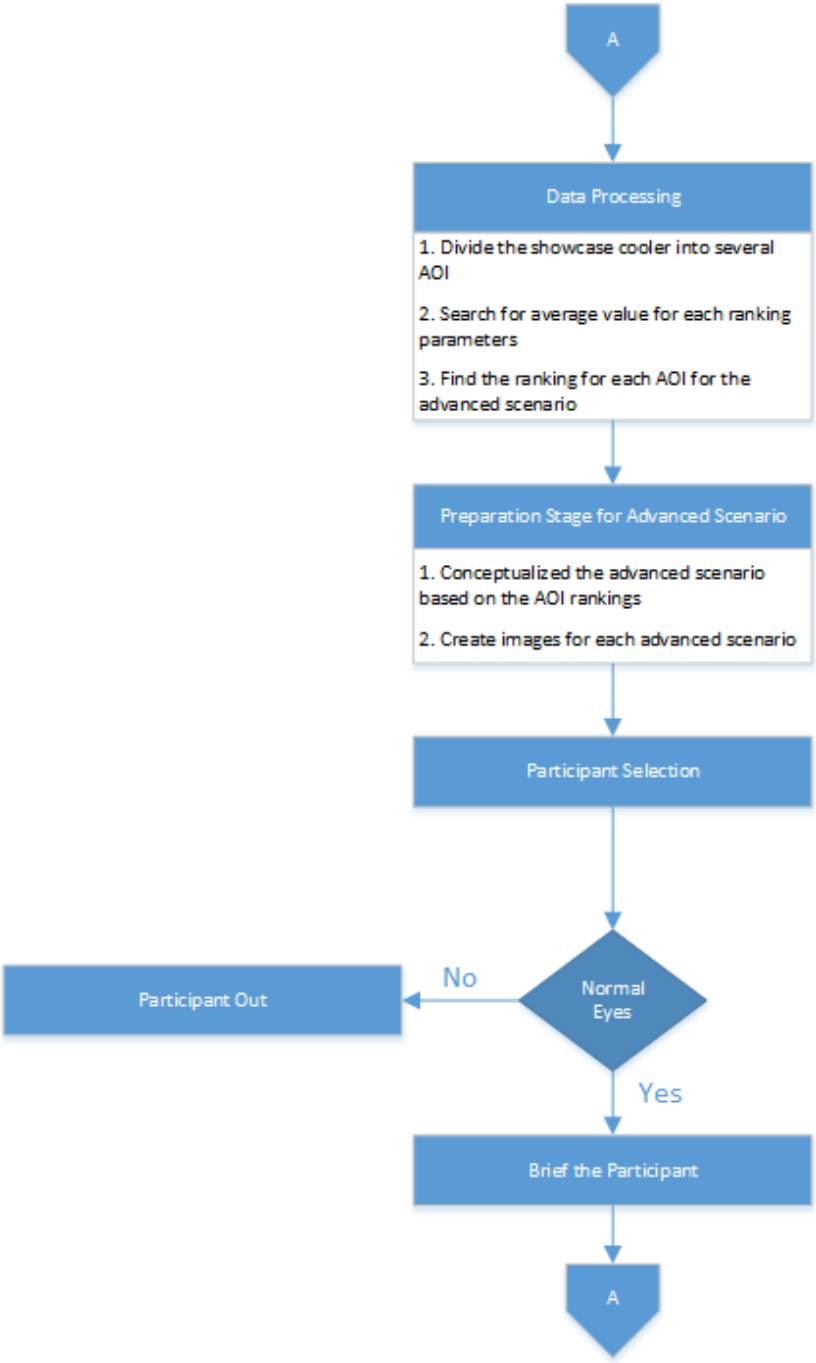

Figure 3. 1 Research Flowchart (con't)

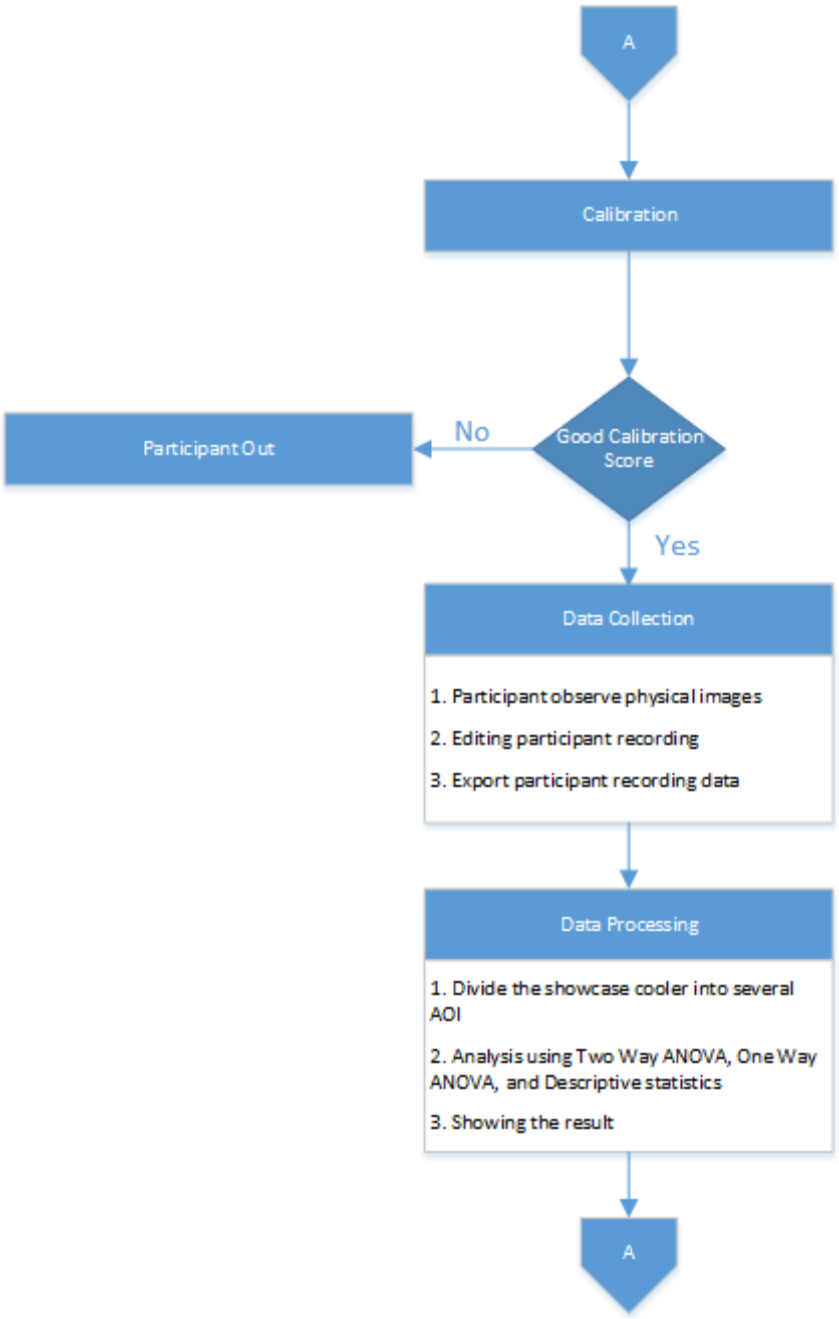

Figure 3. 1 Research Flowchart (con't)

Figure 3. 1 Research Flowchart (con't)

The research flowchart above is a step by step of how this research is done. It starts from doing and searching the literature review until making a conclusion and suggestion of the research.

3.1 Literature Review

A literature review is used to obtain theory, method, and information regarding this research. The literature review that is used in this research is cognitive ergonomics as the main topic of this research. human's eye as the sensory organ to be observed in this research, eye tracker device, Tobii Pro X2-30 eye tracker as the main device for the experiment, the logistic system of beverages industry, refrigeration as the object to be observed, and layout display.

3.2 Preparation Stage

In this subchapter, the preparation stage divided into the four-sub stage, below will be given each of the substages in sequence and the explanation of each.

3.2.1 Determine the Factors that Potentially Affects the Customer Interest

In this substage, the factor is determined as well as the explanation of it. The first factor is the price tag. This is done by giving a price tag for every product in showcase cooler with proper font size and consistent font color, this tag will be placed under the product and it is used to see if the existence of price tag is affecting the independent variable. There are 3 price variances for the price tag. The factors here will be used on the advanced scenario, while for the initial scenario there won't be any factors that are used for the experiment.

Figure 3. 2 Price Tag 1

Figure 3. 3 Price Tag 2

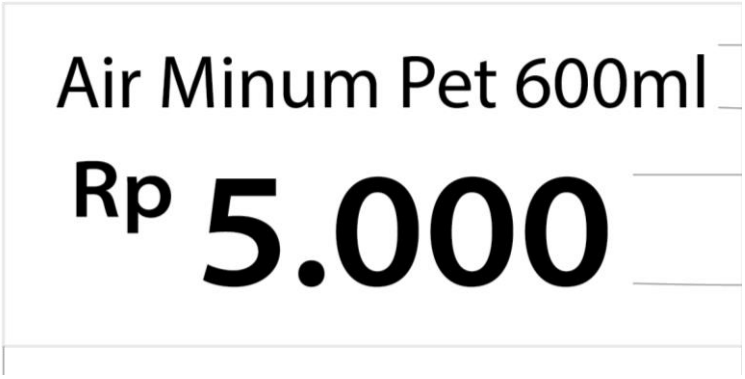

Figure 3. 4 Price Tag 3

The second factor is promo or discount tag, this tag will be placed next to the price tag to see if a discount or promo tag will have an effect on the independent variable.

Figure 3. 5 Promo Tag

3.2.2 Determine the Dependent Variable

Several dependent variables will be determined in this research. The first dependent variable is total fixation duration. Total fixation duration is the time for a participant to observe a certain area of interest. The second dependent variable is the average fixation duration. Average fixation duration is the average value of each AOI fixation last for. The third dependent variable is fixation count. Fixation count

is a number of fixations within an area of interest. The fourth dependent variable would be time to first fixation. This dependent variable indicates at what time that it takes for an observer or respondent to look at a specific AOI from the stimulus onset. The last dependent variable would be the first fixation duration. First fixation duration quantifies the amount of time that respondents have spent looking at a particular AOI for the first time.

3.2.3 Set the Experiment Layout

This substage, the experiment layout needs to be considered and set, since this type of eye tracker is unmovable. There are several devices that are used in this research, which are Projector screen, projector and laptop that connect each other, eye tracker device and webcam to record the active screen for research, personal computer or laptop that is connected to eye tracker device to record the movement of the eye. The first step to set the experiment layout is by making a rough sketch about how all of the devices should be arranged.

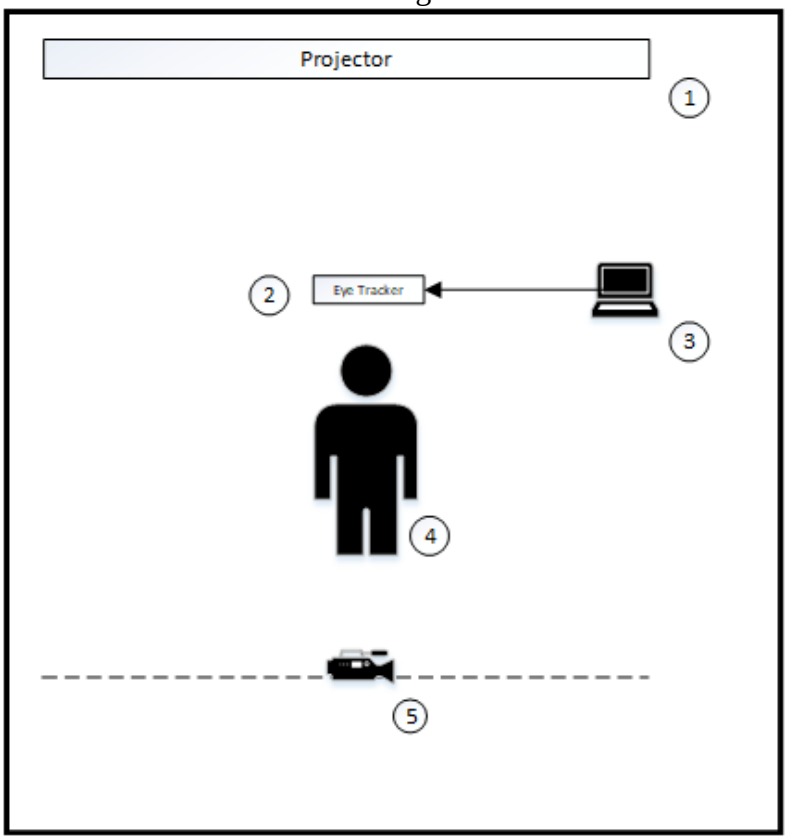

Figure 3. 6 Experimental Layout Sketch

The figure above shows how the layout will be when the experiment is done. The number above will be explained below for further understanding regarding the experiment layout itself.

1. Projector or active screen
2. Tobii Pro X2-30 eye tracker that will be used to track the eye movement of the participant
3. HP ProOne 400 G2 Laptop that will be used to record the data obtained from the eye tracker
4. Participant
5. Logitech C170 WebCam that will be used to capture the active screen that the laptop is not able to record

After creating the rough sketch, then the layout should be set based on the sketch that has been made. This is done in order to get the exact distance and location for all of the devices.

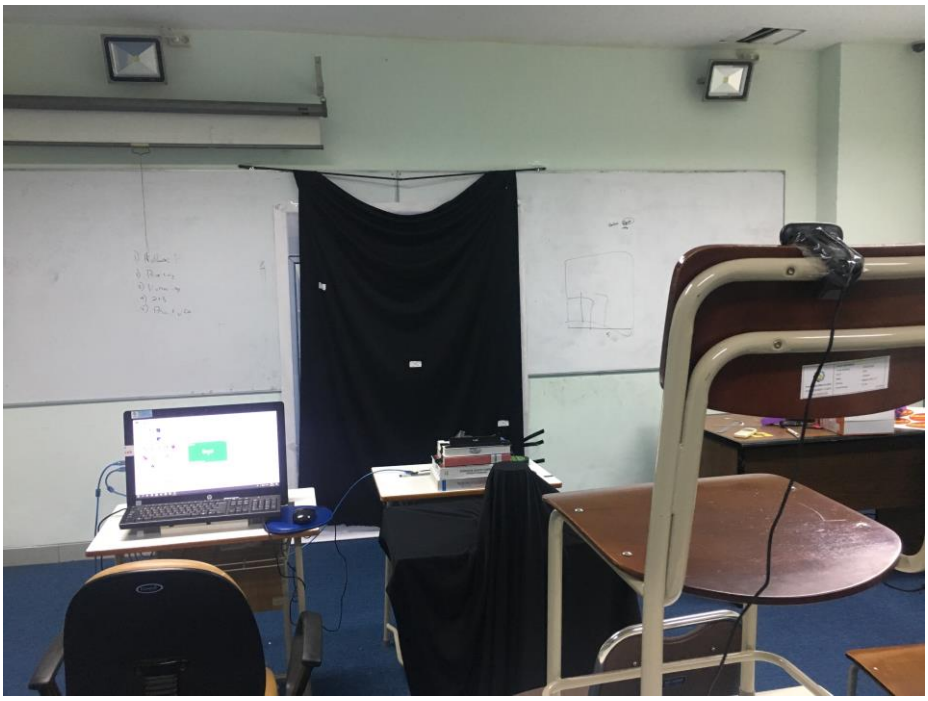

Figure 3. 7 Fixed Experiment Layout

The final layout is then being measured. The measurement value is inputted to the Tobii pro configuration software. The data to be inputted in the software are the distances between the Tobii eye tracker to the physical images, the active display size of the physical images, the height difference between the top of Tobii eye tracker device to the lowest active display height, the physical images slope, and the eye tracker device slope.

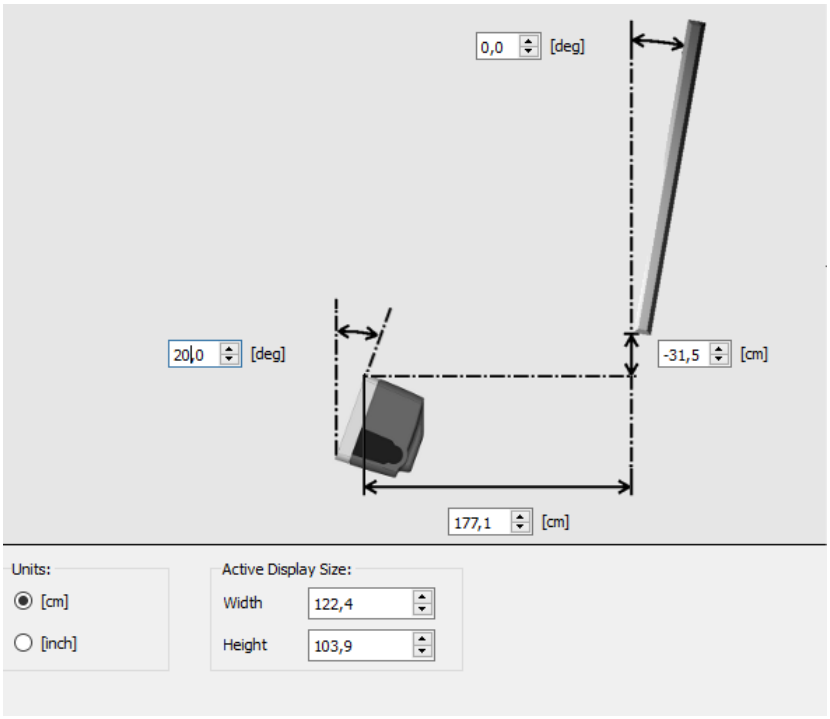

Figure 3. 8 Tobii Pro Configuration

3.2.4 Create Images to be tested in Experiment

In this substage, the images for the initial scenario will be created. The images will be created using SketchUp software. This software is chosen because it can replicate the real dimension of the showcase cooler.

3.3 Participant Selection and Calibration

Participant selection is the process of selecting participants for the research that fit the requirements. The general requirement for participants is people at the

age where they can go to the supermarket by themselves. The only specific requirement for the participant is that either they have normal eyes or not.

The number of participants needed for this research would be 30 participants. The participants will be divided into gender categories which are male and female. Each gender would have 15 participants each. Then the participants will be divided by its age. There are 3 categories of ages, which is 12-16 years old, 16-30 years old, and 31-40 years old. Table 3.1 will show detailed information about the participant's requirements.

Table 3. 1 Participants Requirements

Gender / **Age**	**Male**	**Female**
12 - 16 years	3	4
17 - 30 years	8	8
31 - 40 years	4	3
Total	15	15
	30	

The first participant selection in the flowchart is intended for the initial scenario, while the advanced scenario will have the same general and specific requirement for the participants. Only in the advanced scenario, the participant would be exactly different from the initial scenario.

3.4 Participants Briefing

The selected participants will be briefed for the experiment. The brief will mainly talk about what the participant should do during the experiment, what they should not do during the experiment and how to do the calibration process. Also in this phase, a question and answer session will be opened to avoid misunderstanding from the participant.

3.5 Calibration Process

After the briefing for the participant is complete, then each participant will perform a calibration process using the eye tracker device. This is done in order to get accurate and precision data. It is also minimizing data defect and inconsistency. The calibration process is done by observing three calibration point on the physical images. The minimum score for the calibration point is 1.0°. If a participant score below that for all of the calibration points for three times then it cannot become the participant for this research. Also, if the participant's score for one of the calibration point above 1.0°, then the participant should be recalibrated for that calibration points. The calibration process will be performed from the Tobii pro lab software.

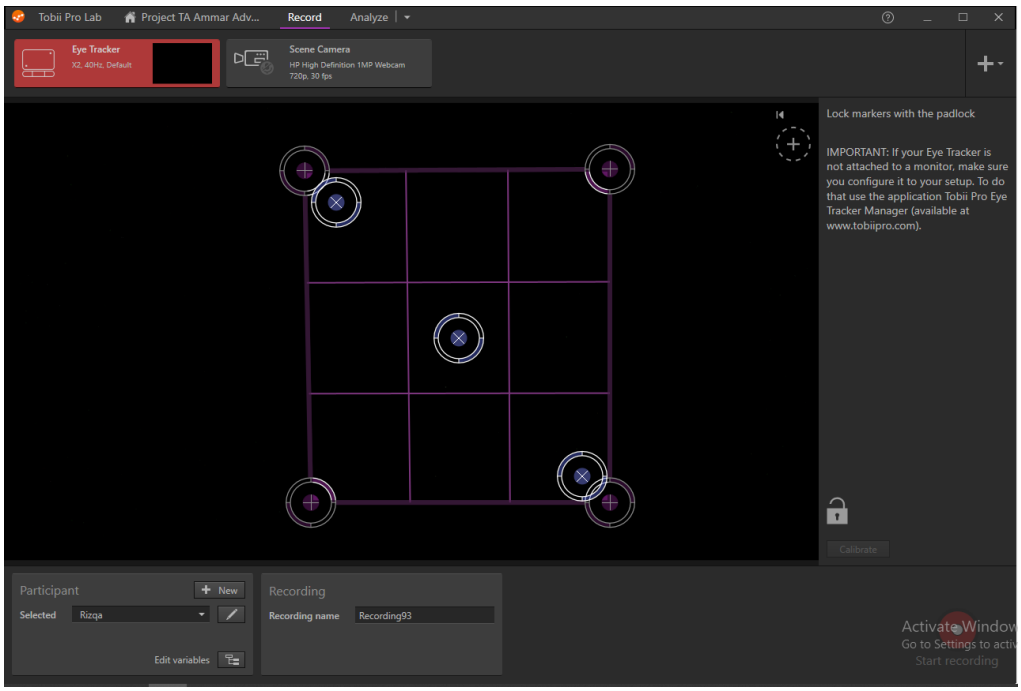

Figure 3. 9 Calibration Screen

3.6 Data Collection

Data collection is obtained through Tobii pro-X2-30 device that record eye movement of the participant. The participant will be standing in front of the active screen and there will be an eye-tracking device in between the participant and the active screen, although the eye-tracking device will be closer to the participant.

The first data collection will only use one scenario which is the initial scenario. There are several steps to collect the data for each of the participants. The first step is by brief the participant about what they should do and what they should not do during the experiment. After that, there will be a calibration process which already explained in the previous sub-chapter. Then the participant will start the observation process. After the participant finished the observation phase, then the recording will be automatically saved in the Tobii pro lab software. Then the recording will be edited to obtain suitable data for analysis. Then the data can be exported for each of the participants for further processing. This data collection is done for both the initial scenario and an advanced scenario.

3.7 Data Processing

After the data is collected for all participant, then the data is processed for further analysis. The showcase cooler is divided into several AOI using Tobii pro software. This method will make plotting for the dependent variable much easier. By doing it, each of the AOI will have their own dependent variable value. This will ease the analysis process of optimum location in the showcase. Then with the ranking method, the final ranking for each of the AOI will be determined and also the result will be used for the concept of advanced scenario.

3.8 Preparation Stage for Advanced Scenario

The total ranking result will be used to find the optimum area and the least optimum area. Based on the optimum area and the least optimum area, then the advanced scenario is conceptualized. There will be three advanced scenarios that are conceptualized for this experiment.

1. The first advanced scenario is a scenario that has a price tag for each area and there will be time constraint in the observation process.
2. The second advanced scenario is a scenario that has a price tag for each area and the observation time is the same with the initial scenario.
3. The third advanced scenario is a scenario with a price tag on each of the area and also promo tags on the least optimum area

After finish conceptualizing the advanced scenario, then all of the advanced scenario images are created using SketchUp software, since it can replicate the real dimension of the showcase cooler.

3.9 Data Processing for Advanced Scenario

In this subchapter, the data for the advanced scenario is processed using several tools of analysis. The advanced scenario 1 data will be processed using descriptive statistics. This is done to observe which area in the showcase cooler has the best parameter for each of the dependent variable, and it can be used to validate the initial scenario result.

For the advanced scenario 2 data, it will be processed using the two-way ANOVA to observe whether the scenario and area are significantly affecting the customer interest. This is done by comparing the data from the initial scenario and the data from advanced scenario 2 for all of the dependent variable. Also, the advanced scenario 2 data will be processed using one-way ANOVA to see whether the optimum area will be affected by the changing scenarios. This is done by comparing the optimum location area from initial and advanced scenario 2.

For the advanced scenario 3 data, it will be processed using the two-way ANOVA to observe whether the scenario and area are significantly affecting the customer interest. This is done by comparing the data from the initial scenario and the data from advanced scenario 3 for all of the dependent variable. Also, the advanced scenario 3 data will be processed using one-way ANOVA to see whether the least optimum area will be affected by the changing scenarios. This is done by comparing the least optimum area from initial and advanced scenario 3.

3.10 Result Analysis

The data collected from Tobii pro-X2-30-eye tracker is further analyzed. The analysis of this research will consist of initial scenario analysis, advanced scenario analysis, and the subjective choice analysis. The analysis will be conducted based on the total fixation duration, average fixation duration, fixation count, time to first fixation, and first fixation duration.

3.11 Making a Recommendation

After the initial scenario analysis and advanced scenario analysis is done then the recommendation layout for beverages inside showcase cooler need to be formulated. The recommendation layout will be based on the result analysis that has been done in the previous stage. The recommendation layout will consist of the entire factor tested in the previous stage.

3.12 Conclusion and Suggestion

This stage will discuss conclusion and suggestion based on the result analysis and data interpretation on the stage before. The conclusion will answer the research objectives and the suggestion is expected and implemented in the next research or the reader of this research.

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CHAPTER 4
DATA COLLECTION AND PROCESSING OF INITIAL SCENARIO

This chapter will discuss the data collection and the data processing for the initial scenario will be given and explained in details.

4.1 Data Collection of Initial Scenario

In this subchapter, the process of collecting data from each of the participants will be given in detail.

4.1.1. Explain the Experiment Instruction to Participants

Before the experiment is conducted for each of the participants, the participant will get informed about what should they do during the experiment. The experiment is conducted separately between each of the participants. The explanation consists of calibration process explanation, what the participant should do when the data collection starts, how long the experiment is conducted for each of the participants, and what they should not do during the experiment.

The participants are instructed to observe physical images in front of them for 20 seconds but only the pupils can move. The heads shouldn't significantly move since it can disturb the eye-tracking recordings. The participants head also should be placed on the chin rest to minimize the head movements.

Figure 4. 1 Initial Scenario Physical Images

4.1.2. Calibration Process

Before doing the calibration process, the vision range of the participant should be set only inside the active display. So the active display size should be set as the same with the information that has been inputted in Tobii pro configuration application.

In this process, the participant will do what is instructed to them for the calibration process. The participants are instructed to observe 3 points that have been placed at the top left corner, middle part and bottom right corner of the physical images. The participant needs to observe each point for about 10 seconds so that there will be enough data recorded by the eye tracker for the calibration score.

Figure 4. 2 Calibration Physical Images

After each of the points is already observed then the calibration score result will pop out from the screen and showed the calibration score of each of the points observed by the participant. The calibration score will consist of 2 pages which are the overall score of the calibration and left eye or right eye calibration score.

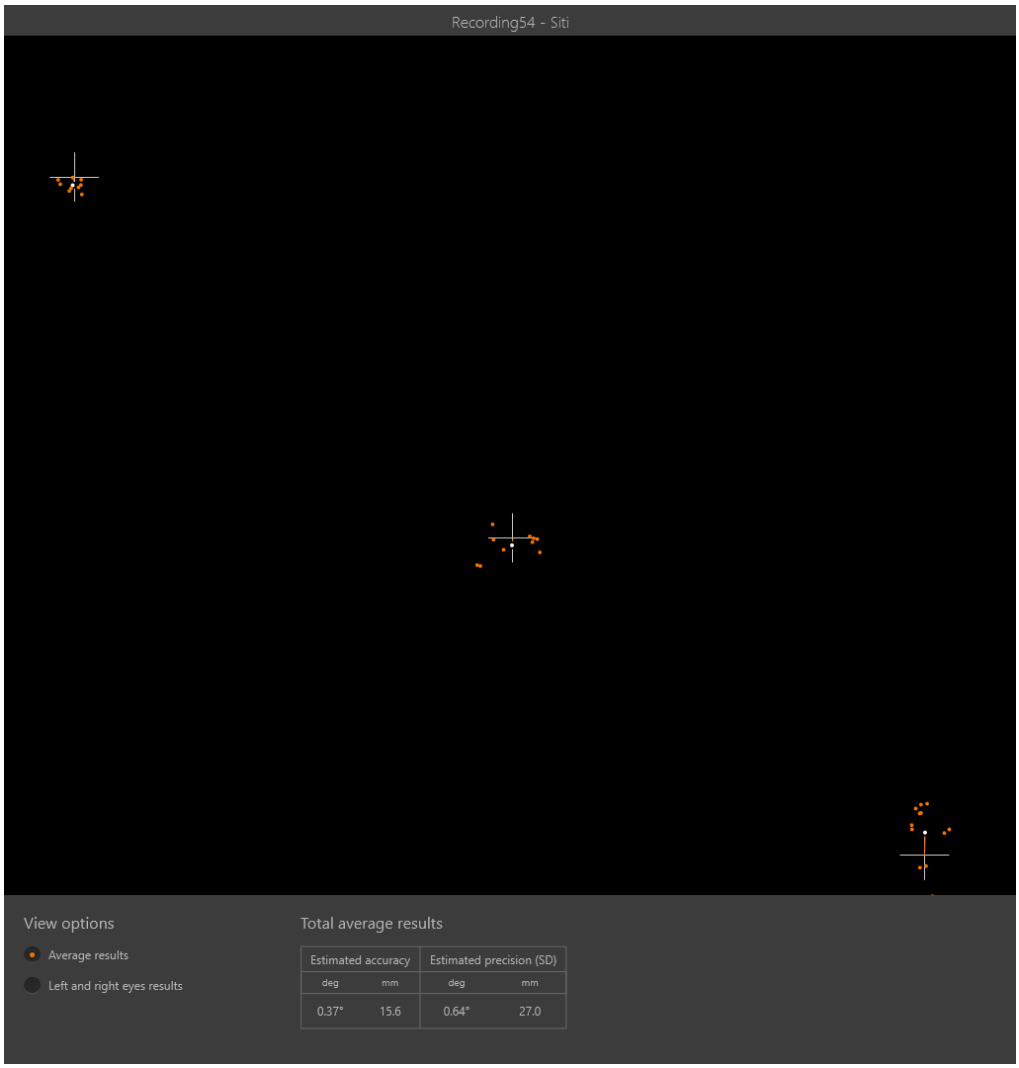

Figure 4. 3 Overall Calibration Score

The calibration score should be below 1 since the diameter of the circle is 1. So to obtain a good calibration score, then the white dot should be inside the circle that is created from connecting each edge of the plus sign. The overall calibration images are obtained from the overall of right eye calibration and left eye calibration.

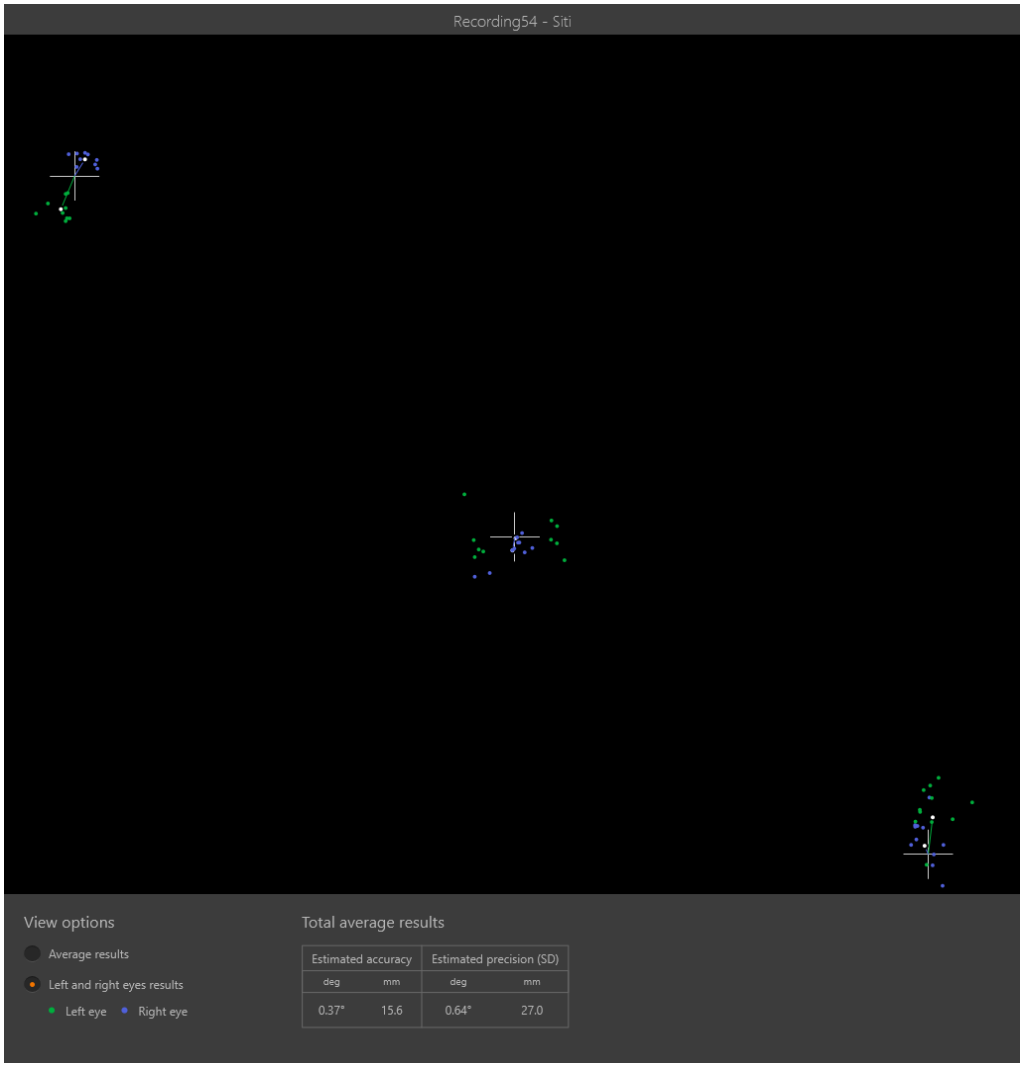

Figure 4. 4 Left Eye and Right Eye Calibration Score

The requirement needed to pass the calibration test is when each of the calibrations points accuracy score below 1.0°. If all of the calibrations points accuracy score above 1.0°, then the participant should do the recalibration test since the result shows that the participant's eye did not focus on all of the calibration points. If only several calibration points that have an accuracy score above 1.0°, then the operator should pick one of the calibration points that has accuracy score below 1.0° and do recalibration on those points. By doing this technique, then the eye tracker will automatically recalibrate all points and makes the accuracy of the

eye tracker recording more precise. The eye tracker needs to be restarted if it shows bad calibration accuracy score continuously when doing the calibration test on a participant.

4.1.3. Participants Recording

The data collection starts exactly after the calibration process is finished. It starts by clicking the *start recording* button on the bottom right corner of the Tobii Pro Lab application. By clicking this button, then the recording process will start one second after the clicking process. One second is used for short and quick preparation.

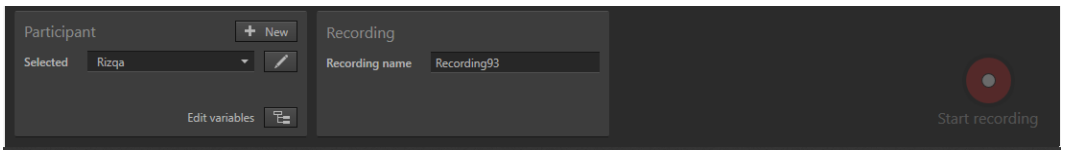

Figure 4. 5 Start Recording Button

In this experiment, the short preparation will be used to remove the black fabric that blocks out the physical image of showcase cooler. After that, the participant will observe the physical image in front of them for 20 seconds. The time limit of 20 seconds is obtained from quick observation in a supermarket in which the author record 20 random people. The time record starts when the person is standing in front of the showcase cooler and finish when they touch the product that they want to buy. The time record for all of 20 participants is recorded and then the average value of the recorded time will be the time limit used in this research. After 20 seconds of observation then the operator will click *stop recording* button to end the recordings. The time range of observation will start from 0 seconds and ends at a various time between 20 until 22 seconds since the clicking time is different for each of the participants.

4.1.4. Recordings Edit Process

After all of the participants have been recorded, then each of the recordings should be checked and revised to meet the desired condition for data processing and

analysis. The first thing to do is creating AOI on each of the recordings. To create AOI for each of the recordings, these following steps should be done in order.

a. Open the Tobii Pro Lab application
b. Open an existing project that is already used for the experiment, the tab is available on the top left corner of the application window
c. Open the analyze tab on the top of the application window and choose the AOI tool
d. Inside the AOI tool tab, there are several icons on top of the application window. To create a rectangle AOI choose the rectangular shape icon
e. Draw the AOI on the desired place of your recordings

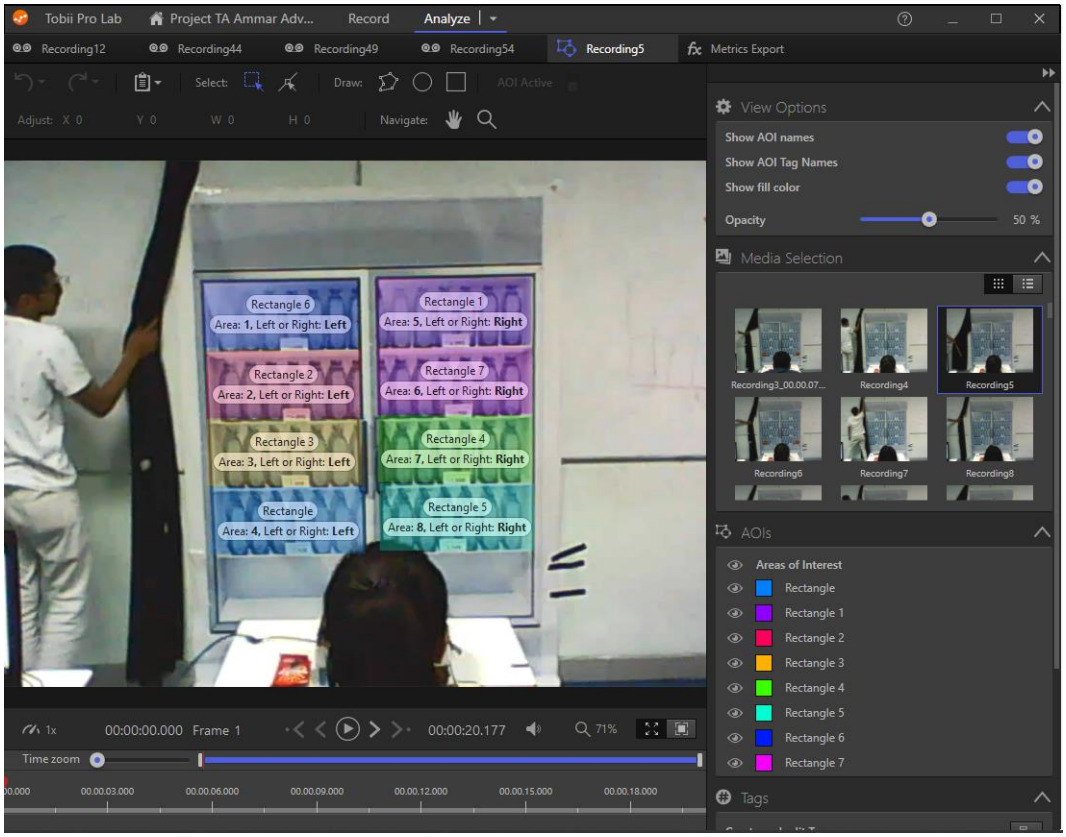

Figure 4. 6 AOI Tool Display Tab

After drawing AOI for further analysis, then the recording time should be edited since each of the participants recording time is different. The recording time should be edited so that all of the participants will have the same recording time

(Time of Interest) as stated before which is 20 seconds. Below will be given the steps about how to edit the recording time.

a. Open the Tobii Pro Lab application
b. Open an existing project that is already used for the experiment, the tab is available on the top left corner of the application window
c. Open the analyze tab on the top of the application window and choose the visualizations
d. Inside the visualizations tab, there are several columns. Choose the time of interest column and click on the plus logo inside the column
e. Set the time of interest-based on the time of experiment needs

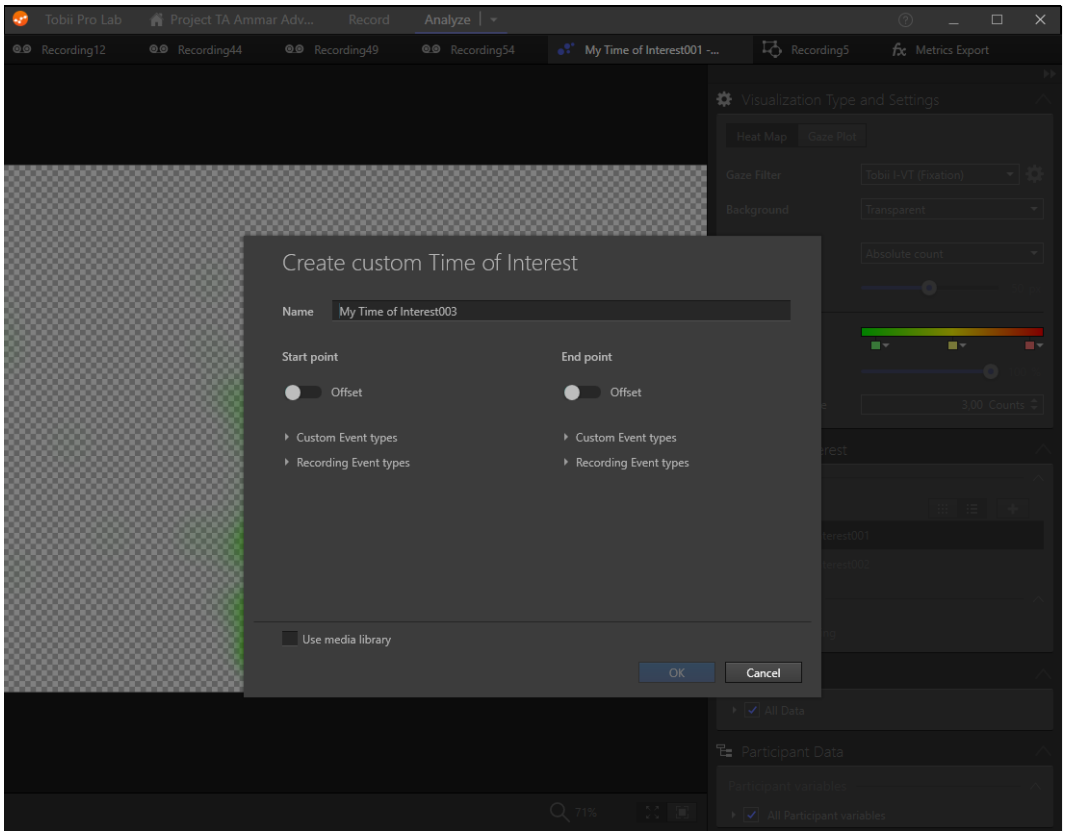

Figure 4. 7 Time of Interest Display Tab

4.1.5. Initial Scenario Data Export

In this subchapter, the data that has already collected in the data collection process then exported from the Tobii Pro Lab software in form of excel file. The step to export the data from Tobii Pro Lab software is shown below:

1. Open the Tobii Pro Lab application
2. Open an existing project that is already used for the experiment, the tab is available on the top left corner of the application window
3. Open the analyze tab on the top of the application window and choose the metrics to analyze method
4. In the metrics window, there are several columns which have a different function. The first column is “Select metrics for the export”. This column will help the operator regarding which type of data the operator needs to be exported. Examples are total fixation time, average fixation time, time to the first fixation, and etc. The second column is “settings”. In this column, it will help the operator regarding in what form the data would be extracted and also what type of gaze filter would be used whether it is fixation or attention. The last column is “data selection”. This column will help the operator to filter what data need to be extracted. Examples are which participant result would be extracted, the times of interest that would be used, the area of interest, and etc. Check the boxes in every criterion inside the column to have only the needed data for further analysis.

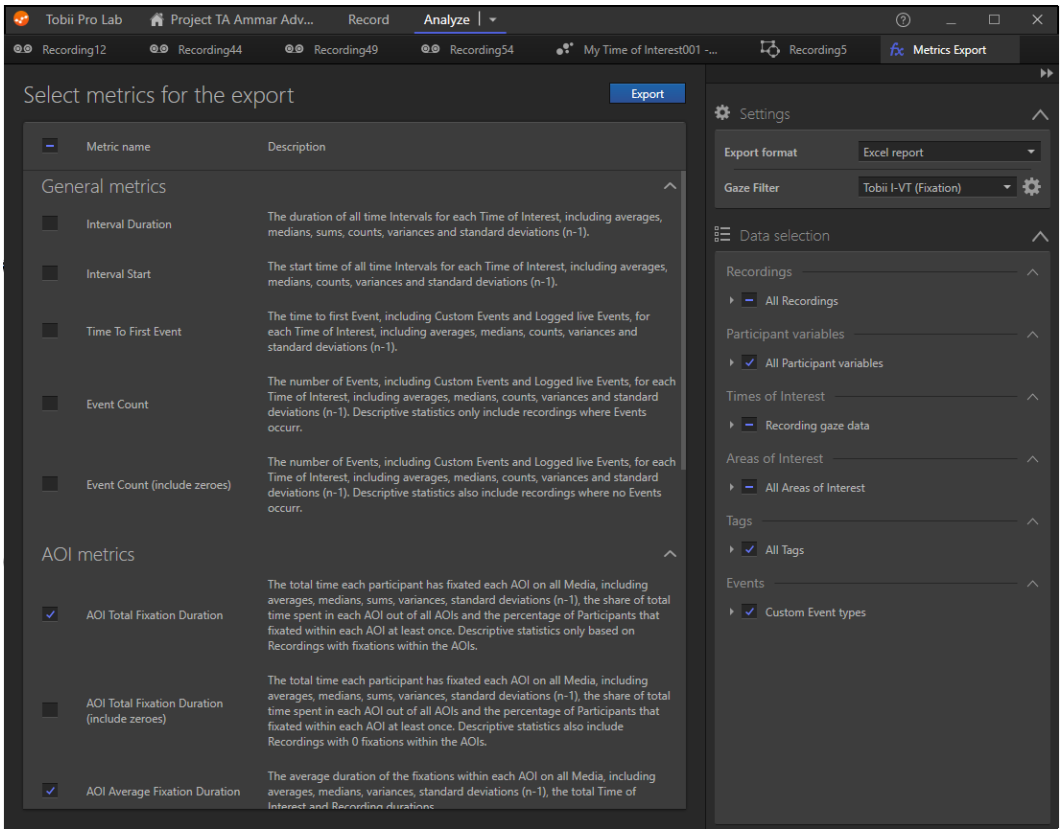

Figure 4. 8 Metrics Tab

5. Click “Export” if all of the necessary criteria for data export is already checked. The export button is available on the top right of the “select metrics for the export” column.

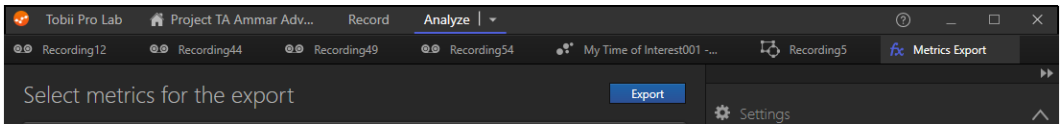

Figure 4. 9 Export Button

4.2 Participants

In this subchapter, the participant's profile will be explained generally for each of the participants and also the data outlier test to eliminate which participant data that is not suitable to be used for this research.

4.2.1. Participants Profile

There will be thirty participants recruited to conduct the initial scenario experiment using eye tracker. The thirty participants are divided into two categories; age and gender. 15 male and 15 female with 7 people aged 12-16 years old, 16 person aged 17-30 years old, and 7 people aged 31+ years old. The participants were mainly from Sepuluh Nopember Institute of Technology and some of it from outside of the campus.

Figure 4. 10 Participants Recording

All of the participants have normal eyes tested using an online eye test from www.zeiss.com, the test consist of visual acuity check, contrast vision check, and color vision check. This whole experiment for the initial scenario is conducted from 6 May 2019 until 17 May 2019. These are the list of the participants that participate in the initial scenario experiment.

Table 4. 1 Participants Attributes

Participant	Age	Gender
Participant 1	17 - 30 Years	Male
Participant 2	17 - 30 Years	Female
Participant 3	17 - 30 Years	Female
Participant 4	17 - 30 Years	Female
Participant 5	17 - 30 Years	Male

Table 4. 2 Participants Attributes (cont.)

Participant	Age	Gender
Participant 6	17 - 30 Years	Male
Participant 7	17 - 30 Years	Male
Participant 8	17 - 30 Years	Male
Participant 9	17 - 30 Years	Female
Participant 10	17 - 30 Years	Male
Participant 11	17 - 30 Years	Female
Participant 12	17 - 30 Years	Female
Participant 13	17 - 30 Years	Male
Participant 14	17 - 30 Years	Female
Participant 15	12 - 16 Years	Male
Participant 16	17 - 30 Years	Female
Participant 17	12 - 16 Years	Female
Participant 18	31++ Years	Male
Participant 19	12 - 16 Years	Female
Participant 20	12 - 16 Years	Female
Participant 21	12 - 16 Years	Male
Participant 22	31++ Years	Female
Participant 23	31++ Years	Male
Participant 24	31++ Years	Female
Participant 25	31++ Years	Female
Participant 26	12 - 16 Years	Male
Participant 27	31++ Years	Male
Participant 28	31++ Years	Male
Participant 29	12 - 16 Years	Female
Participant 30	17 - 30 Years	Female

4.2.2. Data Outlier Test

This step is done to know which participant resulted in outlier data from the experiment that has already conducted. The outlier data is measured from the fixation percentage. Fixation percentage is the rate of participants totals fixation in one experiment, compared with the total time of interest duration. The outlier data is measured by finding the value of the upper control limit (UCL) and lower control limit (LCL). The formula for UCL and LCL can be seen below:

$$UCL = \mu + 3\sigma \quad (1)$$

$$LCL = \mu - 3\sigma \quad (2)$$

Table 4. 3 Data Outlier Recapitulation

Participant	Age	Gender	Sum	Total Time of Interest Duration		Mean	UCL	LCL
Participant 1	17 - 30 Years	Male	3.15	20.00	15.75%	79.02%	134.12%	23.92%
Participant 2	17 - 30 Years	Female	18.13	20.00	90.65%	79.02%	134.12%	23.92%
Participant 3	17 - 30 Years	Female	13.20	20.00	66.01%	79.02%	134.12%	23.92%
Participant 4	17 - 30 Years	Female	17.33	20.00	86.63%	79.02%	134.12%	23.92%
Participant 5	17 - 30 Years	Male	13.89	20.00	69.43%	79.02%	134.12%	23.92%
Participant 6	17 - 30 Years	Male	19.42	20.00	97.09%	79.02%	134.12%	23.92%
Participant 7	17 - 30 Years	Male	14.36	20.00	71.80%	79.02%	134.12%	23.92%
Participant 8	17 - 30 Years	Male	13.08	20.00	65.42%	79.02%	134.12%	23.92%
Participant 9	17 - 30 Years	Female	18.68	20.00	93.39%	79.02%	134.12%	23.92%
Participant 10	17 - 30 Years	Male	18.20	20.00	90.99%	79.02%	134.12%	23.92%
Participant 11	17 - 30 Years	Female	17.82	20.00	89.12%	79.02%	134.12%	23.92%
Participant 12	17 - 30 Years	Female	17.24	20.00	86.21%	79.02%	134.12%	23.92%
Participant 13	17 - 30 Years	Male	18.37	20.00	91.86%	79.02%	134.12%	23.92%
Participant 14	17 - 30 Years	Female	17.17	20.00	85.85%	79.02%	134.12%	23.92%
Participant 15	12 - 16 Years	Male	14.95	20.00	74.75%	79.02%	134.12%	23.92%
Participant 16	17 - 30 Years	Female	18.54	20.00	92.70%	79.02%	134.12%	23.92%
Participant 17	12 - 16 Years	Female	19.02	20.00	95.10%	79.02%	134.12%	23.92%
Participant 18	31++ Years	Male	16.40	20.00	82.02%	79.02%	134.12%	23.92%
Participant 19	12 - 16 Years	Female	17.32	20.00	86.58%	79.02%	134.12%	23.92%
Participant 20	12 - 16 Years	Female	16.91	20.00	84.53%	79.02%	134.12%	23.92%
Participant 21	12 - 16 Years	Male	16.18	20.00	80.91%	79.02%	134.12%	23.92%
Participant 22	31++ Years	Female	17.71	20.00	88.55%	79.02%	134.12%	23.92%
Participant 23	31++ Years	Male	14.51	20.00	72.55%	79.02%	134.12%	23.92%

Table 4. 4 Data Outlier Recapitulation (cont.)

Participant	Age	Gender	Sum	Total Time of Interest Duration		Mean	UCL	LCL
Participant 24	31++ Years	Female	15.71	20.00	78.54%	79.02%	134.12%	23.92%
Participant 25	31++ Years	Female	4.17	20.00	20.85%	79.02%	134.12%	23.92%
Participant 26	12 - 16 Years	Male	17.53	20.00	87.65%	79.02%	134.12%	23.92%
Participant 27	31++ Years	Male	14.66	20.00	73.29%	79.02%	134.12%	23.92%
Participant 28	31++ Years	Male	15.79	20.00	78.97%	79.02%	134.12%	23.92%
Participant 29	12 - 16 Years	Female	18.59	20.00	92.93%	79.02%	134.12%	23.92%
Participant 30	17 - 30 Years	Female	16.09	20.00	80.43%	79.02%	134.12%	23.92%
Mean					79.02%			
Standard Deviation					18.37%			

The Mean value is collected by sum up all of the fixation percentage value for each participant, and then divided by the number of participants. The UCL and LCL value is collected from equation (1). Then based on the table above, the data outlier test can be shown in the graph below

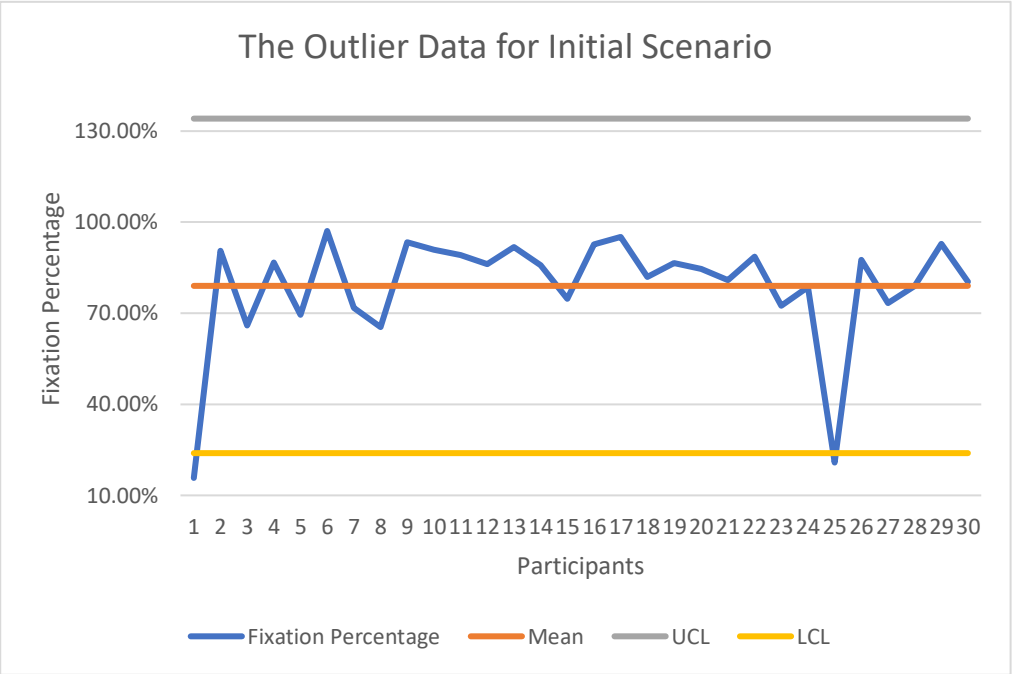

Figure 4. 11 Initial Scenario Outlier Test First Iteration

Based on the figure above, it can be seen that there are 2 data located outside the LCL area which is data from participant 1 (Gustin) and participant 25 (Liza). Thus, it is concluded that these 2 participants should be removed from the data collection.

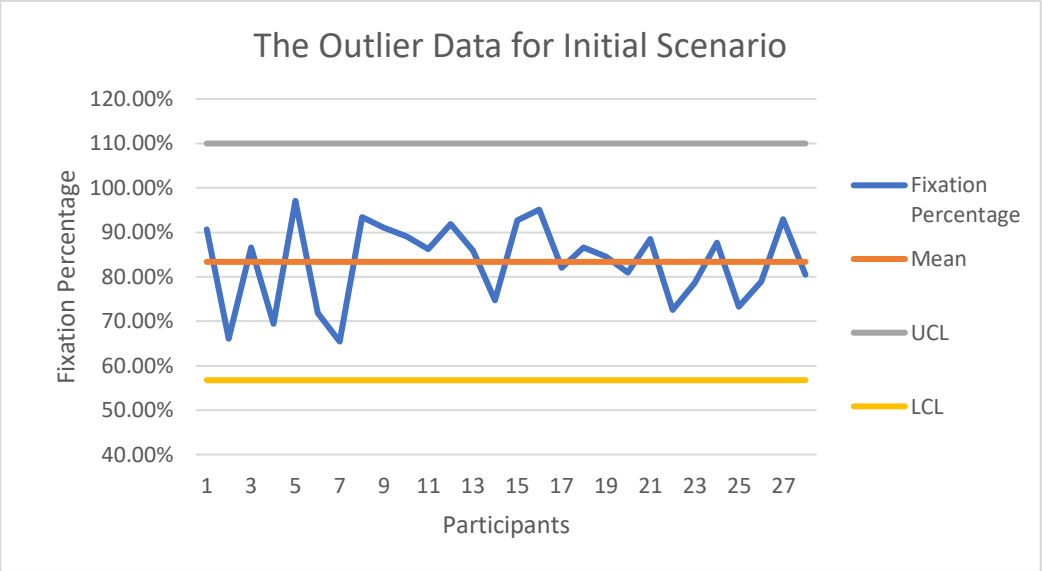

Figure 4. 12 Initial Scenario Outlier Test Second Iteration

Based on the figure above, the new data outlier is created and the conclusion that can be made from the new data outlier test is that every data from the participants are already inside the UCL and LCL limit. Therefore, the new set of data can be used for further analysis.

4.3 Data Screening

In this subchapter, the data that has been exported from Tobii pro lab software is displayed in Microsoft Excel. Each of the parameters data will be given in table 4.5 until table 4.14. the table 4.5 and table 4.6 will be the data collection for total fixation duration, table 4.7 and table 4.8 for average fixation duration, table 4.9 and table 4.10 for fixation count, table 4.11 and table 4.12 for time to first fixation data, the last parameter would be first fixation duration data in table 4.13 and table 4.14.

Table 4. 5 Total Fixation Duration

Participant	Area	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left Area	Right Area	Average	TOI Duration
Participant 1	18.13	0.88	4.94	2.52	1.32	0.54	4.36	2.22	1.34	9.66	8.47	2.27	20.00
Participant 2	13.20		1.85	2.79			4.83	1.69	2.05	4.64	8.56	2.64	20.00
Participant 3	17.33	2.03	1.95	2.49	2.14	3.84	2.56	0.78	1.54	8.61	8.72	2.17	20.00
Participant 4	13.89	1.40	6.55	0.81	2.76	0.91	0.30	0.10	1.06	11.52	2.37	1.74	20.00
Participant 5	19.42	2.42	5.44	1.42		3.10	5.48	1.57		9.27	10.14	3.24	20.00
Participant 6	14.36	0.93	1.45	2.10	0.83	1.70	1.87	2.50	2.98	5.31	9.06	1.80	20.00
Participant 7	13.08	0.63		3.00	2.66	2.43	0.61	0.36	3.39	6.29	6.79	1.87	20.00
Participant 8	18.68	2.14	3.91	3.10	1.59	2.73	1.71	3.48		10.75	7.93	2.67	20.00
Participant 9	18.20		3.37	4.99	0.94		1.84	5.98	1.08	9.30	8.90	3.03	20.00
Participant 10	17.82		1.78	3.72	2.11	0.51	1.48	5.35	2.86	7.61	10.21	2.55	20.00
Participant 11	17.24	1.75	1.64	2.62	3.32	2.80	1.96	1.39	1.77	9.33	7.91	2.16	20.00
Participant 12	18.37	1.50	1.36	2.12	2.05	1.59	3.35	2.65	3.75	7.04	11.33	2.30	20.00
Participant 13	17.17		1.37	3.67	1.88	2.01	3.29	2.93	2.01	6.92	10.25	2.45	20.00
Participant 14	14.95	0.69	1.36	3.52		5.02	3.13	1.22		5.57	9.38	2.49	20.00
Participant 15	18.54	1.41	2.07	1.78	2.28	1.49	3.79	3.53	2.19	7.54	11.00	2.32	20.00
Participant 16	19.02	3.69	5.19				6.40	3.75		8.87	10.15	4.75	20.00
Participant 17	16.40	3.59	0.53	1.83	1.96	0.76	4.43	1.91	1.42	7.90	8.51	2.05	20.00
Participant 18	17.32	0.05		1.62	0.38	4.94	0.45	3.35	6.52	2.06	15.26	2.47	20.00
Participant 19	16.91	1.22	2.74	5.06	0.47	2.11	1.89	0.45	2.96	9.49	7.41	2.11	20.00
Participant 20	16.18	3.02	3.80	1.44		2.18	5.74			8.26	7.92	3.24	20.00
Participant 21	17.71	0.54	0.58	1.19	0.24	1.15	0.98	12.25	0.78	2.55	15.16	2.21	20.00
Participant 22	14.51	0.12	1.74	5.92	1.23	0.42	1.26	3.65	0.17	9.01	5.50	1.81	20.00

Table 4. 6 Total Fixation Duration (cont.)

Participant	Area	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left Area	Right Area	Average	TOI Duration
Participant 23	15.71	4.06	3.63	3.33	1.22	0.35	1.30	1.01	0.80	12.24	3.47	1.96	20.00
Participant 24	17.53	5.64	3.71	2.54	2.73		2.91			14.62	2.91	3.51	20.00
Participant 25	14.66	2.18	3.45	4.95		0.45	0.17	2.26	1.19	10.58	4.07	2.09	20.00
Participant 26	15.79	2.30	1.27	1.73	1.57	2.96	2.31	2.00	1.65	6.87	8.92	1.97	20.00
Participant 27	18.59	2.05	2.12	2.47	2.03	2.55	2.59	1.94	2.84	8.66	9.92	2.32	20.00
Participant 28	16.09	3.73	4.56	0.87		2.17	1.45	1.64	1.67	9.16	6.93	2.30	20.00

Table 4. 7 Average Fixation Duration

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left Area	Right Area	Average	TOI Duration
Participant 1	0.88	0.71	0.42	0.44	0.54	0.55	0.37	0.33	0.57	0.45	0.53	20.00
Participant 2		0.31	0.70			0.60	0.42	1.02	0.46	0.61	0.61	20.00
Participant 3	0.68	0.49	0.83	0.43	0.48	0.32	0.39	0.26	0.57	0.36	0.48	20.00
Participant 4	0.35	0.55	0.27	0.39	0.23	0.30	0.10	0.35	0.44	0.26	0.32	20.00
Participant 5	0.81	0.68	0.71		3.10	5.48	1.57		0.71	3.38	2.06	20.00
Participant 6	0.31	0.24	0.19	0.21	0.34	0.23	0.31	0.37	0.22	0.31	0.28	20.00
Participant 7	0.31		1.00	0.38	0.40	0.20	0.36	0.68	0.52	0.45	0.48	20.00
Participant 8	2.14	0.65	0.77	0.53	2.73	0.43	0.70		0.77	0.79	1.14	20.00
Participant 9		0.48	0.50	0.31		0.31	0.75	0.27	0.46	0.49	0.44	20.00
Participant 10		1.78	0.62	1.06	0.26	0.74	1.34	0.72	0.85	0.85	0.93	20.00
Participant 11	0.44	0.82	0.52	0.55	0.47	0.33	0.69	0.44	0.55	0.44	0.53	20.00
Participant 12	0.38	0.27	0.42	0.51	0.32	0.84	0.66	0.62	0.39	0.60	0.50	20.00
Participant 13		0.34	0.52	0.47	0.50	0.41	0.42	0.67	0.46	0.47	0.48	20.00
Participant 14	0.34	0.34	0.59		0.84	0.45	0.61		0.46	0.63	0.53	20.00
Participant 15	0.47	0.52	0.36	0.38	0.21	0.54	0.71	0.44	0.42	0.46	0.45	20.00
Participant 16	0.61	1.73				0.91	3.75		0.99	1.27	1.75	20.00
Participant 17	0.51	0.26	0.37	0.33	0.15	0.37	0.38	0.71	0.39	0.35	0.38	20.00
Participant 18	0.05		0.32	0.38	0.55	0.23	0.67	1.09	0.29	0.69	0.47	20.00
Participant 19	1.22	0.46	0.72	0.24	0.53	1.89	0.15	0.99	0.59	0.67	0.77	20.00
Participant 20	0.43	0.54	0.72		0.55	0.52			0.52	0.53	0.55	20.00
Participant 21	0.27	0.29	0.24	0.24	0.58	0.24	0.72	0.39	0.25	0.61	0.37	20.00
Participant 22	0.12	0.35	0.39	0.31	0.14	0.31	0.30	0.17	0.36	0.27	0.26	20.00

Table 4. 8 Average Fixation Duration (cont.)

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left Area	Right Area	Average	TOI Duration
Participant 23	0.45	0.60	0.83	0.61	0.18	0.43	0.25	0.80	0.58	0.35	0.52	20.00
Participant 24	0.56	0.53	0.51	0.46		1.46			0.52	1.46	0.70	20.00
Participant 25	0.31	0.38	0.38		0.45	0.17	0.32	0.40	0.36	0.34	0.35	20.00
Participant 26	0.46	0.32	0.43	0.31	0.37	0.39	0.40	0.33	0.38	0.37	0.38	20.00
Participant 27	0.51	0.30	0.82	0.41	0.43	0.65	0.65	0.57	0.46	0.55	0.54	20.00
Participant 28	0.62	1.14	0.43		0.72	0.29	0.55	0.56	0.76	0.50	0.62	20.00

Table 4. 9 Fixation Count

Participant	Area	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left Area	Right Area	Sum	TOI Fixation Count	TOI Duration
Participant 1	36	1	7	6	3	1	8	6	4	17	19	36	37	20.00
Participant 2	24		6	4			8	4	2	10	14	24	29	20.00
Participant 3	39	3	4	3	5	8	8	2	6	15	24	39	40	20.00
Participant 4	35	4	12	3	7	4	1	1	3	26	9	35	46	20.00
Participant 5	16	3	8	2		1	1	1		13	3	16	16	20.00
Participant 6	53	3	6	11	4	5	8	8	8	24	29	53	58	20.00
Participant 7	27	2		3	7	6	3	1	5	12	15	27	37	20.00
Participant 8	24	1	6	4	3	1	4	5		14	10	24	33	20.00
Participant 9	38		7	10	3		6	8	4	20	18	38	39	20.00
Participant 10	21		1	6	2	2	2	4	4	9	12	21	23	20.00
Participant 11	35	4	2	5	6	6	6	2	4	17	18	35	36	20.00
Participant 12	37	4	5	5	4	5	4	4	6	18	19	37	40	20.00
Participant 13	37		4	7	4	4	8	7	3	15	22	37	40	20.00
Participant 14	27	2	4	6		6	7	2		12	15	27	34	20.00
Participant 15	42	3	4	5	6	7	7	5	5	18	24	42	42	20.00
Participant 16	17	6	3				7	1		9	8	17	17	20.00
Participant 17	44	7	2	5	6	5	12	5	2	20	24	44	48	20.00
Participant 18	29	1		5	1	9	2	5	6	7	22	29	35	20.00
Participant 19	27	1	6	7	2	4	1	3	3	16	11	27	34	20.00
Participant 20	31	7	7	2		4	11			16	15	31	37	20.00
Participant 21	35	2	2	5	1	2	4	17	2	10	25	35	38	20.00
Participant 22	45	1	5	15	4	3	4	12	1	25	20	45	55	20.00

Table 4. 10 Fixation Count (cont.)

Participant	Area	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left Area	Right Area	Sum	TOI Fixation Count	TOI Duration
Participant 23	31	9	6	4	2	2	3	4	1	21	10	31	38	20.00
Participant 24	30	10	7	5	6		2			28	2	30	33	20.00
Participant 25	41	7	9	13		1	1	7	3	29	12	41	48	20.00
Participant 26	42	5	4	4	5	8	6	5	5	18	24	42	48	20.00
Participant 27	37	4	7	3	5	6	4	3	5	19	18	37	37	20.00
Participant 28	26	6	4	2		3	5	3	3	12	14	26	29	20.00

Table 4. 11 Time to First Fixation

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left Area	Right Area	Total Recording Duration
Participant 1	3.62	0.69	2.60	11.38	5.34	0.00	6.33	6.66	0.69	0.00	21.97
Participant 2		8.01	12.76			1.54	4.39	2.28	8.01	1.54	21.41
Participant 3	1.11	0.95	4.38	0.69	2.19	2.66	3.71	0.00	0.69	0.00	21.35
Participant 4	1.62	0.54	9.87	6.26	1.95	13.28	4.75	5.07	0.54	1.95	21.16
Participant 5	10.96	10.33	15.94		0.00	3.13	8.68		10.33	0.00	21.78
Participant 6	0.35	2.45	2.25	6.26	0.93	1.99	4.89	5.35	0.35	0.93	21.25
Participant 7	8.36		6.87	5.78	0.00	0.45	3.00	3.40	5.78	0.00	21.35
Participant 8	0.00	7.66	9.73	17.04	3.18	5.94	12.71		0.00	3.18	24.24
Participant 9		0.00	0.54	6.09		9.47	2.76	5.31	0.00	2.76	21.67
Participant 10		10.66	4.34	4.81	0.00	0.62	1.87	7.30	4.34	0.00	21.05
Participant 11	13.35	15.60	7.99	5.05	0.38	0.00	3.22	4.71	5.05	0.00	21.77
Participant 12	19.50	5.70	7.41	16.53	0.00	1.83	9.73	12.17	5.70	0.00	22.52
Participant 13		16.51	6.54	8.39	0.00	2.43	4.26	8.84	6.54	0.00	22.02
Participant 14	2.33	14.10	15.62		4.73	9.95	19.55		2.33	4.73	21.96
Participant 15	2.21	8.68	7.89	12.78	0.56	0.00	5.50	15.51	2.21	0.00	22.03
Participant 16	0.00	3.97				9.60	13.84		0.00	9.60	21.94
Participant 17	0.84	18.19	12.10	9.04	0.71	0.11	7.01	7.53	0.84	0.11	21.63
Participant 18	0.00		3.31	4.97	0.22	1.21	6.07	9.59	0.00	0.22	22.40
Participant 19	0.00	15.03	9.68	9.14	1.51	3.75	20.57	5.72	0.00	1.51	22.59
Participant 20	0.82	0.00	19.38		2.35	3.48			0.00	2.35	22.11
Participant 21	8.62	7.91	0.13	10.60	9.26	17.52	0.50	11.78	0.13	0.50	21.99
Participant 22	0.00	8.61	3.14	2.11	0.19	0.67	1.15	5.64	0.00	0.19	21.91

Table 4. 12 Time to First Fixation (cont.)

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left Area	Right Area	Total Recording Duration
Participant 23	1.17	0.34	3.31	8.26	1.75	4.50	3.09	7.05	0.34	1.75	22.26
Participant 24	7.12	0.00	1.18	3.20		18.09			0.00	18.09	22.19
Participant 25	1.15	0.39	2.53		1.72	17.77	0.00	16.44	0.39	0.00	22.11
Participant 26	3.37	9.92	9.41	7.69	2.82	1.12	0.04	6.51	3.37	0.04	22.03
Participant 27	2.92	2.78	5.93	0.29	0.00	4.30	7.23	1.59	0.29	0.00	22.22
Participant 28	0.00	9.29	14.02		4.52	4.92	6.58	6.85	0.00	4.52	21.06

Table 4. 13 First Fixation Duration

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left Area	Right Area
Participant 1	0.88	0.40	0.54	0.56	0.54	0.19	0.29	0.40	0.40	0.19
Participant 2		0.06	0.30			0.17	0.59	0.13	0.06	0.17
Participant 3	0.99	0.11	0.15	0.19	0.43	0.78	0.57	0.23	0.19	0.23
Participant 4	0.26	0.21	0.52	0.13	0.27	0.30	0.10	0.62	0.21	0.27
Participant 5	0.22	0.34	0.52		3.10	5.48	1.57		0.34	3.10
Participant 6	0.54	0.31	0.13	0.17	0.31	0.19	0.23	0.20	0.54	0.31
Participant 7	0.42		0.25	0.28	0.42	0.24	0.36	1.70	0.28	0.42
Participant 8	2.14	0.35	0.57	0.56	2.73	0.76	0.42		2.14	2.73
Participant 9		0.00	0.52	0.17		0.91	0.13	0.53	0.00	0.13
Participant 10		1.78	0.18	0.14	0.19	1.21	1.03	0.25	0.18	0.19
Participant 11	0.12	1.41	0.18	0.44	0.43	0.35	0.67	0.30	0.44	0.35
Participant 12	0.34	0.17	0.40	1.06	0.03	1.92	0.47	0.34	0.17	0.03
Participant 13		0.19	0.68	0.38	0.04	0.29	0.24	0.24	0.68	0.04
Participant 14	0.21	0.24	0.50		0.85	0.35	0.80		0.21	0.85
Participant 15	0.87	0.86	0.52	0.39	0.20	0.23	0.29	0.81	0.87	0.23
Participant 16	0.69	2.23				1.02	3.75		0.69	1.02
Participant 17	0.30	0.12	0.21	0.74	0.07	0.53	0.49	0.31	0.30	0.53
Participant 18	0.05		0.60	0.38	0.93	0.28	0.79	2.74	0.05	0.93
Participant 19	1.22	0.72	0.63	0.23	0.18	1.89	0.21	0.26	1.22	0.18
Participant 20	0.20	0.31	0.13		1.09	0.16			0.31	1.09
Participant 21	0.37	0.20	0.33	0.24	0.14	0.21	6.95	0.50	0.33	6.95
Participant 22	0.12	0.17	0.17	0.34	0.11	0.44	0.25	0.17	0.12	0.11
Participant 23	0.16	0.57	0.21	0.24	0.28	0.41	0.14	0.80	0.57	0.28

Table 4. 14 First Fixation Duration (cont.)

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left Area	Right Area
Participant 24	0.20	0.11	0.88	0.28		0.16			0.11	0.16
Participant 25	0.23	0.21	0.31		0.45	0.17	0.07	0.14	0.21	0.07
Participant 26	0.88	0.18	0.34	0.44	0.36	0.25	0.43	0.20	0.88	0.43
Participant 27	1.31	0.10	1.20	0.20	0.19	0.24	1.00	1.02	0.20	0.19
Participant 28	0.15	0.94	0.51		0.23	0.31	0.17	0.09	0.15	0.23

4.4. Data Summary

In this chapter, the data collected will be processed by using *Microsoft Excel* for all of the parameters in the initial scenario so that it can be used as a foundation in making the advanced scenarios. The data will be processed by the ranking method by considering each of the AOI. The AOI will be ranked based on each of the initial scenario parameter. The higher the scoring value for the AOI, means that the AOI is relatively attractive to be observed.

a. Total Fixation Duration

The total fixation duration data is processed by finding the mean value for each of the AOI. The mean value will be the parameter for ranking the AOI itself. Below will be given the table for the total fixation duration mean value, variance, and standard deviation.

Table 4. 15 Total Fixation Duration Data Processing

Total Fixation Duration	**Area**	**Area :1**	**Area :2**	**Area :3**	**Area :4**	**Area :5**	**Area :6**	**Area :7**	**Area :8**
Average	16.67	2.00	2.78	2.73	1.70	2.03	2.59	2.69	2.09
Variance	3.15	1.85	2.52	1.73	0.67	1.70	2.79	5.62	1.75
Standard Deviation (n-1)	1.78	1.36	1.59	1.31	0.82	1.30	1.67	2.37	1.32

The higher the mean value of the total fixation duration means that the area of interest is attracting the participant's attention. From this mean result, then the ranking for each area can be made. The highest mean value will be given the highest ranking scoring which is 8, and the lowest mean value will have ranking scoring 1.

Table 4. 16 Total Fixation Duration Ranking

Area	**Area:1**	**Area:2**	**Area:3**	**Area:4**	**Area:5**	**Area:6**	**Area:7**	**Area:8**
Ranking Score	7	1	2	8	6	4	3	5

b. Average Fixation Duration

The average fixation duration data is processed by finding the mean value for each of the AOI. The mean value will be the parameter for ranking the AOI itself. Below will be given the table for the average fixation duration mean value, variance, and standard deviation.

Table 4. 17 Average Fixation Duration Data Processing

Average Fixation Duration	Area :1	Area :2	Area :3	Area :4	Area :5	Area :6	Area :7	Area :8
Average	0.55	0.58	0.54	0.43	0.63	0.70	0.67	0.55
Variance	0.17	0.15	0.04	0.03	0.51	0.98	0.48	0.06
Standard Deviation (n-1)	0.41	0.39	0.21	0.18	0.71	0.99	0.69	0.25

The higher the mean value of the average fixation duration means that the area of interest is attracting the participant's attention. From this mean result, then the ranking for each area can be made. The highest mean value will be given the highest ranking scoring which is 8, and the lowest mean value will have ranking scoring 1.

Table 4. 18 Average Fixation Rankings

Area	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8
Ranking	5	4	7	8	3	1	2	5

c. Fixation Count

The fixation count data is processed by finding the total sum value for each of the AOI. The total sum value will be the parameter for ranking the AOI itself. Below will be given the table for the total fixation duration mean value, variance, and standard deviation.

Table 4. 19 Fixation Count Data Processing

Fixation Count	Area	Area: 1	Area: 2	Area: 3	Area: 4	Area: 5	Area: 6	Area: 7	Area: 8
Sum	926	96	138	150	86	103	143	125	85
Variance	73.64	6.58	5.75	10.17	3.32	5.54	8.88	12.54	3.03

Table 4. 20 Fixation Count Data Processing (cont.)

Fixation Count	Area	Area: 1	Area: 2	Area: 3	Area: 4	Area: 5	Area: 6	Area: 7	Area: 8
Standard Deviation (n-1)	8.58	2.57	2.40	3.19	1.82	2.35	2.98	3.54	1.74

The higher the total sum value of the fixation count means that the area of interest is attracting the participant's attention and making participants curious since the AOI is being fixated multiple times. From the total sum result, then the ranking for each area can be made. The highest total sum value will be given the highest ranking scoring which is 8, and the lowest total sum value will be scored 1.

Table 4. 21 Fixation Count Rankings

Area	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8
Rankings	5	3	1	7	5	2	4	8

d. Time to First Fixation

The time to first fixation data is processed by searching for the lowest time for each of the participant. After the lowest time is determined then all of the lowest time is counted for each of the areas of interest. Below will be given the result of the time to first fixation data processing.

Table 4. 22 Time to First Fixation Data Processing

Time To First Fixation	Area :1	Area :2	Area :3	Area :4	Area :5	Area :6	Area :7	Area :8
Count	8	5	1	0	6	5	2	1
Average	3.73	6.86	7.37	7.45	1.85	5.01	6.21	7.06
Variance	24.64	32.79	25.39	19.29	4.90	30.87	27.57	16.07
Standard Deviation (n-1)	4.96	5.73	5.04	4.39	2.21	5.56	5.25	4.01

The higher the count value of the time to first fixation data means that the related AOI becomes the first area that the participants are interested in. From the count result, then the ranking for each area can be made. The highest total sum value will be given the highest ranking scoring which is 8, and the lowest total sum value will be scored 1.

Table 4. 23 Time to First Fixation Rankings

Area	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8
Ranking	1	3	7	8	2	3	5	7

e. First Fixation Duration

The total fixation duration data is processed by finding the mean value for each of the AOI. The mean value will be the parameter for ranking the AOI itself. Below will be given the table for the total fixation duration mean value, variance, and standard deviation.

Table 4. 24 First Fixation Duration Data Processing

First Fixation Duration	Area :1	Area :2	Area :3	Area :4	Area :5	Area :6	Area :7	Area :8
Average	0.54	0.47	0.54	0.36	0.53	0.69	0.85	0.54
Variance	0.24	0.30	0.16	0.05	0.58	1.07	2.00	0.36
Standard Deviation (n-1)	0.49	0.55	0.40	0.22	0.76	1.03	1.41	0.60

The higher the mean value of the first fixation duration means that the area of interest is attracting the participant's attention for the first time when they see the physical object. From this mean result, then the ranking for each area can be made. The highest mean value will be given the highest ranking scoring which is 8, and the lowest mean value will have ranking scoring 1.

Table 4. 25 First Fixation Duration Rankings

Area	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8
ranking	3	7	3	8	6	2	1	3

f. Total Ranking

After each of the data is processed and ranked, then each of AOI rank for all of the parameters is sum up to obtain the final rank score for further analysis. The ranking process is done manually using Microsoft Excel. Below will be given the detailed ranking for all of the AOI for each data.

Table 4. 26 Total Ranking Recapitulations

	Area :1	Area :2	Area :3	Area :4	Area :5	Area :6	Area :7	Area :8
Total Fixation Duration	7	1	2	8	6	4	3	5
Average Fixation Duration	5	4	7	8	3	1	2	5
Fixation Count	5	3	1	7	5	2	4	8
Time to First Fixation	1	3	6	8	2	3	5	6
First Fixation Duration	3	7	3	8	6	2	1	3
Total	21	18	19	39	22	12	15	27

Based on the table above, the total ranking will be used to determine each AOI rank. The lowest total ranking will be the highest-ranking because on each data parameter the lowest ranking is considered as the best AOI. Below will be given the final rank of each AOI.

Table 4. 27 Total Rankings

Area	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8
Ranking	5	3	4	8	5	1	2	7

The concept for advanced scenario is created based on the ranking on the table above. The ranking result will be the baseline of the advanced scenario in the next chapter.

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CHAPTER 5
DATA COLLECTION AND DATA PROCESSING OF ADVANCED SCENARIO

This chapter will discuss the data collection and the data processing for the initial scenario will be given and explained in details.

5.1. Data Collection of Advanced Scenario

In this subchapter, the process of collecting data from each of the participants will be given in detail.

5.1.1. Advanced Scenario Concept

The final ranking of the previous chapter will become the foundation for making a concept for the advanced scenario. Based on the final ranking itself it can be seen that the middle part of the showcase cooler occupies the four highest ranks. Then the top part occupies the next two ranks. The last one is the bottom part that occupies two lowest ranks. Below will be given each of the advanced scenario concepts that are generated from the final ranks.

1. Scenario 1 Concept

   This scenario is conceptualized by considering the price tag layout inside the showcase cooler and the time pressure. Time pressure here means that the participants are asked to make a quick choice within three seconds (Reutskaja et al., 2011). This scenario is done to observe whether the quick decision making of the customer in a supermarket is affected by beverage layout inside showcase cooler.

   The experiment will be done by placing the most expensive beverage inside the showcase cooler on the best ranks of the previous experiment, which is Area 6 and Area 2. Area 2 is preferred over area 7 is because that area 2 has parallel height with area 6. Then the medium price will be placed on the third row or lower-middle part of the showcase cooler. While the lowest price will be placed on the area with the lowest attractiveness which

is area 4 and area 8. Below will be given the detailed images about scenario 1 physical image that will be tested to the participants.

Figure 5. 1 Advanced Scenario 1 Concept

2. Scenario 2 Concept

Scenario 2 is the same as scenario 1, only the difference is that there is no time pressure in the second scenario. In the second scenario, the participant is asked to observe freely at the physical images for 20 seconds. This scenario is done to observe whether the beverage layout inside showcase cooler is affecting the participant's fixation duration.

The layout of the beverage layout will be the same as the previous scenario or scenario 1. The experiment will be done by placing the most expensive beverage inside the showcase cooler on the best ranks of the

previous experiment, which is Area 6 and Area 2. Area 2 is preferred over area 7 is because that area 2 has parallel height with area 6. Then the medium price will be placed on the third row or lower-middle part of the showcase cooler. While the lowest price will be placed on the area with the lowest attractiveness which is area 4 and area 8. Below will be given the detailed images about scenario 2 physical image that will be tested to the participants.

Figure 5. 2 Advanced Scenario 2 Concept

3. Scenario 3 Concept

This scenario is conceptualized by considering the price tag layout inside the showcase cooler and promo tag. In this scenario, there will be promo tags which indicate that certain product is offer something

interesting. This scenario is done to observe whether a promo tag that is located on a certain area can elevate the fixation of the participant.

There will be a change in the beverage layout for this scenario compared to the other scenarios. But, the observation time will be the same with the second scenario which is 20 seconds. This scenario will be done by placing the most expensive beverage inside the showcase cooler on the lowest ranks of area, which are area 4 and area 8. By doing this, the expensive prices will be disguised with the promo tag. Meanwhile, the cheapest beverage will be placed in the highest ranks of area, which are area 2 and area 6. While top row and the third row will be the same as the previous scenario. Below will be given the detailed images about scenario 3 physical image that will be tested to the participants

Figure 5. 3 Advanced Scenario 3 Concept

5.1.2. Explain the Experiment Instruction

Before the experiment is conducted for each of the participants, the participant will get informed about what should they do during the experiment. The experiment is conducted separately between each of the participants. The explanation consists of calibration process explanation, what the participant should do when the data collection starts, how long the experiment is conducted for each of the participants, and what they should not do during the experiment.

The participants are instructed to observe physical images in front of them for 3 seconds for the first scenario, and 20 seconds for the second scenario and the third scenario. The participants head will be placed on a chin rest to avoid excessive head movement, the participant need only to move their pupil. The heads should not significantly move since it can disturb the eye-tracking recordings. The participant will be given short rest after the calibration process and before the first scenario is conducted, while they listen to the instruction given.

5.1.3. Participants Recording

The data collection starts exactly after the calibration process is finished. It starts by clicking the *start recording* button on the bottom right corner of the Tobii Pro Lab application. By clicking this button, then the recording process will start one second after the clicking process. One second is used for short and quick preparation. In this experiment, the short preparation will be used to remove the black fabric that blocks out the physical image of showcase cooler.

After that, the participant will observe the physical image in front of them for 3 seconds for the first scenario. The time limit of 3 seconds is obtained from the previous research that has been done (Reutskaja et al., 2011). For the second and third scenario, the observation time for the participants is 20 seconds. The time limit of 20 seconds is obtained from quick observation in a supermarket in which the author record 20 random people. The time record starts when the person is standing in front of the showcase cooler and finish when they touch the product that they want to buy. The time record for all of 20 participants is recorded and then the average value of the recorded time will be the time limit used in this research.

After the time of observation has ended then the operator will click *stop recording* button to end the recordings. The time range of observation will start from 0 seconds and ends at a various time between 3 to 5 seconds for the first scenario, and 20 until 22 seconds for the second and third scenario since the clicking time is different for each of the participants.

5.2. Participants

In this subchapter, the participant's profile will be explained generally for each of the participants and also the data outlier test to eliminate which participant data that is not suitable to be used for this research.

5.2.1. Participants Profile

There will be thirty participants recruited to conduct the advanced scenario experiment using eye tracker. The participants are totally different from the previous participant, but the detailed requirement of the participant will be the same with the initial scenario. The thirty participants are divided into two categories; age and gender. 15 male and 15 female with 7 people aged 12-16 years old, 16 person aged 17-30 years old, and 7 people aged 31+ years old. The participants were mainly from Sepuluh Nopember Institute of Technology and some of it from outside of the campus.

All of the participants have normal eyes tested using an online eye test from www.zeiss.com, the test consist of visual acuity check, contrast vision check, and color vision check. This whole experiment for the initial scenario is conducted from 12 June 2019 until 18 June 2019. These are the list of the participants that participate in the initial scenario experiment.

Table 5. 1 Participants Profile

Participant	Age Range	Gender
Participant 1	17 - 30 Years Old	Male
Participant 2	17 - 30 Years Old	Female
Participant 3	31++ Years Old	Female
Participant 4	17 - 30 Years Old	Male
Participant 5	17 - 30 Years Old	Male

Table 5. 1 Participants Profile (cont.)

Participant	Age Range	Gender
Participant 6	17 - 30 Years Old	Male
Participant 7	31++ Years Old	Male
Participant 8	17 - 30 Years Old	Female
Participant 9	17 - 30 Years Old	Female
Participant 10	17 - 30 Years Old	Male
Participant 11	31++ Years Old	Male
Participant 12	12 - 16 Years Old	Female
Participant 13	17 - 30 Years Old	Female
Participant 14	17 - 30 Years Old	Male
Participant 15	31++ Years Old	Male
Participant 16	17 - 30 Years Old	Female
Participant 17	12 - 16 Years Old	Male
Participant 18	31++ Years Old	Female
Participant 19	17 - 30 Years Old	Female
Participant 20	12 - 16 Years Old	Female
Participant 21	31++ Years Old	Female
Participant 22	17 - 30 Years Old	Male
Participant 23	31++ Years Old	Male
Participant 24	17 - 30 Years Old	Male
Participant 25	12 - 16 Years Old	Male
Participant 26	12 - 16 Years Old	Female
Participant 27	17 - 30 Years Old	Female
Participant 28	17 - 30 Years Old	Female
Participant 29	12 - 16 Years Old	Male
Participant 30	12 - 16 Years Old	Female

5.2.2. Data Outlier Test

This step is done to know which participant resulted in outlier data from the experiment that has already conducted. The outlier data is measured from the fixation percentage.

5.2.2.1 Data Outlier for Advanced Scenario 1

The outlier data is measured by finding the value of the upper control limit (UCL) and lower control limit (LCL). Below will be given the fixation percentage value, and also the value of the upper control limit and lower control limit to find the outlier data for the advanced scenario 1.

Table 5. 2 Data Outlier Recapitulation

Participant	Age Range	Gender	Sum	Total Time of Interest Duration	Fixation Percentage	Mean	UCL	LCL
Participant 1	17 - 30 Years Old	Male	1.84	3.00	61.40%	66.23%	123.03%	9.43%
Participant 2	17 - 30 Years Old	Female	1.94	3.00	64.62%	66.23%	123.03%	9.43%
Participant 3	31++ Years Old	Female	0.09	3.00	3.09%	66.23%	123.03%	9.43%
Participant 4	17 - 30 Years Old	Male	2.21	3.00	73.76%	66.23%	123.03%	9.43%
Participant 5	17 - 30 Years Old	Male	2.81	3.00	93.52%	66.23%	123.03%	9.43%
Participant 6	17 - 30 Years Old	Male	2.41	3.00	80.26%	66.23%	123.03%	9.43%
Participant 7	31++ Years Old	Male	1.63	3.00	54.44%	66.23%	123.03%	9.43%
Participant 8	17 - 30 Years Old	Female	1.57	3.00	52.18%	66.23%	123.03%	9.43%
Participant 9	17 - 30 Years Old	Female	2.15	3.00	71.60%	66.23%	123.03%	9.43%
Participant 10	17 - 30 Years Old	Male	2.38	3.00	79.22%	66.23%	123.03%	9.43%
Participant 11	31++ Years Old	Male	2.43	3.00	80.95%	66.23%	123.03%	9.43%
Participant 12	12 - 16 Years Old	Female	1.41	3.00	47.10%	66.23%	123.03%	9.43%
Participant 13	17 - 30 Years Old	Female	1.94	3.00	64.65%	66.23%	123.03%	9.43%
Participant 14	17 - 30 Years Old	Male	1.88	3.00	62.54%	66.23%	123.03%	9.43%
Participant 15	31++ Years Old	Male	2.17	3.00	72.27%	66.23%	123.03%	9.43%
Participant 16	17 - 30 Years Old	Female	0.51	3.00	16.89%	66.23%	123.03%	9.43%
Participant 17	12 - 16 Years Old	Male	2.16	3.00	71.89%	66.23%	123.03%	9.43%
Participant 18	31++ Years Old	Female	1.65	3.00	55.12%	66.23%	123.03%	9.43%
Participant 19	17 - 30 Years Old	Female	2.44	3.00	81.43%	66.23%	123.03%	9.43%
Participant 20	12 - 16 Years Old	Female	1.82	3.00	60.64%	66.23%	123.03%	9.43%
Participant 21	31++ Years Old	Female	2.40	3.00	80.09%	66.23%	123.03%	9.43%
Participant 22	17 - 30 Years Old	Male	2.22	3.00	73.87%	66.23%	123.03%	9.43%
Participant 23	31++ Years Old	Male	2.51	3.00	83.76%	66.23%	123.03%	9.43%

Table 5. 2 Data Outlier Recapitulation (cont.)

Participant	Age Range	Gender	Sum	Total Time of Interest Duration	Fixation Percentage	Mean	UCL	LCL
Participant 24	17 - 30 Years Old	Male	2.47	3.00	82.21%	66.23%	123.03%	9.43%
Participant 25	12 - 16 Years Old	Male	2.42	3.00	80.83%	66.23%	123.03%	9.43%
Participant 26	12 - 16 Years Old	Female	2.62	3.00	87.44%	66.23%	123.03%	9.43%
Participant 27	17 - 30 Years Old	Female	2.16	3.00	71.98%	66.23%	123.03%	9.43%
Participant 28	17 - 30 Years Old	Female	2.02	3.00	67.27%	66.23%	123.03%	9.43%
Participant 29	12 - 16 Years Old	Male	1.69	3.00	56.39%	66.23%	123.03%	9.43%
Participant 30	12 - 16 Years Old	Female	1.67	3.00	55.54%	66.23%	123.03%	9.43%

The Mean value is collected by sum up all of the fixation percentage value for each participant, and then divided by the number of participants. The UCL and LCL value is collected from equation 1. Then based on the table above, the data outlier test can be shown in the graph below.

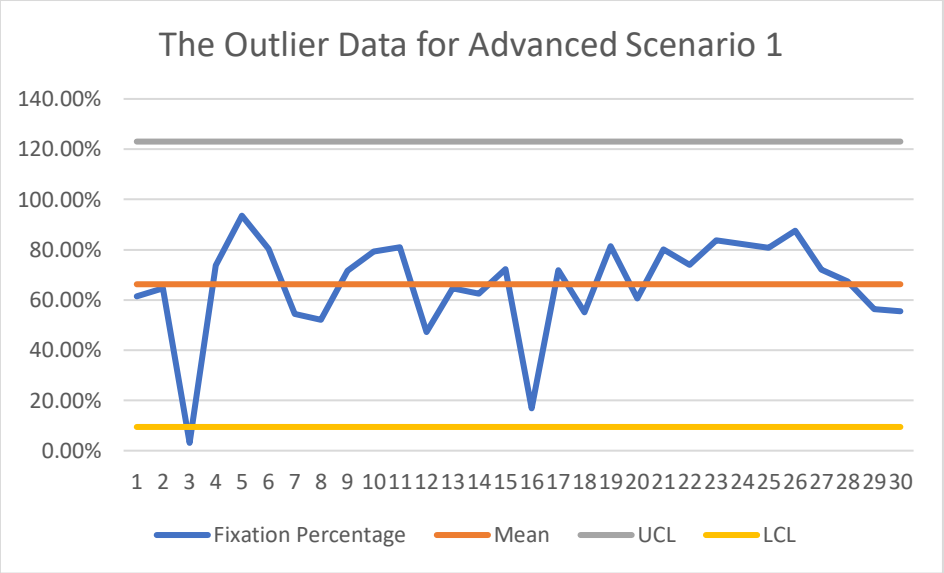

Figure 5. 4 Advanced Scenario 1 Outlier Test Iteration 1

Based on the figure above, it can be seen that there is one participant data that is located outside the LCL area, which is participant 3 (Vinda). Thus, the participant should be removed from the data collection.

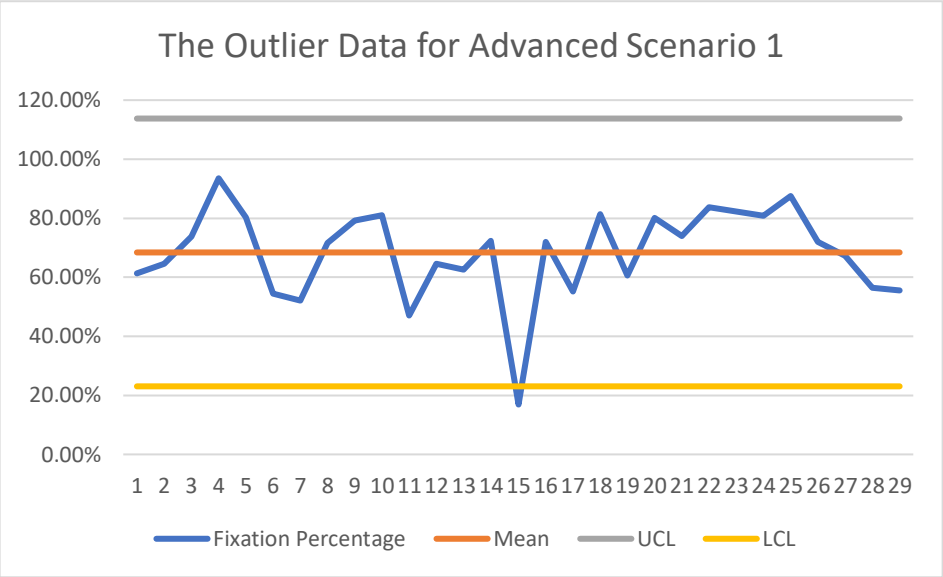

Figure 5. 5 Advanced Scenario 1 Outlier Test Iteration 2

Based on the figure above, it can be seen that there is one participant data that is located outside the LCL area, which is participant 16 (Dinda). Thus, the participant should be removed from data collection.

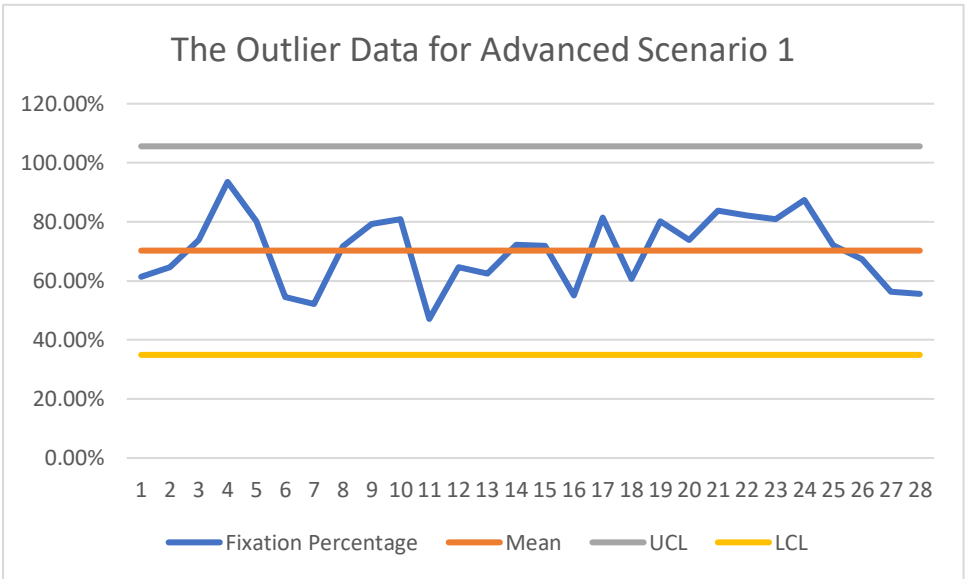

Figure 5. 6 Advanced Scenario 1 Outlier Test Iteration 3

Based on the figure above, the new data outlier is created and the conclusion that can be made from the new data outlier test is that every data from the

participants are already inside the UCL and LCL limit. Therefore, the new set of data can be used for further analysis.

5.2.2.2 Data Outlier for Advanced Scenario 2

Below will be given the complete graph for the data outlier of advanced scenario 2. The outlier data is based on the mean value. The Mean value is collected by sum up all of the fixation percentage value for each participant, and then divided by the number of participants. The UCL and LCL value is collected from equation 1. Then based on the table above, the data outlier test can be shown in the graph below.

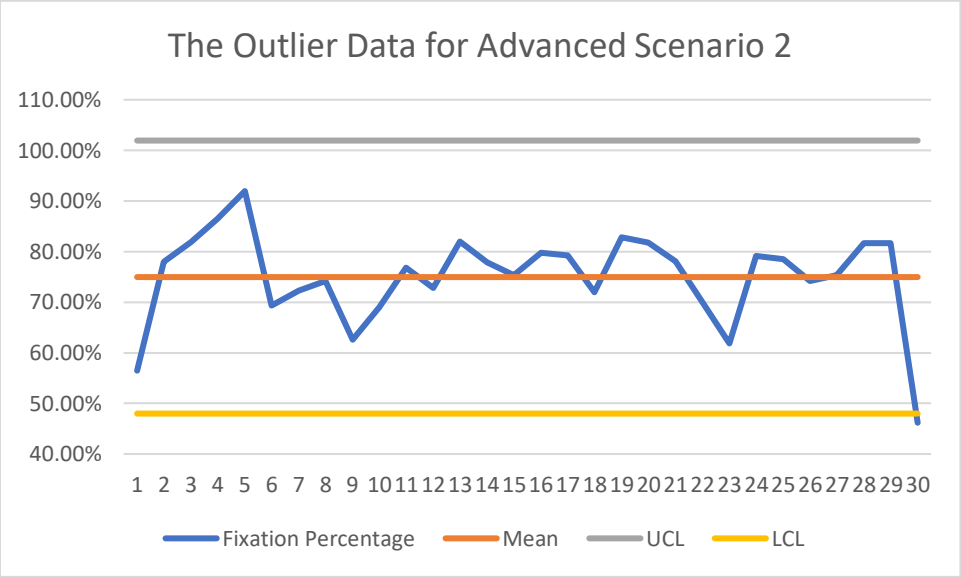

Figure 5. 7 Advanced Scenario 2 Outlier Test Iteration 1

Based on the graph above, it can be seen that there is one data that is located outside the LCL area which is participant 30 (Rizqa). Thus, this data should be eliminated from the data collection and then creating new data outlier test.

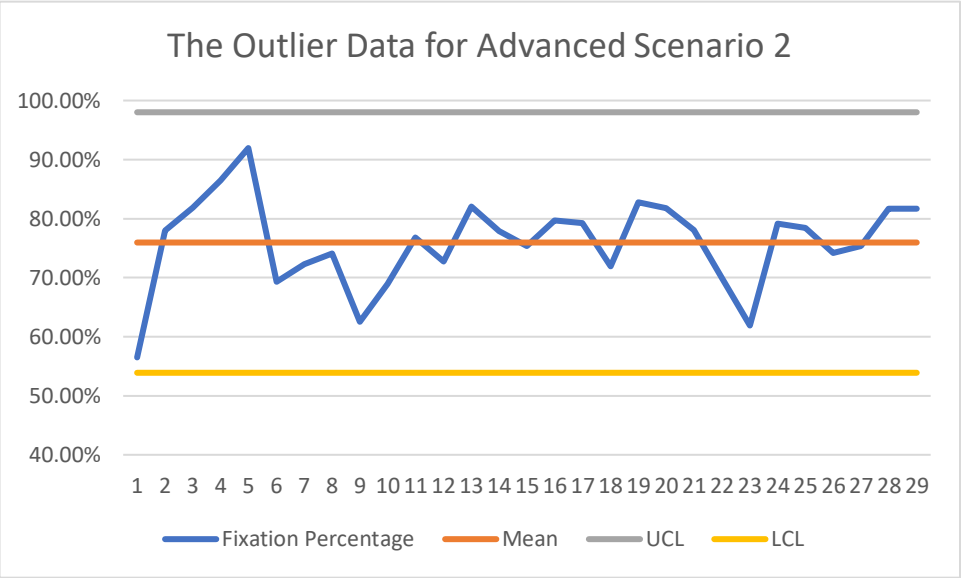

Figure 5. 8 Advanced Scenario 2 Outlier Test Iteration 2

The new data outlier test shows that there are no data that is located outside the UCL and LCL area. This means that the set of data can be used for further processing.

5.2.2.3 Data Outlier for Advanced Scenario 3

Below will be given the complete graph for the data outlier of advanced scenario 3. The outlier data is based on the mean value. The Mean value is collected by sum up all of the fixation percentage value for each participant, and then divided by the number of participants. The UCL and LCL value is collected from equation 1. Then based on the table above, the data outlier test can be shown in the graph below.

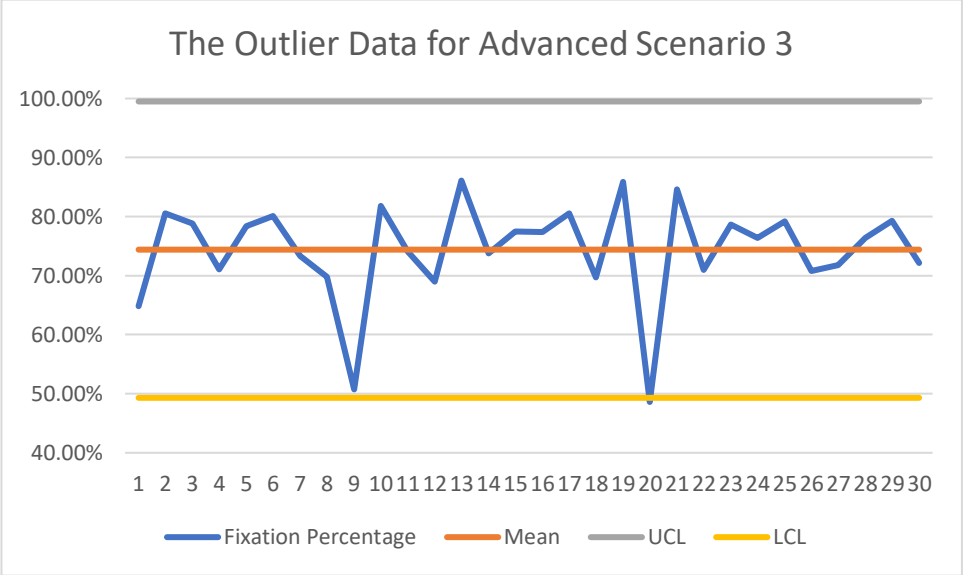

Figure 5. 9 Advanced Scenario 3 Outlier Test Iteration 1

Based on the figure above, it can be seen that there is one data that is located outside the LCL area which is participant 20 (Amalia). Thus, this data should be eliminated from the data collection and then creating a new data outlier test without inputting the outlier data.

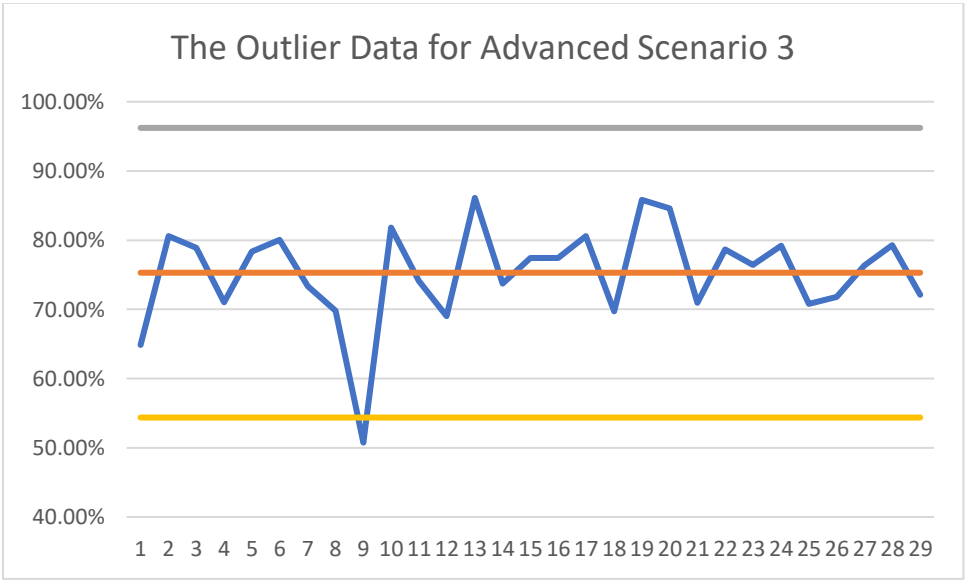

Figure 5. 10 Advanced Scenario 3 Outlier Test Iteration 2

Based on the figure above, it can be seen that there is still one data that is located outside the LCL area which is participant 9 (Salsa). Thus, this data should be eliminated from the data collection and then creating a new data outlier test without inputting the outlier data.

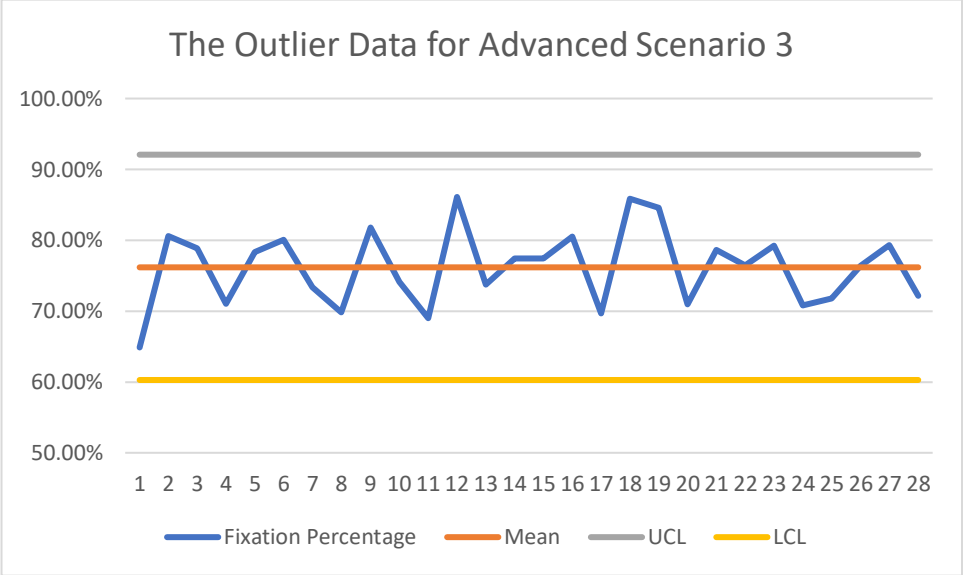

Figure 5. 11 Advanced Scenario 3 Outlier Test Iteration 3

The new data outlier test shows that there are no data that is located outside the UCL and LCL area. This means that the set of data can be used for further processing.

5.3 Data Screening

In this subchapter, the data that has been exported from Tobii pro lab software is displayed in Microsoft Excel.

5.3.1. Independent Variable Data Screening

The example of this data screening will be from advanced scenario 2 since the advanced scenario data will be similar to the initial scenario data. The table would be from table 5.3 until table 5.7 which accommodate each of these parameters sequentially, which are total fixation duration, average fixation duration, fixation count, time to the first fixation, and first fixation duration.

Table 5. 3 Total Fixation Duration for Advanced Scenario 2

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left Area	Right Area	Sum	TOI Duration
Participant 1	0.29	0.57	0.47	2.10	2.52	1.92	0.85	2.58	3.43	7.87	11.30	20.00
Participant 2	0.17	1.19	3.33	3.69	1.67	1.71	2.33	1.52	8.37	7.23	15.60	20.00
Participant 3	1.23	2.88	2.12	1.25	1.50	5.12	1.06	1.23	7.47	8.90	16.37	20.00
Participant 4		7.23	2.86	0.80		2.32	3.65	0.43	10.89	6.40	17.30	20.00
Participant 5			0.20	1.18	14.79	0.31	0.38	1.54	1.37	17.02	18.39	20.00
Participant 6	1.34	1.56	2.81	1.13	0.62	2.68	0.94	2.78	6.84	7.02	13.87	20.00
Participant 7	4.15	4.67	1.15	2.81	0.43		0.21	1.03	12.77	1.68	14.45	20.00
Participant 8	0.41	1.14	1.49	1.56		4.37	5.29	0.58	4.59	10.23	14.83	20.00
Participant 9	2.67	2.12	2.30	0.79	1.10	2.49	0.76	0.28	7.89	4.62	12.51	20.00
Participant 10		3.03	1.61	2.10	0.16	2.60	2.72	1.57	6.75	7.05	13.79	20.00
Participant 11	0.51	0.90	0.30	3.18	2.18	0.51	2.07	5.71	4.89	10.46	15.35	20.00
Participant 12	0.59	2.06	1.38	2.56	1.56		2.66	3.74	6.59	7.97	14.55	20.00
Participant 13	0.38	2.15	3.69	0.22	0.34	1.20	4.22	4.20	6.44	9.96	16.40	20.00
Participant 14	0.55	0.66	3.57	1.45	1.23	0.79	3.18	4.15	6.23	9.36	15.58	20.00
Participant 15	0.23	1.65	0.37	1.92	0.34	1.48	4.43	4.65	4.17	10.89	15.06	20.00
Participant 16	0.70	3.38	4.97	1.41	0.62	0.85	2.04	1.99	10.45	5.49	15.94	20.00
Participant 17	1.99	2.52	2.54	1.84	1.29	1.68	2.34	1.66	8.88	6.96	15.84	20.00
Participant 18	0.85	1.34	2.21	0.22	0.63	2.40	5.98	0.76	4.62	9.77	14.39	20.00
Participant 19	0.80	2.05	1.88	1.43	1.45	3.43	3.76	1.75	6.17	10.39	16.55	20.00
Participant 20	2.19	2.02	1.12	0.88	1.05	4.94	3.35	0.80	6.21	10.14	16.35	20.00
Participant 21	0.90	6.05	1.54	1.79		0.81	2.32	2.20	10.28	5.33	15.61	20.00
Participant 22	0.16	1.44	2.50	0.33	1.19	2.59	4.20	1.61	4.42	9.59	14.01	20.00
Participant 23	2.03	0.73	1.58	0.85	3.01	1.68	1.40	1.11	5.19	7.19	12.38	20.00

Table 5. 3 Total Fixation Duration for Advanced Scenario 2 (cont.)

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left Area	Right Area	Sum	TOI Duration
Participant 24	0.81	3.32	5.29	1.63	1.01	2.57	1.20		11.05	4.77	15.82	20.00
Participant 25	1.77	1.69	2.11	2.00	3.79	1.23	1.47	1.63	7.57	8.12	15.69	20.00
Participant 26	1.74	1.15	2.25	4.27	1.67	0.22	0.83	2.69	9.42	5.41	14.83	20.00
Participant 27	0.33	1.74	4.96	0.88	0.42	0.26	5.74	0.73	7.90	7.17	15.07	20.00
Participant 28	1.62	3.02	1.95	1.64	2.43	2.22	1.60	1.85	8.23	8.10	16.33	20.00
Participant 29	1.12	3.10	3.01	1.70	0.59	0.85	3.39	2.57	8.93	7.40	16.33	20.00

Table 5. 4 Average Fixation Duration for Advanced Scenario 2

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left Area	Right Area	Average	TOI Duration
Participant 1	0.15	0.14	0.23	0.30	0.36	0.19	0.21	0.32	0.23	0.27	0.24	20.00
Participant 2	0.17	0.24	0.28	0.74	0.33	0.34	0.26	0.25	0.36	0.29	0.33	20.00
Participant 3	0.41	0.58	0.24	0.31	0.50	0.51	0.35	0.25	0.36	0.42	0.39	20.00
Participant 4		0.72	0.57	0.27		0.26	0.73	0.43	0.61	0.43	0.50	20.00
Participant 5			0.20	0.29	1.85	0.15	0.19	0.31	0.27	1.00	0.56	20.00
Participant 6	0.34	0.39	0.28	0.23	0.16	0.27	0.19	0.35	0.30	0.26	0.27	20.00
Participant 7	0.38	0.31	0.29	0.47	0.43		0.21	0.21	0.35	0.24	0.33	20.00
Participant 8	0.20	0.23	0.37	0.31		0.55	0.41	0.29	0.29	0.45	0.34	20.00
Participant 9	0.45	0.24	0.26	0.20	0.18	0.36	0.15	0.28	0.28	0.24	0.26	20.00
Participant 10		1.52	0.80	0.53	0.16	0.43	0.54	0.39	0.84	0.44	0.62	20.00
Participant 11	0.51	0.45	0.30	0.80	0.73	0.17	0.30	0.44	0.61	0.40	0.46	20.00
Participant 12	0.30	0.29	0.28	0.28	0.31		0.44	0.37	0.29	0.38	0.33	20.00
Participant 13	0.38	0.43	0.53	0.22	0.34	0.40	0.42	0.42	0.46	0.42	0.40	20.00
Participant 14	0.27	0.33	0.51	0.36	0.25	0.26	0.29	0.38	0.42	0.31	0.34	20.00
Participant 15	0.23	0.41	0.19	0.32	0.11	0.25	0.32	0.46	0.32	0.33	0.29	20.00
Participant 16	0.23	0.42	0.50	0.35	0.21	0.42	0.29	0.33	0.42	0.30	0.35	20.00
Participant 17	0.40	0.42	0.25	0.31	0.32	0.42	0.58	0.33	0.33	0.41	0.38	20.00
Participant 18	0.28	0.34	0.28	0.22	0.21	0.40	0.30	0.38	0.29	0.32	0.30	20.00
Participant 19	0.27	0.29	0.31	0.36	0.36	0.38	0.31	0.35	0.31	0.35	0.33	20.00
Participant 20	0.27	0.20	0.19	0.22	0.35	0.55	0.33	0.27	0.22	0.41	0.30	20.00
Participant 21	0.90	0.36	0.31	0.36		0.40	0.46	0.37	0.37	0.41	0.44	20.00
Participant 22	0.16	0.29	0.23	0.16	0.30	0.32	0.42	0.32	0.23	0.36	0.28	20.00
Participant 23	0.41	0.24	0.40	0.28	0.33	0.34	0.20	0.37	0.35	0.30	0.32	20.00

Table 5. 4 Average Fixation Duration for Advanced Scenario 2 (cont.)

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left Area	Right Area	Average	TOI Duration
Participant 24	0.27	0.41	0.66	0.41	0.34	0.37	0.24		0.48	0.32	0.39	20.00
Participant 25	0.35	0.34	0.23	0.22	0.38	0.21	0.24	0.27	0.27	0.29	0.28	20.00
Participant 26	0.44	0.23	0.45	0.31	0.56	0.11	0.21	0.30	0.34	0.30	0.32	20.00
Participant 27	0.16	0.35	0.35	0.29	0.42	0.26	0.32	0.18	0.33	0.30	0.30	20.00
Participant 28	0.41	0.38	0.49	0.55	0.61	0.55	0.53	0.62	0.43	0.58	0.51	20.00
Participant 29	0.37	0.24	0.43	0.34	0.20	0.21	0.68	0.64	0.32	0.46	0.39	20.00

Table 5. 5 Fixation Count for Advanced Scenario 2

Participant	Area: 1	Area: 2	Area: 3	Area: 4	Area: 5	Area: 6	Area: 7	Area: 8	Left Area	Right Area	Sum	TOI Fixation Count	TOI Duration
Participant 1	2	4	2	7	7	10	4	8	15	29	44	50	20.00
Participant 2	1	5	12	5	5	5	9	6	23	25	48	52	20.00
Participant 3	3	5	9	4	3	10	3	5	21	21	42	47	20.00
Participant 4		10	5	3		9	5	1	18	15	33	36	20.00
Participant 5			1	4	8	2	2	5	5	17	22	23	20.00
Participant 6	4	4	10	5	4	10	5	8	23	27	50	57	20.00
Participant 7	11	15	4	6	1		1	5	36	7	43	48	20.00
Participant 8	2	5	4	5		8	13	2	16	23	39	41	20.00
Participant 9	6	9	9	4	6	7	5	1	28	19	47	54	20.00
Participant 10		2	2	4	1	6	5	4	8	16	24	29	20.00
Participant 11	1	2	1	4	3	3	7	13	8	26	34	38	20.00
Participant 12	2	7	5	9	5		6	10	23	21	44	48	20.00
Participant 13	1	5	7	1	1	3	10	10	14	24	38	41	20.00
Participant 14	2	2	7	4	5	3	11	11	15	30	45	51	20.00
Participant 15	1	4	2	6	3	6	14	10	13	33	46	51	20.00
Participant 16	3	8	10	4	3	2	7	6	25	18	43	44	19.90
Participant 17	5	6	10	6	4	4	4	5	27	17	44	49	20.00
Participant 18	3	4	8	1	3	6	20	2	16	31	47	48	20.00
Participant 19	3	7	6	4	4	9	12	5	20	30	50	50	20.00
Participant 20	8	10	6	4	3	9	10	3	28	25	53	53	20.00
Participant 21	1	17	5	5		2	5	6	28	13	41	44	20.00

Table 5. 5 Fixation Count for Advanced Scenario 2 (cont.)

Participant	Area: 1	Area: 2	Area: 3	Area: 4	Area: 5	Area: 6	Area: 7	Area: 8	Left Area	Right Area	Sum	TOI Fixation Count	TOI Duration
Participant 22	1	5	11	2	4	8	10	5	19	27	46	52	20.00
Participant 23	5	3	4	3	9	5	7	3	15	24	39	51	20.00
Participant 24	3	8	8	4	3	7	5		23	15	38	40	20.00
Participant 25	5	5	9	9	10	6	6	6	28	28	56	58	20.00
Participant 26	4	5	5	14	3	2	4	9	28	18	46	49	19.99
Participant 27	2	5	14	3	1	1	18	4	24	24	48	51	20.00
Participant 28	4	8	4	3	4	4	3	3	19	14	33	37	20.00
Participant 29	3	13	7	5	3	4	5	4	28	16	44	47	20.00

Table 5. 6 Time to First Fixation for Advanced Scenario 2

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left or Right:Left	Left or Right:Right	Count
Participant 1	0.84	4.22	6.34	1.42	3.65	3.40	5.58	2.47	0.84	2.47	20
Participant 2	12.46	0.05	2.44	6.44	0.91	0.71	0.46	4.83	0.05	0.46	20
Participant 3	5.25	0.75	1.75	2.54	6.39	3.50	13.41	3.14	0.75	3.14	20
Participant 4		0.34	0.00	0.07		0.86	1.68	6.43	0.00	0.86	16
Participant 5			0.32	0.55	2.08	4.12	0.00	1.03	0.32	0.00	16
Participant 6	0.00	2.12	2.45	3.89	0.90	9.01	12.89	4.70	0.00	0.90	20
Participant 7	0.00	7.00	0.14	1.44	11.61		0.56	0.85	0.00	0.56	18
Participant 8	0.00	6.80	1.71	4.05		0.34	0.81	2.73	0.00	0.34	18
Participant 9	0.00	4.92	0.19	0.49	6.20	5.52	1.67	1.35	0.00	1.35	20
Participant 10		4.08	2.82	2.13	4.94	0.00	0.31	1.62	2.13	0.00	18
Participant 11	7.32	5.97	6.20	0.30	5.36	2.48	1.90	0.10	0.30	0.10	20
Participant 12	1.36	1.10	2.44	2.29	1.68		2.08	0.00	1.10	0.00	18
Participant 13	1.57	0.75	0.00	5.37	2.02	3.15	2.43	5.62	0.00	2.02	20
Participant 14	1.66	2.27	9.99	6.38	0.15	8.14	2.87	3.11	1.66	0.15	20
Participant 15	4.31	3.96	14.27	10.20	4.61	1.78	0.59	0.00	3.96	0.00	20
Participant 16	14.70	1.01	0.83	5.41	14.38	0.00	0.46	5.97	0.83	0.00	20
Participant 17	0.00	10.97	5.11	7.19	1.10	2.71	3.84	6.56	0.00	1.10	20
Participant 18	0.00	7.67	2.88	3.40	0.35	1.52	2.03	4.05	0.00	0.35	20
Participant 19	7.68	2.85	2.34	1.84	7.13	3.81	0.00	1.16	1.84	0.00	20
Participant 20	5.58	1.67	1.82	0.00	2.03	1.06	0.30	10.72	0.00	0.30	20
Participant 21	5.31	3.87	3.28	3.00		6.70	0.59	2.00	3.00	0.59	18
Participant 22	0.19	2.27	2.88	3.96	0.42	1.27	4.39	4.12	0.19	0.42	20

Table 5. 6 Time to First Fixation for Advanced Scenario 2 (cont.)

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left or Right:Left	Left or Right:Right	Count
Participant 23	0.32	4.93	4.25	0.00	1.04	3.39	7.79	6.20	0.00	1.04	20
Participant 24	1.69	1.30	0.45	0.00	2.36	4.50	6.34		0.00	2.36	18
Participant 25	0.00	3.01	3.31	3.62	0.88	7.04	8.31	4.01	0.00	0.88	20
Participant 26	1.49	0.48	0.04	6.62	1.79	8.06	6.00	6.37	0.04	1.79	20
Participant 27	6.99	0.00	0.53	0.76	7.22	3.32	1.52	2.07	0.00	1.52	20
Participant 28	7.15	5.88	4.66	3.77	0.81	0.00	2.10	3.04	3.77	0.00	20
Participant 29	14.66	0.00	0.23	0.55	15.02	13.80	5.79	0.95	0.00	0.95	20

Table 5. 7 First Fixation Duration for Advanced Scenario 2

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left or Right:Left	Left or Right:Right
Participant 1	0.15	0.07	0.22	0.22	0.22	0.21	0.23	0.63	0.15	0.63
Participant 2	0.17	0.17	0.25	0.25	0.76	0.12	0.17	0.14	0.17	0.17
Participant 3	0.13	0.25	0.28	0.50	0.46	0.98	0.20	0.30	0.25	0.30
Participant 4		0.24	0.00	0.20		0.76	0.34	0.43	0.00	0.76
Participant 5			0.20	0.19	0.41	0.16	0.25	0.38	0.20	0.25
Participant 6	0.57	0.29	0.20	0.41	0.19	1.00	0.13	0.45	0.57	0.19
Participant 7	0.08	0.21	0.38	0.40	0.43		0.21	0.26	0.08	0.21
Participant 8	0.27	0.58	0.64	0.53		0.41	0.10	0.38	0.27	0.41
Participant 9	0.10	0.26	0.26	0.23	0.23	0.12	0.15	0.28	0.10	0.28
Participant 10		0.80	1.22	0.22	0.16	0.28	1.21	0.38	0.22	0.28
Participant 11	0.51	0.18	0.30	0.62	0.35	0.10	0.35	0.11	0.62	0.11
Participant 12	0.24	0.23	0.17	0.11	0.34		0.13	0.89	0.23	0.89
Participant 13	0.38	0.61	0.20	0.22	0.34	0.32	0.32	0.36	0.20	0.34
Participant 14	0.17	0.24	0.24	0.37	0.17	0.45	0.18	0.17	0.17	0.17
Participant 15	0.23	0.31	0.19	0.38	0.08	0.22	0.23	0.35	0.31	0.35
Participant 16	0.22	0.22	0.15	0.48	0.28	0.42	0.30	0.41	0.15	0.42
Participant 17	0.58	0.34	0.17	0.24	0.38	0.63	1.23	0.24	0.58	0.38
Participant 18	0.28	0.57	0.49	0.22	0.25	0.44	0.29	0.61	0.28	0.25
Participant 19	0.14	0.21	0.43	0.43	0.41	0.49	0.12	0.22	0.43	0.12
Participant 20	0.59	0.11	0.14	0.09	0.25	0.21	0.21	0.18	0.09	0.21
Participant 21	0.90	0.25	0.52	0.21		0.14	1.34	0.92	0.21	1.34
Participant 22	0.16	0.23	0.32	0.13	0.27	0.20	0.98	0.23	0.16	0.27
Participant 23	0.14	0.27	0.61	0.22	0.17	0.64	0.14	0.21	0.22	0.17

Table 5. 7 First Fixation Duration for Advanced Scenario 2 (cont.)

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Left or Right:Left	Left or Right:Right
Participant 24	0.28	0.28	0.77	0.38	0.25	0.95	0.44		0.38	0.25
Participant 25	0.81	0.23	0.29	0.32	1.68	0.13	0.32	0.48	0.81	1.68
Participant 26	0.26	0.28	0.26	0.21	0.22	0.11	0.29	0.18	0.26	0.22
Participant 27	0.13	0.49	0.20	0.33	0.42	0.26	0.13	0.17	0.49	0.13
Participant 28	0.53	1.21	1.15	0.13	1.10	0.78	0.91	0.60	0.13	0.78
Participant 29	0.23	0.16	0.25	0.18	0.07	0.25	0.10	1.44	0.16	1.44

5.3.2. Participant's Subjective Choice

After the observation time for each participant is finished, then the participant is asked to choose which product between all of the area of observation that they would like to buy. The subjective choice is tested for each of the advanced scenarios. Below will be given the detailed subjective choice of each scenario.

Table 5. 8 Participant's Subjective Choice

Participant	Advanced Scenario 1 Area	Advanced Scenario 2 Area	Advanced Scenario 3 Area
Participant 1	5	5	5
Participant 2	3	3	3
Participant 3	6	6	8
Participant 4	7	5	8
Participant 5	2	5	8
Participant 6	6	5	8
Participant 7	6	5	8
Participant 8	1	7	8
Participant 9	5	2	4
Participant 10	2	5	4
Participant 11	6	8	6
Participant 12	6	4	6
Participant 13	7	2	8
Participant 14	7	8	4
Participant 15	2	8	7
Participant 16	7	3	8
Participant 17	4	4	5
Participant 18	6	7	4
Participant 19	2	7	8
Participant 20	3	6	3
Participant 21	6	2	8
Participant 22	7	7	8
Participant 23	5	5	8
Participant 24	7	3	2
Participant 25	6	7	8
Participant 26	7	4	8
Participant 27	6	7	8
Participant 28	3	2	8
Participant 29	6	3	4
Participant 30	7	3	8

5.4 Data Processing

In this subchapter, the data processing of each advanced scenario will be given in detail. The data processing is mainly processed using Minitab 18 software.

5.4.1. Data Processing for Advanced Scenario 1

In this data processing, each of the parameters descriptive statistics will be given in detail.

5.4.1.1 Descriptive Statistics for Fixation Duration

The descriptive statistics for the fixation duration data of advanced scenario 1 will be given below.

Table 5. 9 Fixation Duration Descriptive Statistics

Statistics

Variable	N	N*	Mean	StDev	Minimum	Median	Maximum
Area 1	9	19	0.3660	0.1644	0.1105	0.3443	0.6159
Area 2	17	11	0.606	0.775	0.081	0.216	2.806
Area 3	16	12	0.488	0.455	0.028	0.371	1.939
Area 4	7	21	0.4776	0.2338	0.1654	0.4811	0.8076
Area 5	5	23	0.675	0.501	0.137	0.617	1.408
Area 6	17	11	0.738	0.620	0.069	0.530	2.408
Area 7	20	8	0.795	0.687	0.040	0.563	2.466
Area 8	8	20	0.3041	0.1941	0.0692	0.2889	0.6709

According to table 5.9, it is known that fixation made by participants mostly happened in the middle area which are area 2, area 3, area 6, and area 7. The mean value was also dominant on the right middle area which is area 6 and area 7, also on area 6 and area 7, the maximum duration for certain participant is 2.408 seconds and 2.466 seconds, almost the same with the observation duration which is 3 seconds.

5.4.1.2 Descriptive Statistics for Average Fixation Duration

The descriptive statistics for the average fixation duration data of advanced scenario 1 will be given below.

Table 5. 10 Average Fixation Duration Descriptive Statistics

Statistics

Variable	N	N*	Mean	StDev	Minimum	Median	Maximum
Area 1	9	19	0.2879	0.1014	0.1105	0.3335	0.4105
Area 2	17	11	0.426	0.652	0.081	0.202	2.806
Area 3	16	12	0.2974	0.2307	0.0281	0.2709	1.0629
Area 4	7	21	0.4421	0.2488	0.1654	0.3283	0.8076
Area 5	5	23	0.3213	0.2116	0.1368	0.2232	0.6172
Area 6	17	11	0.509	0.532	0.069	0.358	2.408
Area 7	20	8	0.3847	0.2773	0.0401	0.2929	1.0733
Area 8	8	20	0.2252	0.1890	0.0692	0.1625	0.6709

According to table 5.10, it is known that fixation made by participants mostly happened in the middle area which are area 2, area 3, area 6, and area 7. For the average fixation duration, the optimum area which is Area 6 has the highest mean but also it has a high standard deviation.

5.4.1.3 Descriptive Statistics for Fixation Count

The descriptive statistics for the fixation count data of advanced scenario 1 will be given below.

Table 5. 11 Fixation Count Descriptive Statistics

Statistics

Variable	N	N*	Mean	StDev	Sum	Minimum	Median	Maximum
Area 1	9	19	1.333	0.707	12.000	1.000	1.000	3.000
Area 2	17	11	1.471	1.007	25.000	1.000	1.000	5.000
Area 3	16	12	1.688	1.078	27.000	1.000	1.000	5.000
Area 4	7	21	1.143	0.378	8.000	1.000	1.000	2.000
Area 5	5	23	2.200	1.304	11.000	1.000	2.000	4.000

Variable	N	N*	Mean	StDev	Sum	Minimum	Median	Maximum
Area 6	17	11	1.529	0.717	26.000	1.000	1.000	3.000
Area 7	20	8	2.100	1.410	42.000	1.000	2.000	5.000
Area 8	8	20	1.500	0.756	12.000	1.000	1.000	3.000

According to table 5.11, it is known that fixation made by participants mostly happened in the middle area which are area 2, area 3, area 6, and area 7. For the mean value of fixation count, area 5 and area 7 is the most interesting area with significant value compared to others.

5.4.1.4 Descriptive Statistics for Time to First Fixation

The descriptive statistics for the time to first fixation data of advanced scenario 1 will be given below.

Table 5. 12 Time to First Fixation Descriptive Statistics

Statistics

Variable	N	N*	Mean	StDev	Sum	Minimum	Median	Maximum
Area 1	9	19	0.922	0.922	8.300	0.000	0.612	2.447
Area 2	17	11	0.944	0.817	16.047	0.000	0.631	2.174
Area 3	16	12	1.190	1.054	19.039	0.000	0.977	2.972
Area 4	7	21	1.219	0.974	8.534	0.006	1.588	2.422
Area 5	5	23	0.785	0.493	3.924	0.222	0.709	1.519
Area 6	17	11	0.821	0.692	13.962	0.000	0.796	2.046
Area 7	20	8	0.573	0.669	11.462	0.000	0.217	1.894
Area 8	8	20	1.348	0.583	10.787	0.507	1.307	2.201

According to table 5.12, it is known that fixation made by participants mostly happened in the middle area which are area 2, area 3, area 6, and area 7. The time to first fixation data seeks the lowest mean value since the lower the mean value means that the participant observes that certain area firstly and then moving to another area. It is shown that almost every area ever been an object of interest to the certain participant, shown by the minimum value. However, the mean value shows that area 5, area 6, and area 7 has the lowest mean value compared to others.

5.4.1.5 Descriptive Statistics for First Fixation Duration

The descriptive statistics for first fixation duration data of advanced scenario 1 will be given below.

Table 5. 13 First Fixation Duration Descriptive Statistics

Statistics

Variable	N	N*	Mean	StDev	Sum	Minimum	Median	Maximum
Area 1	9	19	0.2973	0.1103	2.6754	0.1105	0.3335	0.4105
Area 2	17	11	0.493	0.696	8.386	0.081	0.202	2.806
Area 3	16	12	0.2901	0.2352	4.6424	0.0281	0.2614	1.0629
Area 4	7	21	0.4446	0.2466	3.1123	0.1654	0.3283	0.8076
Area 5	5	23	0.3454	0.2177	1.7268	0.1368	0.2170	0.6172
Area 6	17	11	0.442	0.540	7.511	0.069	0.275	2.408
Area 7	20	8	0.3833	0.3360	7.6663	0.0401	0.2605	1.2830
Area 8	8	20	0.2242	0.1900	1.7936	0.0692	0.1605	0.6709

According to table 5.13, it is shown that participants mostly fixated on the middle area of the showcase cooler which are area 2, area 3, area 6, and area 7. The first fixation duration means shows that participants mostly fixated for the first time with the longer duration on area 2, area 4, area 6, and area 7. This shows that the middle area is an interesting area to be fixated longer for the first time.

5.4.2. Data Processing for Advanced Scenario 2

In this subchapter, the data processing for advanced scenario 2 will be given in detail. The data processing will be processed using Minitab 18 software.

5.4.2.1 Two Way ANOVA: Fixation Duration vs Scenario, Area

Prior to conducting the test, it is required to determine the hypothesis for each of the possible ANOVA analysis:

H0: $\mu 1 = \mu 2$ (Scenario do not have an effect on fixation duration)

HA: $\mu 1 \neq \mu 2$ (Scenario have an effect on fixation duration)

Description: $\mu 1$ = Initial Scenario and $\mu 2$ = Advanced Scenario

H0: $\mu 1 = \mu 2 = \mu 3 = \mu 4 = \mu 5 = \mu 6 = \mu 7 = \mu 8$ (Area do not have an effect on fixation duration)

HA: $\mu 1 \neq \mu 2 \neq \mu 3 \neq \mu 4 \neq \mu 5 \neq \mu 6 \neq \mu 7 \neq \mu 8$ (Area have an effect on fixation duration)

Description: $\mu 1$ = Area 1, $\mu 2$ = Area 2, $\mu 3$ = Area 3, $\mu 4$ = Area 4, $\mu 5$ = Area 5, $\mu 6$ = Area 6, $\mu 7$ = Area 7, $\mu 8$ = Area 8

H0: There is no interaction between scenario, an area with fixation duration

HA: There is an interaction between scenario, an area with fixation duration

Table 5. 14 Fixation Duration vs Scenario, Area

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenarios	1	12.78	12.779	5.15	0.024
Area	7	60.00	8.572	3.45	0.001
Scenarios*Area	7	7.79	1.113	0.45	0.871
Error	404	1003.11	2.483		
Total	419	1085.09			

According to table 5.14, it is known that there are 3 sources for analysis. For the interaction (scenario*area) source, the p-value is 0.871 which is larger than the predetermined alpha value (5%). Therefore it is needed to accept the null hypothesis. Thus, it can be concluded that somehow the interaction is not affecting the fixation duration result. For the scenario source, the p-value is 0.024 which is smaller than the predetermined alpha value (5%). Therefore it is needed to reject the null hypothesis. Thus, it can be concluded that somehow the scenario is affecting the fixation duration result. For the area source, the p-value is 0.001 which is smaller than the predetermined alpha value (5%). Therefore it is needed to reject the null hypothesis. Thus, it can be concluded that somehow the area is affecting the fixation duration result.

5.4.2.2 Two Way ANOVA: Average Fixation Duration vs Scenario, Area

Prior to conducting the test, it is required to determine the hypothesis for each of the possible ANOVA analysis:

H0: $\mu 1 = \mu 2$ (Scenario do not have an effect on average fixation duration)

HA: $\mu 1 \neq \mu 2$ (Scenario have an effect on average fixation duration)

Description: $\mu 1$ = Initial Scenario and $\mu 2$ = Advanced Scenario

H0: $\mu 1 = \mu 2 = \mu 3 = \mu 4 = \mu 5 = \mu 6 = \mu 7 = \mu 8$ (Area do not have an effect on average fixation duration)

HA: $\mu 1 \neq \mu 2 \neq \mu 3 \neq \mu 4 \neq \mu 5 \neq \mu 6 \neq \mu 7 \neq \mu 8$ (Area have an effect on avereage fixation duration)

Description: $\mu 1$ = Area 1, $\mu 2$ = Area 2, $\mu 3$ = Area 3, $\mu 4$ = Area 4, $\mu 5$ = Area 5, $\mu 6$ = Area 6, $\mu 7$ = Area 7, $\mu 8$ = Area 8

H0: There is no interaction between scenario, an area with an average fixation duration

HA: There is an interaction between scenario, an area with an average fixation duration

Table 5. 15 Average Fixation Duration vs Scenario, Area

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	5.2468	5.24678	29.83	0.000
Area	7	0.7424	0.10605	0.60	0.754
Scenario*Area	7	0.6938	0.09911	0.56	0.786
Error	404	71.0620	0.17590		
Total	419	77.9400			

According to table 5.15, it is known that there are 3 sources for analysis. For the interaction (scenario*area) source, the p-value is 0.786 which is larger than the predetermined alpha value (5%). Therefore it is needed to accept the null

hypothesis. Thus, it can be concluded that somehow the interaction is not affecting the average fixation duration result. For the scenario source, the p-value is 0.000 which is smaller than the predetermined alpha value (5%). Therefore it is needed to reject the null hypothesis. Thus, it can be concluded that somehow the scenario is affecting the average fixation duration result. For the area source, the p-value is 0.754 which is larger than the predetermined alpha value (5%). Therefore it is needed to accept the null hypothesis. Thus, it can be concluded that somehow the area is not affecting the average fixation duration result.

5.4.2.3 Two Way ANOVA: Fixation Count vs Scenario, Area

Prior to conducting the test, it is required to determine the hypothesis for each of the possible ANOVA analysis:

H0: $\mu 1 = \mu 2$ (Scenario do not have an effect on fixation count)

HA: $\mu 1 \neq \mu 2$ (Scenario have an effect on fixation count)

Description: $\mu 1$ = Initial Scenario and $\mu 2$ = Advanced Scenario

H0: $\mu 1 = \mu 2 = \mu 3 = \mu 4 = \mu 5 = \mu 6 = \mu 7 = \mu 8$ (Area do not have an effect on fixation count)

HA: $\mu 1 \neq \mu 2 \neq \mu 3 \neq \mu 4 \neq \mu 5 \neq \mu 6 \neq \mu 7 \neq \mu 8$ (Area have an effect on fixation count)

Description: $\mu 1$ = Area 1, $\mu 2$ = Area 2, $\mu 3$ = Area 3, $\mu 4$ = Area 4, $\mu 5$ = Area 5, $\mu 6$ = Area 6, $\mu 7$ = Area 7, $\mu 8$ = Area 8

H0: There is no interaction between scenario, an area with a fixation count

HA: There is an interaction between scenario, an area with a fixation count

Table 5. 16 Fixation Count vs Scenario, Area

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	75.46	75.465	8.32	0.004
Area	7	310.61	44.373	4.89	0.000
Scenario*Area	7	107.92	15.417	1.70	0.108

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Error	404	3666.23	9.075		
Total	419	4173.06			

According to table 5.16, it is known that there are 3 sources for analysis. For the interaction (scenario*area) source, the p-value is 0.108 which is larger than the predetermined alpha value (5%). Therefore it is needed to accept the null hypothesis. Thus, it can be concluded that somehow the interaction is not affecting the fixation count result. For the scenario source, the p-value is 0.004 which is smaller than the predetermined alpha value (5%). Therefore it is needed to reject the null hypothesis. Thus, it can be concluded that somehow the scenario is affecting the fixation count result. For the area source, the p-value is 0.000 which is smaller than the predetermined alpha value (5%). Therefore it is needed to reject the null hypothesis. Thus, it can be concluded that somehow the area is affecting the fixation count result.

5.4.2.4 One Way ANOVA: Fixation Duration vs Area 6 on Scenario

Prior to conducting the test, it is required to determine the hypothesis for each of the possible ANOVA analysis:

H0: $\mu 1 = \mu 2$ (Area 6 on Scenario do not have an effect on fixation duration)

HA: $\mu 1 \neq \mu 2$ (Area 6 on Scenario have an effect on fixation duration)

Description: $\mu 1$ = Area 6 on Initial Scenario and $\mu 2$ = Area 6 on Advanced Scenario

Table 5. 17 One Way ANOVA: Fixation Duration vs Area 6 on Scenario

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	5.237	5.237	2.22	0.142
Error	53	124.826	2.355		
Total	54	130.063			

According to table 5.17, it is known that there is only one source of analysis. The scenario source, the p-value is 0.142 which is higher than the predetermined alpha value (5%). Therefore it is needed to accept the null hypothesis. Thus, it can

be concluded that somehow the area 6 on the scenario is not affecting the fixation duration result.

5.4.3. Data Processing for Advanced Scenario 3

In this subchapter, the data processing for advanced scenario 2 will be given in detail. The data processing will be processed using Minitab 18 software.

5.4.3.1 Two Way ANOVA: Fixation Duration vs Scenario, Area

Prior to conducting the test, it is required to determine the hypothesis for each of the possible ANOVA analysis:

H0: $\mu 1 = \mu 2$ (Scenario do not have an effect on fixation duration)

HA: $\mu 1 \neq \mu 2$ (Scenario have an effect on fixation duration)

Description: $\mu 1$ = Initial Scenario and $\mu 2$ = Advanced Scenario

H0: $\mu 1 = \mu 2 = \mu 3 = \mu 4 = \mu 5 = \mu 6 = \mu 7 = \mu 8$ (Area do not have an effect on fixation duration)

HA: $\mu 1 \neq \mu 2 \neq \mu 3 \neq \mu 4 \neq \mu 5 \neq \mu 6 \neq \mu 7 \neq \mu 8$ (Area have an effect on fixation duration)

Description: $\mu 1$ = Area 1, $\mu 2$ = Area 2, $\mu 3$ = Area 3, $\mu 4$ = Area 4, $\mu 5$ = Area 5, $\mu 6$ = Area 6, $\mu 7$ = Area 7, $\mu 8$ = Area 8

H0: There is no interaction between scenario, an area with fixation duration

HA: There is an interaction between scenario, an area with fixation duration

Table 5. 18 Fixation Duration vs Scenario, Area

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	8.72	8.715	4.17	0.042
Area	7	172.64	24.663	11.79	0.000
Scenario*Area	7	308.41	44.058	21.06	0.000
Error	381	797.11	2.092		

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Total	396	1323.34			

According to table 5.18, it is known that there are 3 sources for analysis. For the interaction (scenario*area) source, the p-value is 0.000 which is smaller than the predetermined alpha value (5%). Therefore it is needed to reject the null hypothesis. Thus, it can be concluded that somehow the interaction is affecting the fixation duration result. For the scenario source, the p-value is 0.0042 which is smaller than the predetermined alpha value (5%). Therefore it is needed to reject the null hypothesis. Thus, it can be concluded that somehow the scenario is affecting the fixation duration result. For the area source, the p-value is 0.000 which is smaller than the predetermined alpha value (5%). Therefore it is needed to reject the null hypothesis. Thus, it can be concluded that somehow the area is affecting the fixation duration result.

5.4.3.2 Two Way ANOVA: Average Fixation Duration vs Scenario, Area

Prior to conducting the test, it is required to determine the hypothesis for each of the possible ANOVA analysis:

H0: $\mu 1 = \mu 2$ (Scenario do not have an effect on average fixation duration)

HA: $\mu 1 \neq \mu 2$ (Scenario have an effect on average fixation duration)

Description: $\mu 1$ = Initial Scenario and $\mu 2$ = Advanced Scenario

H0: $\mu 1 = \mu 2 = \mu 3 = \mu 4 = \mu 5 = \mu 6 = \mu 7 = \mu 8$ (Area do not have an effect on average fixation duration)

HA: $\mu 1 \neq \mu 2 \neq \mu 3 \neq \mu 4 \neq \mu 5 \neq \mu 6 \neq \mu 7 \neq \mu 8$ (Area have an effect on avereage fixation duration)

Description: $\mu 1$ = Area 1, $\mu 2$ = Area 2, $\mu 3$ = Area 3, $\mu 4$ = Area 4, $\mu 5$ = Area 5, $\mu 6$ = Area 6, $\mu 7$ = Area 7, $\mu 8$ = Area 8

H0: There is no interaction between scenario, an area with an average fixation duration

HA: There is an interaction between scenario, an area with an average fixation duration

Table 5. 19 Average Fixation Duration vs Scenario, Area

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	5.5259	5.52586	30.63	0.000
Area	7	0.4991	0.07130	0.40	0.905
Scenario*Area	7	1.1149	0.15927	0.88	0.520
Error	381	68.7409	0.18042		
Total	396	76.2458			

According to table 5.19, it is known that there are 3 sources for analysis. For the interaction (scenario*area) source, the p-value is 0.520 which is larger than the predetermined alpha value (5%). Therefore it is needed to accept the null hypothesis. Thus, it can be concluded that somehow the interaction is not affecting the average fixation duration result. For the scenario source, the p-value is 0.000 which is smaller than the predetermined alpha value (5%). Therefore it is needed to reject the null hypothesis. Thus, it can be concluded that somehow the scenario is affecting the average fixation duration result. For the area source, the p-value is 0.905 which is larger than the predetermined alpha value (5%). Therefore it is needed to accept the null hypothesis. Thus, it can be concluded that somehow the area is not affecting the average fixation duration result.

5.4.3.3 Two Way ANOVA: Fixation Count vs Scenario, Area

Prior to conducting the test, it is required to determine the hypothesis for each of the possible ANOVA analysis:

H0: $\mu 1 = \mu 2$ (Scenario do not have an effect on fixation count)

HA: $\mu 1 \neq \mu 2$ (Scenario have an effect on fixation count)

Description: $\mu 1$ = Initial Scenario and $\mu 2$ = Advanced Scenario

H0: $\mu 1 = \mu 2 = \mu 3 = \mu 4 = \mu 5 = \mu 6 = \mu 7 = \mu 8$ (Area do not have an effect on fixation count)

HA: $\mu 1 \neq \mu 2 \neq \mu 3 \neq \mu 4 \neq \mu 5 \neq \mu 6 \neq \mu 7 \neq \mu 8$ (Area have an effect on fixation count)

Description: $\mu 1$ = Area 1, $\mu 2$ = Area 2, $\mu 3$ = Area 3, $\mu 4$ = Area 4, $\mu 5$ = Area 5, $\mu 6$ = Area 6, $\mu 7$ = Area 7, $\mu 8$ = Area 8

H0: There is no interaction between scenario, an area with a fixation count

HA: There is an interaction between scenario, an area with a fixation count

Table 5. 20 Fixation Count vs Scenario, Area

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	124.1	124.139	12.45	0.000
Area	7	1175.2	167.887	16.84	0.000
Scenario*Area	7	1705.0	243.565	24.43	0.000
Error	381	3798.0	9.968		
Total	396	7112.9			

According to table 5.20, it is known that there are 3 sources for analysis. For the interaction (scenario*area) source, the p-value is 0.000 which is smaller than the predetermined alpha value (5%). Therefore it is needed to reject the null hypothesis. Thus, it can be concluded that somehow the interaction is affecting the fixation count result. For the scenario source, the p-value is 0.000 which is smaller than the predetermined alpha value (5%). Therefore it is needed to reject the null hypothesis. Thus, it can be concluded that somehow the scenario is affecting the fixation count result. For the area source, the p-value is 0.000 which is smaller than the predetermined alpha value (5%). Therefore it is needed to reject the null hypothesis. Thus, it can be concluded that somehow the area is affecting the fixation count result.

5.4.3.4 One Way ANOVA: Fixation Duration vs Area 4 on Scenario

Prior to conducting the test, it is required to determine the hypothesis for each of the possible ANOVA analysis:

H0: $\mu 1 = \mu 2$ (Area 4 on Scenario do not have an effect on fixation duration)

HA: $\mu 1 \neq \mu 2$ (Area 4 on Scenario have an effect on fixation duration)

Description: $\mu 1$ = Area 4 on Initial Scenario and $\mu 2$ = Area 4 on Advanced Scenario

Table 5. 21 Fixation Duration vs Area 4 on Scenario

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	66.71	66.707	44.54	0.000
Error	47	70.39	1.498		
Total	48	137.10			

According to table 5.21, it is known that there is only one source of analysis. The scenario source, the p-value is 0.000 which is smaller than the predetermined alpha value (5%). Therefore it is needed to reject the null hypothesis. Thus, it can be concluded that somehow the area 4 on the scenario is affecting the fixation duration result.

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CHAPTER 6
ANALYSIS AND RECOMMENDATION

This chapter will explain the interpretation and analysis of the collected and processed data in the previous chapter. The analysis and recommendation will be based on the result of the data collection.

6.1 Analysis of Initial Scenario Result

The initial scenario is used to determine where is the optimum and least optimum location inside a showcase cooler without any factors or variable given. The result will indicate which location has the best parameters value and which location has the worst value. Based on the final rankings given, it can be concluded that area 6 becomes the optimum area since it has the best parameters value compared to others, but the value is not much different from the second rank which is area 8. Table 4.17 shows that the middle part of the showcase cooler which are area 2, area3, area 6, and area 7 has the four best area rankings inside the showcase cooler.

This is happening possibly because the middle area is the easiest area for a consumer to reach if the product is a functional product or product that is easily replaceable. Also, the middle area of the showcase cooler is the often become the eye level of the consumer since the eye height of a person is somewhere between 1300 to 1500 mm based on the Indonesian Anthropometry, while the height of the showcase cooler itself is 2100 mm.

The door handle of the showcase cooler can also give effect to the consumer. Since the door handle is located on the middle of the showcase cooler then it will give stimuli to the consumer to think that picking functional product near the door handle will give less energy and time, which means the consumer will be likely to choose product that located on the area where it is located near the door handle.

Based on table 4.17, it can be concluded that the least optimum area is area 4. The difference between the lowest ranking with the second-lowest ranking is significant, and the difference between the second-lowest to the third-lowest is also

significant. The second-lowest area ranking is area 8. Based on the observation, it can be concluded that the lower area of the showcase cooler which is area 4 and area 8 gives the least ranking position. This is possibly happen because the lower area of the showcase cooler is the area that is way below the eye level of the consumer and also it takes extra effort for a consumer to pick and take a product in the lower area of the showcase cooler since they have to bent down their body or staying in squat position.

Also, the pattern of observation seen from the participants variable (age and gender) is not significantly different for the participants. Male and female participants are both tend to observe the showcase cooler from the middle area, and then moving on to the top area, and some of them will observe the lower area for a quick amount of time.

6.2 Analysis of Advanced Scenario 1 Result

The result of this scenario will show how does the pattern of observation and decision making on a showcase cooler if the consumer has a time constraint. Based on the number of fixations made by the participants, it can be seen that the N value occurs dominantly on the middle area of the showcase cooler which are area 2, area 3, area 6, and area 7. Based on the total fixation duration, it can be seen that the mean value is also dominant on the middle area of the showcase cooler, also for the fixation count data it is also seen dominate in the middle area of the showcase cooler dominates the value of fixation count.

The Average Fixation Duration and first fixation duration also show dominance in the middle area of the showcase cooler, only if that in this parameter, the area 4 also happens to be dominant. For the time to first fixation parameter, it shows that in area 7 there are 7 first fixations happens in this area and it is significantly different from the other areas.

Based on the result analysis of each parameter it can be concluded that consumer tends or often to focus on the middle area of the showcase cooler, mainly the right side of the showcase cooler. Thus it can be concluded that the consumer will be likely focus on the middle area of the showcase cooler since it is the closest

area to be reached and less energy and time spent if they have time constraint when going for a shop since the product is a functional product, so the price of the product did not matter because the function of the product itself is the same. Also by this result, it can be confirmed that the initial scenario result and analysis is validated on this scenario since the participant did not have time to make a proper decision in this scenario.

Also, the pattern of observation seen from the participants variable (age and gender) is not significantly different for the participants. Male and female participants are both tend to observe the showcase cooler from the middle area, and then moving on to the top area, and some of them will observe the lower area for a quick amount of time.

6.3 Analysis of Advanced Scenario 2 Result

In this scenario, the showcase cooler still has the same group of the product with the initial scenario, but there is the price tag for each area to indicate how much a product in that area cost. The result of this scenario will indicate is there any effect of the beverage price with the way consumer observes the showcase cooler, and to see whether the area 6 which is the optimum area significantly affected with the new layout.

Based on the previous chapter that processed the data of advanced scenario 2, it can be seen that the overall conclusion is the scenario source is significantly affecting each parameter, showed by the p-value that is smaller than the predetermined alpha (5%). This means that laying out beverage based on the price will significantly affect the way consumer observes and pick what they want to buy. This can happen due to price variations of the products inside the showcase cooler. Since the product is a functional product, then some consumer will seek for the lowest price, some will seek a product that is easily reachable or product that has a reputable brand or high quality.

The area source also shows a more dominant parameter that significantly affects the dependent variable. The area source did not significantly affect the average fixation duration because the average fixation duration value will not differ

greatly for each area since the value is average based. The other dependent variable is significantly affected by the area source, showed by the p-value that is smaller than the predetermined alpha (5%). This can happen due to the existence of price tag in the advanced scenario and also the price variations in the advanced scenario. Each area has its own product price, and it is most likely that affect the participant's observation method.

For the optimum area itself, the analysis is done using one-way ANOVA to see if the change in Area 6 on scenario will significantly affect the dependent variable. Based on table 5.16, it can be seen that the p-value is larger than the predetermined alpha (5%). This means that the change in area 6 on scenario did not significantly affect the dependent variable. In other words, the optimum location did not change much when there is a price tag on each area.

Also, the pattern of observation seen from the participants variable (age and gender) is not significantly different for the participants. Male and female participants are both tend to observe the showcase cooler from the middle area, and then moving on to the top area, and some of them will observe the lower area for a quick amount of time.

6.4 Analysis of Advanced Scenario 3 Result

The difference between this scenario and scenario 2 is that in this scenario, there will be promo tags that are placed on the least optimum area based on the result of the initial scenario, which is area 4 and area 8. The result of this scenario will indicate is there any effect of the promo inside the showcase cooler with the way consumer observe it and to see if promo tags can leverage a certain area significantly.

Based on the previous chapter that processed the data of advanced scenario 3, it can be seen that the overall conclusion is that the scenario source is significantly affecting each parameter, showed by the p-value that is smaller than the predetermined alpha (5%). This means that the existence of the promo tag is affecting the way consumer observes the showcase cooler. This can happen mostly because the promo tag will give stimuli to consumers that say a certain product has

a discount or another interesting offer. It will result, the consumer will most likely observe longer to that certain area since they think by buying that product, they will have benefits.

The area source shows a more dominant parameter that did not significantly affect the dependent variable. This means that most of the independent variable has the p-value for area source above the predetermined alpha (5%). It can be concluded that the area source did not significantly affect the dependent variable. This can happen due to the consumer's attention is distracted with the promo tags so that the other area will be distributed evenly.

For the least optimum area itself, the analysis is done using one-way ANOVA to see if the change in Area 4 on scenario will significantly affect the dependent variable. Based on table 5.20, it can be seen that the p-value is smaller than the predetermined alpha (5%). Thus, it can be concluded that the existence of the promo tags will leverage the least optimum area. This can happen because the promo tags will likely attract customer to do more fixation in that area.

6.5 Subjective Choice Analysis

The subjective choice shows what the participants choose after finished observing the physical images. Based on table 5.8 for advanced scenario 1, it can be seen that the most dominant area chosen by the participants is in area 6. It has more than 50% portion of the total choice made by participants. This is happening due to the short time given to observe the physical images, so the participants can't decide properly and they tend to choose or pick what they first fixate or the easiest location to be reached. By this result, it also can be concluded that with a short time of judgment the optimum area will be likely chosen.

Based on table 5.8 for advanced scenario 2, it can be concluded that the proportion is almost equally distributed. The most selected area is area 7, but it is not significantly different from another area since the value is not so much different. This can happen because the participants have enough time to make a proper decision about the functional product that they like to buy. The participants will

have their own preferences whether they will buy cheap product, easily reachable product, or a good quality product (often comes with a high price).

Based on table 5.8 for advanced scenario 3, it can be concluded that the most dominant area chosen by a participant is area 8. It has almost 2/3 of the proportion. This can happen because the participant's attention is distracted to the promo tag and also by choosing the product that currently has a promo, they think that they have benefited from it. Also, area 8 is chosen more often than area 4 is because area 8 is on their right side of them which the participant is mostly right-handed so they tend to choose the right side.

6.6 Recommendation

In this subchapter, the recommendation based on the result of this experiment will be given. Several points of recommendation will be given below:

1. Laying out the highest profit margin product on the middle area of the showcase cooler, mainly the right side.
2. If indeed there is a product that is currently on a promo, then it should be placed on the bottom area of the showcase cooler to attract the customer
3. Ongoing promo product should not be placed on the eye level since it can significantly attract the customer's attention and it will decreasing customer's attention to other areas.
4. Product with excessive stock should be placed on area 6 since the customer's attention in this area is higher and possibly it can reduce the stock faster

CHAPTER 7
CONCLUSION AND SUGGESTION

In this chapter, the conclusion that has been taken from conducting the research and experiment will be given and also the suggestion will be given as a future improvement related to this research.

7.1 Conclusion

Based on the previous chapter, there are several conclusion that can be taken. The conclusion is given as follows:

1. The experiment took place in Ergonomics and Work System Design Laboratory, Industrial Engineering ITS. The experiment provides 4 different scenarios with 8 total areas of observation inside the showcase cooler. The objective of this research is to give several recommendations to related parties about area categorization of product inside showcase cooler and observing whether the laying out beverages can significantly affect customer interest.
2. The initial scenario result shows that without any treatment for the product inside the showcase cooler, and the product is displayed homogeneously it would be dominant in the middle area of the showcase cooler. After the ranking process is done for each parameter, it is found that in the total ranking, area 6 has the best ranking value compared to others.
3. The advanced scenario 1 result shows that by having a time constraint, the participant will not have enough time to make a proper decision, so they tend to make a decision based on what they see or what they think it is easily reachable.
4. Using two-way ANOVA for advanced scenario 2, it can be concluded that the scenario source is significantly affecting customer interest. While the area source shows that is significantly affecting customer interest. But, there is no interaction between the scenario and. Using one-way ANOVA, it can be concluded that the optimum area (Area 6) is not significantly different if compared from the initial scenario.
5. The result of the advanced scenario 3 shows that scenario source is affecting the customer interest. While for the area source and the interaction between

scenario and area, shows that both of that source is not significantly affecting the customer interest. While using one-way ANOVA shows that the promo tag can be used to significantly leverage the customer of interest in a certain area.

6. Subjective choice of the participant shows that in advanced scenario 1, the participant will be likely to focus on the middle area of the showcase cooler with 83% of the total proportion. While for the advanced scenario 2, it can be seen that the distribution of the proportion is equally distributed. For the advanced scenario 3, the preference of the customer shows that 73% of the proportion is located on the area with the promo tag on it.

7.2 Suggestion

The suggestion that can be given for the improvement of further research that related to this final project is given below:

1. Improvement of the fixated layout for the research need to be fixed long before the date of the experiment and all of the device and supporting device need to be installed permanently to avoid the unnecessary movement.
2. Using more precision measurement tool to measure the configuration of the Tobii eye tracker.
3. Check every fixation percentage resulted by each participant before moving on to another participant to avoid data outlier.
4. Further observation can be done by observing more about the time constraints factor since nowadays the virtual shop is being developed rapidly.

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APPENDIXES

Appendix 1: Preliminary Study Questionnaire

BEVERAGE LAYOUT QUESTIONNAIRE

Name:

Job:

Retailer Company:

Address:

Answer the question below!

1. How does your supermarket arrange the beverage layout?

2. Is the beverage arrangement based on the category of the beverages?

3. Is this supermarket consider certain areas inside the showcase cooler when arranging the layout?

4. Does your supermarket use this tag inside showcase cooler? Tick the box if your supermarket uses it.

- ☐ Price Tags
- ☐ Promo Tags
- ☐ Other Tags

5. Is there any of this problem in implementing the price tag for your supermarket?

- ☐ Didn't immediately update the change of price for the products
- ☐ Some product doesn't have a price tag underneath

- The font is too small
- Inconsistent Price tag color

6. Are promo tags always displayed inside the showcase?

Appendix 2: Advanced Scenario 1 Data Collection

Total Fixation Duration

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average	Total Time of Interest Duration
Participant 1		0.36			1.41	0.07			0.61	3.00
Participant 2			1.94						1.94	3.00
Participant 3		0.16				0.34	1.71		0.74	3.00
Participant 4		2.81							2.81	3.00
Participant 5						2.41			2.41	3.00
Participant 6						1.63			1.63	3.00
Participant 7		0.20	0.31	0.75			0.24	0.07	0.31	3.00
Participant 8	0.11	0.44	0.38	0.50		0.23	0.15	0.34	0.31	3.00
Participant 9			0.03	0.48			1.69	0.18	0.59	3.00
Participant 10	0.33	0.35	0.57			0.90	0.28		0.49	3.00
Participant 11	0.33		0.23	0.32		0.23		0.30	0.28	3.00
Participant 12			0.54			0.88	0.52		0.65	3.00
Participant 13			0.27		0.32	0.68	0.61		0.47	3.00
Participant 14	0.38	1.39				0.36	0.04		0.54	3.00
Participant 15	0.18	0.18	0.36	0.33		0.32	0.32	0.47	0.31	3.00
Participant 16	0.62	0.15			0.89				0.55	3.00
Participant 17		1.97				0.26	0.21		0.81	3.00
Participant 18		1.15	0.32				0.35		0.61	3.00
Participant 19		0.22				1.11	1.07		0.80	3.00
Participant 20	0.34	0.10	0.63		0.14		1.01		0.44	3.00
Participant 21			0.27	0.81			0.76	0.67	0.63	3.00

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average	Total Time of Interest Duration
Participant 22							2.47		2.47	3.00
Participant 23		0.46	0.40			1.20	0.24	0.13	0.48	3.00
Participant 24			0.43	0.17			2.03		0.87	3.00
Participant 25		0.16	0.07			1.18	0.47	0.28	0.43	3.00
Participant 26			1.06			0.22	0.74		0.67	3.00
Participant 27	0.41	0.13			0.62	0.53			0.42	3.00
Participant 28	0.58	0.08					1.00		0.56	3.00

Average Fixation Duration

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average	Median	Total Time of Interest Duration
Participant 1		0.36			0.47	0.07			0.30	0.36	3.00
Participant 2			0.39						0.39	0.39	3.00
Participant 3		0.16				0.17	0.86		0.40	0.17	3.00
Participant 4		2.81							2.81	2.81	3.00
Participant 5						2.41			2.41	2.41	3.00
Participant 6						0.54			0.54	0.54	3.00
Participant 7		0.20	0.15	0.75			0.24	0.07	0.28	0.20	3.00
Participant 8	0.11	0.22	0.38	0.25		0.23	0.15	0.17	0.22	0.22	3.00
Participant 9			0.03	0.48			0.34	0.18	0.26	0.26	3.00
Participant 10	0.33	0.17	0.28			0.90	0.28		0.39	0.28	3.00
Participant 11	0.33		0.23	0.32		0.23		0.15	0.25	0.23	3.00
Participant 12			0.27			0.44	0.17		0.29	0.27	3.00
Participant 13			0.27		0.16	0.23	0.30		0.24	0.25	3.00

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average	Median	Total Time of Interest Duration
Participant 14	0.38	0.28				0.36	0.04		0.26	0.32	3.00
Participant 15	0.18	0.18	0.36	0.33		0.32	0.32	0.16	0.26	0.32	3.00
Participant 16	0.21	0.15			0.22				0.19	0.21	3.00
Participant 17		0.98				0.26	0.21		0.49	0.26	3.00
Participant 18		0.57	0.16				0.17		0.30	0.17	3.00
Participant 19		0.22				0.56	1.07		0.62	0.56	3.00
Participant 20	0.34	0.10	0.21		0.14		0.20		0.20	0.20	3.00
Participant 21			0.27	0.81			0.76	0.67	0.63	0.72	3.00
Participant 22							0.82		0.82	0.82	3.00
Participant 23		0.46	0.40			0.60	0.24	0.13	0.36	0.40	3.00
Participant 24			0.21	0.17			0.41		0.26	0.21	3.00
Participant 25		0.16	0.07			0.59	0.23	0.28	0.27	0.23	3.00
Participant 26			1.06			0.22	0.37		0.55	0.37	3.00
Participant 27	0.41	0.13			0.62	0.53			0.42	0.47	3.00
Participant 28	0.29	0.08					0.50		0.29	0.29	3.00

Fixation Count

Participant	**Area:1**	**Area:2**	**Area:3**	**Area:4**	**Area:5**	**Area:6**	**Area:7**	**Area:8**	**Median**	**Sum**	TOI Fixation Count	TOI Duration
Participant 1		1			3	1			1.00	5	7	3.00
Participant 2			5						5.00	5	6	3.00
Participant 3		1				2	2		2.00	5	6	3.00
Participant 4		1							1.00	1	1	3.00

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Median	Sum	TOI Fixation Count	TOI Duration
Participant 5						1			1.00	1	1	3.00
Participant 6						3			3.00	3	4	3.00
Participant 7		1	2	1			1	1	1.00	6	8	3.00
Participant 8	1	2	1	2		1	1	2	1.00	10	10	3.00
Participant 9			1	1			5	1	1.00	8	9	3.00
Participant 10	1	2	2			1	1		1.00	7	7	3.00
Participant 11	1		1	1		1		2	1.00	6	8	3.00
Participant 12			2			2	3		2.00	7	8	3.00
Participant 13			1		2	3	2		2.00	8	10	3.00
Participant 14	1	5				1	1		1.00	8	8	3.00
Participant 15	1	1	1	1		1	1	3	1.00	9	9	3.00
Participant 16	3	1			4				3.00	8	8	3.00
Participant 17		2				1	1		1.00	4	4	3.00
Participant 18		2	2				2		2.00	6	6	3.00
Participant 19		1				2	1		1.00	4	4	3.00
Participant 20	1	1	3		1		5		1.00	11	11	3.00
Participant 21			1	1			1	1	1.00	4	4	3.00
Participant 22							3		3.00	3	3	3.00
Participant 23		1	1			2	1	1	1.00	6	6	3.00
Participant 24			2	1			5		2.00	8	8	3.00
Participant 25		1	1			2	2	1	1.00	7	7	3.00
Participant 26			1			1	2		1.00	4	4	3.00
Participant 27	1	1			1	1			1.00	4	4	3.00

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Median	Sum	TOI Fixation Count	TOI Duration
Participant 28	2	1					2		2.00	5	6	3.00

Time to First Fixation

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average
Participant 1		0.06			1.52	1.39			0.99
Participant 2			0.74						0.74
Participant 3		2.16				1.85	0.00		1.34
Participant 4		0.00							0.00
Participant 5						0.00			0.00
Participant 6						0.00			0.00
Participant 7		1.66	1.24	0.29			1.89	2.20	1.46
Participant 8	0.61	0.35	2.08	0.01		0.80	1.10	1.29	0.89
Participant 9			2.97	0.36			0.18	0.95	1.12
Participant 10	2.45	1.98	0.00			1.05	0.69		1.23
Participant 11	1.32		2.77	2.42		1.72		2.02	2.05
Participant 12			2.16			0.37	0.00		0.84
Participant 13			1.86		0.22	0.68	1.47		1.06
Participant 14	0.86	0.15				2.05	0.00		0.76
Participant 15	0.00	0.61	0.21	1.86		0.87	1.26	1.64	0.92
Participant 16	0.00	0.80			0.51				0.43
Participant 17		0.63				0.29	0.00		0.31
Participant 18		0.95	0.00				0.25		0.40

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average
Participant 19		0.04				0.33	1.51		0.63
Participant 20	0.55	0.42	0.00		0.97		1.17		0.62
Participant 21			2.43	1.59			0.05	0.85	1.23
Participant 22							0.00		0.00
Participant 23		0.34	0.86			0.00	1.49	1.32	0.80
Participant 24			0.61	2.01			0.00		0.87
Participant 25		1.73	0.00			1.18	0.14	0.51	0.71
Participant 26			1.09			0.00	0.26		0.45
Participant 27	0.22	2.00			0.71	1.40			1.08
Participant 28	2.29	2.17					0.00		1.49

First Fixation Duration

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average
Participant 1		0.36			0.54	0.07			0.33
Participant 2			0.24						0.24
Participant 3		0.16				0.24	1.28		0.56
Participant 4		2.81							2.81
Participant 5						2.41			2.41
Participant 6						0.38			0.38
Participant 7		0.20	0.11	0.75			0.24	0.07	0.27
Participant 8	0.11	0.23	0.38	0.27		0.23	0.15	0.19	0.22
Participant 9			0.03	0.48			0.11	0.18	0.20
Participant 10	0.33	0.12	0.25			0.90	0.28		0.38

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average
Participant 11	0.33		0.23	0.32		0.23		0.13	0.25
Participant 12			0.37			0.33	0.08		0.26
Participant 13			0.27		0.21	0.18	0.36		0.26
Participant 14	0.38	0.66				0.36	0.04		0.36
Participant 15	0.18	0.18	0.36	0.33		0.32	0.32	0.14	0.26
Participant 16	0.18	0.15			0.22				0.18
Participant 17		1.44				0.26	0.21		0.64
Participant 18		0.93	0.15				0.07		0.38
Participant 19		0.22				0.12	1.07		0.47
Participant 20	0.34	0.10	0.14		0.14		0.21		0.19
Participant 21			0.27	0.81			0.76	0.67	0.63
Participant 22							0.66		0.66
Participant 23		0.46	0.40			0.28	0.24	0.13	0.30
Participant 24			0.32	0.17			0.58		0.35
Participant 25		0.16	0.07			0.46	0.30	0.28	0.25
Participant 26			1.06			0.22	0.49		0.59
Participant 27	0.41	0.13			0.62	0.53			0.42
Participant 28	0.40	0.08					0.22		0.23

Appendix 3: Advanced Scenario 3 Data Collection

Total Fixation Duration

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average	Sum	Total Time of Interest Duration
Participant 1		0.85	0.80	2.37	0.34	2.83	0.66	5.12	1.85	12.97	20.00
Participant 2	2.50	0.65	2.46	1.59	3.25	1.52	2.62	1.54	2.01	16.12	20.00
Participant 3	1.92	0.76	1.07	3.60	2.32	0.85	1.82	3.41	1.97	15.77	20.00
Participant 4		0.52	2.57	6.07		0.31	2.22	2.52	2.37	14.21	20.00
Participant 5		0.99	1.12	3.19	1.03	0.85	1.59	6.91	2.24	15.67	20.00
Participant 6	0.23	0.87	0.17	4.25	0.17	1.57	1.07	7.70	2.00	16.01	20.00
Participant 7			0.35	3.09		0.74	2.18	8.31	2.93	14.67	20.00
Participant 8		0.59	0.83	5.56		0.20	2.72	4.05	2.33	13.96	20.00
Participant 9		0.82	2.07	4.71		3.27	1.37	4.13	2.73	16.36	20.00
Participant 10		1.09	0.86	3.27	0.37	2.65	0.24	6.35	2.12	14.83	20.00
Participant 11	0.35	0.11		3.57	0.43	1.73	1.44	6.19	1.97	13.81	20.00
Participant 12		0.40	0.43	6.32		0.71	0.56	8.81	2.87	17.22	20.00
Participant 13	0.51	0.67	1.22	2.96	0.92	1.17	4.17	3.13	1.84	14.75	20.00
Participant 14	0.27	0.63	0.78	3.27	0.99	1.54	3.01	5.00	1.94	15.49	20.00
Participant 15	2.57	1.97	1.72	1.79	1.70	1.81	1.03	2.90	1.93	15.48	20.00
Participant 16	0.80	0.31	1.14	7.05	0.20	1.73	1.08	3.81	2.01	16.11	20.00
Participant 17	0.88	0.95	0.14	4.87		1.43	0.26	5.40	1.99	13.94	20.00
Participant 18				5.12			0.54	11.50	5.72	17.17	20.00
Participant 19	1.48	2.96	0.32	3.69	1.54	2.54	0.54	3.85	2.11	16.92	20.00
Participant 20	0.17	0.38	1.13	4.13	0.28	0.68	1.71	5.72	1.77	14.20	20.00
Participant 21	0.60	0.20	0.94	4.13	2.33	0.40	1.62	5.50	1.97	15.73	20.00

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average	Sum	Total Time of Interest Duration
Participant 22	1.15	4.17	1.12	1.16	0.38	0.33	4.03	2.93	1.91	15.28	20.00
Participant 23		0.26	0.79	4.80			0.66	9.34	3.17	15.85	20.00
Participant 24		1.48	0.64	5.25	0.14	0.76	0.19	5.70	2.02	14.16	20.00
Participant 25	0.20	0.32	2.01	5.55	0.13	0.25	0.50	5.40	1.79	14.35	20.00
Participant 26	1.43	2.46	1.65	2.99	2.42	1.34	0.42	2.56	1.91	15.27	20.00
Participant 27	1.39	0.75	1.87	4.24	1.09	0.62	3.31	2.58	1.98	15.86	20.00
Participant 28	1.20	0.85	1.47	5.09	1.64	0.16	0.23	3.79	1.80	14.43	20.00

Average Fixation Duration

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average	Median	Total Time of Interest Duration
Participant 1		0.21	0.27	0.24	0.17	0.31	0.22	0.47	0.28	0.25	20.00
Participant 2	0.42	0.22	0.27	0.40	0.54	0.30	0.29	0.22	0.33	0.32	20.00
Participant 3	0.48	0.25	0.27	0.36	0.46	0.28	0.91	0.68	0.46	0.44	20.00
Participant 4		0.17	0.21	0.36		0.16	0.32	0.25	0.25	0.26	20.00
Participant 5		0.33	0.37	0.32	0.51	0.28	0.32	0.26	0.33	0.32	20.00
Participant 6	0.23	0.43	0.17	0.35	0.17	0.31	0.21	0.41	0.30	0.33	20.00
Participant 7			0.35	0.34		0.37	0.44	0.49	0.40	0.40	20.00
Participant 8		0.59	0.42	0.35		0.20	0.91	0.45	0.48	0.44	20.00
Participant 9		0.41	0.34	0.36		0.65	0.27	0.34	0.39	0.36	20.00
Participant 10		0.22	0.29	0.27	0.19	0.66	0.24	0.49	0.34	0.28	20.00
Participant 11	0.17	0.11		0.36	0.43	0.22	0.29	0.34	0.28	0.31	20.00
Participant 12		0.40	0.43	0.53		0.36	0.28	0.40	0.41	0.40	20.00

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average	Median	Total Time of Interest Duration
Participant 13	0.17	0.67	0.30	0.27	0.23	0.29	0.30	0.26	0.30	0.28	20.00
Participant 14	0.27	0.16	0.19	0.54	0.99	0.51	0.33	0.50	0.43	0.41	20.00
Participant 15	0.43	0.39	0.34	0.45	0.43	0.45	0.26	0.32	0.38	0.39	20.00
Participant 16	0.40	0.15	0.28	0.64	0.20	0.43	0.22	0.42	0.36	0.40	20.00
Participant 17	0.22	0.19	0.14	0.37		0.29	0.13	0.45	0.27	0.29	20.00
Participant 18				0.43			0.27	0.72	0.51	0.50	20.00
Participant 19	1.48	0.33	0.32	0.74	0.39	0.36	0.27	0.43	0.52	0.39	20.00
Participant 20	0.17	0.19	0.23	0.32	0.28	0.23	0.24	0.25	0.24	0.25	20.00
Participant 21	0.20	0.20	0.31	0.38	0.58	0.13	0.27	0.42	0.32	0.32	20.00
Participant 22	0.38	0.60	0.28	0.58	0.19	0.17	0.58	0.33	0.40	0.38	20.00
Participant 23		0.26	0.39	0.28			0.33	0.33	0.32	0.32	20.00
Participant 24		0.30	0.16	0.28	0.14	0.25	0.19	0.30	0.24	0.27	20.00
Participant 25	0.20	0.32	0.22	0.31	0.13	0.25	0.17	0.42	0.26	0.26	20.00
Participant 26	0.36	0.49	0.24	0.33	0.30	0.27	0.42	0.37	0.34	0.33	20.00
Participant 27	0.35	0.19	0.23	0.42	0.22	0.21	0.30	0.20	0.27	0.24	20.00
Participant 28	0.60	0.21	0.37	0.42	0.41	0.16	0.23	0.42	0.36	0.39	20.00

Fixation Count

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Median	Sum	TOI Fixation Count	TOI Duration
Participant 1		4	3	10	2	9	3	11	4.00	42	45	20.00

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Median	Sum	TOI Fixation Count	TOI Duration
Participant 2	6	3	9	4	6	5	9	7	6.00	49	51	20.00
Participant 3	4	3	4	10	5	3	2	5	4.00	36	40	20.00
Participant 4		3	12	17		2	7	10	8.50	51	55	20.00
Participant 5		3	3	10	2	3	5	27	3.00	53	55	20.00
Participant 6	1	2	1	12	1	5	5	19	3.50	46	50	20.00
Participant 7			1	9		2	5	17	5.00	34	39	20.00
Participant 8		1	2	16		1	3	9	2.50	32	35	20.00
Participant 9		2	6	13		5	5	12	5.50	43	43	20.00
Participant 10		5	3	12	2	4	1	13	4.00	40	46	20.00
Participant 11	2	1		10	1	8	5	18	5.00	45	50	20.00
Participant 12		1	1	12		2	2	22	2.00	40	40	20.00
Participant 13	3	1	4	11	4	4	14	12	4.00	53	59	20.00
Participant 14	1	4	4	6	1	3	9	10	4.00	38	39	20.00
Participant 15	6	5	5	4	4	4	4	9	4.50	41	41	20.00
Participant 16	2	2	4	11	1	4	5	9	4.00	38	42	20.00
Participant 17	4	5	1	13		5	2	12	5.00	42	44	20.00
Participant 18				12			2	16	12.00	30	30	20.00
Participant 19	2	1	7	5	1	2	11	7	3.50	36	37	20.00
Participant 20	1	9	1	5	4	7	2	9	4.50	38	39	20.00
Participant 21	1	2	5	13	1	3	7	23	4.00	55	57	20.00
Participant 22	3	1	3	11	4	3	6	13	3.50	44	45	20.00
Participant 23	3	7	4	2	2	2	7	9	3.50	36	39	20.00
Participant 24		1	2	17			2	28	2.00	50	51	20.00

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Median	Sum	TOI Fixation Count	TOI Duration
Participant 25		5	4	19	1	3	1	19	4.00	52	53	20.00
Participant 26	1	1	9	18	1	1	3	13	2.00	47	50	20.00
Participant 27	4	5	7	9	8	5	1	7	6.00	46	47	20.00
Participant 28	4	4	8	10	5	3	11	13	6.50	58	61	20.00

Time to First Fixation

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average
Participant 1		4.96	5.18	0.00	6.91	1.34	1.59	1.94	2.51
Participant 2	3.09	7.73	0.25	0.00	2.77	2.21	0.77	1.02	1.82
Participant 3	0.08	0.00	17.17	3.64	1.42	2.33	11.46	7.73	4.45
Participant 4		0.09	0.00	1.81		0.59	3.90	0.94	0.95
Participant 5		0.08	4.49	1.52	8.26	7.21	0.60	0.00	2.47
Participant 6	7.21	0.83	0.63	0.00	7.51	1.30	1.13	2.05	2.12
Participant 7			4.59	2.26		0.00	0.88	1.18	1.43
Participant 8		12.97	6.24	0.00		13.63	13.86	0.19	5.87
Participant 9		2.76	3.66	0.41		5.85	2.57	0.00	1.93
Participant 10		4.19	3.41	2.50	8.79	0.52	0.25	0.00	2.32
Participant 11	8.71	14.56		0.79	9.46	0.29	10.36	0.00	4.95
Participant 12		1.70	10.23	0.00		2.16	16.45	2.65	4.28
Participant 13	4.37	11.36	9.11	0.00	4.13	3.13	2.14	0.91	3.56
Participant 14	11.61	11.19	10.24	0.03	12.04	4.02	3.73	0.70	5.40
Participant 15	0.00	1.42	7.43	9.21	3.13	5.44	14.16	9.92	5.23

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average
Participant 16	5.85	17.67	1.44	0.21	5.58	5.16	11.31	3.00	5.20
Participant 17	0.00	1.87	2.81	1.65		0.51	0.69	0.95	0.97
Participant 18				0.00			1.30	0.92	0.54
Participant 19	1.17	0.75	0.40	0.00	2.72	12.35	8.99	3.11	3.09
Participant 20	1.32	1.11	3.76	2.74	12.92	0.87	0.56	0.00	2.38
Participant 21	4.01	3.74	7.24	0.00	4.81	11.46	1.98	0.41	3.38
Participant 22	1.86	2.74	6.05	0.00	1.54	8.39	5.49	0.30	2.65
Participant 23		6.34	4.50	0.00			5.03	0.67	2.41
Participant 24		5.83	0.79	0.03	11.17	5.18	4.92	1.47	3.35
Participant 25	10.20	10.46	1.82	0.00	9.98	9.66	7.84	0.91	5.13
Participant 26	8.91	2.18	0.00	3.73	0.56	0.36	2.79	3.24	2.19
Participant 27	4.36	4.19	2.95	0.09	4.86	9.82	2.09	0.76	2.96
Participant 28	7.34	5.42	0.73	1.15	7.10	6.89	0.46	0.00	2.95

First Fixation Duration

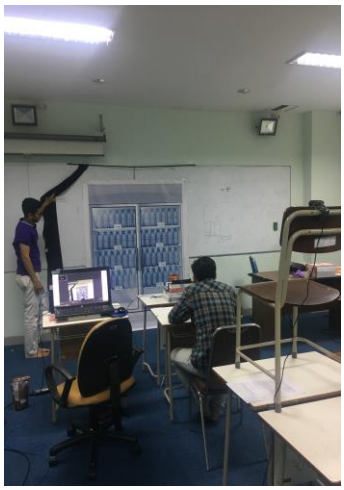
Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average
Participant 1		0.19	0.47	0.38	0.14	0.22	0.11	2.02	0.47
Participant 2	0.45	0.23	0.26	0.02	0.27	0.26	0.17	0.17	0.20
Participant 3	0.25	0.01	0.19	0.76	0.88	0.40	1.66	0.10	0.47
Participant 4		0.07	0.02	0.20		0.07	0.23	0.67	0.17
Participant 5		0.13	0.57	0.27	0.58	0.29	0.35	0.01	0.25
Participant 6	0.23	0.23	0.17	0.23	0.17	0.51	0.13	0.88	0.30
Participant 7			0.35	0.55		0.14	0.22	1.00	0.39

Participant	Area:1	Area:2	Area:3	Area:4	Area:5	Area:6	Area:7	Area:8	Average
Participant 8		0.59	0.17	0.15		0.20	0.51	0.21	0.27
Participant 9		0.51	0.18	0.14		0.25	0.12	0.30	0.25
Participant 10		0.26	0.34	0.15	0.26	0.23	0.24	0.17	0.22
Participant 11	0.29	0.11		0.14	0.43	0.39	0.40	0.04	0.21
Participant 12		0.40	0.43	1.10		0.43	0.38	0.27	0.61
Participant 13	0.17	0.67	0.42	0.42	0.17	0.31	0.25	0.14	0.33
Participant 14	0.27	0.15	0.26	0.18	0.99	0.87	0.26	0.49	0.40
Participant 15	1.38	0.11	0.84	0.63	0.23	0.33	0.34	0.27	0.63
Participant 16	0.49	0.14	0.14	1.19	0.20	0.38	0.10	0.73	0.55
Participant 17	0.05	0.14	0.14	0.15		0.13	0.19	0.34	0.14
Participant 18				0.09			0.33	0.31	0.20
Participant 19	1.48	0.17	0.32	0.15	0.28	0.31	0.24	0.18	0.35
Participant 20	0.17	0.14	0.07	0.41	0.28	0.17	0.24	0.01	0.16
Participant 21	0.33	0.20	0.56	0.11	0.27	0.13	0.20	0.34	0.25
Participant 22	0.62	0.18	0.07	0.23	0.18	0.14	0.49	0.21	0.26
Participant 23		0.26	0.47	0.53			0.41	0.70	0.50
Participant 24		0.21	0.15	0.72	0.14	0.22	0.19	0.11	0.32
Participant 25	0.20	0.32	0.16	0.43	0.13	0.25	0.13	0.16	0.25
Participant 26	0.23	0.29	0.12	0.15	0.39	0.17	0.42	0.31	0.23
Participant 27	0.43	0.11	0.28	0.60	0.27	0.31	0.79	0.14	0.39
Participant 28	0.69	0.11	0.35	0.12	0.16	0.16	0.23	0.39	0.30

Appendix 4: Participants Recording Process






Appendix 6: Two Way ANOVA Result for Scenario 2

Time to First Fixation vs Scenario, Area

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenarios	1	529.3	529.34	30.21	0.000
Area	7	238.9	34.13	1.95	0.061
Scenarios*Area	7	512.8	73.25	4.18	0.000
Error	404	7079.7	17.52		
Total	419	8329.8			

First Fixation Duration vs Scenario, Area

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenarios	1	4.471	4.4708	12.97	0.000
Area	7	2.816	0.4022	1.17	0.321
Scenarios*Area	7	1.425	0.2036	0.59	0.764
Error	404	139.299	0.3448		
Total	419	148.141			

Appendix 7: Two Way ANOVA Result for Scenario 3

Time to First Fixation vs Scenario, Area

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	240.7	240.68	12.36	0.000
Area	7	225.9	32.27	1.66	0.118
Scenario*Area	7	957.8	136.83	7.03	0.000
Error	381	7420.2	19.48		
Total	396	8972.8			

First Fixation Duration vs Scenario, Area

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	5.359	5.3593	14.79	0.000
Area	7	2.188	0.3126	0.86	0.536
Scenario*Area	7	2.461	0.3516	0.97	0.452
Error	381	138.052	0.3623		
Total	396	148.513			

Appendix 8: One Way ANOVA Result for Scenario 2

Average Fixation Duration vs Area 6 on scenario

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	1.811	1.8107	3.43	0.070
Error	53	27.970	0.5277		
Total	54	29.781			

Fixation Count vs Area 6 on scenario

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	3.239	3.239	0.37	0.544
Error	53	459.197	8.664		
Total	54	462.436			

Time to First Fixation vs Area 6 on scenario

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	23.34	23.34	1.07	0.305
Error	53	1151.36	21.72		
Total	54	1174.70			

First Fixation Duration vs Area 6 on Scenario

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	1.206	1.2057	1.99	0.164
Error	53	32.103	0.6057		
Total	54	33.309			

Appendix 9: One Way ANOVA Result for Scenario 3

Average Fixation Duration vs Area 4 on Scenario

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	0.3281	0.32815	8.70	0.005
Error	48	1.8103	0.03772		
Total	49	2.1385			

Fixation Count vs Area 4 on Scenario

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	1153	1152.52	52.21	0.000
Error	48	1060	22.07		
Total	49	2212			

Time to First Fixation vs Area 4 on Scenario

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	366.4	366.44	35.58	0.000
Error	48	494.3	10.30		
Total	49	860.7			

First Fixation Duration vs Area 4 on Scenario

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Scenario	1	0.3299	0.3299	1.26	0.268
Error	48	12.5833	0.2622		
Total	49	12.9132			

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AUTHOR'S BIOGRAPHY

Ammar was born in Surabaya, 2nd March 1997. The author is the second child of five siblings from Mr. Zaki and Mrs. Fatmah. The author had graduated from formal school SD Al-Hikmah Surabaya, SMP Al-Hikmah Surabaya, and SMAN 5 Surabaya. The author continues to study his bachelor degree in Industrial Engineering Department at Sepuluh Nopember Institute of Technology, Surabaya. During college, the author has been participating in various organizations and social activities. The author actively involved in Asian Games 2018 Athlete Village Volunteer as the athlete village volunteer, staff of security and permittance for INCHALL 2017 and IE GAMES 2017. The author also active on non-academic activities by becoming Futsal Player for HMTI ITS since the first year of college until last year of college and successfully captained the winning team for The Real FOG 2019 – Futsal and ITS Futsal Championship 2019. Besides that, the author has internship experience in PT. Tirta Investama (DANONE – AQUA) in Pulogadung, East Jakarta for one month. In the company, the author is placed on the Supply Chain department and also working together with people from the Customer Relation Department

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