Visual Exploration through Visual Communication Design
Work Creation as an Introduction Attempt of Marine
Biodiversity phase 2 – Nudibranchs

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Abstract. Nudibranchs are a part of marine biota that have a very interesting visual
appearance. There are over 3,000 species of nudibranchs that have been discovered. Their
varied visual appearances, in both shapes and colours, have made nudibranchs very popular in
Underwater Macro Photography (UMP). Nudibranchs' visual appearances can be a big
potential if processed through visual communication design, especially illustration. Nudibranchs' visual strength and illustration's fluidity can give life to nudibranchs' visual
appearances and make them a part of Indonesia's maritime culture. By introducing nudibranchs
to Indonesians, especially the young generations, the researchers hope that the young
generations will gain more interest in the ocean. This research seeks to elevate nudibranchs as
maritime visual ambassadors in the effort of developing Indonesians' maritime paradigm.

1. Introduction
In the first phase of the research, there are a few things that could be summarised. First, marine biota
is very diverse and to make it a reference for a focused visual creation, the marine biota samples need
to be narrowed down. The researchers decided to choose nudibranchs as their sample. Second, the
process of collecting visual samples needs the support of both good skill and proper camera
set(equipment?). The process is also time-consumming and it needs a relatively big fund. Besides
collecting independent samples, in phase two of this research, the researchers will also use references
of existing visual samples to have a sufficient sample quantity.

Nudibranchs are considered to be suitable for being the visual ambassadors in this research. There
are a few things taken into this consideration, first, nudibranchs are a unique species. Visually, they
have a shape, texture, and colours that cannot be found in other animals on land, making nudibranchs
different and unique. Second, nudibranchs' diversity is extraordinary, as there are 3,000 species of it
that have been discovered [1], each of them having different shapes and colours. The shapes and
colours are a strong foundation to later be developed to different visual treatments. Third, nudibranchs
have been a big favourite in the Underwater Macro Photography (UMP) world. It has been an
important resource in the development of the diving tourism potential in many areas. UMP is one of the special-interest activities on diving tours that prioritise using marine biota as commodity objects [2]. The interest in nudibranchs that has been around in the diving community can influence other social communities and help develop a maritime paradigm that in its philosophical level can act as an effort to preserve and develop culture. Visual Communication Design can also help spread awareness about maritime paradigms through work creation process. In a term written by Acep Saidi, there is a need to create a work that is manifested in material culture. It is important to know how to interpret the beauty of underwater life from something that only has a natural nature to it, to a cultural object that has a value, a meaning, and its own philosophy. This cultural object can then be close and attach itself to humans, being an important part in shaping a human's spirit, myths surrounding the beauty and the sacredness of it. These things, if passed from generations to generations, will eventually raise awareness on how important it is to conserve underwater life [3]. The creation of a visual artifact can be a way of showing the importance of underwater life conservation.

2. Goal and Urgency
This research seeks to collect visual data of nudibranchs and start the early process of visual artifact creation in the effort of raising awareness about underwater life and developing Indonesians' maritime paradigm as the people who love the ocean. The presence of nudibranchs among wider communities, outside the Underwater Photography world, is expected to gain people's interest in the ocean, especially its underwater life.

It is estimated that by 2030, coral reef damage will reach 60% [4]; plastic pollution is still the main threat to survival of marine biota, starting from a microscopic scale of pollution to a big one, such as plastic entanglement and ingestion among fishes, sea turtles, and other types of marine life [5]. Both things mentioned above have eventually worsened Earth's condition and directly affected human life.

Indonesia is currently working on its improvement. President Joko Widodo has emphasised the concept of transforming Indonesia as a global maritime axis [6]. The concept is included in his programs. It is important to develop a maritime paradigm and implement it in developments in every field, including social-cultural field. This situation opens a door of opportunity for the Visual Communication Design world to take part in it actively.

Indonesians need to keep raising their awareness as the people of a maritime nation. The development of a maritime socio-cultural foundation is important so that the exploitation of marine resources will not turn into a disaster as has happened in the mainland sector [7]. Developing a maritime paradigm does not only need a direct approach but also socialisation and enculturation of cultural values in some aspects of life, like literature, art, and so on; by using formal and informal education systems; crossing communities and cross-cultural differences. This exposure is important to maintain and enhance the maritime spirit in asserting the identity of Indonesian people as a maritime nation.

The ocean in Visual Communication Design has been an inspiration in both research and the creation of visual artifacts. Visual artifacts creation can help boost visual teaching, stimulate imagination and creativity, and find new methods. In Visual Communication Design, the ocean has transformed into symbols, motifs, and an art expression that makes it more than just a part of nature that has a distance from humans. Unfortunately, the marine species used in visual experiences are usually the ones that have been widely known and there has not been any exploration on specific marine species. On the other hand, the understanding of people or communities is no further than the widely known species, so the presence of research does not encourage additional insight into marine species. In the end, people keep struggling with the same visuals over and over again, when in reality, there are numerous marine species with diverse visual appearances. One of the species is nudibranchs, that has never been explored in a Visual Communication Design research.

Underwater ecosystems are not easily accessible, even for those involved in marine science. Introducing the diverse underwater biota to wider communities can help them get to know the unknown side of the underwater world. The researchers believe that nudibranchs would increase
people's interest in marine biota, especially underwater life. Nudibranchs have a big potential in being the visual agent of the ocean's culture, that not only works to preserve the nature but also offers a new embodiment that can indirectly revive a maritime culture and its spirit that can later be implemented in the socio-cultural-economic aspects of Indonesian people. In this case, creating illustration works of nudibranchs can be a creative solution that will not turn into the same visuals and will be accepted more easily [8]. This research aims to look deeper into the visual potential of Nudibranch in the context of the world of graphics. Can it be develop in many branches of graphical approach as an economic - cultural artefact? Which approach will give the best result and impact in the development and the preservation of Indonesian marine culture. This creative approaches includes cognitive skills: analogical reasoning and abstract thinking that can be done at various levels of meaning. This process can be defined through relevance, recognition, verification, belief, and curiosity [9].

3. Method

The effort of discovering a new visual language will always take position as art and design. In its creative process, it does not only respond to reality, but it also creates a new reality that may appear strange, but has the potential of raising awareness and creating a new style and trend. It is not only able to solve problems from an existing structure, but also able to restructure it altogether [3].

It can go back and forth as art and design to be able to go through the public. As art, it does not only meet the market demand, but also brings tensions to create a new market, making it the reason why it seems to be independent and exclusive. As design, it should not have any distance with the market, it needs to have a public aesthetic so it can be functional and can portray itself as a cultural strategy [3]. The pull of these two things, art and design, is important for it to be a strong agent of change.

The creation process which is both an autobiography and ethnography is inspired and can be modified from this art and design creation process scheme by Acep Saidi:

![Figure 1. Creation Process Scheme. Diagram by researchers](image-url)
4. Visual Approach

4.1. Nudibranchs

Nudibranchs (pronounced: noo-dee-branch) are a part of Mollusca phylum; Gastropod class, which is a type of marine animal with a soft body, like snails or slugs. The word "nudibranch" comes from the Latin words *nudus* which means naked and *branchia* which means gills. These words show the characteristic of this animal which belongs in the Opisthobranchs family: sea slugs which shed half or all of their shell [10].

Nudibranchs are divided into two main kinds, Dorids and Eolids [11]. The main difference of their anatomy is Dorids have their branchial (gill) plume located on the posterior part of the body, while Eolids have cerata spread across their backs that work as both a respiratory and self-defense organ.

![Dorids (Wilan's Chomodoris)](image1)

![Eolids (Blue Dragon)](image2)

**Figure 2.** Differences in the anatomy of Dorids and Eolids nudibranchs. Pictures by researchers

Nudibranchs live at the bottom of the sea, crawling on sand or coral reefs by using their whole muscles on the bottom part of their body. These muscles move like sea waves and in some other kinds of nudibranchs, these muscles enable them to swim [11].

Nudibranchs typical anatomies are:

- **Rhinophores:** shaped like a pair of antennas, often mistaken as eyes or ears when in fact they are a sensory organ used as a chemical substance to look for food underwater.
- **Branchial Plume:** shaped like flowers. A nudibranch can have some "hairy" cone-shaped columns of branchial plume, functioning as gills to breathe.
- **Cerata:** shaped like small tubes that function to process food. The tip of the cerata has poison or a stinger that works as self-defense.

Nudibranchs sizes vary, but on average their length is around 4-6 cm. Their colours and shapes vary too. Nudibranchs feed on algae, sponge, anemone, and coral. They get their colours from their diet and they make use of these colours as camouflage and to send a warning sign to their predators that they are poisonous [12].

The lifespan of nudibranchs is relatively short which is one year. Nudibranchs are simultaneous hermaphrodite which means they possess a set of reproductive organs for both sexes. A nudibranch can mate with any other nudibranch of their species and produce eggs. An adult nudibranch can lay thousands of ribbon-shaped eggs at one time. Nudibranchs’ species diversity and their various shapes make them unique thus making them interesting to become the visual ambassador of the underwater world.
4.2. Nudibranchs Photography
Underwater Macro Photography (UMP) is one of the methods used to collect visual appearances of nudibranchs. When taking photographs underwater, especially photographs of nudibranchs, some things need to be highlighted such as light refraction that can cause objects to appear larger or closer than they actually are, and the phenomenon of loss of light and colours underwater [13]. The proper camera and lens sets are needed in taking photographs of nudibranchs that are relatively small. A photographer needs to use a camera with a macro zoom lens that can zoom in from 5 to 10 times or more without losing the details of the objects. Other than that, artificial lighting, a strobe light, is also needed to bring back the colour waves that disappear in the depth of the sea columns.

Specific understanding and techniques about manipulating cameras, lenses, and strobe lights are also needed to produce good-quality macro photographs. These good-quality photographs also demand good knowledge of depth of field, focus, bokeh, lighting intensity and direction, background [13], and the most important one, the knowledge of the photograph's subject. In producing photographs of nudibranchs, there are a few things that need to be applied:

- Angles; to be able to correctly portray nudibranchs in photographs, camera angles have to be at eye level or lower and the shots need to be straight-on (frontal angles).
- The proper cropping; to help maintain the focus on the subjects and not on the background or surrounding elements, unless those elements are to help enhance the desired artistic expression.
- Emphasising the symmetry impressing of nudibranchs
- Placing focus on nudibranchs’ rhinophores, while intentional blurring can be used on other parts of the animals.
- Taking photographs of nudibranchs while they are doing certain activities like mating, laying eggs, or showing their symbiotic relationship with emperor shrimps.

In this research, the need of nudibranch photographs is met by independent photography activity and by collecting the photographs from the internet. The photographs are collected from these two sources due to time and fund limitations, and to supply the references needed to create the desired illustration work.

4.3. Illustration
In the world of Visual Communication Design, illustration has become a field that keeps on lasting and evolving with the times. It can transform into things that are close to socio-cultural situations and it can keep up with the always-evolving technological development [14]. Technology allows illustration to flow freely with conventional or digital media that makes it flourish in the current era.

The essence of illustration has two purposes. First, its purpose acts as a way to communicate with the intention of explaining, educating, persuading, or documenting something; and the second purpose is to pass on the sense of aesthetics to trigger certain emotions, such as happiness, sadness, amazement, et cetera [15]. These two purposes enable illustration to have such fluidity to present itself in various media.

In the connection of this research, it is considered suitable to choose illustration as a channel for nudibranchs to help develop a maritime paradigm.

5. Creative Process
Illustration is a broad field of art and its output can be independent and can also be a product or a part of message delivery. In the effort of introducing nudibranchs, there are 3 suitable approaches: aesthetic expression approach, character design approach, and motif and pattern approach.

The foundation of these approaches is the understanding of shapes and how they are a part of visual principle and element [16]. The understanding of shapes is essentially a study of how shapes can deliver a message about certain characters, emotions, and impressions. This can later be developed by including semiotic and communication aspects until it transforms into a more specific meaning.
5.1. Aesthetic Expression
The aesthetic expression approach prioritises the strength of beauty in the effort of touching human emotions and creating an empathetic experience, so that the beauty can enter the soul and leave an impression there.

By using a literature approach, which is figure of speech, the researchers feel that it can help create the empathetic experience. Figures of speech such as, hyperbole, metaphor, association, symbolism will be strongly pictured through visual.

The right combination of visual and figure of speech will create drama, tragedy, and happiness that can leave a great impression in the human soul.

In the aesthetic expression approach, the visual creation of nudibranchs does not only imitate the nudibranchs, but might also add, change, reshape the visual, look at it from a different perspective, and also do visual distortions, turning it into an interesting visual experience.

![Image](image_url)

**Figure 3.** Metaphor used by combining visuals of nudibranch and coral reef (making use of the similar forms of coral reef and the nudibranch's branchial plume). Picture by researchers

The picture above is an example of the application of figure of speech and visual manipulation that can be done in the aesthetic expression approach. This can certainly be explored further with a variation of shapes, colours, objects, shape manipulation of nudibranch's branchial plume and rhinophores, and the use of different figures of speech.

5.2. Character Design
The second approach is done through character design studies. Character design in illustration is widely known, it flourishes in comic creation, animation, and in product design as mascot.

Character design requires verbal and visual definition in a unified concept that supports the storyline that wants to be delivered [17]. The character needs to have soul, certain characteristics, and emotions to make it resemble a figure that can be recognised and understood. This process of giving life or humanising is what is called personification.

Through the process of putting body parts that resemble those of a human, animals or even inanimate objects can transform into a new figure with its own characteristics. By using morphology techniques [18], it is possible to map and design a character as desired, in this case, nudibranchs. Mapping and designing their iconic, semi-realistic, or realistic shapes, characteristics, and movements can help develop the story around the character.

The result of nudibranchs' character design can be turned into an ambassador who helps tell a story about Indonesia's maritime environment to the people and keep the story around for generations.
5.3. Motif and Pattern
The third approach is done through the studies of ornamental variety design. Ornamental varieties have played an important role in the richness of Indonesian culture. They play a part in the decorative and symbolic order of the culture. The presence of ornamental varieties is often close, attached to the body in the form of accessories and clothes, making ornamental varieties an ideal agent of identity.

Turning the visual of nudibranchs into ornamental varieties is able to represent the identity of Indonesians as the people who are close to the maritime world. The ornamental varieties are expected to help introduce people to the maritime world and develop their concern for it.

A stylisation concept is essential in designing motif and pattern in ornamental varieties. A stylisation concept is a concept of creating new forms without losing track of the original forms of the object. The new form can have geometric, abstract, and or biomorphic characteristics. To function as a pattern, an ornamental variety has to be designed repeatedly in a field by using the principles of symmetry, rotation, mirroring, et cetera, to not only fill the field but also follow the layout principles of a visual.

Figure 4. An example of character design - the addition of eyes and a mouth to a nudibranch illustration gives it life and turns it into a figure with characteristics. Picture by researchers

Figure 5. An example of stylisation by applying a certain style as the decorative elements to create a motif, later applied into a pattern. Picture by researchers
6. Conclusion
This research acts as the early mapping of the potential of nudibranchs visual development in the Visual Communication Design world. This research managed to find 3 approaches that are considered suitable to place nudibranchs in the map of graphical approach. The next phase will be to improve those 3 approaches with greater detail and considerations. Such as, to determine the specific species of nudibranch to work with within different approaches (in consideration of its shape, color, et cetera.); to develop the characteristic features in character study development based on cultural aspect, target market, et cetera; to developed visual style related to pattern making technique and material. Then share them with Indonesians, starting from the individual to the community level, to broaden their recognition of nudibranchs. Some of the ways to do it are visual learning through teaching materials, community service and trainings, all by first considering the target characters, interest, etc.

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