**Chapter 5 – Financial Accounts and Projections**

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**5.1 Introduction**

The project has been costed in terms of being the number of labour hours plus marketing costs. It has been assumed that the labour cost for each member of this group is set at the same pay rate of £42.50 per hour.

To make it easier to analyse the financial costs associated with labour, and where efficiencies could have been made, a breakdown of tasks has been provided. A full analysis has also been completed to determine where costs were greater than estimated and where they were lower and what could have made this project more efficient financially.

**5.2 Breakdown of Tasks**

A breakdown of the tasks that were completed during the duration of this project has been listed below (see *Table 1* below*)* with the actual number of hours spent on each task compared with the original estimation which was calculated during the planning stage of this project. The tasks have also been grouped under appropriate headings. These are as follows:

* Requirements Analysis
* Database Management
* Login and Accounts
* Enquiry System
* Chat System
* Mapping
* Ratings and Reviews
* Payment System
* Email Notifications
* File Downloads
* Admin Permissions
* Hacking and Bot Proofing
* Testing and Debugging

It is also important to note that the listed hours is the total time cost for the project team and not a per person time cost. In total, there were 60 small tasks to complete with the largest proportion of time being spent on developing the chat and enquiry system.

Table 1 - Breakdown of Tasks

|  |  |  |
| --- | --- | --- |
| **Task** | **Estimated Time Cost (Hours) [[1]](#footnote-1)** | **Actual Time Cost (Hours) 1** |
| **Requirements Analysis** | **44** | **30** |
| Feasibility Analysis | 7 | 5 |
| Scalability Analysis | 3 | 1 |
| Identify Key Users | 2 | 1 |
| Identify the technology required | 7 | 4 |
| Project schedule/cost estimation | 5 | 3 |
| Aims and deliverables | 6 | 5 |
| Ethical and legal issues | 5 | 5 |
| SWOT analysis | 4 | 2 |
| Risk assessment | 5 | 4 |
| **Database Management** | **32** | **26** |
| Use case diagram | 5 | 6 |
| Top-down ERD | 5 | 6 |
| Bottom-up ERD | 5 | 3 |
| Merged ERD | 16 | 8 |
| Create MySQL Database | 1 | 3 |
| **Login and Accounts** | **13** | **22** |
| User sessions | 3 | 1 |
| Different types of accounts | 1 | 4 |
| Reset password enabled | 1 | 4 |
| Track and cancel their orders | 2 | 5 |
| Shopper chooses delivery/local pickup | 1 | 2 |
| Edit Profile Details | 2 | 2 |
| Make a ‘guest’ account | 2 | 2 |
| Seller's limitation on number of pictures | 1 | 2 |
| **Enquiry System** | **21** | **21** |
| Captcha implementation | 5 | 1 |
| Simple and easy to complete | 10 | 15 |
| Encryption | 5 | 4 |
| Input Masks | 1 | 1 |
| **Chat System** | **28** | **30** |
| Payment link implementation | 9 | 4 - scrapped |
| Discussion between baker and customer | 10 | 16 |
| Discussion history | 7 | 8 |
| Baker's information visible after enquiry | 2 | 2 |
| **Mapping** | **5** | **10** |
| Display map to show a baker’s location | 1 | 1 |
| Outputs a list of bakers given a location | 1 | 4 |
| Allow more complex SQL queries | 3 | 5 |
| **Ratings and Reviews** | **10** | **13** |
| Approved purchase required to review | 6 | 3 |
| Flag inappropriate reviews for review by admin | 2 | 5 |
| Baker reviews by customers | 2 | 5 |
| **Payment System** | **15** | **25** |
| JSON API - PayPal | 5 | 15 – not complete |
| Secure implementation | 10 | 10 |
| **Email Notifications** | **14** | **14** |
| Notification on website and/or email | 2 | 2 |
| A new event will send a notification | 3 | 2 |
| Baker notification | 3 | 2 |
| Customer notification | 3 | 3 |
| Reset password | 3 | 5 |
| **File Downloads** | **5** | **9** |
| PDF download of transactions | 3 | 3 |
| Upload pictures of cakes to database | 2 | 6 |
| **Admin Permissions** | **13** | **25** |
| Can alter/delete/create/view certain content | 3 | 5 |
| Will have a list of bakers waiting for approval | 3 | 5 |
| Can grant additional space for pictures | 2 | 3 |
| Track any payments throughout the website | 3 | 8 |
| Retrieve information for billing purposes | 2 | 4 |
| **Hacking and Bot Proofing** | **13** | **9** |
| Captcha | 4 | 1 |
| SQL injection proofing | 4 | 1 |
| Remove error messages from display | 1 | 1 |
| Server side/form validation | 1 | 2 |
| Password requirements (input masks) | 1 | 1 |
| File uploads | 2 | 3 |
| **Testing and Debugging** | **93** | **102** |
| Insert dummy data | 2 | 1 |
| Join all different parts of the website together | 10 | 15 |
| Create dummy accounts | 1 | 1 |
| Test functionality | 80 | 85 |

**5.3 Analysis of Financial Costs**

The total number of labour hours was estimated to be **296**, before this project started, with the actual number of hours spent being **336**. Unfortunately, unforeseen circumstances meant that more time had to be spent on this project to realise the client specification.

**5.3.1 Requirements Analysis**

The original estimation of hours that were going to be spent on the Requirements Analysis was 44. The project team were able to bring this down to 30 saving **£595.00**.However, this came at a cost, as later on in the project several design amendments had to be made to the system, which ultimately was down to not spending enough billable hours on planning and fully understanding and mapping the client’s requirements.

**5.3.2 Database Management**

Just like the Requirements Analysis section, the team spent fewer hours than estimated on designing and planning the database. It was estimated that the team would spend 32 hours on this section but ended up only spending 26 hours saving **£255.00**. In hindsight, the team should have spent at least another 5 hours on this section, as several minor amendments had to be made to the Entity Relationship Diagram (ERD), such as extra fields in tables and on one occasion an extra table had to be created due to the increasing complexity of the system, which the team had not anticipated in the planning stage.

**5.3.3 Login and Accounts**

The project team spent 9 hours more than first estimated, going **£382.50** over budget, on developing the functionality to have multiple account types and for users to be able to login to the system. At first, it was decided that there would be different login pages for different account types, however, later on in the project, after discussions, the team decided that it would be best to have one login page encompassing all account types. This design decision was made to make the system, as simple as possible to use, both for the end users and the client.

**5.3.4 Enquiry System**

The project team spent 21 hours on the development of the enquiry system. This was in line with the original estimate for this section of the development. However, it soon became clear that the Captcha implementation was a lot simpler than first thought as Google’s documentation for its reCAPTCHA API[[2]](#footnote-2) was very clear and simple to understand. As a result of this, the developer in charge of this, Ben Scott, was able to complete this task in 1 hour rather than the 5 hours that the team originally thought it would take. On the other hand, the team spent 5 hours more than the original estimate to work on making the enquiry system simple and easy to use, with as few fields to fill out, in the form, as possible. The majority of these extra 5 hours was spent on making the code maintainable and easy to alter if the client needs to redevelop the enquiry system in the future.

**5.3.5 Chat System**

The project team were able to, more or less, stay in line with the estimated time that was allocated to develop the chat system. None the less, the team did end up spending 2 hours more than the original estimate, going **£85.00** above budget. Notably, the client decided to change its payment system provider late on in the project from WorldPay to PayPal, and so the development of the feature to integrate a payment link generator, from within the chat, had to be scrapped. This is therefore listed as being ‘scrapped’ in *Table 1* above. Despite this, the team would still have spent more hours than the original estimate as the team found it quite difficult to implement the feature to allow for a private one-to-one discussion between a baker and a customer.

**5.3.6 Mapping**

The mapping system took the project team 5 hours more than originally estimated, going **£212.50** above budget. Much of this extra time was because the team found it more difficult than anticipated to develop the feature to display a list of bakers given a customer’s location. This was because the locations had to be geocoded before the distance between a shop and the customer is calculated, thus the query and algorithm, to retrieve a list of bakers within a certain distance, was quite complex.

**5.3.7 Ratings and Reviews**

The development of the ratings and review system took 3 hours more than originally anticipated, going **£127.50** above budget. This was mostly down to under-estimating the complexity and difficulty of developing the review flagging feature for the bakers’ use.

**5.3.8 Payment System**

The project team were unable to complete the payment system, as per the client’s requirements. However, the team spent 15 hours on the development of the system and the developer working on the payment system, Pritam Sangani, reckoned it would have taken at most another 5 hours to get the system complete and tested. Part of the reason why it was not completed was because, at first, the client wished to use WorldPay to process the transactions going through the site. However, it soon became clear that it would be very difficult to develop the payment system to mirror the client’s requirements using WorldPay’s Payments API. As a result of this, and because the client realised that it would take a long time to register an account with WorldPay, a decision was made to use PayPal’s APIs, which would enable third-party payments to be made easily.

**5.3.9 Email Notifications**

The project team were able to stay in line with the original estimate when developing the feature allowing notifications to be sent by email. It is useful to note that the developers working on getting this feature up and running, were aiming to complete this system in 10 hours rather than the 14 hours it took. The reason why it took the developers more time than was wanted, is because the developers realised that the server that was being used to test this system had to be configured to allow emails to be sent. Therefore, the developers had to research how to do this as the developers were in unknown territory when it came to configuring a server.

**5.3.10 File Downloads**

The developer working on the feature, allowing the downloading and uploading of files, spent 4 hours more than first anticipated, going **£170.00** over budget. This is because of the nature of the files being uploaded to the server and the client’s requirements. The client had requested that there be a limit on the number of images an individual baker can have, associated with it, on the server at any one time. As a result of this, the development of this feature was more complex than first anticipated.

**5.3.11 Admin Permissions**

The project team, hugely underestimated the time cost required to successfully develop the features for the admins, as per the client’s requirements. It was originally estimated that 13 hours would be spent on this section of the system. However, necessary amendments to the ERD meant that this part of the project overran by 12 hours, going **£510.00** above budget.

**5.3.12 Hacking and Bot Proofing**

The developers working on making the site hacking and bot proof, were able to bring down the time cost from 13 hours to 9 hours, saving **£170.00**. The time cost saving came down to there being easy-to-follow tutorials online and the developers made the necessary amendments to make it work for the client.

**5.3.13 Testing and Debugging**

The testing and debugging section of the project took up the biggest chunk of time and to make things easier when doing final system checks, testing and debugging was done throughout the development stage of the project. This process was done by both, the developer working on that code and another developer independent of that code base, to make sure that the system was easy to use for people who hadn’t seen it before. The final system checks took longer than anticipated by about 9 hours, going over budget by **£382.50**. This was because of a number of reasons, most notably, differing file names and developers working off old code bases, meaning code had to be merged and tested and debugged again.

**5.4 Other Costs**

There were also some small costs associated with this project due to costs to produce marketing materials. For the Project Showcase event, posters were created to advertise this project. The cost of producing this material comes in at 3 x A2 Posters at £2.01 per poster, with the total cost equalling **£6.03**.

There were no costs associated with meeting room bookings as these were complimentary from The Union MMU[[3]](#footnote-3).

**5.5 Conclusion**

The estimated labour cost was calculated to be 296 x £42.50 coming in at **£12,580.00** with the actual labour cost coming in at 336 x £42.50 equalling **£14, 280.00**. Therefore, the labour cost overran by **£1,700.00**.

The total cost for this project is calculate as being **£14, 280.00** plus **£6.03**, bringing the total cost to **£14,286.03**.

1. The time costings have been simplified to include the number of hours spent on training and researching documentations, but not the number of hours spent on meetings associated with these tasks. [↑](#footnote-ref-1)
2. The documentation for Google’s reCAPTCHA API is available at: https://developers.google.com/recaptcha/intro [↑](#footnote-ref-2)
3. The Union MMU is located at 21 Higher Cambridge St, Manchester M15 6AD [↑](#footnote-ref-3)