Software Requirements Specification

for

Swap-It Bartering Application

Prepared by James Nemecek, Julia Axelrod, Muhammad Haroon and Bose Ali

Deakin University

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Trello - https://trello.com/b/zobcj7AO/agile-board-swap-it-website-based-barter-system

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1. Introduction

1.1 Purpose

The intended purpose of this document is to provide a high-level description of an online web-based application that facilitates product listings and manage communications between sellers and buyers. It will outline the systems purpose and primary features, discuss identified interface requirements, and explore constraints that the system will abide by and operate under.

1.2 Intended Audience and Reading Suggestions

This software requirements specification (SRS) is primarily intended to inform and advise developers, teaching staff, and users of the bartering web application. Furthermore, secondary audiences are identified as interested parties that aim to gain a deep understanding of development processes, bartering applications and web applications.

1.3 Project Scope

This SRS aims to outline a bartering application that allows users to list unwanted household goods or equipment for others to purchase, through payment methods of either agreed upon trade or service. Unlike majority of trading applications that restrict payment to accepting money, this application provides a platform for users to either trade off other items or offer their skilled services as payment. Common services are expected to include, grass cutting, car cleaning, general landscaping, house maintenance, and educational tutoring. This unique approach benefits both sellers and buyers, where sellers are provided with a varied payment selection, whilst giving buyers the opportunity to offer a service to others. This application will further include a login system and chat feature, which is further discussed in section 3.

1.4 References

A software requirements specification template freely provided by Process Impact and authored by Karl E. Wiegers was used to help structure and format information within this document. No further materials or sources were used and referenced throughout this document.

2. Overall Description

2.1 Product Perspective

The Swap-It bartering application is a web application being developed in response to the increasing amount of waste in our communities, generated from people choosing to purchase new goods rather than recycle. This online approach takes inspiration from platforms such as eBay and Facebook marketplace by allowing users to list items they wish to unload. However, unlike majority of online marketplaces, this web application promotes recycling by allowing users to trade items for other items or items for services.

The web application consists of three actors that will interact with the system, including users, developers (admin), and a databasing management solution. Users' initial interaction with the system will be with the login page, guiding users to login to their account or sign up and create an account. Whereas the nominated database will be storing and retrieving data whilst interacting with the login page, the sign-up page, and product listing page.

2.2 Product Features

This web application provides three primary features for users to engage with. Firstly, the Swap-It allows users to create an account which they will need to login to, to post item listings and communicate with other users. Secondly, the system will collate and display a catalogue of listed items to the user, filtered by individual preference. Thirdly, users will be granted the ability of communicating with other users to gain further clarity of the listed item, organise a payment in item or service, or arrange a meet. These features have been selected to help in delivering a bartering application that provides greater clarity of items and promotes positive user to user interaction.

2.3 User Classes and Characteristics

There are predicted to be two general types of users that will use this system, sellers and buyers. The former are individuals who aim to sell an item for another or service. Whereas the latter are people who wish to purchase an item in exchange for an item they possess, or a service they can provide. Both users share equal importance and significance, as both user behaviours contribute to the system and bartering process in working effectively.
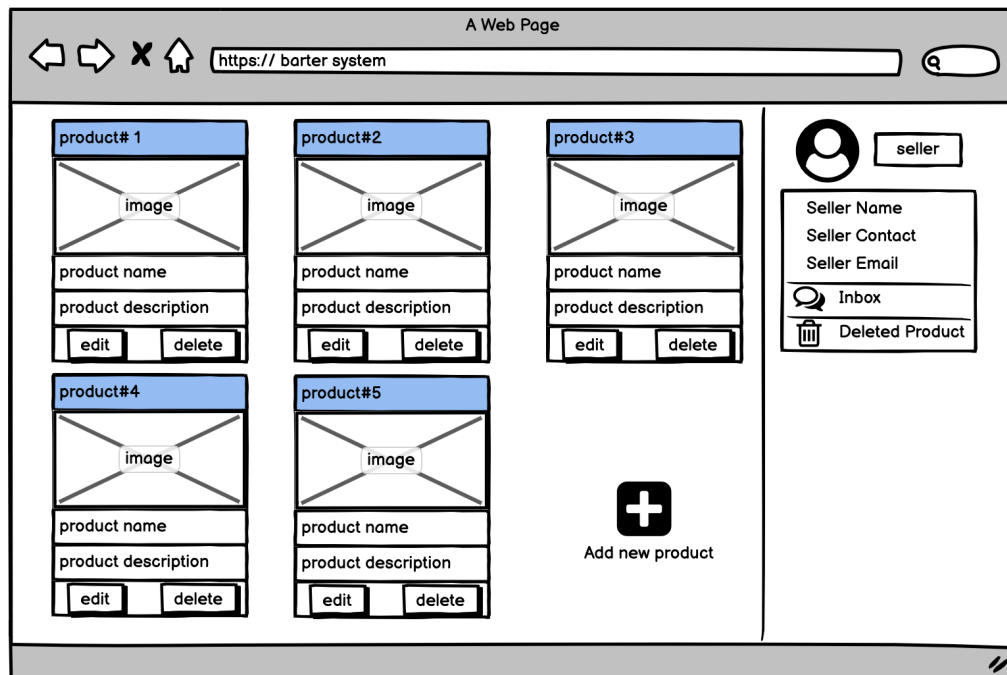
Figure 1 - Item listing wireframe

A wireframe has been created using Balsamiq that illustrates the interface is presented to users when viewing item listings within Swap-It.
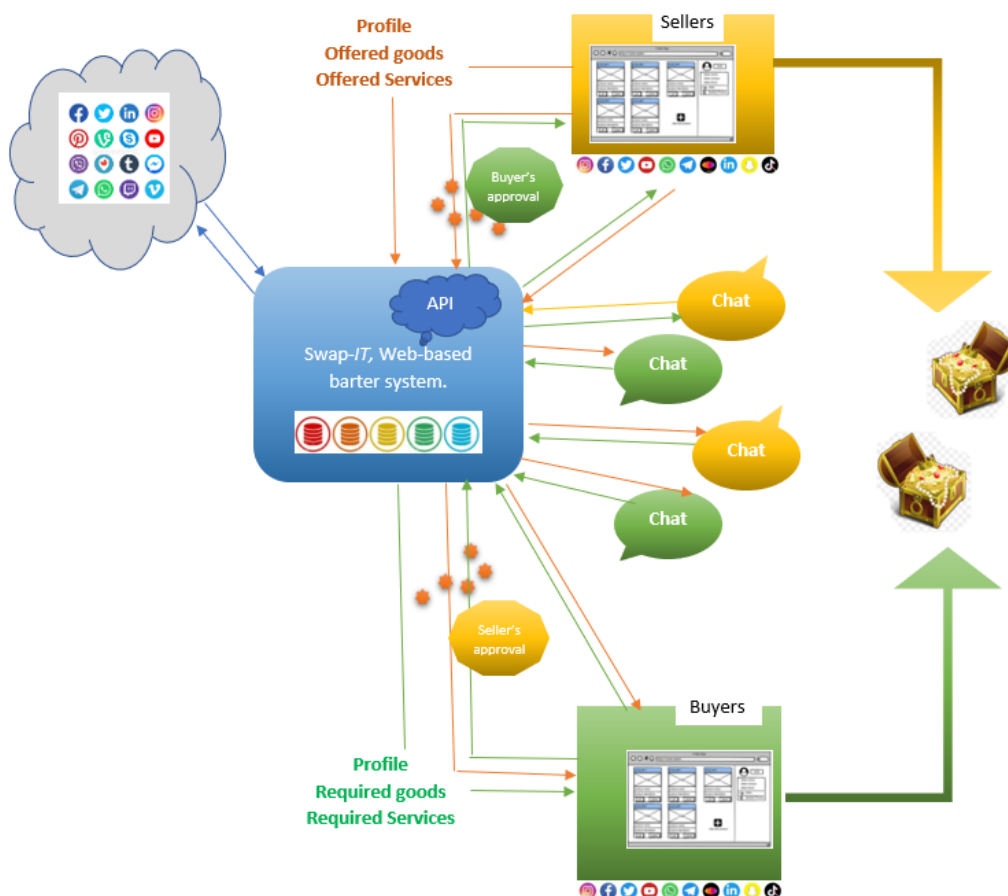

Figure 2 - System behaviour

A context diagram has been created to help visualise system behaviours and interactions between system features and users.

2.4 Operating Environment

The application developed by members is being created on individual machines using Windows, macOS, and Linux operating systems. Moreover, the chosen integrated development environment to help edit and run source code required to generate the application is Visual Studio Code. Upon completion of the project, users will be able to access the application through majority of web browsers on either a computer or mobile device.

2.5 Design and Implementation Constraints

Potential obstacles that may affect the progression of the project include having a 6-week timeline to complete the project. This short time period may impede progress not allowing the developing team to refine and perform rigorous testing within the system, consequently impacting the final deliverable. Furthermore, the developing team aren't all familiar with the programming languages and systems nominated to be used to develop Swap-It. This potential hurdle may cause some features and systems to not be fully developed and implemented.

2.6 User Documentation

Since the application being developed is aiming to be highly user friendly and easy to navigate, video tutorials and live chat helps won't be provided. Alternatively, a brief user guide will be created to inform beginner users of how to use and interact with the web application.

2.7 Assumptions and Dependencies

Currently there are no development factors that aren't stated in this SRS that could affect the identified requirements. Additionally, Swap-It is not expected to be reliant on or dependent on any external or third-party software component or system, which may impact its completion.

3. System Features

The proposed system intends to serve the needs of broader community allowing people from all walks of life and geographic locations to barter goods and services for goods and services. We, authors, intend to provide a platform where people will be able to give surplus items second lease on life and obtain goods they require. Similarly, users may be able to barter services they need or can provide for other services or goods. While at present stage the product will feature basic barter functionality, in perspective multi-stage exchanges will be available where advanced version of our product will be able to form barter chains using intelligent analysis.

Benefit, penalty, cost, risk for features and Priority

Priority of each feature was rated on the basis of its significance for the project to be viable.

Benefit was rated 9 – most significant for operational benefit, 1- least significant.

Penalty was rated as significance of the impact of not having a specific feature – i.e., 9 means that project will not be able to operate.

Cost was rated as time – manpower estimate for development of the feature

Risk - determines how challenging the feature may be to implement for our group, as our skills and knowledge may not compliment some desired features.

We did not perform risk assessment of the proposed project, as we do not plan to implement any identity protection or PID protection at the first stage. Customers will be using it at their own risk. At the same time, the risk for end-user is mitigated by bartering as no payments or financial transacting is planned.

Issues of personal safety while executing the trade are out of scope, and users are advised to follow common sense and situational awareness and rely on local law enforcement for any misadventures.

3.1 System Feature – Sign up and Login

Use Case#	System Feature – Sign up and / or log in.			Functional Requirements
1	**Sign up**		High Priority	
	Stimulus	**Response Sequence**	Priority, B/P/C/R	
	User is required to have access to a device with Internet connectivity			0.0– BYOD, Internet connectivity
	User opens Internet Browser			0.01– Any browser v. after 2017
1.1	User accesses www.swap-it.org; user and does not log in.	Website/home is loaded, keyword search text field is available followed by <Search> button Log in / Sign In controls are available.	High Priority Benefit – 9 Penalty – 9 Cost – 1 Risk - 1	0.10 – Website is not blocked in the country
1.2	User selects "sign in" and fills in required fields – username or email address (*) and password, and presses <Sign Up> button	System verifies input and responds issuing a "Welcome" message User record is created in database and stored encrypted and encoded.	High Priority Benefit – 9 Penalty – 9 Cost – 1 Risk - 1	0.20 – Search database of records matching the user 0.21 – Verify encrypt and encode records 0.22 – If user setup fails, Issue error message and provide facility to re-do sign on.
1.3	**Login for existing user.**			
1.4	User accesses www.swap-it.org; user and attempts log in.	System responds by matching login details with existing record and providing access to the account if login details match the account username and password. No access is provided and error messages is issued if login is unsuccessful.	High Priority Benefit – 9 Penalty – 4 Cost – 5 Risk - 3	0.41 – User account exists on the website 0.42 – User account and password can be verified against login 0.43 – User input is filtered to prevent website hacking 0.44 – user credentials are encrypted 0.45 – user login allows user access to their account 0.46 – user login does not allow access to other accounts 0.47 – without login, no access to account 0.48 – incorrect user name issues error 0.49 – incorrect username / password

				combination issues an error. If error is issued, user cannot access any accounts

3.2 System Feature – Browse and view items

Use Case#	System Feature – Browse and view goods and services – no login			Functional Requirements
1	**Browse available goods and services by keyword – no login.**		High Priority	
	Stimulus	**Response Sequence**	Priority, B/P/C/R	
	User is required to have access to a device with Internet connectivity			1. – BYOD, Internet connectivity
	User opens Internet Browser			1. – Any browser v. after 2017
1.1	User accesses www.swap-it.org; user does not sign in / log in.	Website/home is loaded, keyword search text field is available followed by <Search> button Log in / Sign In controls are available.	High Priority. Benefit – 9 Penalty – 9 Cost – 1 Risk - 1	1.10 – Website is not blocked in the country
1.2	User keys in keyword and presses <Search> button	System responds by presenting list icons of items fitting the search criteria	High Priority Benefit – 9 Penalty – 9 Cost – 3 Risk - 2	1.20 – Search database of items matching the word 1.21 – Ability to display outcome in HTML 1.22 – Search by category works and can be displayed in HTML
2	**Arrange selected available goods and services on the page - no login.**		Med Priority	
2.1	User clicks on drop down control allowing to **view 10 – 20 – 50 – all per page**	System responds by rearranging the view accordingly – per page	Low Priority Benefit – 2 Penalty – 4 Cost – 5 Risk - 3	2.10– HTML capability to display items per page as specified 2.11 – Ability to display icons for each listed item in HTML 2.12 – Search by category or by keyword works and can be displayed in HTML
2.2	User clicks on drop down control allowing to **view by proximity**	System responds by rearranging the view by proximity	Med Priority Benefit – 4 Penalty – 5 Cost – 5 Risk – 6	2.20– HTML capability to display items per page as specified 2.21 – geographic position of the user and the item can be identified

3	**View extended item information - no login.**		High Priority	
3.1	User clicks on item icon control to access Item / Details page	System responds by presenting Item / Details or displays error "No details available for this item	High Priority Benefit – 9 Penalty – 7 Cost – 4 Risk – 2	3.10– route to Item / details exists or error message is issued 3.11 – Ability to display Details page for each listed item in HTML where details exist

3.3 System Feature – Browse and view items

Use Case#	System Feature – Browse and view goods and services, engage with seller. Prerequisite: user has an account and is logged in			**Functional Requirements**
4	**Browse available goods and services by keyword – login.**		High Priority	
	Stimulus	**Response Sequence**	Priority, B/P/C/R	
	User is required to have access to a device with Internet connectivity			4.01– BYOD, Internet connectivity
	User opens Internet Browser			4.02 – Any browser v. after 2017
4.1	User accesses www.swap-it.org	Website/home is loaded, keyword search text field is available followed by <Search> button Log in / Sign In controls are available	High Priority Benefit – 9 Penalty – 9 Cost – 1 Risk - 1	4.10 – Website is not blocked in the country 4.11 – User account exists on the website 4.12 – User account and password can be verified against secure login 4.13 – User input is filtered to prevent website hacking 4.14 – user credentials are encrypted and encoded 4.15 – user login allows user access to their account 4.15 – user login does not allow access to other accounts' 4.16 – without login, no access to any account

4.2	User logs in by keying in username and password Or Email and password	Login is verified by the system and user is greeted or error "Username / Password incorrect" is issued.	High Priority Benefit – 9 Penalty – 9 Cost – 3 Risk - 2	4.21 – incorrect user name issues error 4.22 – incorrect username / password combination issues an error 4.23 – if error is issued, user cannot access any accounts
4.3	User keys in keyword and presses <Search> button	System responds by presenting list icons of items fitting the search criteria	High Priority Benefit – 9 Penalty – 9 Cost – 3 Risk - 2	4.30 – search returns all items satisfying selection criteria 4.31 – search does not return items not satisfying search criteria 4.32 – if no items satisfy search criteria, message is displayed advising user accordingly.
5	**Arrange selected available goods and services on the page - login.**		Med Priority	
5.1	User clicks on drop down control allowing to **view 10 – 20 – 50 – all per page**	System responds by rearranging the view accordingly – per page	Low Priority Benefit – 2 Penalty – 4 Cost – 5 Risk - 3	5.10 – system displays correct listing after rearranging display 5.11 – system displays correct number of icons 5.12 – resorting is fast
5.2	User clicks on drop down control allowing to **view by proximity**	System responds by rearranging the view by proximity	Med Priority Benefit – 4 Penalty – 5 Cost – 5 Risk – 6	5.21 – system identifies location of the item correctly from item setup page 5.22 – system identifies location of the buyer correctly from the env parameters of their BYOD.
6	**View extended item information - login.**		High Priority	
6.1	User clicks on item icon control to access Item / Details page	System responds by presenting Item / Details or displays error "No details available for this item. Item / Details page loads button leading to seller's profile Item / Details page loads button which initiates chat with the seller.	High Priority Benefit – 9 Penalty – 7 Cost – 4 Risk – 2	6.10 – database is available 6.11 – query returns correct item 6.12 – query returns correct details 6.13 – query correctly displays error message when Item Details were not provided by the seller

				6.14 – Item /Details page correctly links the item with the seller 6.15 – item / Details page buttons provide access to the intended functionality - correctly
7	**Communicate with seller - login.**		High Priority	
7.1	User clicks on Chat icon to chat with seller	Chat is loaded, dialogue is stored in Mongo DB, making messages available "offline" – if the other party is not logged in at the moment. If the seller is logged in and responding, two can chat. Chat is stored in Mongo DB.	High Priority Benefit – 8 Penalty – 4 Cost – 7 Risk – 5	7.10 – chat connects user with correct seller 7.11 – chat is saved and retrieved as needed 7.12 – chat is not available without login (buyer) 7.12 – chat is not available without login and only allows access to own chats (seller) 7.13 – if chat is not available temporarily, relevant error message is displayed 7.14 – chat is stored in the database and is encrypted 7.15 – chat to be archived and kept for 7 years
7.2	User clicks on "mailto:"	System redirects user to external email program – i.e. outlook and passes seller's email address	High Priority Benefit – 7 Penalty – 2 Cost – 4 Risk – 4	7.21 – correct client is invoked 7.22 – correct email address is passed
8	**User logout.**		Med Priority	
8.1	User clicks om Menu "Logout"	System logs user out.	Med Priority Benefit – 7 Penalty – 2 Cost – 1 Risk – 8	8.11 – after logout, personal information is cleared by the client 8.12- chat is not available without login (buyer) 8.13 - Seller functionality is not accessible

3.4 System Feature – Item listing

Use Case#	System Feature – Log in as seller, create / maintain personal page, list items for sale, maintains items and flags them as <sold>. Prerequisite: seller, as user, has an account and can log in.			**Functional Requirements**
9	**User can set up personal page with contact details**		High Priority	
	Stimulus	**Response Sequence**	Priority, B/P/C/R	
	User is required to have access to a device with Internet connectivity			9.01– BYOD, Internet connectivity
	User opens Internet Browser			9.02 – Any browser v. after 2017
9.1	User accesses www.swap-it.org	Website/home is loaded Log in / Sign In controls are available	High Priority Benefit – 9 Penalty – 9 Cost – 1 Risk - 1	9.10 – Website is not blocked in the country 9.11 – User account exists on the website 9.12 – User account and password can be verified against secure login 9.13 – User input is filtered to prevent website hacking 9.14 – user credentials are encrypted and encoded 9.15 – user login allows user access to their account 9.15 – user login does not allow access to other accounts 9.16 – without login, no access to any account
9.2	User logs in by keying in username and password Or Email and password	Login is verified by the system and user is greeted or error "Username / Password incorrect" is issued.	High Priority Benefit – 9 Penalty – 9 Cost – 3 Risk - 2	9.21 – incorrect user name issues error 9.22 – incorrect username / password combination issues an error 9.23 – if error is issued, user cannot access any accounts
9.3	User selects Menu Home / Seller	System responds by displaying / Seller page with menu options: / My profile / My contact details / My items	High Priority Benefit – 9 Penalty – 9 Cost – 3 Risk - 2	9.30 – user accesses correct account 9.31– seller menus are displayed

10.	**User (seller) sets up / maintains their profile.**		Med Priority	
10.1	User accesses Home / Seller / My profile and sets up their details - screen name **(*)**, avatar, photo, blog	System responds by storing details in Mongo DB. Screen name is only mandatory if user chooses to create a profile; otherwise, user login to be used. \<Save> button commits changes to DB	Low Priority Benefit – 2 Penalty – 4 Cost – 7 Risk - 3	10.10 – screen name is mandatory 10.11 – database is available to store the details 10.12 –correct user account is updated 10.13 – if DB is unavailable error is issued to this effect.
10.2	User accesses Home / Seller / My profile and edits their details - avatar, photo, blog	System responds by storing details in Mongo DB. Screen name cannot be changed. \<Save> button commits changes to DB	Low Priority Benefit – 2 Penalty – 4 Cost – 7 Risk - 3	10.20 – screen name is not maintainable 10.21 – database is available to store the details 10.22 –correct user account is updated 10.23 – if DB is unavailable error is issued to this effect.
11	**User (seller) sets up / maintains their contact details.**		Med Priority	
11.1	User accesses Home / Seller / My Contact Details and edits their details – email address, phone number, anything else?	System responds by storing details in Mongo DB. \<Save> button commits changed to DB	Med Priority Benefit – 2 Penalty – 4 Cost – 7 Risk - 3	11.10 – screen name is not maintainable 11.11 – database is available to store the details 11.12 –correct user account is updated 11.13 – if DB is unavailable error is issued to this effect.
12	**User (seller) sets up / maintains / deletes their sale items.**		High Priority	
12.1	User accesses Home / Seller / My items and creates a new item. User adds name(*), selects **CATEGORY(*)** , description, T&C, expiry, photo, blog	Item creation screen contains pre-existing **category** list for selection. System responds by storing details in Mongo DB. \<Save> button commits changes to DB and System makes item visible to buyers	High Priority Benefit – 9 Penalty – 6 Cost – 5 Risk - 4	12.10 – category can be selected 12.11 – database is available to store the details 12.12 –correct user account is updated 12.13 – if DB is unavailable error is issued to this effect 12.14 - item becomes available to the public.
12.2	User accesses Home / Seller / My items and maintains existing item. User selects **CATEGORY(*),** description, T&C, expiry, photo, blog to edit.	Item screen contains pre-existing **category** list for selection. System responds by storing details in Mongo DB. \<Save> button commits changes to DB and System makes updated item visible to buyers	High Priority Benefit – 9 Penalty – 6 Cost – 5 Risk - 4	12.20 – category can be selected 12.21 – database is available to store the details 12.22 –correct user account is updated

				12.23 – if DB is unavailable error is issued to this effect 12.24 - item updates become available to the public.
12.3	User accesses Home / Seller / My items and flags item as <Paused>	<Pause Sale> button commits changes to DB and System makes updated item **NOT** visible to buyers System makes updated item **visible** to seller System toggles <Pause> button to <UnPause>. System responds by storing details in Mongo DB.	High Priority Benefit – 9 Penalty – 6 Cost – 5 Risk – 4	12.31 – database is available to store the details 12.32 –correct user account / item is updated 12.23 – if DB is unavailable error is issued to this effect 12.24 - item is not accessible to the public but is maintainable for seller. 12.25 – successful item update toggles <Pause> to <UnPause> button
12.4	User accesses Home / Seller / My items and flags item as <Sold>	<Sold> button commits changes to DB and System makes updated item **NOT** visible to buyers System makes updated item **visible and NOT modifiable** to seller System responds by storing details in Mongo DB.	High Priority Benefit – 9 Penalty – 6 Cost – 5 Risk – 4	12.41 – database is available to store the details 12.42 –correct user account / item is updated 12.43 – if DB is unavailable error is issued to this effect 12.44 - item is not accessible to the public and is not maintainable for seller.
13	**User logout.**		High Priority	
13.1	User clicks om Menu "Logout"	System logs user out.	High Priority Benefit – 7 Penalty – 2 Cost – 1 Risk – 8	13.11 – after logout, personal information is cleared by the client 13.12- chat is not available without login (buyer) 13.13 - Seller functionality is not accessible

3.5 System Feature – Communication between users

Use Case#	System Feature – Log in as seller, chat with buyer. Prerequisite: seller, as user, has an account and can log in; seller set up an item for sale.			**Functional Requirements**
14	**User (seller) can chat with buyer**		High Priority	
	Stimulus	**Response Sequence**	Priority, B/P/C/R	
	User is required to have access to a device with Internet connectivity			14.01– BYOD, Internet connectivity
	User opens Internet Browser			14.02 – Any browser v. after 2017
14.1	User accesses www.swap-it.org	Website/home is loaded Log in / Sign In controls are available	High Priority Benefit – 9 Penalty – 9 Cost – 1 Risk - 1	14.10 – Website is not blocked in the country 14.11 – User account exists on the website 14.12 – User account and password can be verified against secure login 14.13 – User input is filtered to prevent website hacking 14.14 – user credentials are encrypted and encoded 14.15 – user login allows user access to their account 14.15 – user login does not allow access to other accounts 14.16 – without login, no access to any account
14.2	User logs in by keying in username and password Or Email and password	Login is verified by the system and user is greeted or error "Username / Password incorrect" is issued.	High Priority Benefit – 9 Penalty – 9 Cost – 3 Risk - 2	14.21 – incorrect username issues error 14.22 – incorrect username / password combination issues an error 14.23 – if error is issued, user cannot access any accounts
14.3	User set up item(s) for sale	Buyer logged in and sent a chat message regarding the item for sale or is online to chat.	High Priority Benefit – 9 Penalty – 9 Cost – 3	14.30 – correct user accesses correct chat 14.31– seller chat messages are

			Risk - 2	displayed correctly for correct user for correct item
14.4	User accesses Home / Seller / My Items – Chat and responds to buyer's messages	Item / Details page loads button which initiates chat with the seller Chat is loaded, dialogue is stored in Mongo DB, making messages available "offline" – if the other party is not logged in currently. If the seller is logged in and responding, two can chat. Chat is stored in Mongo DB.	High Priority Benefit – 9 Penalty – 7 Cost – 6 Risk – 8	14.41 – database is available 14.42 – if DB is not available, error message is issued to this effect 14.43 – Message send commits message to DB with date and time stamp

3.6 Future Features

Use Case#	System Feature – Future Enhancements - Out of scope
15	**Moderator / Analytics / Censorship**
	Preventing illegal activities
16	**Transaction keeping**
	Transacting in the application
17	**Multi – Point bartering powered by analytics**
	Intelligent algorithm for building of multi - user bartering transactions: i.e. A - needs a bike, offers to mow lawn. B - needs a fridge moved, has a bike to offer. C - has a truck to move the fridge, needs babysitting. D - offers to babysit, needs lawn mowed.

4. External Interface Requirements

4.1 User Interfaces

Swap-It uses a friendly GUI and is designed for an easy and fast trade like process. Images are displayed, navigation icon is implemented, and it supports swipe to refresh. Overview modifiable at run. Layout contains notification overview UI have a constraint layout for views. Homepage contains few image displays, and sign in buttons allowing individuals to log in and log out. Application supports Australian English language. While populating e-

form there is authentication via email/mobile once it is populated via e-form to create account / sign-up (register as new user). However, error message pops-up below placeholder for wrong data entry and refill is possible.

Listings:

-Goods / Service

-Swipe to see more goods

-Chat to connect navigates to seller's profile page, add chat to sellers profile

-Exchange status (in-progress, open, closed).

4.2 Hardware Interfaces

Barter System Application is designed to support any device connectible to internet. The application supports lowest version of android phones, tablets, computer, i-phones, different screen sizes- screen constraints, single APK, and any browser which is supported by HTML and JavaScript.

4.3 Software Interfaces

Software interfaces being incorporated and applied include Materialize, Html, CSS, Mongo DB, GUI-MW.

4.4 Communications Interfaces

Communication interfaces include email, Web-Google chrome, Internet Explorer, MS Edge, Network server protocols- Hyper Text Transfer Protocol, Simple e-form with placeholder, Message in app chat (text), Images, XML document, RESTful API, JSON.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The initial market of the project will be specifically targeted towards individuals living in Australia, limiting trading and communication to be between people within the country. Global and international trading was considered for the system, however given the projects timeframe a smaller project scope needed to be adopted.

5.2 Safety Requirements

This website will use some methods to provide product safety traded through this website. Firstly, the web application will require users to upload a picture as proof of the product intended to be traded. Potential buyers will be able to communicate with the seller and arrange for greater detail or more photos of the item if they desire, allowing for greater trust and transparency item between users.

5.3 Security Requirements

This web application aims to apply secure sign-up and login methods to allow for authorised individuals to login to their appropriate account after registering. The sign-up process will require users to create an account through an email and password, protecting their account by preventing unauthorised individuals from accessing their any account trading under a false name. Failing to uphold this security requirement may result in reducing our market by users losing trust and interest with engaging in the web application.

5.4 Software quality attributes

This web application aims to be a secure and user friendly. The main listing panel will help buyers add an item to trade, where sellers can either accept or reject the trade. Only the authorised user of that account can add, remove, or delete their listed item. Other users can view that item, the items details, and can send a trading offer. The system will be easy to understand for everyone that won't need any time to learn the working.