Requirements analysis (Contributor-Ben Scott)

For our project, the client (MaryandAmy’s owners Judit Tolnai and Zoltan Tolnai) wished for us to produce an e-commerce website for bakers which would allow for bakers to receive enquiries from customers with requests for a cake of the customers choosing or to be able to create their own products in advance.

Within this website, there are multiple features that the client has requested us to produce, such as the ability for a user to search for a baker based on distance and product/business type, the ability for a user to make enquiries to bakers to allow for them to discuss the products details in a Facebook-styled chat, the ability for bakers to upload images of their products(as well as their logo), to be to send payment links through the chat system, bakers being allowed to change their details such as service area and logo as well as many more features.

The current system used by our clients currently does not meet up to their requirements…

This is the case as…

For the e-commerce website we our creating, for all three of the main users(customers, bakers and the site admin), we have ensured that minimal IT skills are required for use of the website as all database interactions are done through HTML forms and input fields, all message boxes are easily generated through clear buttons and access to the profile page is simple and sef-explanatory(and subsequently, the ability to edit your profile is too)(moreover the navigation system has been made self-explanatory by the front end team). Because of these features that the development team have implemented, the system should require no training for most customers and bakers. The only exception to this however is if the sites users do not understand how to use web browsers and search engines, then they may struggle to use the site, however this is unlikely to be the case has the intended audience are middle aged people and business owners, both of which are most likely IT literate.

For the system to be developed, the only physical resources that would be required are a server to host the final website on, which has been provided by the clients, as well as computers to develop the e-commerce website on, these computers however are easy to obtain as the university as a wide selection of computers to make use of and most of the development team currently own their own laptops.

Software resources required for this project prove to be more numerous however with a WAMP(Windows Apache MySQL PHP) development server being required for PHP and database functionality to be tested, a text editor to allow for the code to be written up, a repository to store the groups work as well as API’s for finding geographical information as well as for bot detection. In the case of the WAMP server, we will make use of the XAMPP(by apachefriends), a free PHP development local server, for the text editor, we will make use of notepad++(by Don Ho and several contributors) which provides syntax highlighting(which will make development easier), the repository we will use will be Github, which allows for version control and the API’s that will be used both be provided by google, consisting of re-captcha and google maps(in the case of the later, the client has agreed to pay for its use).

The project will require us to have a range of both technical and soft skills in order to succeed. In the case of the technical, we will need a good understanding of PHP object orientated programming(as well as an understanding of database interactivity in PHP), a understanding of SQL(and its MySQL variant), a basic understanding of HTML and CSS, a decent understanding of JavaScript and for some of the team, a decent understanding of AJAX. In the case of HTML, CSS, PHP and JavaScript, as all members have taken Computer Science, we all have a foundation in these languages through the first year unit “Introduction to Web Design and Development” and for anything(like object-orientated PHP programming) we don’t understand, we can easily research it through resources like W3Schools and Lynda.com. For SQL and AJAX it is likely that research will need to be done for the more advanced features of SQL and for AJAX, however, the above resources will prove adequate to learn them and will allow for the skills to be learnt during development.

There are a large variety of soft skills that will be required for this project, including teamworking, communication, logical problem solving and leadership. In the case of teamworking and communication skills, these will prove vital in order to coordinate tasks effectively as well as to ensure that everyone has a common vision of the project(and in turn will avoid inconsistencies). These two skills have already been developed partially by everyone during the previous years “Information Systems” group project and will naturally improve during this project. For logical problem solving, it will prove vital for all coding problems and algorithm creation and have been developed during last years “Programming” and this years “Advanced Programming” units and will continue to be improved throughout the project. Finally, good leadership will be required in order to improve organisation of task distribution and will be developed throughout the completion of the project.

Overall, our development team do have the soft and technical skills required to start this project, however we will need to do research into areas such as password hashing and AJAX to complete the project.

From the start of planning to the end of development and testing the project will take approximately three to four months to complete if the Gantt chart is a reliable measure for how long each part of the project will take (see Chapter 3-Design and Planning). This should be kept to due to the plans made using use case diagrams, Gantt charts and Entity relationship diagrams for the database.

Relating to the non-functional requirements of the website, there are many, especially in relation to performance. For one, the system must be able to handle several, concurrent server requests from multiple AJAX sources, such as during the refresh of chat logs and for any ajax-required features on the bakers page. This maintenance of performance will be relatively easy to achieve due to the small scale of the customer base, the high scalability of the SQL database and the high quality of the server the client will make use of. Furthermore, we have made considerations for scalability of the website, for instance, we have made use of scalable technologies such as MySQL to ensure that any increased load in data requests will not affect the performance to any significant degree and we have also made extensive use of object orientated principles in the design of our system to ensure that any changes in the code that are needed to accommodate increased demand on the site can be more easily implemented. Moreover, we have taken maintainability into consideration through our planned use of Object-Orientated programming for all the PHP code, which will allow for any future changes to the website to be more easily implemented as well as for any bugs not found during development to be found and fixed more easily by future maintenance teams. Finally, we shall ensure that maximum security is ensured through a few methods. For instance, we shall make use of hashed(and salted) passwords to ensure that, in the event of a database leak, no accounts are easily compromised(especially admin accounts). Moreover, we shall suggest to the client to make use of a Secured Socket Layer(SSL) to ensure that all data transmissions(such as usernames and passwords) and much harder to be accessed as they would not be in plain text. Finally, security will be maintained by making use of a 3rd party payment system(X) to deal with financial transactions. This will avoid any bugs that could occur if our team created a payment system from nothing that might lead to serious legal or financial problems for the client.

Throughout the development of the web-shop, we shall need to consider many legal and some ethical considerations, mostly in relation to the technologies we shall be using.

To begin with, we shall be making use of Oracle's MySQL relational database management system. This product is somewhat restricted in the ways it can be used for for-profit purposes due to it being "under version 2 of the GNU" (Oracle, 2010) (also called the GPL/General Public License). This gives us a few options for its commercial use; we could request that the client makes the code of her website "available in the open source sense" (Kofler, 2007) which will allow her product to be both commercial and not go against the GNU. However, this solution is unlikely to be approved. A better solution is to purchase a MySQL license, whether it be a MySQL network license (applies to one computer/server for one year) (Kofler, 2007) or through the "Classic Commercial MySQL License" (Kofler, 2007). It is possible though that GoDaddy (the company the client currently is hosting through) already purchases and provides the MySQL license when you pay for a business account with them, in turn resulting in no action that needs to be taken by our development team.

Additionally, as part of the specification of the web-shop, the client wished for pdf document reports to be generated. To achieve this, we needed an open-source PHP pdf generator library. In this case, we shall use the fpdf (free pdf) library, which is available "under a permissive license" (FPDF, 2002) and entirely free for commercial purposes.

With the exception of the above two, all other technologies that we shall be using, including HTML, CSS, PHP, AJAX and node.js, are open-source and entirely free to use for commercial purposes.

Besides the fact as to whether technologies are open source, consideration will need to be taken into copyright, especially of images. If the client supplies us with images that they either don't own the copyright for or don't have permission to use, then they could end up with legal issues and their company could face a reduction in its reputation. Moreover, inline linking of images should be avoided as "it could…be a violation of copyright" (Stevens, 2017) due to a lack of permission to use the images, additionally this could be considered ethically wrong due to the inline linking of images using up the bandwidth of the server that you got the image from, in turn causing a reduction in their profits due to lost advertising revenue. However inline linking should not be too much of a concern as most images would be stored locally and we may warn the client of these issues if needed.

Moreover, considerations of the privacy of the client's website must be considered. For the most part, the client will need to provide us with a privacy policy due to the storage of data about the customers' and sellers' postcodes, names etc. Furthermore, security of the website is of the utmost importance due to the risk of data leaks and the creation of malicious links within the website. For the most part, we shall be able to prevent this via the use of prepared statements to prevent SQL injection and by preventing cross-site scripting (the injection of JavaScript code into a website).

Overall, the legal and ethical considerations of the project mainly relate to copyright and the use of images, and the protection of sensitive data. The first of which can be easily resolved by ensuring that the client supplies us with non-copyright infringing content and the second can be dealt with during development, with the use of prepared statements to prevent SQL injection and by encoding information that is input to ensure it is not treated as HTML/JavaScript code to prevent cross-site scripting.

With the exception for the security issues mentioned above, there are no safety concerns that really need to be considered for the development of the project.

Overall, the client wishes for us to develop an e-commerce website which will allow for a range of customer-baker interactions as well as the implementation of a payment system. Additionally, we plan to make use of Object-Orientated Programming principles and a multitude of technologies in order to produce a secure, scalable and maintainable website that meets the client’s requirements.