



FINAL SYSTEM REPORT
WITH INTEGRITY TEST

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Presented by

FAUNIC

Version No.	Changes	Author	Date
1.0	Initial draft	Faunic	24/10/2020
1.1	Reviewed by team	Faunic	25/10/2020

Version control table



Table of Contents

<u>1.</u>	<u>Introduction</u>	1
<u>2.</u>	<u>Application overview</u>	1
<u>2.1</u>	<u>Project overview</u>	1
<u>2.2</u>	<u>Data sources</u>	2
<u>2.3</u>	<u>Security aspects</u>	5
<u>3.</u>	<u>Integrity test plan</u>	6
<u>4.</u>	<u>Sign-off statement</u>	10



1. Introduction

This report contains the details of our application's final build, along with the integrity test plan and sign-off statement for mentors to complete.

We restate the problem and our solution, as well as the audience for which our system is designed. Potential changes and updates are also included, in light of outstanding issues with our application. We also detail the open data sources used and the security aspects considered in our design and implementation.

This report is to be used as the final step for application acceptance by Monash studio mentors.

2. Application overview

2.1 Project overview

The bushfires of 2019 have brought to public attention the erosion of the ecosystem in Australia. The state of Queensland has the richest animal biodiversity in the country, comprising of 2,678 species as of 2017, but 224 species are currently listed as threatened; and this number has been rising every year for the past 13 years. A major reason for this increase is human impact on natural habitat sites, but there is no education in the standard curriculum on biodiversity and the effects of human activity on it.

To bridge this gap, we have designed a website geared to 9- to 13-year-olds that educates them about the types of, and threats to, endangered species in Queensland. Our application provides them with ways that children can help to save our fauna. It encourages them to include small sustainable practices in their everyday lives, and also shows them how to build backyard habitats for child-friendly animals. Our website builds a long-lasting sense of responsibility in children by fostering a connection with our fauna on the brink of extinction.

Our website is complete according to the tasks detailed on our LeanKit board. However, as our design has changed since ideation, aspects of our initial lean canvas have changed. In particular, as our last iteration's direction shifted (from incorporating games to instructions on building habitats), our website does not contain a metric to measure its effectiveness or success.

A metric that was considered late in our last iteration was to implement a form for users to choose their state or territory of residence and fauna species they have attracted by building a backyard habitat. This could then be displayed on the website in the form of a chart, which could inform later users as to which species they could expect to attract from each habitat by state or territory. This feature could be considered a metric as well as an element to retain users. It was not implemented due to time constraints, but could be considered as part of the future scope.

Our website can be accessed at <https://www.blazingforest.tk>.

2.2 Data sources



Dataset index	Names	Physical access used	Frequency of source updates	Frequency of iteration system updates	Granularity	Copyright details
1	Conservation status of Queensland wildlife https://www.data.qld.gov.au/dataset/a951ca57-a119-40ad-9530e9c20-4222e8a/resource/1c8b4 https://www.data.qld.gov.au/dataset/a951ca57-a119-40ad-9530e9c20-4222e8a/resource/6344ea	CSV	Annually	Annually	Kingdom Class Family Name (scientific, common) Status State	CC BY 4.0 Free to share and adapt, with attribution and no additional restrictions https://creativecommons.org/licenses/by/4.0/
2	Species Profile and Threats Database https://www.environment.gov.au/cgi-bin/sprat/public/publicreports.pl?proc=species	XLS	Annually	Annually	Species Category Presence type	CC BY 3.0 AU Free to share and adapt, with attribution and no additional restrictions https://creativecommons.org/licenses/by/3.0/au/deed.en
3	Threatened Species State Lists https://data.gov.au/data/dataset/ae652011-f39e-4c6c-91b8-1dc2d2dfee8f/resource/c478a397-e1e9-4292-950c-e0f9ed9430c8/download/20200814sps.csv	CSV	When changes are made in the database	Monthly	Name (scientific, common) Threatened status State Class Family	CC BY 3.0 AU Free to share and adapt, with attribution and no additional restrictions https://creativecommons.org/licenses/by/3.0/au/deed.en
4	Images and contents for these endangered animals from the Queensland government website, https://environment.des.qld.gov.au/wildlife/threatened-species/endangered the IUCN Red List of Threatened Species https://www.iucnredlist.org/	JPG, JFIF, TXT	N/A	N/A	N/A	CC BY 4.0 Free to share and adapt, with attribution and no additional restrictions https://creativecommons.org/licenses/by/4.0/ CC BY-SA 3.0 Free to share and adapt, with attribution and no additional restrictions https://creativecommons.org/licenses/by-sa/3.0/
5	Green Kids Guide to Threatened Species: 9 Ways You Can Help http://www.environment.gov.au/biodiversity/threatened/publications/factsheet-green-kids-guide-	TXT	N/A	N/A	N/A	CC BY 3.0 AU Free to share and adapt, with attribution and no additional restrictions



	threatened-species-9-ways					https://creativecommons.org/licenses/by/3.0/au/deed.en
6	<p>YouTube videos for kids' DIY projects</p> <p>https://www.youtube.com/watch?v=wVlyhgZl-X0</p> <p>https://www.youtube.com/watch?v=R1KKz57qnLw</p> <p>https://www.youtube.com/watch?v=N3Xo50640BA</p> <p>https://www.youtube.com/watch?v=Eq3C9g139cc</p> <p>https://www.youtube.com/watch?v=9uVdi-3AqRE</p> <p>https://www.youtube.com/watch?v=tYJ-sQeyDY</p>	Link to YouTube video	N/A	N/A	N/A	<p>©2020 Google</p> <p>Authorised to use https://www.youtube.com/howyoutubeworks/policies/copyright/#overview</p>
7	<p>Plastic from Britannica kids</p> <p>https://kids.britannica.com/kids/article/plastic/400149</p>	Webpage	N/A	N/A	N/A	<p>© Encyclopedia Britannica</p> <p>Free to display and reproduce</p> <p>https://corporate.britannica.com/termsfuse.html</p>
8	<p>Why butterflies are beneficial to the environment</p> <p>https://www.goldcoast.qld.gov.au/documents/bf/Backyard-Biodiversity-%20Butterflies.pdf</p>	Webpage	N/A	N/A	N/A	<p>CC BY 3.0 AU</p> <p>Free to share and adapt, with attribution and no additional restrictions</p> <p>https://creativecommons.org/licenses/by/3.0/au/</p>
9	<p>Engaging with Nature: Butterfly gardens – acting module for teachers</p> <p>http://www.naturalresources.sa.gov.au/files/sharedassets/adelaideandmtloftyranges/nrm/education/amlr-butterfly-garden-taking-action-gen.pdf</p>	PDF	N/A	N/A	N/A	<p>CC BY 4.0</p> <p>Free to share and adapt, with attribution and no additional restrictions</p> <p>https://creativecommons.org/licenses/by/4.0/</p>
10	<p>YouTube videos about building butterfly habitats</p> <p>https://www.youtube.com/watch?v=a9zIFhcKzWk</p> <p>https://www.youtube.com/watch?v=lHxEw1fVKsc</p>	Link to YouTube video	N/A	N/A	N/A	<p>©2020 Google</p> <p>Authorised to use https://www.youtube.com/howyoutubeworks/policies/copyright/#overview</p>
11	Threatened species and ecological communities in Australia	Webpage	N/A	N/A	N/A	<p>CC BY 3.0 AU</p> <p>Free to share and adapt, with attribution and no</p>



	https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-and-ecological-communities-australia					additional restrictions https://creativecommons.org/licenses/by/3.0/au/
12	How to bring birds to your garden https://www.environment.sa.gov.au/goodliving/posts/2017/10/attracting-birds	Webpage	N/A	N/A	N/A	CC BY 3.0 AU Free to share and adapt, with attribution and no additional restrictions https://creativecommons.org/licenses/by/3.0/au/
13	Creating habitat for birds https://www.environment.nsw.gov.au/resources/nature/sbsDrpStage106HabitatForBirds.pdf	PDF	N/A	N/A	N/A	CC BY 4.0 Free to share and adapt, with attribution and no additional restrictions https://creativecommons.org/licenses/by/4.0/
14	YouTube video about building bird habitats https://www.youtube.com/watch?v=wHyIzulXYIA	Link to YouTube video	N/A	N/A	N/A	©2020 Google Authorised to use https://www.youtube.com/howyoutubeworks/policies/copyright/#overview
15	Australian Frogs https://www.environment.gov.au/biodiversity/threatened/publications/factsheet-australian-frogs	Webpage	N/A	N/A	N/A	CC BY 3.0 AU Free to share and adapt, with attribution and no additional restrictions https://creativecommons.org/licenses/by/3.0/au/

Datasets 1, 2 and 3 include the details of endangered fauna in Australia, especially in Queensland. These details include the scientific name, common name, category, threatened status and the states in which they are located. We used these datasets to present visualisations about the current situation of the threatened fauna in Queensland.

Dataset 4 contains the images and contents of these endangered animals, which were used in our website to introduce these fauna's outlook and habits.

Dataset 5 contains information about how children can help to protect the fauna and practice sustainability by themselves, which was utilised for the information for iteration 1.

Dataset 6 is a list of videos on YouTube to introduce several DIY projects for children. We used these videos to tell children how to make some DIY projects for environmental sustainability for protecting biodiversity.

Dataset 7 is a website that presents information about plastics from a child's perspective. We have used this to tell children the dangers of plastic to animals.

Datasets 8 and 9 contain information about the role of butterflies in the ecosystem and why their conservation is important. This will be used to present textual information on the website.



Dataset 10 contains videos about building butterfly habitats that will be embedded on the website.

Dataset 11 contains general information about biodiversity and the threatened species in Australia. This will be used to present textual information on the website.

Datasets 12 and 13 contain information about the role of birds in the ecosystem and why their conservation is important. This will be used to present textual information on the website.

Dataset 14 contains videos about building bird habitats that will be embedded on the website.

Dataset 15 contains information about the role of frogs in the ecosystem and why their conservation is important. This will be used to present textual information on the website.

2.3 Security aspects

- **Man In The Middle attack**

When transmitting the data between the server and the browser, an attacker may interrupt the transmission and access the data. To avoid this attack, we installed secure SSL to help establish and encrypt the transmitted data. Because we used WordPress to develop our project, we used the SSL Zen plugin to install an SSL certificate for the website. This makes the data transmitted more secure by encrypting it.

- **DDoS attack**

DDoS attacks, which are the most common attacks today, can easily waste the bandwidth of the target system. In our project, because we used an AWS student account and set up a small server with 1 core processor, 1 GB RAM and 1MB bandwidth, it is very simple to attack the server. To mitigate this problem, we wrote a simple script that runs in the server every minute. This script detects the number of TCP connections made via the same source IP address and bans the address if it exceeds a certain number. The script is lightweight, so it can run on the student server with little influence on the computation. The script can be downloaded at [https://github.com/hwan0085/Heng-Wang/blob/master/DDOS Mitigation Script.sh](https://github.com/hwan0085/Heng-Wang/blob/master/DDOS%20Mitigation%20Script.sh)

- **SSH security**

In our project, we used a cloud service to host our website in AWS rather than using a real server. Therefore, to attack our server, the attackers only need the IP address, password and username. Normally, the password and the username are default such as ubuntu and ec2-user and if we do not change the password and username, the server may be easily attacked. To mitigate this, we generated a key pair to replace to password to login. The key pair is saved on a local computer, which is difficult to access remotely.

- **Password protection**

For convenience, some developers set their administrator password very simply, such as 123456 or the default password. This is very dangerous because attackers can easily access the system. There is a dictionary which collects the 100,000 most commonly used passwords. To mitigate this issue, the password should be set to be as difficult as possible. To this end, we have used a password generator that randomly provides a password for any length needed. The Java file can be downloaded at <https://github.com/hwan0085/Heng-Wang/blob/master/Generate-Password>



3. Integrity test plan

Date Tested: 24/10/2020**Date Accepted: 24/10/2020****Date Retested: -**

No.	Activity	Pass/Fail	Comments
1	EPIC 1 - Mary wants to know about the current situation of endangered animals in Queensland and why we should save them so that she can learn more about them.	Pass	This functionality is accepted.
1.1	Mary wants to know about the fauna of Queensland and how they are threatened so that she can understand their situation.	Pass	
	1) Mary can click on the "Explore" tab on the navigation bar. She can then click on the "Animal Biodiversity" option. 2) On this page, Mary can read about the fauna biodiversity of Queensland, including the numbers of species by animal kingdom type shown in a bar plot.	Pass	
1.2	Mary wants to know the human impacts on fauna in Queensland so that she can identify the causes and problems leading to their threatened status.	Pass	
	1) Mary can click on the "Explore" tab on the navigation bar. She can then click on the "Animal Biodiversity" option. 2) Mary can scroll down this page to find the list of causes of fauna degradation in Queensland. 2) Mary can also hover over the photo cards which show the human impacts on the fauna, with explanations on the back.	Pass	
2	EPIC 2 - Harry wants to know about what he can do to save the animals.	Pass	This functionality is accepted.
2.1	Harry wants to know about the concept of a sustainable lifestyle so that he can change his habits to save animals in the long run.	Pass	



	<p>1) Harry can click on the "Explore" tab on the navigation bar. He can then click on the "Sustainability" option.</p> <p>2) On this page, Harry can read a definition of sustainability, followed by photo cards which explain the ways in which children can practise sustainability in their day-to-day lives on the back.</p>	Pass	
2.2	Harry wants to know how plastic usage can be reduced by performing some activities so that he can implement it in real life.	Pass	
	<p>1) Harry can click on the "Explore" tab on the navigation bar. He can then click on the "Sustainability" option.</p> <p>2) On this page, Harry can read explanations of the impacts of plastic on biodiversity in the "Kids vs. Plastic" section, using photo cards with explanations on hover.</p> <p>3) Harry can click on the "Take Action" tab on the navigation bar. He can then click on the "Be a sustainability hero" option.</p> <p>4) Harry can watch videos showing simple projects he can do to reduce plastic use.</p>	Pass	
2.3	Harry wants to visit animal conservation centres near him so that he can visit them and be a part of conservation efforts.	Pass	
	<p>1) Harry can click on the "Explore" tab on the navigation bar. He can then click on the "Visit Zoos" option.</p> <p>2) On this page, Harry can see a list of some well-known zoos and animal conservation centres in Queensland.</p>	Pass	



	3) Harry can click on the logos or zoo or conservation centre names to go to the websites, where he can join in their activities.		
3	EPIC 3 - Mark wants to have a learning journey where he gets to know about the endangered animals of each animal class, so that he can learn about the animal's characteristics and learn about how to save them.	Pass	This functionality is accepted.
3.1	Mark wants to know what the endangered animals look like and their basic descriptions so that he can identify them if he encounters any.	Pass	
	<p>1) Mark can select the "Meet Animals" tab from the navigation menu, and then select the animal class (mammal, birds etc). Mark can then select the animal species which he wants to see. This will lead him to the animal species page.</p> <p>2) Mark can scroll through the image slider at the top, which has the pictures of the selected animal.</p> <p>3) Mark can then scroll through the page, which includes basic information about the selected animal in a coloured card.</p>	Pass	
3.2	Mark wants to know the reasons why the animal became endangered and any recovery actions taken to save the animal, so that he can know about any helpful actions that he can perform.	Pass	
	1) Mark can select the "Meet Animals" tab from the navigation menu, and then select the animal class (mammal, birds etc). Mark can then select the animal species which he wants to see. This will lead him to the animal species page.	Pass	



	2) Mark can scroll through the page down to the section "How can you help" that is in a coloured card. This tells him about the causes of that animal becoming endangered, the recovery plan, and the actions that he can perform to help save the animal.		
4	EPIC 4 - Harry wants to build a habitat for the animal species so that he can see how endangered species live and might be able to save them by attracting them to the habitat.	Pass	This functionality is accepted.
4.1	Harry wants to know what type of animal species he might attract with the habitat, to get a brief idea of which animal species he might target to save.	Pass	
	<p>1) Harry can click on the "Take Action" tab from the navigation menu. This will direct him to a page of projects. From here, he can click on the "Build some animal habitats" option to view some possible habitats.</p> <p>2) Harry can then click on one of the habitats. This will direct him to a page for that habitat. There, Harry can read about the endangered animals which may use the habitat, along with the state in which they are found and with images; why saving those animals are essential to the ecosystem; and the causes of natural habitat destruction for those animal species.</p> <p>3) On hovering on the image of a species, Harry can read the physical description of the animal for identification.</p>	Pass	
4.2	Harry wants to know how to build the habitat given the surroundings and needs of the animal species so that he can follow the instructions to build the habitat and attract the animal species.	Pass	



	<p>1) Harry can click on the "Take Action" tab from the navigation menu. This will direct him to a page of projects. From here, he can click on the "Build some animal habitats" option to view some possible habitats.</p> <p>2) Harry can then click on one of the habitats. This will direct him to a page for that habitat. Harry can scroll down to read a step-by-step guide of how to build the habitat. He can also watch videos to guide his implementation.</p>	Pass	
4.3	Harry wants to know the dos and don'ts regarding the habitat so that he can follow the instructions to build an effective habitat.	Pass	
	<p>1) Harry can click on the "Take Action" tab from the navigation menu. This will direct him to a page of projects. From here, he can click on the "Build some animal habitats" option to view some possible habitats.</p> <p>2) Harry can then click on one of the habitats. This will direct him to a page for that habitat. At the bottom of the page, Harry can read about what he should or should not do with the habitat or its surroundings in order to maximise his chances of attracting an animal.</p>	Pass	

4. Sign-off statement

I, Gaurang Pant, have reviewed and approved the functions of the entire system described in this report as fully functional, unless stated otherwise.

I hereby accept the final system, including all the available functions, designed by Faunic on condition that any changes are completed. I will sign off those changes in a further document.

Team member signature: Manali Choudhary



Team member signature: Sophie Li

Team member signature: Heng Wang

Team member signature: Zijie Huang

Date: 24/10/2020

Monash studio mentor signature: _____

Monash studio mentor signature: _____

Date: 2/11/20