



# SYDNEY WILDLIFE

Group 9 - Feasibility Study

14 March 2016 Version 1

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# 1 - Introduction

## 1.1 - Problem Identification

Sydney Wildlife is an organisation that takes in sick and injured animals in the Sydney area, consisting of both staff and volunteers, with an objective to protect Australia's native animals and their natural environments. At the present time, the system used for animal identification, animal health tracking and data storage are all being done through the use of hard paper forms and storage. Our sponsor has approached us with the problem that this system is becoming archaic and burdensome, with large quantities of time being spent on recording information, filing this information and organising it. Our sponsor has also discussed problems that their organisation has with animal identification, and how it is a lengthy and convoluted process at the current time.

These paper forms which are currently being used contain a lot of information. Some of this information may be redundant, for example the same details being repeated multiple times within each form. With electronic form, accuracy is enhanced through the use of predetermined fields, which narrow down possible data entry.

Due to redundancy, inefficiency is built into this business process as it is quite difficult to produce work tasks from the forms without manually sifting through each one individually to collate work tasks to be completed. This makes the job of management much more difficult and time-consuming when it comes to triage planning. Paper forms can also cause complicated filing systems which potentially could allow for vulnerabilities in the system and process and potential loss of information.

There is rich information in the archive forms which is unable to be evaluated effectively due to its paper based nature. Management is also missing out on being able to effectively summarise patient data in order to have a better understanding of their business. If information is recorded immediately there's less chance of mistakes being made or information becoming missing which will need to be estimated at a later date. With an electronic form data can be recorded instantaneously through a browser, which can be optimised in order to exist on mobile platforms as well.

Paper forms can be expensive to produce, maintain and store. There is the risk of damage to the forms and loss of business continuation in an emergency situation such as natural disaster fire or theft. There are a number of stakeholders involved in the business process each of the stakeholders needs to be part of the business process in terms of communication as the process relies on a continuation of services. For example the caller/reporter of the incident the administration workers at Sydney Wildlife the foster parent/carer and the veterinary service provider/clinician. With a paper-based system critical information which needs to flow through to the stakeholders as the patient moves through the system stages is slow and inefficient as the paperwork needs to be delivered manually. Stakeholder information with a paper-based system is insecure in the event of theft, sensitive personal staff details would be exposed.

Animal identification at the current time is an imprecise science. Because of the myriad of different types of animals that exist in the Sydney area, identification is often hard, and can't be performed by volunteers who are the first point of contact when it comes to assessing the animal. Contacting experienced vets or carers is needed if the animal can not be immediately identified, which is inefficient.

## 1.2 - Opportunities

There are many different opportunities that can arise from redesigning the current system. These opportunities relate to making the system more efficient and less costly, and include other benefits to the Sydney Wildlife Organisation.

One opportunity is that the new type of the form will reduce the cost of printing storing and distribution. Wastage will be reduced and the e-forms will be filled out faster because of the nature of the web applications being mobile and having autofill abilities. With a centralised database repository functions like calculate look up and validate will be possible also reducing the time to complete the form.

Another opportunity is that with the availability of modern digital signatures approval of work to be completed or signed off on can be done quickly and easily and the documents stored in the database. The new system will reduce the cost of relaying data because the information will be stored immediately as it's gathered so there is no double handling.

With the move to an online system there is opportunity for application integration to improve overall scheduling and business intelligence, for example the system could be linked to a person's diary or electronic calendar.

There is the opportunity to improve the messaging and communication as well as generally automating most of the critical information through a role based access system where notifications are sent to the user's email or through a notification pushed by system to the user's application on their smartphone or tablet. With a centralised database external business stakeholders can access information from an intranet based platform linked to the database. For example the opportunity exists for suppliers to become self-sufficient thus reducing the internal cost of administering external contractors. As the intake of patients increases that information will be represented on a summary page for users to identify critical supply shortages for food, space accommodation and additional services.

This creates the opportunity to greatly improve the overall service and business enabling it to see reductions in the cost of resources and improvements in throughput. The transition process is a great time to evaluate the business process. Sydney wildlife can evaluate their business process looking to see if they can lean out the business process potentially cutting out some of the irrelevant time costly processes which hindered efficiency previously.

There is also the opportunity to update the old database with some of the archived forms allowing the system to generate reports based on previous reporting periods in order to gain understanding of their expectations in the future. The most relevant opportunity is the chance to rethink the questions asked in the existing form and to concentrate on information that is most vital. The risk of loss of information is reduced completely by

having a centralised database with information secured on servers which are thoroughly backed up and protected. Stakeholder personal information can be encrypted insuring their identity is protected. Work scheduling is easily identified so tasks can be allocated to employees and contractors. With the use of a database with an information system containing groups of functions to identify stages and milestones enables manager to quickly gain understanding of what needs to be done what is outstanding and what is urgent. One of the most noticeable potential improvements will be efficiency enabling any backlog of work to be processed and for a higher volume of patients to be cared for with the same resources.

### 1.3 - Mandates

The main mandate that exists is posed by the NSW National Parks and Wildlife Service - NSW Government. They require all records that have been collected to be submitted annually. These records are currently seldom being collected due to the paper based nature of the system. If these records are collected using the proposed electronic system, it will be much easier to meet this mandate. They also require a decision tree to be used for the identification of new animals being brought into Sydney Wildlife.

Other non third party mandates also exist;

- This solution requires the use of the mobile phone platform.  
People using the app are out and about rescuing and helping wildlife, and therefore do not have easy access to a desktop or laptop computer in the field. This mobile phone platform would enable the use of the system where and when it is most needed in a convenient form.
- A second set of data needs to be collected for scientific reasons.  
Along with the NSW government required data to be collected, Sydney Wildlife has also requested we collect additional scientific data which would aid in research. Extra data such as tracking weight, health status and other measures will have to also be implemented into the collection and data storage / management process, separated from the NSW Parks required data.
- The identification process of animals must be made more efficient, and a decision tree should be used.  
Because the first step of entering the animal into the system and allowing the animal to receive proper treatment is the identification of the animal itself, this process should be made as easy and as efficient as possible. Our sponsor has requested the use of a decision tree system, that is able to be used on mobile phones.
- The system should adhere to the ethical standards of the organisation.  
Because the system will include sensitive information such as the addresses animals were found, carer information and animal health data, the system must adhere to the ethical requirements of Sydney Wildlife and follow any applicable privacy laws.

## 2 - Success Factors

The objective of this project is to improve the assessment and care of incoming wildlife by developing decision trees for when individuals encounter sick, injured or orphaned animals. It will be made into a smart phone app for Sydney Wildlife members, as well as for the general public to use, available on multiple mobile phone platforms. This project focuses on 5 faunas that are common in Sydney: rainbow lorikeet, tawny frogmouth, brushtail possum, ringtail possum and grey headed flying fox. More animals can be added in the future. The mobile app can be used to identify the animal found and whether it is a baby, juvenile or adult. Based on these factors the mobile app can suggest recommended actions, such as leaving the animal alone and contacting the Rescue Hotline immediately or relocating the wildlife to a safe and quiet environment. This project can be considered as a success if the application can consistently display accurate information and provide the best procedure in response to the problems identified. This mobile application minimises the need for personal judgement and emotional response. Sometimes the wildlife found is at a state that is beyond treatment and the only decision is to perform euthanasia.

This mobile application will also incorporate the animal record form. Users can fill in the form on their smartphones and submit them digitally to Sydney Wildlife. This will eliminate the problem of misplacing animal rescue forms. Both Sydney Wildlife and NSW National Parks and Wildlife Service will benefit from this improvement.

There are four members involved in this project and they are Jonathan Wong, Samuel Hickman, Sam Turner and Andrew Bryant. The following table presents the tasks to be done in this project and their due dates.

Task	Due date
Project plan and requirements document	31/3/16
Updated project plan, updated requirements document, design, test cases and prototype	2/5/16
Updated (project plan, requirements document, design, test cases, prototype)	27/5/16
Project presentation and software demonstration, RTM, user manual and final report	9/6/16
Delivery of product to Sydney Wildlife	16/6/16

Tasks will be allocated based on each members' strengths. Samuel and Sam are responsible for developing the mobile application, and Jonathan and Andrew focus more on researching the 5 faunas and the procedures required for handling them. All members are involved in documentation and designing the mobile app. The aim is to develop a prototype by 22<sup>nd</sup> April so that testing can be done as soon as possible and be used by our sponsor to provide feedback. Dummy data will be used to test the decision trees and animal forms. The

decision trees will be considered a success if the application can provide consistent and accurate procedures based on the animals identified and their conditions. The electronic form of the animal record form will be considered a success if users can complete the animal record forms on their mobile phones and be sent to Sydney Wildlife's database system. At the end of the year the data can be compiled and be sent to NSW National Parks and Wildlife Service.

## 3 - Current Situation

Sydney Metropolitan Wildlife Services Inc (Sydney Wildlife) is a voluntary organisation that is dedicated to rescue, rehabilitate and release sick, injured and orphaned native fauna in Sydney. This organisation operates for 24 hours a day, every single day of the year, there are staff at the Rescue Hotline ready to provide answers and advice. Individuals at least 18 years of age can become a member by completing a Rescue and Care course, and after that they become a wildlife rescuer and carer and can help rescue and rehabilitate a wide range of animals.

Currently when an individual discovers a sick, injured or orphaned animal, they would contact the rescue hotline to ask for assistance. The hotline staff will recommend appropriate action depending on the animal identified and its state. For example, some animals should be moved to a quiet and dark location and wait for rescuers to come and retrieve the animal. On the other hand, injured animals such as flying foxes and snakes should not be handled and should call Sydney Wildlife right away, these animals require special handling and need to be rescued by Sydney Wildlife's rescuers. Sometimes it can be difficult for callers to identify animals that are in their infancy. The injured animal will be taken to a veterinarian, to Sydney Wildlife or to a carer's home for foster care, depending on its condition. Sometimes the only course of action is to perform euthanasia the animal to end its suffering.

Staff are required to fill in an animal record form, which includes the caller's personal details, the location where the animal is found and the caller's observation of the animal, the injuries incurred and/or its cause. The animal record forms need to be stored in a secure location for record keeping. Also, at the end of every year Sydney Wildlife is required to submit all animal record forms to NSW National Parks and Wildlife Service. Due to the nature of the forms, being a single piece of A4 paper, it is easy to misplace them and some do not even arrive at the Sydney Wildlife office. It is estimated that only 15% of all incidents are recorded and submitted to NSW National Parks and Wildlife Service.

## 4 - Benefits

### 4.1 - Tangible Benefits

- One of the tangible benefits of our proposed solution is that it allows for a centralised storage system of animal health data and any other required data that the carers/staff of Sydney Wildlife need. Because we will be using a relational database, it can be scaled to fit any growth or extra features Sydney Wildlife may need in the future.

- Another Tangible benefit is the use of e-forms for data collection. At the moment, a paper form that is both long and slightly convoluted is being used to record information related to found and cared for animals. Not only does our e-form solution allow for the convenient recording of information through the use of data entry through a mobile phone, it also links up with our database, allowing for safe and convenient storage of the entered information with no additional manual work.
- Time saving is another tangible benefit that our proposed solution provides. Because the e-form will be shorter through the use of prefilled fields and drop down boxes, among other UI design elements, and the automation of data recording through the use of a database, this saves substantial time when compared to the current way this process is done. The decision tree webapp we are designing will also speed up animal identification, and allow for the whole process to be sped up.
- Security is another tangible benefit that will be provided by our solution. Currently, all information is being stored in a paper storage system. Although there are ways to secure this data such as locks and restricted areas, a secured database will allow only database administrators and specific staff to view the database, allowing for protection of sensitive information, such as carer details, etc.

## 4.2 - Intangible Benefits

- One intangible benefit is reduction of animal health bias. Currently, animals are being assessed partially based on emotional feelings towards the animal. Our sponsor has stated that some carers will not identify animals as having declining health due to biased statements such as “The animal seems more active than before”. Through the use of recording specific medical details of the animals such as weight, diet, etc, it allows a more scientific and unbiased tracking of the animals health. This has intangible benefits for the animal, as through this it allows for more effective treatment of the animal, as well as the carer, who gains job satisfaction from hopefully improving the health of more animals.
- Another intangible benefit is that it improves job satisfaction. Filling out a two page form can be seen as boring, and ideally our e-form system will speed this whole process up. This allows carers to spend less time filling in paperwork and instead performing other tasks they may find more satisfying, therefore directly improving job satisfaction.

# 5 – Alternative Solutions

## 5.1 - Alternative 1: Decision tree application specifically for iOS

**5.1.1 - Advantages:** This would allow the focusing of time and effort on just one version of the application, which would be for Apple’s mobile operating system, IOS. Although IOS does not hold a majority market share in the mobile phone platform market, it is still an extremely prevalent mobile operating system, and would be a widespread solution. The



development of the decision tree as an application would decrease some compatibility issues other solutions possess.

**5.1.2 - Disadvantages:** The focus on just one mobile phone platform does not allow for a very flexible solution, as only apple phone users would be able to use it. These days, there is no one mobile platform and therefore, applications should ideally be developed with multi platform compatibility in mind.

## 5.2 - Alternative 2: Decision tree application specifically for Android

**5.2.1 - Advantages:** This would allow the focusing of time and effort on just one version of the application, which would be for Google's mobile operating system, Android. According to IDC, 70-82% of the world's mobile phone shipments between 2014 and 2015 have been android phones (IDC 2015). This clearly shows that android is one, if not the top, mobile platform in the market in the present day. Developing for such a widespread operating system would provide a solution that could be used by a large portion of staff. Developing the decision tree as a mobile application would decrease some compatibility issues other solutions possess.

**5.2.2 - Disadvantages:** The focus on just one mobile phone platform does not allow for a very flexible solution, as only Android phone users would be able to use it. These days, there is no one mobile platform and therefore, applications should ideally be developed with multi platform compatibility in mind.

## 5.3 - Alternative 3: Decision tree application developed on both Android and Apple Platforms

**5.3.1 - Advantages:** Developing the decision tree for both Android and Apple platforms would allow for widespread use of the application with little outliers, as most of the market is dominated by these two platforms with 91.93% of the market share combined (netmarketshare 2016). Developing the decision tree as a mobile application would decrease some compatibility issues that other solutions possess.

**5.3.2 - Disadvantages:** Developing two applications for two different platforms would require a significant time investment, and this on top of developing an e-form and database, could potentially spread the project too thinly, resulting in a lackluster solution.

## 5.4 - Alternative 4: Development of new paper form for data entry

**5.4.1 - Advantages:** This would simplify this specific portion of the project greatly. Development of the form could be done by someone with no technical knowledge, and could be easily prototyped and developed, with little time investment when compared to an e-form. This would in turn free up time to work on other parts of the project such as the decision tree and database.

**5.4.2 - Disadvantages:** This solution would provide little to no benefit over the current data entry format. Because data entry is already being done using a paper form, it is not

innovative and would have to be done in a way that has not been thought of by Sydney Wildlife staff, which is unlikely. It also does not align with the clients requirements for the solution, and would only add additional work with manual data entry into the database becoming a requirement of the system.

## 5.5 - Alternative 5: No changes being made to current system

**5.5.1 - Advantages:** This approach would be using the already tried and tested method of animal identification, data collection and data storage that is already in place. Although not ideal, it would require no additional resources or costs and would still provide a system that suits the client's needs.

**5.5.2 - Disadvantages:** The main disadvantages with this is that the client desires for the system to be overhauled, therefore defeating the purpose of the project if the system is left unchanged. It does not provide an opportunity to enhance various aspects of the current system, and leaves a fairly dated system in place which wastes staff time to do tasks that could be reasonably automated. The old system's issues such as inaccuracy of animal health data and common paper trail issues will still exist and will not be resolved.

## 5.6 - Alternative 6: Web based decision tree application

**5.6.1 - Advantages:** This approach would involve developing a web application that could be accessed through mobile phones, and potentially a PC as well. It would eliminate nearly all compatibility issues between mobile platforms, and is a very flexible solution. It would also allow easy linking to other parts of the system if this is desired.

**5.6.2 - Disadvantages:** Web applications do not have the same integration levels as something like a mobile application does, such as the facts that it can't use mobile app specific features like push notifications or reminders. There are also issues with compatibility with browsers, although designing the application for the main browsers such as chrome and firefox will alleviate this.

# 6 - Recommended Solution

Each of these alternatives I have outlined all have issues that does not suit the client's requirements or our project constraints, and therefore another solution will be used. Alternative 1 and Alternative 2 are both too inflexible in regards to the project as the solution needs to be compatible in a large environment with many staff members, and having a solution that only works on one platform is unsuitable. Alternative 3 is a good solution that suits the client's requirements, however it requires significant time investment, and instead a webform or web application could be used that would only have to be developed once. Alternative 4 and 5 are both needlessly simple solutions that would not live up to the full potential of our group. They both also do not suit our clients requirements for the solution, and do not solve the many issues that the current system has.

Instead we have decided to go with alternative 6, a web application for the decision tree, as well as an e-form for data entry and a database for data storage. The web application is the most suitable in our opinion as it allows multi platform functionality, that also does not restrict itself to a mobile platform, and could potentially be operated on a computer. Although there are issues with browser compatibility, we will focus on popular browser compatibility, such as chrome, in order to alleviate this. A web application also allows less complex integration when combining this with the other parts of our recommended solution. This solves the difficulty of animal identification that currently exists in the present system. An e-form would be the second part of our solution, and we believe this to be the most appropriate as it allows for a more convenient form of data entry, that is entirely paperless and allows data to be directly fed into a database, automating the process and saving time by increasing efficiency of the system as a whole. The third part of our solution will be to create a database that stores information that is processed through the e-form, and centralises this data in a manageable format, that can be present using queries such as SQL queries, and tied into other future systems such as a website or mobile application.

Due to the time restraints of the project, as well as the skillsets of the members of our team, we have decided to mainly focus on the e-form and database, with the decision tree following up in priority.

## 7 - References

- IDC 2016, *Smartphone OS Market Share, 2015 Q2*, accessed 13 March 2016, available from <<http://www.idc.com/prodserv/smartphone-os-market-share.jsp>>
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