



POLITECNICO
MILANO 1863

Elk River project

Digital Innovation Lab

LUCA COSTA

RICCARDO FACCHINI

NICCOLÒ POZZOLINI

NIKOLA VUKOVIC

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Authors:	Luca Costa - Riccardo Facchini - Niccolò Pozzolini - Nikola Vukovic
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1 Introduction

1.1 The Elk River problem

The Elk is a river in central West Virginia, USA. Elk River watershed is a relatively big but low populated area with Charleston being the only big city. It is characterized by vast natural resources and less developed industry and infrastructure. In 2014, one of the biggest employers in the area was involved in a major ecological incident, namely a chemical spill, which lead to closure of the plant, leaving many people jobless and making impact on the local flora and fauna. Since then, the area has not been able to resume economic development, but still it attracted a lot of tourists, especially fishers who like to enjoy many fishing spots that the river offers. After analyzing the current situation in the area and all groups of people living and visiting the area, it becomes clear that there is room for improving touristic offering to well-being for all.

1.2 Stakeholders

1.3 Definitions, acronyms and abbreviations

What follows is the list of all the main terms and abbreviations used in the document.

1.3.1 Definitions

- **Reservation:** data referring to the wish of the user to have the specified service at that time for himself.
- **System:** All the software needed to deliver every functionality needed.

1.3.2 Acronyms

- **BPMN:** Business Process Model and Notation
- **SDK:** Software Development Kit
- **API:** Application Programming Interface
- **DB:** Database
- **DBMS:** Database Management System

1.3.3 Abbreviations

No other abbreviations aside from acronyms were used.

1.3.4 Revision History

- 29/05/2019 First draft of the basic structure

2 Overall Description

2.1 Proposed project solution

Elk River area resources

Project structure

The final system is going to be divided in two main components:

1. Mobile application version for phones and tablets.
2. Backend structure to support the functioning of the service.

While the backend structure is needed for the functioning of the service provided, the user will never interact with it but will ever only see and use the mobile application. A more detailed view will be explained in [8.1](#)

2.2 Product Functions

TO BE EXPANDED

1. Register to the system with email and password.
2. Logging to the service.
3. Manage the information of an account.
4. Create or delete a reservation.

2.3 User Characteristics

The users interested in using the system should be at least familiar with the concept of using a smartphone in the day to day routine without needing any technical competence regarding the topic, they must be aware of the laws regarding fishing, they should also know how to traverse the environment and have basic first aid knowledge if they wish to work as fishing experts.

2.4 Goals

The project is designed to satisfy the user needs, or (in other words) to achieve certain specific *Goals* stated in the following list.

TO BE EXPANDED

Goal.1: Allow anyone that owns a smartphone to become a registered user of the service.

Goal.2: Create and later manage reservations.

3 Target Group and Personas

3.1 Target Group - Fishing Enthusiasts

The main purpose of the application is to bring closer people living in the area, mainly those that are fishing pros, and people who come to the area because of fishing and other similar activities in the nature, everything to the economic benefit of locals without damaging the already fragile environment. It is expected that it could also attract new people unaware of the region to visit the area. Therefore, the two groups in the focus are:

Locals: they need a new income system, possibly based on a clean use of the natural resources and environment

Others: they want a new and different place where to practice their passion and try different fishing techniques

Two personas representing each of the groups are given in the following section.

3.2 Personas

Bob The Fishing Enthusiast

Bob (40) is father of 2 young children (10 and 12) that has lived his entire life in the small town (700 people) of Webster Springs West Virginia. He used to work at Freedom Industries before the spill of 2014 when shortly after the company filed for bankruptcy and Bob was left without a job. Given that he never attended college and the little possibilities in his hometown, Bob now works at his wife's bakery while he is still searching for another job to help the family put aside some money for the children tuition and health care plan.

Interests: Fishing, camping, hiking, restoring classic cars and classical music.

3 reasons for me to engage with you:

1. I am looking for a new job.
2. I know the territory and believe it can be used for tourism and fishing enthusiasts like myself.
3. I have been fishing all my life and would love to teach people how to fish.

3 reasons for me not to engage with you:

1. I am not sure it would provide enough for my family
2. The water is still not completely clean
3. Too much tourists may destroy the natural environment of the area.

My skills:

Fishing expert, Great sense of direction, it's almost impossible for him to get lost in the local area he has been roaming since childhood, Good survival skills, basic medical training, can cook the best trout on the grill of the state

Typical day:

Bob wakes up with his wife every weekday at 4:40 AM and they both head up to the bakery in order to prepare everything the little community needs during the day. At around 7:00 AM he takes the little van they have for the activity and he starts the delivery for the other businesses of the area and once he is done he goes back home to work on his latest car project until he has to go and pick up the kids from school. Once home again, they eat all together and then he watches some baseball with the kids and then helps them with their homework until it's time for dinner. After the boys are in bed he likes to relax for some time on his chair listening to some classical music before going to bed himself, always waiting for

the next fishing trip during the weekend.

My personality:

Bob is a kind man that has always a smile on his face no matter the situation, he is an optimist at heart and always believes that everything will be alright and no problem can't be solved if people work together. He is always the first one to volunteer when work for the community has to be done and takes pride and joy in helping the others when they are in need, often refusing any form of compensation.

My social environment:

Active member of the community in the small town of Webster Springs West Virginia he is well known and respected. He is usually more forward thinking than the older people that live in town and since he is more accepting of new ideas for the future he often can convince the others to back up new opportunities.

My dreams:

Have an independent job, spend more time with his kids, provide more for his family, buy a 1968 Mustang and then restore it with his children

Jack The Tourist Fisherman

Jack(36) is a father of a little girl (6 years) and lives with her and his wife in Columbus, Ohio. He is an IT technician in a medium size company where he has been working since 2007 and is a respected employee. He never obtained a degree but studies IT in high school and has always been tech savvy. Jack's father always brought him to do outdoors activities when he was younger, from rafting to camping, he always loved playing football until he got a knee injury, but his true passion has always been fishing, which he does to this day with his father and friend.

Interests: Fishing, camping, driving, football, rafting and bowling

3 reasons for me to engage with you:

1. Wants a new place to spend the weekend fishing.
2. He knows how to fish the "usual" way, but he never tried fly fishing.
3. He loves natural places and off the grid camping spots.

3 reasons for me not to engage with you:

1. He's never been to West Virginia.
2. He still doesn't trust the area after the spill.
3. It's a longer drive than usual.

My skills:

Fishing expert, tech enthusiast, problem solver, knows his way in the great outdoors.

Typical day:

Jack wakes up every weekday at 7:00 AM with the family, they all have breakfast together and then he brings his daughter to preschool and then goes to work which starts at 8:00 AM. Around 12:30 AM he heads back home for lunch, which he usually prepares when his wife arrives home with the little girl. After lunch he helps his daughter to bed for the afternoon nap and heads back to work for the afternoon shift. Once home again in the evening they have dinner and spend some more time together watching some TV until it's bedtime for the kid, once she is asleep Jack usually catches up with the latest football updates until it's time for him too to go to sleep.

My personality:

Jack is a loving father and husband, a great friend and he is know at work for his great work ethic. He rarely gets upset and is always glad to learn something new, from a simple fact, to a new tech that is going to change the marker, up to a better way to do his job. He worked for what he has but does not like to remind people of this and is a great teacher, whether it is on the job, at the bowling alley or during a

fishing trip with someone new joining the group.

My social environment:

One of the most experienced people in the company he works for and between the ones that have been there since the early years, Jack is well known and respected by his colleagues and loved by his friends. He is always present at every social event, from birthdays to a quiet evening in the bar.

My dreams:

Become a manager of the company, teach his daughter to fish, buy a house with a pond.

4 Thinking Hats

4.1 White - Factual







4.2 Red - Emotional

4.3 Yellow - Logical

4.4 Black - Cautious

4.5 Green - Out of the box

4.6 Blue - Management

 <p>Factual</p>	<p>Scarcely populated area, zone has been polluted in 2014, avoid eating too many fish, supposedly people lost their jobs after the spill, no economic growth, rich of natural places where it is possible to camp, raft, fish etc.</p> <p>River is not very deep (2m), road are present but not state of the art, no railroad nor public transportation.</p> <p>The only economic/social center is Charleston at one of the ends of the river.</p> <p>The area is already known as a fishing spot.</p>
 <p>Emotional</p>	<p>I feel sad about the situation in the zone and the people living there, it does not feel like a place where I would go to spend my time as it seems to be a shadow of its former self.</p> <p>I would work on the place using the extensive natural resources to bring value to the zone.</p>
 <p>Logical</p>	<p>The lack of jobs and the unemployed could easily start a new work environment based on a new system that we can propose.</p> <p>The area is already known as a fishing spot and we could use that to start a new flow of people as fishing tourists.</p> <p>Given that the river is quite long, the amount of people we can attract is as large as the area can afford to hold and manage.</p> <p>Giving new jobs to the people will surely improve the quality of life in the area.</p>
 <p>Cautious</p>	<p>The health care institution suggest not eating more than one fish per month because of the pollution, the river be a hazard if there is too much rain during a season, while if there is a drought there will not be enough water for fishing.</p> <p>The area is not easily reachable and there aren't many structures where people could spend time.</p> <p>Since the river is not very deep, it is unsuitable to use it with ferries or other boats.</p> <p>During winter there isn't much to do.</p>
 <p>Out of the box</p>	<p>The natural area is ideal for camping and cabins where people could live during the summer as a different type of vacation.</p> <p>Hunting is an option in the woods.</p> <p>Music festivals in the woods are a small but researched type of entertainment. Cryptocurrencies.</p>
 <p>Management</p>	<p>All ideas given can be put in place, probably the safest bet is correlated to fishing as it is the one that requires the least amount of change to the natural area and is already in place in non competitive and non commercial way.</p> <p>Hunting is already practised but it involves safety hazards, especially if we consider a larger number of people being involved.</p>

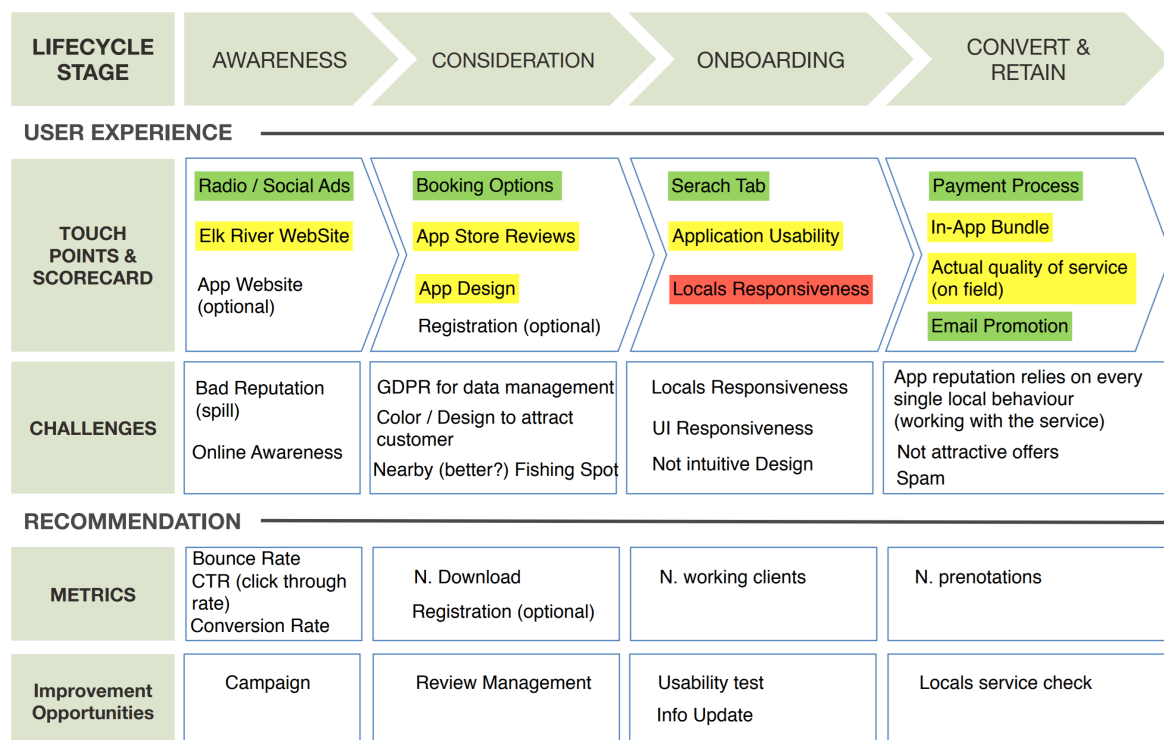


Figure 1: Customer journey map of a person who visits the area and uses services offered by locals

5 Customer Journey

5.1 Awareness phase

5.2 Consideration phase

5.3 Onboarding phase

5.4 Convert and retain phase

6 Business Process Model and Notation

7 Data Analysis

8 Prototype - Mobile Application

8.1 Application Structure

9 Appendix

10 Software & Services Used

1. Texmaker as an editor for \LaTeX .
2. Git & GitKraken
3. Android Studio
4. Firebase