

Project Charter

eVehicle

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Client Tezla

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Version History

Issue	Date	Change
1	23/03/17	Basic information added and start on introduction.
2	23/03/17	Minor changes to Introduction; add vision statement; Start business benefits
3	23/04/17	Started on the objectives
4	23/03/17	Added Vision statement, Project goals and stakeholders
5	24/03/17	Added sections of Success criteria
6	26/03/17	Added in the Scope, Finished Business benefits
7	29/03/17	Edited Stakeholders section
8	30/03/17	Edited Stakeholders section
9	02/04/17	Finished up the assumptions
10	03/04/17	APA style Bibliography draft added

1.0 Introduction

Visas R Us (the **Developer**) have been contracted by Tezla (the **Client**) to design and implement the architecture for a software system (the **System**) to support eVehicle (the **Project**): a battery swap system for electric vehicles. The objective of this project charter is to provide guidance for the Developer by outlining the project vision, objectives and scope of the project as well as identifying key stakeholders, business propositions and success criteria that are associated with the Project.

1.1 Context

As the popularity of electric vehicles continues to rise, the need for an efficient, reliable and scalable system to support the running of these vehicles is increasing in urgency. The Project aims to fulfill this requirement by implementing a universal battery swap system for electric vehicles.

The key aim of the Project is to automate to an extent the management of the batteries and the relationship between the key partners within the business. The software to be developed is a business requirement of the company to track batteries, meet customer needs and handle interactions the company may have with other key partners. The software must be able to track the company's merchandise as they are the owners of the batteries and should be able to keep basic information about the batteries and their location in relation to car or station. The system must also see to customer needs through an online portal where they can get details concerning the status of their battery and payment details and setup. Another key requirement is the software needs to automate to a degree as well as store any information any interactions the company will have with energy suppliers, battery manufacturers and service stations.

1.2 Opportunity

Being a first-mover in this space, the Client is in an advantageous position to shape a global, mass-market industry, and the Developer has a unique opportunity to contribute to this. The Client's proposed battery swap and charge system aims to appeal to all customers by offering variety when charging their car. The key features for the user of the eVehicle system is fixed rates on charging their car, elimination of battery costs when purchasing an electric car as well as no battery maintenance or replacement cost, more options when compared to petrol and greater travel range. The introduction of the software also allows greater control over how users pay and check their cars resources through the portal and custom payment options not able to be implemented in petrol cars.

2.0 Project Vision

2.1 Vision Statement

eVehicle aims to enable the 'eRevolution' by providing electric vehicle owners a safe, reliable and affordable alternative to battery ownership by removing the upfront cost and maintenance responsibilities. Through a universal, automated and "green" approach, eVehicle envisions a world where the electric vehicle experience is the most superior on the market, and our revolutionary technology aims to bring us one step closer to this.

2.2 Project Goal

The goal of the System is to support and enhance an electric vehicle owner's relationship with their batteries. This will be achieved by:

- Providing the customer with the versatility afforded by being able to choose between charging their battery or swapping for a fully charged battery on the spot at a service station.
- Maintenance/emergency/safety stuff
-
- Customer satisfaction (obj: metric like ces or nps) (see above)
- Sustain competitive market rates (vs traditional fuel)
- Demonstrate tangible price discounts between vehicles featuring our system and vehicles which come with the battery
- Footprint in 70% of pre-occupied service station locations

The System will also aim to assist the company in several aspects significant to everyday operation. These include:

- Using GPS to allow tracking of each uniquely identifiable battery.
- Provide detailed statistics describing the usage each battery.
- Battery statistics will also describe which service station has the highest and lowest amount of consumers.
- Supply information regarding stock levels across distribution sites such as service stations and electric vehicle dealerships. (obj: some metric regarding number of out of stocks in a timeframe)

3.0 Objectives

3.1 Provide Competitive Prices

eVehicle aims to provide a significantly lower cost of running to the customer. This will be achieved by working closely with energy providers and through the System's automation of much of the customer interaction, which will lower the businesses operating costs.

<https://avt.inl.gov/sites/default/files/pdf/fsev/costs.pdf>

3.2 Ensure Ease of Access

It is important that customers are able to access eVehicle facilities as easily as traditional fuel facilities. By 2020, eVehicle aims to have batteries available at all dealerships which stock vehicles which use our system as well as 70% of all currently existing service stations.

3.3 Acquire Market Share

eVehicle aims to achieve a 50% market share across electric vehicles manufactured after 2025.

3.4 Provide a Positive User Experience

eVehicle aims to deliver a positive experience for electric vehicle owners by removing the need for maintenance and the risk of failure whilst also providing convenient charging and swapping options. We aim to achieve a 90% customer effort score (Clark, 2013) by 2020.

3.5 Prevent Stock Loss

eVehicle aims to lose less than 1% of all battery stock per year through the use of GPS tracking and usage statistics provided by the System.

3.6 Ensure Availability

eVehicle aims to have less than 10% of distribution points experience an out of stock incident per year.

4.0 Business Benefits

The key partners of the Project are the vehicle owners, the battery manufacturers, the service stations and the energy suppliers. The Project will deliver a number of benefits to each stakeholder, all of which are reflective of the Project's vision.

For vehicle owners:

- Fixed price per swap - no more fluctuating "fuel" prices
- Long-term savings - cheaper to run and maintain an electric vehicle, the Project facilitates this
- Deeper insights into driving habits
- Ability to leverage technology available in the System for multitude benefits - finding nearby service stations
- Greater choice of supplier - universal battery spec means increased competition amongst battery manufacturers, resulting in more choice for vehicle owners and availability of innovative products

For battery manufacturers:

- Implementing a standard for the design of batteries means simpler, cheaper manufacturing.
- Opportunity for niche battery innovations (our battery lasts longer, etc.)
- Early adopters get potential benefit of increased brand awareness and consumer trust.
- Early adopters will get an increase revenue when more consumers make the switch from fuel to electric vehicles.

For service stations:

- Decreased operational costs - the Client will operate maintenance, distribution and customer relations, leaving the service station to focus on driving traffic to their location
- Early adopters get more revenue
- Low/no cost of customer acquisition
- Existing service stations only have to install necessary equipment/infrastructure at existing location i.e. expansion is not required (initially)

For energy suppliers:

- Significantly increased in revenue due to more consumers switching from fuel to electric which creates a brand new customer base.
- Opportunity to expand current footprint and dominate the entire market
- Low/no cost of customer acquisition

5.0 Scope

5.1 In Scope

In order to fulfill the Project's requirements and maximise business benefit, the scope of the Project is limited to the delivery of:

- a customer-facing web portal;
- a distribution management system to support battery distribution, and;
- a battery management system for service stations.

These components of the System will address key functions pertaining to the Project's success, including:

- detection tracking for the batteries;
- registration/deregistration of batteries per user;
- recording battery charge (for billing purposes);
- billing, specifically invoicing and authorizing and making payments;
- stock levels (at service stations and storage facilities), and;
- requesting battery deliveries and repair'

5.2 Out of Scope

Some actors, while somewhat relevant, have been deemed indirect contributors to the Project's goals, and Project's scope explicitly excludes the delivery of:

- the specification of batteries;
- the manufacturing/maintenance of batteries;
- the equipment required for battery swapping;
- an action plan for energy supply sustainability, and;
- the physical delivery of batteries (to service stations, etc.).

5.3 Unresolved

It should be noted that a number of items pertaining to the Project have yet to be determined. These include:

- the specific features that will be made available in the System not yet been determined; it expected that the System's development will be subject to continuing iteration cycles;
- action plans for overcoming varying state/country government laws

6.0 Stakeholders

6.1 Sponsor

- Car Companies, E.g: (Honda, Holden, Toyota, etc)
- Advertising companies
- Electrical components factories

Organization	Name	Designation	Contact	Comments
Tesla	Elon Musk	CEO	Personal contact details are not public Headquarters Hotline: (650) 681-5000	
Tesla	Deepak Ahuja	Chief Financial Officer	Personal contact details are not public Headquarters Hotline: (650) 681-5000	
BMW	Harald Kruger	CEO	Personal contact details are not public Headquarters Hotline: +1 800-831-1117	
BMW	MELANIE KENYON-SMITH	Marketing Coordinator	Personal contact details are not public Headquarters Hotline: +1 800-831-1117	

6.2 Influencers

- GPS Companies such as Google
- Car battery companies, E.g: (Bosch, Century, AC Delco, etc)

Organization	Name	Designation	Contact	Comments
Panasonic	Masahisa Shibata	Senior Vice President, Automotive	Personal contact details are not public	

		& Industrial Systems Company In charge of Automotive Business	Headquarters Hotline: +81-6-6908-1121	
Johnson Matthey Battery Systems	Louise Arnold	Technology Director	Personal contact details are not public Headquarters Hotline: +44 (0)20 7269 8400	
Shell Global	HARRY BREKEL MANS	Projects & Technology Director	Personal contact details are not public Headquarters Hotline: +31 70 377 9111	

6.3 Users

6.3.1 Key Users

- Consumers (Car owners)

Type of end Users	Description	Relation to project objectives
Ordinary Car Users	Ordinary car users are users who are the average car consumers in the market who uses the car for everyday usage, E.g, Consumers who use the cars to go to work and school, etc.	Ordinary car users can give feedback regarding the performance of how stable the car is as they are the largest group of consumers that will be using the car for everyday needs which will provide the most feedback versus the usage of petrol/diesel
Long distance Drivers	Long distance drivers are drivers who use the cars to drive for long distance, more than 5 hours of constant driving	Long distance drivers could give us important information of how long a fully charged battery can last and how convenient it is to find a service station

Delivery Drivers	Delivery drivers are in charge of driving vans and large vehicle.	Delivery drivers normally drive vans and Trucks which can provide important information if the amount of battery is sufficient to power up the vehicle when it is loaded with goods. More amount of batteries or higher power batteries might be needed.
Race Car Drivers	Race car drivers are drivers who normally take part in NASCAR racing or F1 races	Race car drivers are able to provide details if cars are equally powerful to the cars that run on petrol, if the additional weight of the batteries might be a problem to the performance of the cars

6.3.2 Restricted Users

someone who is responsible to respond to people's queries

Type of end Users	Description	Relation to project objectives

6.4 Anti-Users

- Black hackers that might break the batteries code and disrupt the battery

Type of end Users	Description	Relation to project objectives
Hackers	Hackers that might try to sabotage the GPS system, electrical components of the battery	The hackers might take advantage of the electrical system and disable batteries of cars once they get hold of the security chip and overwrite the car's safety and security feature

6.5 Others

E.g infrastructure team

7.0 Success Criteria

7.1 Scope

An accurate representation of the requirements that the software needs to be implemented to perform at a high level. The scope provides a high level description of how the system will deliver the web portal, manage and distribute batteries. The program must also be able to be built upon for future expansion of the company with flexibility to adjust to new requirements.

7.2 Cost

The cost estimate for the project is one that accurately represents the expenditure needed to undergo a software project such as this. This requires reasonable additional funds for errors in initial requirements and for change of the software to take place. The final cost of the project is close to the initial estimate given within reasonable leniency of 15% over or under budget.

7.3 Time

The time taken was close to estimated amount of time taking in consideration for changes in the requirements engineering. The estimates given include times for achieve core and extended goals as well as updates after release.

7.4 Quality

The product given fulfills the requirements outline with little or no faults in code that would make the system skip tasks or become unusable. The system is not vulnerable to anti-user's attacking the system to obtain personal data stored.

7.5 Security

The software is built to protect the data of the company and personal data of the users as well as providing flexibility in the system to make for physical failures in the batteries to protect car owners and service station personnel. A requirement of the system is to protect data from hackers after data stored by the system or misuse any control the system has over batteries. The system must also have the capacity to check batteries for damage or anything that could lead to injury in the swap or charge system.

7.6 User Satisfaction

Users are able to reliably navigate the web portal and make updates to their account through a easy and consistent interface. The web portal provides all necessary interactions to make updates to their account settings and details as well as view their personal history and data that we store of their eVehicle. Security of the system is stable and is at a quality that the users can trust the information stored is secure.

7.7 Customer Satisfaction

The customers of the eVehicle system believe that it is a reliable and quick option to alternative fuel systems in place. The software of the system make interactions between customer and company easy and quick.

7.8 Team Development

The development team is able to understand and accurately translate the task given by the client team and produce all requirements that the system needs for stakeholders and users.

7.9 Other

8.0 Assumptions and Constraints

8.1 Assumptions

Ref. #	Assumption Description
A01	We are the only company that will hold the distribution rights to the batteries, we will not have any other competitors.
A02	We are assuming that all car manufacturers will use our one size fit all battery in any model.
A03	When users chooses the option to charge their car's battery, the charging dock will be able to detect the battery's ID and link it with the owner's account to charge it automatically.
A04	We are not responsible for the maintenance of the docking or charging system kept at service stations they are owned and upkeep by service station, however we have unrestricted access to its data.
A05	Batteries are able to provide any sufficient data required for logging (charge levels, etc.)

8.2 Constraints

Ref. #	Constraint Description
C01	All user interface features must have user testing and be confirmed with the clients before implemented

9.0 References

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<http://www.henley.ac.uk/html/hwss/files/8.1-Customer-Effort-Clark-and-Bryan-2013.pdf>

Tesla management details

<http://ir.tesla.com/management.cfm>

<https://corporateofficehq.com/tesla-motors-corporate-office/>

BMW management details

<http://www.bmw.com.au/en/topics/world-of-bmw/careers/financial-services-careers/team.html>

<https://en.wikipedia.org/wiki/BMW>

https://www.google.com.au/search?safe=active&espv=2&biw=1920&bih=950&q=bmw+headquarters+usa+contact+info&oq=bmw+headquarters+usa&gs_l=serp.3.1.0l3j0i22i30k1l2.157550.162133.0.163573.12.11.0.0.0.0.494.1206.2-3j0j1.4.0....0...1c.1.64.serp..8.4.1205..0i67k1.Qe0Mylki6Lg

Panasonic management details

<http://www.panasonic.com/global/corporate/ir/inquiry.html>

<http://www.panasonic.com/global/corporate/profile/executives.html>

http://www.matthey.com/contactus/general_enquiries

Johnson Matthey Battery Systems management details

<http://www.matthey.com/careers/meet/journeys/research-technology>

Shell management details

<http://www.shell.com/about-us/leadership/executive-committee/harry-brekelmans.html>

<http://www.shell.com/about-us/contact-us.html>

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