CHAPTER 2 LITERATURE REVIEW

A. Data Of Utility Aspects Of Design Work

1. Mushroom

A mushroom is defined as "a macrofungus with a distinctive fruiting body which can be either epigeous or hypogeous. The macrofungi have fruiting bodies large enough to be seen with the naked eye and to be picked up by hand"[2] In a narrow sense, the word mushroom also refers only to the fruitbody. Mushrooms used to be classified into the Kingdom Plantae, but now they belong to the Kingdom Fungi due to unique fungal characteristics which draw a clear line from animals or plants. Unlike green plants, mushrooms are heterotrophs. Not having chlorophyll, they cannot generate nutrients by photosynthesis, but take nutrients from outer sources. Most mushroom species are under the Basidiomycota and Ascomycota, the two phyla under the Kingdom Fungi can be seen in table 1

<table>
<thead>
<tr>
<th>Filum/Divisi</th>
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<tbody>
<tr>
<td>Ascomycota</td>
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<tr>
<td>Basidiomycota</td>
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<tr>
<td>Zygomycota</td>
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<td>Chytridiomycota</td>
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<td>Deuteromycota</td>
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Table 1. The Kingdom Fungi

Mushrooms are heterotrophic organisms. Mushrooms require food substances by absorbing from the weathering process. [3] Based on the shape and size of the mushrooms can be grouped into microscopic mushrooms and macroscopic mushrooms. Microscopic mushroom is a mushroom that can only be seen with a microscope, because it has a very small body size, while the macroscopic fungus is a relatively large (macroscopic) fungus, can be seen with the invisible, can be held or plucked by hand, and the shape is striking [3](Gunawan A. W, 2001).

Inventory is the recording or collection of data that has been achieved. Fungal inventory is the recording or collection of data from research on fungi. It is estimated that there are 1.5 million species of fungi in the world and only 69,000 species of fungi have been identified. A total of 200,000 species of the 1.5 million species of
mushrooms are present in Indonesia. [3] The existence of fungi can be influenced by environmental factors such as temperature, humidity, and light intensity.[3] While mushroom growing substrate include forest litter leaves were damp and a bit of direct light reaching the forest floor and rotting trees provide plenty of nutrients for the life of mushrooms.[3]

1.1 Common characteristics of mushrooms

According to El Shirazi (2010)[4], the characteristics of fungi are different from other organisms, namely in terms of body structure, how to eat, and reproduction. The following is explained in detail:

a. Mushroom Body Structure

Mushroom body structure There is one cell, for example: yeast, some fungi are multi-cellular fruiting bodies form large size reaches one meter, for example: wood mushrooms. Mushroom body composed of the basic components called hyphae. Hyphae form a network called mycelium. Mycelium composes quasi-fabrications into fruit bodies. The mushroom body is generally composed of parts called pileus, lamellae, gills, annulus/ring, stipe, volva, rhizoids, scale. Body parts of the mushroom can be seen in Figure 1. as follows.

Figure 1 Structure of the mushroom body
Source by Google
b. How to Eat

In obtaining food, fungi absorb organic substances from the environment through the hyphae and mycelium to be stored in the form of glycogen. Mushrooms are heterotrophs that are pure consumers dependent on substrates that provide carbohydrates, proteins, vitamins, and other chemical compounds. As a heterotrophic creature, mushrooms can be obligate parasites, facultative parasite, or saprophyte.

c. Reproduction

Reproduction of mushroom can be done sexually (generative) and asexual (vegetative). Asexually, mushroom produces spores. While sexually in the mushroom through gametangium contact and conjugate. Contact gametangium resulted in singamis, that is cell union of two individuals.

1.2 Identifying poisonous mushrooms

Determining a fungus into a class that can be consumed or toxic is very difficult to do. One way to determine it is by knowing exactly the species of the mushroom. Knowledge of the characteristics of mushroom differences that can be consumed with mushrooms that can not be consumed / toxic.

The following are some rules of instruction that can help to avoid poisonous mushroom:

1. In general have a striking color, such as blood red, jet black, dark blue, or other colors (El Shirazi, 2010). Avoid mushrooms brown and light brown mushroom, especially the gills with light reddish color, brownish, purple brownish or blackish.

2. It produces a foul odor that pierces the nose, such as H2S rotten eggs or ammonia smell (El Shirazi, 2010).

3. Has a ring or a cup, but there is also mushroom that has rings but is not as toxic as straw mushroom and compost mushrooms (El Shirazi, 2010).

4. Generally grow in dirty places such as landfills and animal waste.

5. If the poisonous mushrooms cut off with a knife made of silver then the knives will be black or blue.
Only a few fungi can cause severe pain and others can lead to a milder illness. Poisonous mushrooms can also cause Hallucinogenic (Fly) and sometimes cause unpredictable reactions. [4]

1.3 Factors affecting the growth of mushrooms

Climatic conditions and different geographic locations will have different effects on the growth of microorganisms. Judging from the damage caused by weathering mushrooms, temperature and precipitation are very important climatic factors [4]

According to Tambunan and Nandika (1989)[4], there are several factors that affect the growth and development of mushrooms, among others:

a. Temperature

Wood damaging mushrooms can develop at fairly wide temperature intervals, but at the fastest growing natural conditions occur during warmer and more humid periods in each year. The optimum temperature is different for each type but generally ranges from 220C to 350C. Its maximum temperature ranges from 270C to 390C, with a minimum temperature of approximately 50C.

b. Oxygen

Oxygen is needed by the mushroom to perform respiration that produces CO2 and H2O. Conversely, for optimum growth, oxygen must be taken freely from the air. Without oxygen, no mushrooms can live.

c. Humidity

Mushroom needs will have different moisture, but almost all types of mushroom can live on substrates that have not saturated water. Substrate low water levels are often a limiting factor for fungal growth. this is particularly true for the types of fungi that live on wood or soil. Wood with a moisture content of less than 20% is generally not attacked by a destructive mushroom. Conversely, wood with moisture content of 35-50% is favored by the destructive mushroom. The moldy mushroom will attack different woods in a humid environment for a relatively long time.
d. Hydrogen concentration (pH)

In general, the mushroom will grow well at a pH less than 7 (in an acidic to neutral atmosphere). Optimum growth will be achieved at pH 4.5 to 5.5.

e. Food Material

Mushrooms require food of substances contained in wood such as cellulose, hemicellulose, and lignin and other cell contents substances. Cellulose, hemicellulose, lignin comprising wood are present as macromolecules that are too large and insoluble in water to be directly assimilated by the fungus.

2. Application

According to Buyens (2001) application is a software unit created to serve the needs of various activities. If you will develop your own application program, then to write the application program, it needs a programming language that is language software, which can take the form of assembler, compiler or interpreter. So the language software is the language and the program written is an application program. Language software functions in order to write programs with easier language and will translate in machine language to be understood by the computer.

2.1 Mobile application

Mobile applications are consist of software/set of program that runs on a mobile device and perform certain tasks for the user. The mobile application is a new and fast developing segment of the global Information and Communication Technology. The mobile application is easy, user-friendly, inexpensive, downloadable and run-able in most of the mobile phone including inexpensive and entry-level phone. The mobile application has wide uses for its vast functioning area like calling, messaging, browsing, chatting, social network communication, audio, video, game etc.

3. Mockup

A mockup is a static high-profile visual design draft of a design or device, used to represent the structure of information, visualize the content and demonstrate the basic functionalities in a static way. Unlike wireframe, mockups provide visual details, such as colors and typography. While wireframes are design placeholders, mockups
are built to give the viewer a more realistic impression of how the end product will look. As Marcelo Graciolli explains: “While the mockup furthers the wireframe’s purpose of documentation and organizing the team’s vision, it has an extra advantage that the wireframe does not: with its superior visuals, the mockup is more useful to stakeholders and investors.” Essentially, the mockup adds visual richness to the foundation laid out by the wireframe.

4. User Interface

The UI (User Interface) is defined as a bridge between users (users) and products through a visual display. Both in terms of shape, color, writing (typography) so that the product can provide interesting interactions for users.

The main purpose of UI is to facilitate users when using a product effectively. Simply put, UI Design is how a product is visible to the user's eyes.

5. User Experience

UX (User Experience) is defined as the user experience when using or interacting with a product. UX is subjective because it relies heavily on individual perceptions and thoughts, which are related to the system and what they feel when using a product.

For this reason, the UX Design process is carried out, namely the process of making a product easy and not confusing when used by the user.

B. Data Of Firmitas Aspect Of Design Work

1. Unified Modeling Language (UML)

The Unified Modeling Language (UML) is “a standard language for writing software blueprints. UML may be used to visualize, specify, construct, and document the artifacts of a software-intensive system”. UML purposed was to provide the development community with a stable and common design language that could be used to develop and build computer applications.[5] The most useful, standard UML diagrams are use case diagram, class diagram, sequence diagram, statechart diagram, activity diagram, component diagram, and deployment diagram. The UML is a de facto standard for object-oriented modelling, so use-cases and use-case-based elicitation is increasingly used for requirements elicitation.[6]
1.1 Use case diagram

Use-cases are a scenario-based technique for requirements elicitation which was first introduced in the Objectory method. Actors in the process are represented as stick figures, and each class of interaction is represented as a named ellipse. The set of use-cases represents all of the possible interactions to be represented in the system requirements. Use-cases identify the individual interactions with the system.[7] A use-case diagram is typically used to communicate the high-level functions of the system and the system's scope.[5]

2. Technology needed

1. Laptop

It takes a laptop with qualified specifications in order to design graphics smoothly.

2. Software

Software in question is a graphics processing software whether it is based vector or bitmap, and mockup creation for apps.

3. Logo

David E. Carter (as quoted by Kurniawan, 2008) also explained "the logo is the identity of a company in a visual form that is applied in various facilities and activities as a form of visual communication. The logo can also be referred to as a symbol, a sign of a picture, a trademark that serves as a symbol of the identity of a business entity and that is a characteristic of the company".

C. Data Of Venustas Aspekt Of Design Work

1. Layout

Layout is a field so that it forms an artistic arrangement. The main purpose of the layout is to arrange the elements of the picture and text in such a way as to be communicative with the aim of making it easier for the reader to receive the information presented and look more attractive.

1.1 Layout Principle

Layout principles include sequence, emphasis, balance, unity, and consistency. Sequence refers to the reading flow. Emphasis refers to important objects in the order of reading. The balance refers to the division of weight of
space, including the content and empty space. Unity refers to the effort to
create unity of objects, including overall space. Consistency refers to the
aesthetic control of the overall appearance. Consistency is increasingly felt in
periodic publishing. Consistency other than aesthetic control is especially
useful for the overall coordination of the material in the layout.

1.2 Grid System

A grid creates as a solution to the problem of structuring visual elements
in a space. The grid system as a device to facilitate the creation of a visual
component. Using a grid system that can be used to make a systematics to
maintain consistency in repetition of a composition that has been created. The
main purpose of using the grid system in graphic design is to be communicative
and aesthetically satisfying.

2. Typography

According to Hendri Hendratman in Guruh (2008: 15) explained that
typography is the art of selecting and arranging letters in space to create a special
impression, so that readers can read as much as possible. Typographic development
develops from a manual method by hand drawn to using a computer. With
computers, the use of typography becomes easier and faster with a choice of varied
letters. The types of fonts are so many, but can still be categorized as follows:

a. Hookless Letters (Sans Serif)

Letters that do not have a hook (hook) is only stems and stalks. Example:
Arial, Avant Garde, Switzerland, Vaground and others. The edge of the
letter can be sharp or blunt. Letter that has a less formal, simple, familiar
character. This letter has the advantage of being very easy to read. Fonts
that are suitable for design letters on computer screens, television designs
and other electronic media.

Figure 2 Sans Serif Font
Source by Google
b. Hook Letters (Serif)

Letters that have hooks on the ends. Example: New Times Roman, Garamond, Dwitan, Tiffany and others. This letter is formal, elegant, luxurious, elegant, intellectual. This letter when compared to Sans Serif font is less easy to read. This letter is suitable for design in print media such as newspapers, theses, brochures and others.

![Serif Font](http://digilib.mercubuana.ac.id/)

Figure 3 Serif Font
Source by Google

c. Writing Font (Script)

The letters that are each related are like handwriting. Example: Brush Script, Shelley, Mystral, Comic Sans, Lucida Handwriting and others. Letters that have graceful, traditional, personal, informal characteristics. Letters that are less easy to read, so it is recommended not to use too much and too small. Fonts that are suitable for design at wedding invitations, birthdays, families, traditional ceremonies and others.

![Script Font](http://digilib.mercubuana.ac.id/)

Figure 4 Script Font
Source by Google

d. Decorative Letters

Letter that every part is made in detail, complex and complicated. Example: Augsburger Initial, English and others. Letter of character luxurious, free, traditional graceful. This letter is usually very difficult to read, only one letter is good, don't appear one word. The letter should be used for decoration, accents, the initial letter of the paragraph article, wedding logo, company logo.
The letters whose form can be the same as the Sans Serif or Serif letters. The thing that distinguishes is the distance and space of each letter are the same, for example the distance and space of the letter 'i' and 'm' are calculated as ". Example: Courier, Monotype, Lucida Console and others.

This letter is formal, simple, futuristic, rigid like a typewriter. Fonts that can be said to be easy to read, but seem less neat and efficient space if they appear too much. This letter is suitable for displaying the code / language of the program on a computer, alternative music group logo or grunge.

monospace letters

Each letter form has its own uniqueness. But the point remains within certain limits such as body size, baseline, meanline, x-height, descender, and ascender.
If using capitalize will consist of simpler boundaries, namely capline, baseline, and capital height.

Each letter also has a general anatomical basis is the stem, the tip (terminal) or stalk.

As we know in word processing software such as Word and graphic software in general, always provides a selection of fonts and characteristics such as: Bold, Italic and Underline.
1. **Bold**

   Bold text will invite attention because it contrasts with normal letters. Usually used in titles or subtitles. Too many bold letters will blur the focus on meaning.

2. **Italic**

   The Italic text will attract the eye because it contrasts with normal text. Too long sentences with italic text will be difficult to read, especially if used on a computer screen. Many italic texts are used if there are foreign words.

3. **Underline**

   Text with an underline usually indicates something important. Can also be used to mark hyperlinks on the web.

4. **Color**

   According to many psychologists, color is considered to affect a person's psyche and character because it relies heavily on subjective factors, so everyone has a different perspective in choosing colors. Colors are also very important for life. Even colors are often used as symbols and characteristics of certain ethnicities and countries, as the most common example is the red color which is very identical to oriental or Chinese culture. Color can cause emotions.

   *Colors, like features, follow the changes of the emotions.* — Pablo Picasso

   According to research, color can affect mood and cause changes in feelings. Some colors can increase blood pressure, increase metabolism, and eye strain. In some countries such as Egypt and China even colors are used as a healing therapy called Chromotherapy.
Philosophically each color has different meanings.

- Red: Spirit, Strong, Important, Aggressive
- Blue: Calm, Relax, Safe, Reliable
- Green: Natural, Fresh, Stable
- Yellow: Happy, Friendly, Remind
- Orange: Cheerful, Fresh, Cheap
- Purple: Luxury, Romantic, Mysterious
- Pink: Feminine, Young
- Chocolate: Natural, Traditional
- Black: Strong, Sharp
- White: Clean, Simple, Holy
- Gray: Formal, Neutral

Broadly speaking, colors can be categorized into three groups: cold colors (blue, green, purple), hot colors (red, pink, orange, yellow), and neutral colors (black, white, gray, brown).

**Color scheme for interface design**

In theory, there are several types of techniques for "mixing" colors in interface design. The following are:

a. Monochromatic
Monochromatic is a color selection technique using one dominant / strong color. This technique creates a minimalistic and harmonious atmosphere as a whole.

For example the use of blue as the dominant color and other important elements.

![Figure 11 Monochromatic](http://digilib.mercubuana.ac.id/)

b. Analogous

This technique is almost the same as monochromatic, only added additional color accents taken by sliding the colors on the palette.

Suppose we use cold colors: blue, then additional colors are taken by sliding the palette slightly towards green or purple to get the derivative.
c. Complementary

Complementary techniques is to combine contrasting colors or counterclockwise to create the impression of "inviting" the firm. By using this technique, the division of functions or context becomes clear.

Suppose the dominant color used is blue, pink can be chosen as a secondary color.

This pink color can later be used for the color of the main button or other interactions. When applied with good consistency, this color scheme will stimulate the user to remember that pink is the color of the button to trigger interaction.
d. Split-complementary

This technique is a development of complementary techniques. The difference is the use of additional colors from each dominant color derivative.

For example, the main colors are blue and pink, so the additional colors are taken from the blue and pink derivatives.
e. Triadic

This technique uses three colors, each of which is equally strong (not derived from each other).

Suppose we use blue as the main color, green as the color of the content (graph, icon, etc.), and pink as the button.

This technique is usually used to create interfaces with varying content or complex functions.
f. Rectangular Tetradic

This technique uses two pairs of complementary colors.

For example, before we have used blue and pink, we can add another pair of colors that are not too far from the color, for example purple and orange.

This technique is a little tricky because it needs extra attention to maintain consistency in its application.