

Software Engineering Group Project

Deliverable 1 - Project Envisioning

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1 - USER UNDERSTANDING

Stakeholder Analysis

The table below identifies primary, secondary and tertiary stakeholders. It should also be considered that facilitating stakeholders exist, such as the developers who create and maintain such a system. These have not been included as per the specification.

Stakeholder	Type	Role/Description
Marketing Agency	Secondary Tertiary	Secondary stakeholder as they design custom advertising campaigns for their clientele. These campaigns serve as an input to the dashboard. Tertiary stakeholder as they would be affected by the system. The system will be tracking the trends in the advertising campaigns designed by the <i>Marketing Agency</i> for a client. This will allow the clients to evaluate the success of the campaign and decide whether to keep their working relationship with the <i>Marketing Agency</i> .
Marketing Agency's Clients	Primary Secondary	Primary stakeholders because they will use the system directly to evaluate the success of the advertising campaigns provided to them by the <i>Marketing Agency</i> . Secondary stakeholders because they will provide user website interaction data for the system.
Web Users (Ad-Viewers)	Secondary Tertiary	Secondary stakeholders as they are the source of data such as impressions and clicks. This is an indirect input of the system through server-side logging. Tertiary stakeholders because the results shown by the system to the client may change where the web users will see an advertising campaign or how an advertising campaign appears to the customer.
Ad-Hosting Website Owner	Tertiary	Tertiary stakeholder as they will be affected by the advertisements available on their website pages, resulting in gain/lose of revenue due to the real-time bidding process.

Personas

Annabelle Wallis - Marketing agency owner

Annabelle is a young entrepreneur who has always been fascinated by the world of marketing. With the financial help from her father, soon after graduating, Annabelle founded her own marketing agency, which in recent years has become popular and gained a lot of new clients. She is happy for the success of the company, however, the work has become more overwhelming. She also feels frustrated at home because her parents are constantly pushing her to find a husband and have children. On top of this, her current employees are finding it difficult to cope with the growing amount of clients and are regularly making complaints about not having enough time to evaluate the success of each campaign and thus repeatedly making mistakes. She realises the need to hire more consultants to mitigate this but she simply does not have the time to handle the recruitment process and being stressed all the time does not help.



She has been active in her research as she would like to preserve her passion for marketing and make her employees happy. Annabelle believes that a tool for easy evaluation of campaigns can ease her consultant's workload and possibly free up some time for the recruitment process.

Alan Johnson - Consultant in a marketing agency



Alan is a consultant at an online marketing agency whose job is to create custom advertising campaigns and advise his clients on how to improve their campaigns. He works with companies both large and small and has fifteen years of experience under his belt in the marketing field. His market research techniques include focus groups and surveys and he is always excited about new clients. However, some of the clients find Alan's methods old-fashioned and are considering moving to a different agency. This frustrates Alan and he often stays in the office after-hours trying to find ways of satisfying his clients; this makes his wife extremely unhappy because she wishes he could spend more time with her and their

three children. This has caused Alan to be stressed recently, trying to balance between being with his family and preserving valuable clients.

In order to maintain a better working relationship with his clients, without spending extra hours at work, Alan wants a way to move forward with the times and find more user-friendly and informative way to collect data about marketing campaigns which would be easy for a technical novice to use and will show all key metrics to the clients on a user-friendly tool.

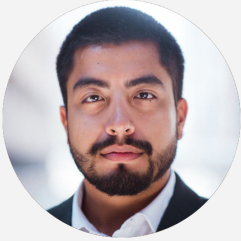
Lucy Jenkins - Client Services Manager in a marketing agency

Lucy is a recent university graduate with first-class honours in Marketing from Bangor University. Her lecturers often gave her high praise when it came to her practical research assignments and how she would use innovative methods and tools on the web to aid in these assignments. She is a very technical savvy person and she had always wanted to help create advertising campaigns for large, well-known companies. She thought starting out small would be a good way to gain the experience she needed to make it big in the world of marketing.



She started her first job in the field just a year ago and is still getting used to clients having different requirements. She is finding it hard to fulfil all their needs and is continually asking her colleagues for better ways to document both the client's needs for their campaigns and the successfulness of each campaign. As a perfectionist, Lucy would sometimes feel like she is not up to date with the best methods for campaign evaluation. She would often turn to social media to gain opinions which she saves in a basic document. Sometimes, Lucy is not very careful with keeping her files and has lost such documents several times. Therefore, she thinks that having a universal system, that is easily accessible and summarises and saves data about key campaign metrics will be a good contribution to her work life.

Peter Quinn - CO of a kitchen equipment company



Peter is the CO of a company which specialises in a range of kitchen equipment for business use from large cookers to mixers and cutlery. His clientele are normally schools and independent restaurants. He has been the CO for several years now and after looking at the company's financial details wants to find a way to sell more equipment. Peter has also been part of the Environmentalists Club in his town for 5 years and he tries to introduce more eco-friendly practices in his company.

He has been looking into ways to gain more customers and sell more items other than via a catalogue which is not eco-friendly and is getting very expensive to print and ship to companies who may disregard the catalogue. His goal to promote the services of his company in a more ecological way motivated him to work with a marketing agency, which created custom ads for him. The services of the agency were quite expensive and Peter is very annoyed that he constantly has to ask the consultants there if his campaigns were successful and then wait for several days for the data to be gathered. Peter wants to have an easy and fast way to evaluate how successful his campaigns are so that he doesn't waste his money.

Jessica Pierce - PR Manager at a well-known toy company

Jessica works as a public relations manager at a well-known toy company. The company itself is large and has HQ's across the globe. Her main role within the department is to take the feedback from advertising campaigns for new launches and use that in future products and advertisement development. Jessica has dyslexia and is struggling with the large amount of written feedback she receives from different sources. She is having a hard time keeping track of all the information she is getting, as well as filtering between the different types of feedback and knowing whether it is positive or negative. She feels like it would be easier to gather information about a campaign through viewing charts, rather than through reading a huge amount of user comments.



She would like to be able to use a unified and clear system that provides the option to view important metrics about a campaign in a summarised graph.

Robert Milner - YouTube vlogger (Ad-Viewer)

Robert is a very keen user of the internet. He works from home and is a popular YouTube vlogger. Robert uploads his vlogs on a weekly basis and they are often related to testing and reviewing products he finds from clicking on ads on different websites. The process he goes through before uploading the videos takes up most of Robert's time and he gets very angry when he clicks on useless ads, which make the video editing a lot harder and slower. Sometimes he even has to start recordings from the beginning. Robert prefers to only see ads that are popular amongst other web users, which would also help him gain more subscribers, who might be thinking of buying what's advertised.



Robert wishes that there was a system for campaign evaluation so that non-successful campaigns are taken off websites.

2 - REQUIREMENTS PLANNING

User Stories

ID	User Story
01	As a <Marketing Agency Owner> I want <data to be gathered from Impression log> So that <my clients can have access to accurate data for impressions generated during an advertising campaign>
02	As a <Marketing Agency Owner> I want <data to be gathered from Server log> So that <my clients can have access to accurate data for users' interactions during one visit of an advertising campaign>
03	As a <Marketing Agency Owner> I want <data to be gathered from Click log> So that <my clients can have access to accurate data for clicks generated during an advertising campaign>
04	As a <Marketing Agency Owner> I want <my clients to view key metrics about a campaign on a user-friendly dashboard> So that <they can use the system without prior training>
05	As a <Marketing Agency Owner> I want <my clients to have the option to view key metrics about a campaign as a chart> So that <they have better visualization of data>
06	As a <Marketing Agency Client> I want to <view the performance metrics of advertising campaigns over a time interval> So that <I can detect common trends amongst web users>
07	As a <Marketing Agency Client> I want to <view the performance metrics of advertising campaigns over a time interval> So that <I can detect sudden changes in the performance of an advertising campaign>
08	As a <Marketing Agency Client> I want to <view a summary of number of impressions> So that <I can manage my outgoing finances for every time an ad is shown to a web user>
09	As a <Marketing Agency Client> I want to <view performance metrics filtered by gender> So that <I can identify trends amongst web users of different gender>
10	As a <Marketing Agency Client> I want to <view performance metrics filtered by age> So that <I can identify trends amongst web users of different age>
11	As a <Marketing Agency Client> I want to <view performance metrics filtered by income> So that <I can identify trends amongst web users with different incomes>
12	As a <Marketing Agency Client> I want to <view the Click-through-rate (CTR) of an ad> So that <I know if the advertising campaign is of interest to web users>
13	As a <Marketing Agency Client> I want to <view the Bounce Rate of an ad> So that <I can determine if an advertising campaign hasn't kept the attention of the web user for a long time>
14	As a <Marketing Agency Client> I want to <view the Conversion Rate of an ad> So that <I can evaluate how many web users have shown further interest in a campaign>
15	As a <Marketing Agency Client> I want to <view the Cost-Per-Acquisition (CPA of an ad)> So that <I have statistics of average outgoing finances of for every time a web user clicks and acts on an ad>
16	As a <Marketing Agency Client> I want to <define that a bounce is registered as time spent on the advertising campaign website> So that <I can create statistics of web users who have not interacted with the website for more than 10 seconds >
17	As a <Marketing Agency Client> I want to <define that a bounce is registered as number of pages visited> So that <I can create statistics of web users who have not visited more than 1 page of the advertising campaign website>
18	As a <Marketing Agency Client> I want to <view the Cost-Per-Click (CPC) metrics of an ad> So that <I have statistics of average outgoing finances for every time a web users clicks on an ad campaign>
19	As a <Marketing Agency Client> I want to <view the Cost-Per-Thousand Impressions (CPM) metrics of an ad> So that <I have statistics of average outgoing finances for every one thousand times an advertising campaign is shown to a web user>

20	As a <Marketing Agency Client> I want to <view the number of clicks on the campaigns> So that <I know how frequently a web user shows interest in an ad>
21	As a <Marketing Agency Client> I want to <see a histogram of the click costs> So that <I know how often web users follow an advertising campaign link>
22	As a <Marketing Agency Client> I want to <know the the total cost for an advertising campaign> So that <I can make better management of outgoing finances for each campaign>
23	As a <Marketing Agency Client> I want to <know how many unique web users have clicked on an ad> So that <I can create monthly statistics about how many new users have been attracted by an advertising campaign>
24	As a <Marketing Agency Client> I want to <compare metrics between different audience segments> So that <I can highlight the most engaged web users>
25	As a <Marketing Agency Client> I want <to filter performance metrics by date range> So that <I can detect common trends amongst web users>
26	As a <Marketing Agency Client> I want to <filter performance metrics by context> So that <I have statistics of the websites that referred the most users >
27	As a <Marketing Agency Client> I want to <be able to compare data of different campaigns> So that <I have statistics of what type of ads are more appealing to web users >
28	As a <Marketing Agency Client> I want to <view charts of the performance of advertising campaigns during at a particular time of the day> So that <I can detect when web users respond better to them>
29	As a <Marketing Agency Client> I want to <view charts of the performance of advertising campaigns at a particular day> So that <I can detect when web users respond better to them>
30	As a <Marketing Agency Client> I want to <have the option to save advertising campaign summary charts in different formats> So that <I can have offline access to the data at any point in time>
31	As a <Marketing Agency Client> I want to <have the option to print advertising campaign charts> So that <I have all the data on paper, as well as on a computer>
32	As a <Marketing Agency Client> I want to <change the font size of the software for evaluating advertising campaigns> So that <my eyes don't hurt if the font is too small>
33	As a <Marketing Agency Client> I want to <change the colors of the software for evaluating advertising campaigns> So that <I have the freedom to customize the software I'm working with>
NFRs as User Stories	
34	As a <Marketing Agency Owner> I want <the software for evaluating advertising campaigns to handle large datasets> So that <my clients can sufficiently evaluate the success of the custom-made ad campaigns>
35	As a <Marketing Agency Owner> I want <the software for evaluating advertising campaigns to handle a time span of several months> So that <my clients have a persistent statistics of the success of a campaign>
36	As a <Marketing Agency Client> I want <the software for evaluating advertising campaigns to respond to any interaction within 5 seconds> So that <I can make use of the software without devoting a lot of time to it>
37	As a <Marketing Agency Owner> I want <the software for evaluating advertising campaigns to support color inversion> So that <it is suitable for clients with visual impairments>
38	As a <Marketing Agency Owner> I want <the software for evaluating advertising campaigns to be available as an Android/iOS app> So that <my clients have the flexibility to access it any time>

Product Backlog

Product backlog ID	User story ID	User Story Heading	Estimation/Size	Priority
01	04	User-friendly dashboard (GUI)	XL	MUST HAVE
02	05	View metrics as chart	XL	MUST HAVE
03	01, 02, 03	Data gathered from 3 logs	L	MUST HAVE
04	06, 07	Time interval	M	MUST HAVE
05	08	Number of Impressions	M	MUST HAVE
06	14	Conversion rate summary	M	MUST HAVE
07	22	Total cost statistic	M	MUST HAVE
08	15	CPA statistics	M	MUST HAVE
09	18	CPC statistics	M	MUST HAVE
10	19	CPM statistics	M	MUST HAVE
11	12	CTR statistics	M	MUST HAVE
12	13	Bounce rate summary	M	MUST HAVE
13	20	Number of clicks	S	MUST HAVE
14	23	Number of uniques	S	MUST HAVE
15	Spike	Database schema design	S	MUST HAVE
16	Spike	Overall design of the dashboard	M	MUST HAVE
17	Spike	Research Java libraries	M	MUST HAVE
18	21	Click costs histogram	L	SHOULD HAVE
19	24	Compare audience segments	L	SHOULD HAVE
20	16	Bounce definition - time	S	SHOULD HAVE
21	17	Bounce definition – number of pages	S	SHOULD HAVE
22	25	Date range filter	S	SHOULD HAVE
23	26	Context filter	S	SHOULD HAVE
24	09	Gender filter	S	SHOULD HAVE
25	10	Age filter	S	SHOULD HAVE
26	11	Income filter	S	SHOULD HAVE
27	27	Compare different campaigns	XL	COULD HAVE
28	32	Change font size option	L	COULD HAVE
29	28	Time of day statistics	M	COULD HAVE
30	29	Specific day statistics	M	COULD HAVE
31	30	Saving option	M	COULD HAVE
32	33	Colour change option	M	COULD HAVE
33	38	Android/iOS app	XXL	WON'T HAVE
34	31	Printing option	L	WON'T HAVE
35	34	Support large datasets	L	MUST HAVE
36	35	Support several months span	L	MUST HAVE
37	36	System to respond within 5 sec	L	SHOULD HAVE
38	37	Colour inversion	L	COULD HAVE

3 - PROJECT PLANNING

Increment Plan

In Sprint 0, we include spikes (activities related to research, design, investigation and exploration), which are useful for better understanding of requirements and are used to research options in the solution domain, and to gain the prior knowledge needed for the technical development of the project.

Increment 0/ Sprint 0	
15	Database schema design
16	Overall design of the dashboard
17	Research Java libraries

Increment 1/ Sprint 1 2 weeks to deliver		Increment 2/ Sprint 2 6 weeks to deliver		Increment 3/ Sprint 3 2 weeks to deliver	
PbID	User story heading	PbID	User story heading	PbID	User story heading
01	User-friendly dashboard (GUI)	06	Conversion rate summary	18	Click costs histogram
03	Data gathered from 3 logs	07	Total cost statistic	19	Compare audience segments
02	View metrics as a chart	08	CPA statistics	27	Compare different campaigns
05	Number of impressions	09	CPC statistics	29	Time of day statistics
04	Time interval	10	CPM statistics	30	Specific day statistics
28	Change font size option	11	CTR statistics	32	Colour change option
		12	Bounce Rate Summary		
		13	Number of clicks		
		14	Number of uniques		
		20, 21	Change bounce definition		
		22	Date range filter		
		23	Context filter		
		24	Gender filter		
		25	Age filter		
		26	Income filter		
		31	Saving option		
NFRs - backlog constraints					
35	Support large datasets				
36	Support several months span				
37	System to respond within 5 seconds				
38	Colour inversion				

Sprint Backlog

Sprint Backlog				
PbID	TID	Task	Size	Dependencies
01 [GUI]	01A	Plan main interface 'windows' and navigation links	S	-
	01B	Plan layout of main window's interfaces	M	01A
	01C	Code planned GUI and any dependencies	L	01B
	01D	Test basic structure of coded implementation	M	01C
03 [Data from 3 logs]	03A	Setup/code functioning GUI independent database	M	-
	03B	Interface database with GUI	M	01A/03A
	03C	Setup/choose initial indexes	S	03A
	03D	Write script to import from 'Impression Log'	S	03A
	03E	Write script to import from 'Click Log'	S	03A
	03F	Write script to import from 'Server Log'	S	03A
	03G	Test correct import of data	M	03D/03E/03F
02 [View as chart]	02A	Research 3rd-party graphing options (e.g. JFreeChart)	M	-
	02B	Code basic UI and structure for graphs	L	02A
	02C	Implement graphs in GUI	S	01C/02B
	02D	Test graphs with predetermined data	M	02C
05 [Number of impressions]	05A	Create query to get campaign calculation from database	S	03A
	05B	Create query to get graph data from database	S	03A
	05C	Create graph for fetched data	M	02C/05B
	05D	Test correctness of implemented queries and graphs	M	05A/05C
04 [Select time intervals]	04A	Modify graph queries for time interval grouping	M	05B
	04B	Modify graph UI to handle interval grouping	M	02C
	04C	Verify correctness of resultant graphs	M	04A/04B
28 [Change font size]	28A	Extend GUI elements to allow global font size changing	L	01C
	28B	Modify GUI to allow selection of different font size	S	28A
	28C	Test to make sure extension has not affected existing GUI	M	28B

Day 0 Burndown Chart



The burndown chart has been configured so that we only record task progress every three days (except the last stage); this is due to this module being weighted equally against other modules and thus reduces the chance that significant progress would be made on a daily basis. This could be adapted during the sprint if significant daily progress is being made.

4 - PROJECT SET-UP

Risk Analysis

Risk	P	S	RE	Mitigation
Loss of deliverable code	2	5	10	All team members must make use of local version control (git) with regular pushes to a centralised repository (GitHub). Can make use of branches to mitigate loss of work-in-progress code.
Task size underestimate	3	4	12	Hold regular meetings to make sure group members do not have an unsustainable or unfair workload.
Deviation of project from specification	2	4	8	At meetings, regularly check against specification for accuracy and regularly consult with client (supervisor).
Lack of accurate progress feedback by team members	3	3	9	Hold regular meetings and monitor task management tools to ensure group members are doing their share of work.
Specification change during project	2	3	6	Keep track of emails from lecturers and consult with client (supervisor) to see if there are any specification changes.
Design decisions that conflict with future tasks	3	3	9	Keep track of dependencies between tasks and update sprint plans accordingly if more work is required.
Permanent or temporary loss of group members	2	4	8	Redistribute 'MUST HAVE' workload to other team members and suspend work on lesser priority tasks (e.g. 'COULD HAVE').

P = Probability [1 - 5 (high)], S = Severity [1 - 5 (high)], RE = Risk Exposure [$E = P \times S$]

Summary of Agile Methods

As a university project, the agile process is challenged due to the highly distributed nature of the team. To adapt to this, we have implemented a strong infrastructure of internet technologies into our process aiding team communication and progress sharing. Our communication tool is *Slack* as it gives many options for managing conversations concerning different topics. *Slack* also interfaces well with our task management tool *Meistertask* and version control tool *GitHub* (git). Using *Meistertask* allows team members to easily check their task assignments or use the open task list to take initiative. And by version controlling production code with *GitHub*, we have an accountable and recoverable platform for development. Lastly, using a shared workspace in *Google Drive* allows us to easily work on the same documents and share draft ideas.



In conjunction with these tools we also made use of other technologies. For example, whilst in the envisioning process we made use of *planningpoker.com* to utilise the whole teams individual knowledge for assessing task size. However, even with these tools, face-to-face team communication will be the key to the success of the project so we have and will also schedule a minimum of two meetings a week. Given the time requirements of this project, this should be appropriate.