

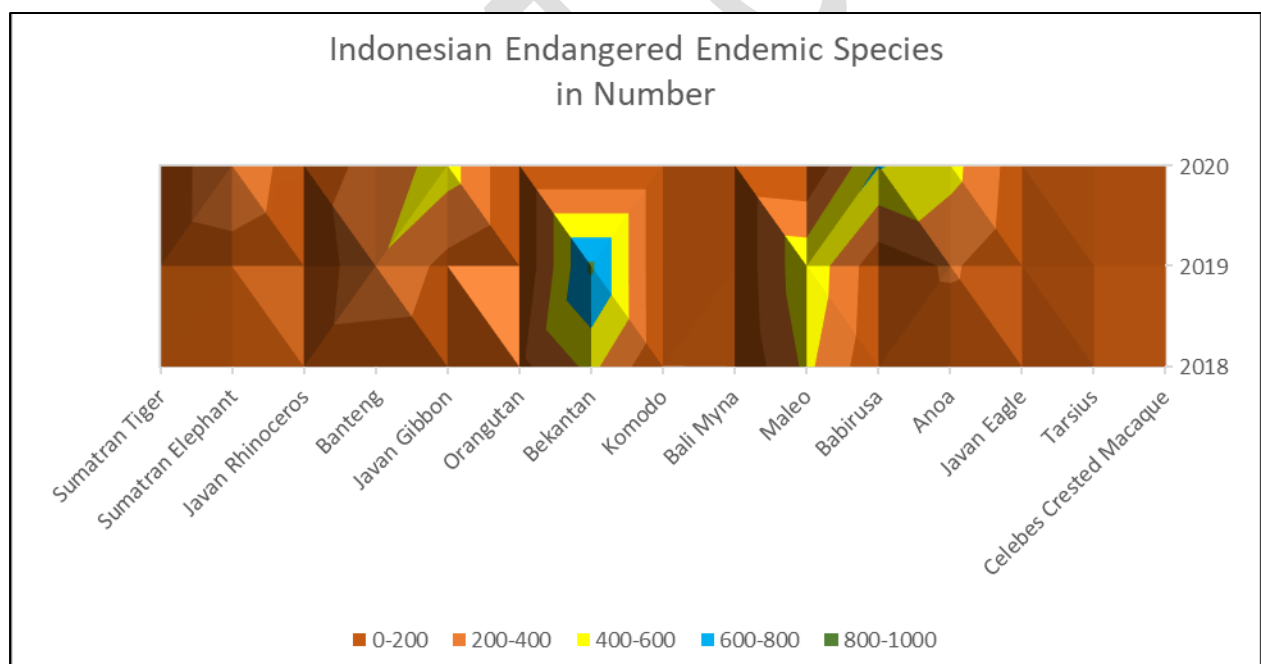
## KOMODO HUB

### A Digital Platform for Community-Supported Animal Conservation

#### BACKGROUND

##### The Problems

Badan Pusat Statistik, the Indonesian Bureau of Statistics, has recently published data on the country's endangered endemic species. Despite spending millions of dollars on conservation efforts, the government might have not seen any significant breakthroughs in the population of some species. The success of Komodo has been largely exclusive, and the world is now left with merely less than 100 Sumatran Tigers, Javan Rhinoceros, Bali Mynas, Javan Eagles, Tarsius, and Celebes Crested Macaques, respectively. Habitat loss remains the primary cause of the problems. Other causes include habitat changes, commercial over-exploitation, the introduction of harmful non-native species, pollution, and the spread of diseases.



##### The Vision

Nevertheless, people have started to realize that this is not just the government's struggle and that communities play an important role in the initiative. Local communities, especially, are the primary stakeholders in such a conservation project, and their involvement is crucial

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to its success. In 2022, Yayasan Komodo (the Komodo Foundation), a not-for-profit organization, was given a substantial amount of funds to initiate the development of a revolutionary digital platform for animal conservation in Indonesia. The proposed digital platform, Komodo Hub, is expected to be fully operational by the end of 2024. Komodo Hub will be the national standard for a conservation digital tool to explore, identify, and protect Indonesian endemic species, educate people about animal conservation, and endorse the involvement of communities.



Image source: The Internet

Yayasan Komodo has envisioned Komodo Hub to be available to citizens nationwide, from remote indigenous communities to regional towns and urban areas. They aim to involve communities and primary schools in the protection and promotion of domestic endangered species. The digital platform will provide registered and non-registered users equal opportunity to access the rich knowledge base of Indonesian endangered endemic species and get involved in a broad range of conservation programs. Komodo Hub will allow registered users to further extend its knowledge base by sharing their records of the species.

## REQUIREMENT COLLECTION

The following are some interviews conducted during the inception phase. In reality, the requirement collection might have involved more stakeholders and potential system users. However, for the sake of clarity and simplicity, only some of them are presented below.

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**INTERVIEW 01:** Bintang Akbar – Teacher at Ujung Raya Primary School, Ujung Kulon

<b>Q</b>	<b><i>Hi. Could you please tell me about your involvement in the initiative?</i></b>
<b>A</b>	<p>Sure, but first, welcome to our school. Here is a very remote area, we are at the Western tip of Java island, so there may not be much you can do. But I hope you are enjoying your time here.</p> <p>About Komodo Hub, several months ago, one of their representatives visited our school and explained that they are initiating a revolutionary program involving more communities, schools, and citizens in general in the conservation of endangered species. Since we are located in Ujung Kulon, which is the main conservation area of the Javan Rhinoceros, they expect us to play a leading role in the program. I personally believe our involvement in the program is a very good move, and it is for a good cause, especially for the students. They will be exposed to a country-level initiative and have the opportunity to learn about and contribute to animal conservation, especially the Javan Rhinoceros.</p>
<b>Q</b>	<b><i>How do you expect the initiative to affect your daily job?</i></b>
<b>A</b>	<p>Well, I am responsible for a class, or several classes, assigned by the school. Every class has a syllabus - the content structure that consists of materials to deliver to students and activities they need to do to achieve the learning objectives. That is my responsibility. Another part of my job is to manage my classes, including admitting students to the classes, assessing my students, generating student progress reports, and engaging with the students through emails, messages, or notes.</p> <p>Now, the plan is to integrate Komodo Hub into our class syllabus and activities. Once our students are enrolled in the initiative, they will have opportunities to access the learning materials, and participate in the programs - either internal, local, regional, or even national, including reporting the sighting of any endangered species.</p>

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<b>Q</b>	<b><i>How do you expect this new app to help with your job?</i></b>
<b>A</b>	As I said, this initiative is for a good cause, so I do not really expect the digital platform to help with my job. We really want to give back to the society. However, I think the app should be easy to use, and can particularly help me develop and manage content and activities related to animal conservation. I know that the app will come with an extensive list of contents and games, so if I can just pick what I want to have in my class, add some information, and publish it for my students to access, that will be good.
<b>Q</b>	<b><i>You said something about engaging with students, can you elaborate?</i></b>
<b>A</b>	<p>Absolutely. Once we start the initiative, the students should be able to do tons of learning and practical activities, both in class and outdoors. Well, part of my job is to assess the students to examine their progress in the program, including whether the process, resources, and structure are effective in helping children achieve their objectives.</p> <p>I need to communicate with my students about their work, appreciate their effort, give instructions on specific activities, or encourage them. Emails will be a more formal way; and if I want a more responsive method, I should be able to directly message my students. I also want to be able to leave notes on the children's work, submissions, photos, sighting reports, <i>et cetera</i>.</p>
<b>Q</b>	<b><i>The student's activities, can you explain more?</i></b>
<b>A</b>	<p>Sure. I think each student needs to have her own digital account that they can personalize to some extent, for instance, the avatar, the colour scheme, <i>et cetera</i>. The digital library they use should be curated carefully because we don't want them uploading inappropriate pictures or graphics. Nevertheless, personalization will make the students feel unique and more appreciated, I believe.</p> <p>Now, in terms of contributing to the initiative, students should be able to see which program they are enrolled in, find the activities related to it, perform the activities, share content, <i>et cetera</i>. They can message me, if they need to, or respond to the notes</p>

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	I leave them on their work. Their work then should be compiled in the school's library which everyone can have a look at and learn from. Be mindful, however, that we do not want the app to disclose students' personal information and profiles as they are sensitive data and can put our students in danger.
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## INTERVIEW 02: Khairunnisa - Principal at Ujung Raya Primary School, Ujung Kulon

<b>Q</b>	<b><i>What do you think of the Komodo Hub initiative?</i></b>
<b>A</b>	<p>Personally, I believe it is going to be great. You know, we are located in Ujung Kulon, one of the main conservation regions in Indonesia, especially for Javan Rhinos. Conservation is one of our stronger qualities as a community, I may say.</p> <p>I know from the meeting with the foundation, government representatives and some communities that this app will be fully packed with programs, learning materials, contents, and activities, which will only help us, especially our teachers and students. Oh, and yes, we are also very honoured to be given the opportunity to get involved in this country-level initiative.</p>
<b>Q</b>	<b><i>Do you know that your school will need to subscribe to the initiative to get the full functionalities?</i></b>
<b>A</b>	<p>Yes, I know, and I don't mind that. I mean, I know that for our school to have a unique profile and to be able to customise our involvement in the initiative, we need to have an account. If the app can support teacher and student registration, that would be great. However, our internal management meeting has decided that only the school's profile and library will be available to the public. I mean, we certainly do not want strangers to be able to see the profiles of our students, don't we? If the app can then give us a feature to generate and distribute a unique access code for our students to access the app, that would be perfect. This is to allow teachers to internally access students' contributions, activities, and progress in a program without having to worry about any data leaked to the public.</p>

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<b>Q</b>	<b><i>And, as part of your job, do you also need to communicate the school's contributions to the public?</i></b>
<b>A</b>	<p>Ah yes, of course. But as I mentioned, the students should be able to upload their work, such as sighting reports on endangered species, to the school account's library. The public should only be able to access this library, but not a student's profile.</p> <p>Internally, we expect the app to allow direct communication between the school management team, teachers, and students only. We already have another digital platform to communicate with parents and our external stakeholders. Mind you, we really need to be careful about whom we can send student data to. For instance, only the assigned teacher of a class has access to student data enrolled in a program, and only the higher-level management can retrieve data of teachers and students. There are very strict data privacy and protection regulations we apply. We don't want any mistakes in this area.</p>

**INTERVIEW 03:** Ayu Lestari - School Admin at Ujung Raya Primary School, Ujung Kulon

<b>Q</b>	<b><i>Hi. What do you know about the Komodo Hub initiative that is in development currently?</i></b>
<b>A</b>	I am very excited about it, really. I think it is a great idea. I only attended one workshop about the initiative several weeks ago, so I may not know much about it. But I understand that the digital platform will really help with running conservation programs on endangered species. So, I fully support the initiative.
<b>Q</b>	<b><i>How do you think it will affect your job?</i></b>
<b>A</b>	Well, I am the school administrator here. So, I assume I will be dealing with the subscription, account registration, enrollment, and similar things related to the app. Of course, I will work closely with the school principal, Mrs. Khairunnisa, as she will be the one with the authority to instruct registration, student enrollment, <i>et cetera</i> . I can't wait for it.

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**INTERVIEW 04:** Asnawi - Account Development at Yayasan Komodo, Jakarta

<b>Q</b>	<b><i>How do you feel about the new initiative?</i></b>
<b>A</b>	<p>Very excited. Extremely excited. I mean, this is like the biggest project with the largest social impact, and the biggest funding, we have ever had so far. This will potentially bring so many changes to Indonesian conservation practices, good changes, for the endangered species, communities, and the country in general. There are obviously very high expectations for the initiative, but we are ready for the challenges.</p>
<b>Q</b>	<b><i>How are you going to be involved in the running of the initiative?</i></b>
<b>A</b>	<p>I will be the Komodo Hub's system administrator - the superuser. Well, I am not an IT person, so I will not be responsible for the technicalities, the development, system maintenance, servers, troubleshooting, those sorts of things. I mean, after you develop the system and the system is fully deployed, you will hand over the system to us and there will be a technology team who will take care of it.</p> <p>I will be, on the other hand, responsible for the running of the initiative from the business perspective. I will be the front line, the first one to contact when schools and communities want to subscribe to our services or have any questions regarding Komodo Hub, the programs, or the foundation. I will be managing accounts, registering schools, registering communities, engaging with schools and communities through email, generating a business dashboard to be presented to stakeholders, <i>et cetera</i>.</p>

**INTERVIEW 05:** Tegar Prayudi - Project Director at the Komodo Hub Initiative, Jakarta

<b>Q</b>	<b><i>Could you tell me more about the initiative?</i></b>
<b>A</b>	<p>Well, we have been in conservation work for decades now, so Komodo Hub will surely be furnished with enhanced knowledge and the technical know-how required to deliver conservation programs involving a broader range of audience, including schools and communities. Komodo Hub is a concentric diversification initiative from our team and Yayasan Komodo to ensure sustainable conservation programs and increase the adoptability of our best conservation practices.</p>

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	<p>For these purposes, Komodo Hub digital services will be delivered on a platform designed to augment user experience and engagement. Komodo Hub should be, to say the least, a combination of a rigorous discovery process, research, and focus group discussions, as well as expertise and advancement in digital technologies.</p>
<b>Q</b>	<p><b><i>Since Komodo Hub will serve specific purposes, what should be the focus of the development here?</i></b></p>
<b>A</b>	<p>Komodo Hub can be used by anyone in general, individually and as a group, throughout Indonesia. However, we need to specify two types of users at the organizational level, which are schools and communities. They are particularly important because, firstly, they are almost everywhere across the country land, which means our programs can cover a vast amount of areas. Secondly, they usually have a very good structure and strong network to support their involvement in our programs.</p> <p>Users at the organizational level will have the authority to register their members, enrol them in our programs, and manage them. The difference between a community-based organization and a school is how the public can see their contributions, be they reports of sightings, essays, news columns, or articles. With communities, the public can access the community's library page and the links to each member's contributions, including their profile page. Schools, on the other hand; we need to treat them differently and make the members, which in this case are students, unavailable to the public. So, the public can only see the school's library page, but not the students' profile pages or any information about them. This is a very important feature as we need to protect students' data.</p> <p>We also have to make sure that we refer to the highest standards of human-system interaction as a guideline in the development of Komodo Hub digital tools, such as ISO 9241-210:2019, or the like. This practice should give us more confidence in our product design and implementation workflow by focusing on usability, interactivity, sustainability, and system security.</p>

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Q	<b><i>We will get into those design principles, but first, could you elaborate on what you mean by usability for Komodo Hub?</i></b>
A	<p>We aim to involve as many people as possible in this initiative. This is conservation from people, by people, to endangered species. The potential users of Komodo Hub will vary from adults to children, and from professionals to students. So, we need to make sure that our digital tools are designed following widely adopted usability principles, for instance, easy to learn, efficient, and error-tolerant. Our digital tools should allow users to build on their knowledge without deliberate effort, for instance, through the smart use of tooltips and navigation signs. Users should be able to navigate through each activity intuitively and complete tasks efficiently, say with only a minimum number of clicks or touches.</p> <p>On top of that, we understand that errors may occur during users' interaction with the system coming from, for instance, mistyping or clicking the wrong button. Komodo Hub should be designed to treat errors by following some principles. Firstly, our design should make it difficult for users to take incorrect actions using distinctive links and action buttons, clear and polite instruction language, and non-technical jargon only. Next, Komodo Hub's interface should be constructed in a way that prevents invalid actions by limiting choices to those which are correct and presenting only appropriate navigation options. Finally, users should be presented with the ability to backtrack and undo or reverse actions to avoid dead-end screens.</p>
Q	<b><i>Now, how do you envision Komodo Hub in terms of interactivity?</i></b>
A	<p>Komodo Hub should be designed to be pleasant and satisfying to use, especially for children. We understand that the visual presentation, including the selection of themes, colours, images and other multimedia elements of the interface, and the characters in Komodo Hub should be the first to capture the user's immediate reaction.</p> <p>Teachers, especially, should be able to further develop a class syllabus by creating a series of in-class and outdoor activities for students. This will allow more flexible and</p>

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	<p>adaptive integration of our programs into the school's curriculum, class agenda, and activities. Komodo Hub should also provide an open-ended experience for all users to self-evaluate their contributions and achievements throughout a program by creating a creative canvas, which is a compilation of materials and assets they created during activities and challenges. This will capture the unique experience of users that they can show others or tell a story about.</p>
<b>Q</b>	<b><i>Could you tell us more about sustainability in the initiative?</i></b>
<b>A</b>	<p>We always envision Komodo Hub as integrated digital services for conservation enthusiasts, communities, and students, and the number of users will be growing vastly every year. To cope with this, Komodo Hub will need an infrastructure with a high level of scalability. Komodo Hub will need to run on a platform with the ability to grow and shrink to meet our needs. We want Komodo Hub to have the flexibility to increase its IT resources, such as processing power, data storage capacity, and networking to cope with the growing number of users, customers, and services. So, to achieve sustainability, Komodo Hub should run on a platform that does not require us to invest in the provision and management of computing infrastructures, such as network, storage, server, and virtualization. The platform should allow us to develop and manage our own digital apps without having to worry about any issues of incompatibility and cross-platform management.</p>
<b>Q</b>	<b><i>What about security?</i></b>
<b>A</b>	<p>Our compliance team is certainly more fluent in talking about this issue than I am. But in short, system security is a very serious matter for Komodo Hub, especially related to data protection as we handle children's data.</p>
<b>Q</b>	<b><i>Last question, how are you going to use Komodo Hub?</i></b>
<b>A</b>	<p>I am in the management team of the Komodo Hub initiative, so, I will be interested in monitoring Komodo Hub from the business point of view. I will need to access Komodo Hub's business dashboard and retrieve data about subscriptions, user behaviour, user demography, service availability, which services are popular, which</p>

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	require replacement, and those sorts of information. They will help me make strategic decisions on how Komodo Hub's services can be improved in the future.
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**INTERVIEW 06:** Besoeki Rachmat - Chairman at #SaveOurAnimals Community, Jakarta

<b>Q</b>	<b><i>Could you tell me about your role in the initiative?</i></b>
<b>A</b>	Well, I am the Chairman of #SaveOurAnimals Community, which was established in 2011. Our community is one of the biggest, if not the biggest, communities in the field of animal conservation and protection. We have 128 offices and representatives in 27 provinces throughout Indonesia with over 3000 members. I believe Yayasan Komodo recognizes our potential, so they asked us to join their initiative. We are really interested in their programs and decided to join and contribute to the conservation programs of Indonesian endangered species.
<b>Q</b>	<b><i>How can Komodo Hub help the community?</i></b>
<b>A</b>	<p>It is not what it can give to the community; it is what we, #SaveOurAnimals, can give to our country and our land. This surely is going to be one of our priority programs. So, I would expect Komodo Hub to give us access to the programs and let us contribute through articles, essays, or columns about Indonesian endangered species and conservation. We can also help with reporting sightings of rare and endangered species and extending Komodo Hub's library.</p> <p>We can help with the registration of our members and Komodo Hub can provide us with our own library page, as well as profile and contribution pages for our members. This way the public can see and appreciate our contributions, both as individuals and as an organization.</p>

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**INTERVIEW 07: Bhaskara - Digital Security Compliance at The Komodo Hub Initiative, Jakarta**

<b>Q</b>	<b><i>Could you tell me about the Komodo Hub initiative?</i></b>
<b>A</b>	Well, the government realizes that we must up our game if we really want to reap the benefits of adopting digital technology. At the same time, we trust our experience and expertise in conservation programs. This initiative is our attempt to pay back our debt to nature and our country's land.
<b>Q</b>	<b><i>What are your biggest concerns about the initiative?</i></b>
<b>A</b>	My job is to make sure that Komodo Hub is built with data protection and system security in mind. We are talking about children's data here, and teachers' data, at schools across Indonesia. They are highly sensitive information. We don't want to take any risks. So, Komodo Hub must apply the highest security measures possible from top to bottom.
<b>Q</b>	<b><i>Can you elaborate?</i></b>
<b>A</b>	Well, to illustrate, Komodo Hub's security measures should be implemented following a point-to-point approach, starting from the front end, the digital tools and services, all the way to the backend, the data storage, server machines, the network, and all the system components. Here, we are talking about server location, data protection, encryption, authentication methods, access and privileges, system availability, recovery time, evaluation, and audit, among others. As I said, we are very serious about this, and we don't take any risks. We will go the full length if necessary. Komodo Hub must satisfy these requirements and comply with our standards before it is launched.

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