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| Product Specification | | | | | | |
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| Centre Name | Brunel University | |  | Start Date | 07/10/2016 |  |
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| Lecturer  Group Tutor | Simon Kent  Stephen Swift | |  | End Date | 24/03/2017 |  |
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| Module | CS2001 Group Project | |  |  | |  |
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| Proposed project title | | Supermarket tracker and route planner (Current working title preceding app name) | | | |  |
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| Section One: Working title, description, aims and objectives, group responsibilities and development methods | | | | | | |

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| Working title of project:  Supermarket tracker and route planner  **Product description:**  The finished product will be an Android app that utilises GPS tracking to display the supermarkets in a user-specified radius and their real-time availability, displaying their opening times and current status, assisting with route planning for shopping to accommodate the variation of flexibility in time to visit supermarkets that users may have. It will feature an interactive map display that updates in real-time with the user’s movements to accurately pinpoint their location, measuring the distance between supermarkets and the expected time to reach the destination(s). The app will implement touch-screen functionality, allowing the user to expand and collapse a list of all supermarkets in their designated vicinity, allowing the user to choose one or more of these locations to calculate an optimal route to visit them within their opening hours. The user is provided the option to choose the distance in which they would like to search from their current location, filtering the displayed results to suit an appropriate travelling distance based on a user’s individual requirements.  Project aims and objectives:  The project aims to build upon generic GPS tracking services in order to specialise in providing in-depth information and dedicated route planning for finding supermarkets that are available based on the current time of day, and provide this information in a format that is easily accessible to the user. This is to address many of the circumstances that arise when finding these information components manually, and account for particular real-world scenarios that would benefit its users. Using a GPS tracking app such as Google Maps, the user would have to locate supermarkets by manually typing the name one at a time, and would then be required to use a search engine to check their current availability; this turns one process into many processes as the user must check each supermarket and find their opening times to avoid travelling to a closed supermarket, costing time and money. By comparison, this app will streamline the information within the app without the need for multiple searches, creating a more efficient process for the user where they are not required to spend time finding each of those locations but are instead all presented within a user-defined radius, assisting the user with choosing which of these stores would suit their needs.  Information is collectively delivered so that even a user who is unfamiliar with the area may discover supermarkets they were unaware of in that location; as an aim, this would benefit users who require access to the data fast, and those that travel frequently, planning their schedule within a short period of time. As a result, users would not need to research the area and the availability of its facilities beforehand and could easily gather this information from using the app, providing a real-time assistant for route planning.  The objectives of the project include the ability to show prototyping of the app, receiving user feedback on its design to refine the functionality and layout to create an optimal solution in terms of usability. This means that the app will be developed incrementally, and small or significant changes may occur where ideas can be implemented or changed to deliver an ideal product to its users. This would see a potential increase in the scope of the app where new scenarios can be accounted for, so the finished product would be a scalable solution with further improvement suggestions to account for the growth in technology and user needs.  The app will also update in real-time, relying on the network connection of a user’s device to provide dynamic GPS tracking for accurate information regarding accessibility and route planning. This also applies to the method of providing the data for the supermarkets. A MySQL database would be created using information from an open source of data to provide the opening times of the stores and their locations; the app will connect to the MySQL database which is populated with information from an open source datasheet, meaning updates and changes will occur dynamically and in real-time so that the information provided is current and reliable, in order to reduce maintenance overheads through manual data input and allow for additions and changes to the data sheet to be made to the database and consequently the app as well, keeping its information up-to-date through a fluid system of processes.  The app aims to allow the user to choose their method of transport. This is to account for the needs and provide valid time estimates from the app in relation to the method used to travel. This functionality would cater to users who may travel using their own vehicle, those who use public transport or those who travel by foot or bicycle; this is not only an implementation to account for user needs but also to verify that the algorithms used to calculate the time and distance can factor in the travelling speed of the user and the routes available to them. As a result, the app would provide accessibility in terms of what methods of travel are required based on the distance the user wishes to travel, as they may be within walking distance but may also plan for a route that spans several miles.  Group Project responsibilities and Development methods  As a group the code and documentation will be shared through Github. This allows us to freely make pull requests and update or edit various components as necessary so that sharing of information is accessible and fast. In addition, Kanban posters can be utilised to help communicate with the team to provide the current targets for the project’s development. Since there are several learning outcomes that need to be achieved individually requiring active participation in various aspects of the project including technical drawings, coding, group meetings and research, the distribution of responsibilities will not follow a tiered list designating our members to roles such as Project Manager, Software Developer and Business Analysis; more tasks based in these skills will be done by the members who are more proficient in them but the responsibilities will be interchangeable and everyone will contribute to each aspect of the Group Project.  The development methods will be largely focused on Incremental Development and Agile Development methodologies; through prototyping the concept of the app will be evaluated and feedback will be given, and in addition the group will incorporate a SCRUM period of 1 month to write a significant amount of the required code in order to have a suitable working version of the app for testing. User feedback will be taken advantage of to develop the functionality and features in several phases so that it is tailored to suit the needs of the users and the need to learn of how to implement these features. Usability evaluation techniques will also be applied in order to suggest changes to the product design and undertake research relevant to Usability Engineering. While the project will see Agile methodologies such as Prototyping and SCRUM present it does not strictly follow Agile Development and Incremental methodologies will also be implemented as sufficient documentation and contribution would be necessary in order to meet all target objectives and learning outcomes of the project and module itself. | |
| Section Two: Reasons for choosing this project, Key Stakeholders and target audience | |
| Reasons for choosing the project:  There are many advantages to developing an app with Android based on the current economy and how Android’s growth will see it becoming a more popular option to use as a device. This includes the following:  Android's market share rose from 5% in the year 2009 to 70% in the year 2014, and in addition Android has launched Android TV which means apart from mobile devices, android will be part and parcel of household entertainment. Android has come up with Android Wear API which will enable development for wearable devices (like Android watch), showing that there are other devices and means of use utilizing Android that this project may be potentially applicable to.  Key stakeholders and target audience (competitors):  Google and Apple are the prime competitors to this app. Both feature their own search engines which would typically be used to find information regarding the supermarkets and their opening hours, while this app aims to remove the need for use of a search engine which would consequently affect usage of their search engines for this purpose. In addition, both provide their own Maps app which allows for real-time navigation; what separates this app is that it will specialise in discovering supermarkets on the app and finding relevant information in a shorter period of time with less searching; since it will provide the full list based on any filters provided such as distance or stores that have already closed for the day in terms of selecting destinations, it is a more efficient solution for this particular purpose which would see users who frequently travel and those who have moved into a new area taking advantage of this accessibility to navigate the area more effectively. As a result, Android would see new customers using the app and the app itself would receive feedback specific to its aims which would allow it to stand out against these competitors.  Key stakeholders and target audience (users):  Tourists, commuters and the general public can all benefit from using this app; a study from March in 2016 found that 78% of UK shoppers preferred to visit stores than order online, and given that supermarkets are typically preferred for grocery shopping, this makes a large target audience who could use the app for efficient planning of shopping. In addition, the following users can be identified as stakeholders who would benefit from this product:  Users who are unfamiliar to an area; people staying in a hotel for a number of days would be able to find the supermarkets and their opening times without having to ask for directions to them or spend time searching them out, they’d also know the times of these stores so they could ensure they’re able to stock up on various goods while they stay in the area. This also applies to people visiting family members, businessmen who are working from remote locations and people who have been out late and need to know where the nearest supermarket is before heading home.  Users who have commitments that limit the times they could visit a store – knowing the opening times would allow these users to plan the supermarket visit around their other commitments such as work shifts.  Customers with loyalty to certain stores can see if the stores they frequent are in the area, for example if a customer uses a store such as Tesco and takes advantage of membership points they would be able to find the store in that location which would make the app desirable for users who travel a lot and aim to make the most of bargains and spending rewards – Costco would also be a good example of this since they require membership to buy products from, so it would also help businesses who operate from many branches across the UK. | |
| Section Three: Activities and timescales | Expected timescale |
| Perform Research on the product to understand its scope and objectives  Create a presentation to deliver the app’s purpose to a target audience (group tutor)  Produce technical drawings of the design and functionality of the product as well as illustrate information flow  Create the initial prototype of the app to gain feedback and provide a graphical interpretation of its concept  Utilise the SCRUM methodology to provide working code of the app for testing and evaluate the components/feasibility of requirements to implement  Research improvements gathered through surveys and studies to decide on any further implementations to add to the app  Implement any further versions of the app and analyse the product against the specification and methods used for development  Confirm completion of the project and identify any areas for improvement through self-and-peer assessment as well as the app itself  Complete the portfolio, checking with other group members that all required information is present and make adjustments as necessary prior to the final coursework deadline | 1 week    1 week  2 weeks  3 weeks  4 weeks  2 weeks      3 weeks  2 weeks  5 weeks |
| Milestone one: **Create the prototype of the app**  Target date: 23/12/2016  Milestone two: **Write the code of the app for functionality and testing**  Target date: 25/01/2017  Milestone three: **Finish the project and complete all sections of the portfolio**  Target date: 25/02/2017 | |
| **Section Four: System Specification (Software/Hardware Requirements), User and System Requirements** | |
| **Software Requirements:**  Android Studio – the IDE used for programming the app using Java. A majority of the code will be written in Android Studio, including the GPS tracking and the user interface  Android Emulator – used to test the design and functionality of the app prior to using an Android device to verify that it will work as desired and can be altered or incremented with an accurate representation as necessary  MySQL – used to create the database that connects with the data sheet in order to provide information that can be accessed and organised easily for display or editing  Jetty – used to connect to MySQL through a computer and modify or view the contents of the database  Virtual Server – provided by Brunel University to allow for data storage and access without requiring a dedicated hardware server  Excel Data Sheet – used to store the details of supermarkets and their opening times in rows and columns for access by the MySQL database  Github – to host code and information and allow free access and editing to these components for project development  **Hardware Requirements:**  Computer or Laptop with an Operating System to use Android Studio for coding and debugging.   |  |  | | --- | --- | | Minimum Requirements | Recommended Requirements | | Any standard-use Operating System (Such as Windows, MAC, Linux) | Windows 10 Operating System | | Dual-core 1.6GHz processor | Quad-Core 2.6GHz processor | | 1GB RAM | 4GB RAM |   Android mobile device for testing the app and verifying its real-world functionality  Vehicle for testing of its route-planning functionality to verify the time taken and accuracy of the app  **User and System Requirements:**  **User Requirement 1**: The user should be able to recognise their location, current position and the location of stores on the map  **Purpose:** The user would not be able to judge distance between points and would need to open Google Maps – the app would not be useful  **System Requirement 1.1:** Utilise GPS tracking in the program code and providing a dynamic interface as a map to navigate  **System Requirement 1.2:** Plot the user’s co-ordinates and those of supermarkets to measure distance between the user and these markets as well as for planning routes  **User Requirement 2:** The user must have a network connection and a ‘check’ should flag a warning for unstable/no signal  **Purpose:** The app must be ‘online’ to function and a check will help warn users of issues/inaccuracy that may occur due to their signal strength  **System Requirement 2.1:** On opening/resuming the app, the system should detect if there is no signal, displaying an appropriate message  **System Requirement 2.2:** A message should prompt the user to enable Wi-Fi for more accurate results  **System Requirement 2.3:** A stop sign or similar should display instead of a map with no signal to avoid confusing the user or assuming a long load time  **User Requirement 3:** While running, the app must be able to update information displayed dynamically  **Purpose:** To provide accurate information of the user’s location as well as that of the supermarkets  **System Requirement 3.1**: The app must update the geolocation of the user to provide accuracy in navigating the map  **System Requirement 3.2:** The app must update changes to supermarket information – by accessing the open data this is an automatic process | |
| **Comments and agreement from lecturer/assessor** | |
| Comments:  Agreed:  Date: | |