**C868 – Software Capstone Project Summary**

**Task 2 – Section A**



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| **Capstone Proposal Project Name:** | Client-Tracker© Business Integration Summary |
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# **Business Problem**

**The Customer**

The business Hardcore Book Publisher is a small company that has just been created. They publish the books of any author. They do not stick to certain book genres. Right now, they only have the capability to publish traditional softback and hardback books. They can only publish in traditional sizes. They do plan to expand publishing capabilities in the future. This will allow them to access more clientele in the market. Hardcore Book Publisher uses publishing agents to seek out authors, who can be potential clients, in a salesman style manner. They also assign agents to authors who contact the company to express interest in publishing their works. The agents setup and attend meetings with their clients to work out publishing options. Once the options have been worked out, the agents then submit them to the publishing manager to get the final approval. If the work order is approved, it then proceeds to the book workshop to have the physical books produced. If an order is too big, the company hires a third-party publishing company to assist. Hardcore Book Publisher projects that, in three years it will cut out or drastically lower the number of times it will need to hire third party companies.

## **Business Case**

The software Client-Tracker© will help Hardcore Book Publisher by enhancing their data keeping and scheduling capabilities. Hardcore Book Publisher uses paper, Microsoft Excel, and a large communal whiteboard to keep track of their customers and the meetings that they schedule. This is acceptable now since they do not have a great deal of customers because they have only just been created. In the future, however, this will not work once the number of customers start to grow. There will not be enough space for the increased number of papers. It will take a longer, and longer time to search through the papers and Excel sheets to find what agents are looking for. It will be harder for one manager to keep track of all the growing amount of data that the company will be collecting. The cost of supplies will steadily increase as the company begins to expand. The company’s total processing time will also increase as the company expands.

Client-Tracker© will be able to enhance the company’s abilities now, and when the company starts to scale upward. The software will be able to link with a database and get any relevant data. It then manipulates and/or views that data and displays it to the user in a useful way. It then takes the user’s inputs and saves it to the database if needed. As the company scales upward, the software will be able to keep up with the company.

## **Fulfillment**

Client-Tracker© will fulfill the needs of Hardcore Book Publisher by providing a powerful system that assists the company’s agents in their daily assignments. The software will be written in the Java Programming Language. It will be used in a Microsoft Windows environment and link to a database that uses a SQL Server. When the software is started, it gets the data from the database and uses it to present the agents with relevant, useful, and organized information. The agents are then able to access reports and manipulate customer and appointment data. The reports are lists of customer or appointment information. The lists will display information to give an overview of how things are going in the company. For customer and appointment data, agents will be able to create, update, and delete information. The software will provide alerts, when logging in, for imminent upcoming appointments. It will also catch and warn of any errors that agents will commit when entering information into the program.

# **Existing Gaps**

The company Hardcore Book Publishing uses paper and Microsoft Excel to keep track of all their data. In the beginning of the day, the managers go through spreadsheets and papers to find data so they can decide what to assign their staff. This takes time to do. That time will take longer as the company adds more clients.

During the company’s morning meetings, the managers verbally report on certain types of information that pertains to customers and appointments. They also hand out written papers. These can be detailed assignments to create, update, or delete certain customers or appointments on the company spreadsheet. Verbally reporting everything can make these meeting last longer than needed. The detailed handwritten assignments can take time away from the agents who need to perform their traditional job of finding or assisting clients.

After the meeting, if the agents get assigned an update paper, they will have to manually search for the row in the database and update the information. This also takes time away.

Since the company is small, they have one computer to access the spreadsheet. This means that only one agent can access the spreadsheet at a time. This creates a line that is filled with agents who want to use the computer. Sometimes agents must leave for a meeting before they are able to use the computer. When an agent can use the computer, there is a learning curve on looking up certain information from the spreadsheet. The spreadsheet does not have an easy-to-use GUI. A user-friendly GUI will reduce the time needed to learn how to use the software.

# **SDLC Methodology**

The best method for the nature of this project calls for using the Lean method. The main reason for this is that the company, Hardcore Book Publisher, is at an accessible location and the requirements for this project are minimal. Deciding what to cut out during the development cycle will be easy since the requirements are not too complicated. Testing throughout the development cycle will be available since the company is accessible. Also, testing will not take long because the company is small and will not produce many testing obstacles. Certain things will still have to happen first before other things can start. So, the order of the phases will be arranged to reflect this. This methodology will include a requirement phase, a design phase, a developing phase, a testing phase, a delivery phase, and a maintenance phase.

**Requirement Phase**

This phase focuses on scheduling appointments with managers from the company. There, we will discuss the exact needs of the company. We will discuss what the agents needs to perform their job effectively and efficiently. We will also discuss what kind of information the company needs to upload to the database concerning the customers and appointments. The company representatives will be the only people allowed to approve the requirements.

**Deliverable**: documented requirements that have been approved by company representatives.

**Design Phase**

This phase focuses on designing the wireframes based on the requirements of the company. The wireframes include how the flow of the software and general layout will be. The wireframe will act as a prototype that the company representatives will be able to review and operate. If they have any corrections, we will take it back and fix every error. Then we will take it back to the company representatives. This will allow us to not waste time by going back and forth after every single correction. We will then let them review and operate it again. We will do this process until they have no corrections. Using the approved wireframe, we will design the entity diagram. This diagram will represent the database that the software will use.

**Deliverable**: an approved working wireframe and entity diagram.

**Developing Phase**

This phase focuses on developing the software. The IDE will be set up to build the software. The database will be created according to the wireframe and entity diagram. Once this is ready, development of the software will start. The class views, models, and controllers will be developed first. Then any other classes that will be required will be created. After this, the only thing left to do will be to polish up the program.

**Deliverable**: completed software implementing the requirements of the wireframe and entity diagram.

**Testing Phase**

This phase focuses on taking the completed software to the company and having the representatives try it out. This will allow the representatives to provide feedback on any errors they see. This will also allow for bugs to be discovered. These errors will be documented along with any other suggestions or changes that the representatives desire. We will take back the software and implement unit tests to assist in correcting discovered bugs and errors. Any desired changes or suggestions will be applied. All elements will be done first before heading back to the company so no time will be wasted going back and forth after each correction.

**Deliverable**: documented bug report, unit testing, and a fully tested and corrected software program.

**Delivery Phase**

This phase focuses on the delivery of the finished software program Client-Tracker©. An appointment will need to be made with the company since it will take time to setup the software. The software will then be packaged, delivered, and installed into one or multiple computers depending on what the company desires. The databases will also be setup at this time according to the needs of the company and will be linked to the software.

**Deliverable**: completed software packaged, installed, and linked to a database on company computers.

**Maintenance Phase**

This phase focuses on monitoring the use of the software by the company employees. At this time, there are usually some bugs that manifest in the program after repeated and unrestricted use by users. Sometimes, some mistakes are uncovered too. These will be documented and patched up when they surface. The order in which they will be addressed will be according to how severe they are to the operation of the software.

**Deliverable**: continued monitoring for, fixing, and documenting of bugs and mistakes in the software

# **Deliverables**

The project deliverables are things that get turned in after a certain phase. This can be documents with certain information or a product of some kind. Bug reports are an example of documentation and software to be tested by the company is an example of a product. The two types of deliverables for this project are project deliverables and product deliverables.

## **Project Deliverables**

These deliverables fall under the responsibilities of the Project Manager. These describe the path a process should take or a goal that a process should work towards.

* **Project Requirements Document**
  + This document describes the requirements that the company desires for the software to contain. It lists out each feature, layout, and any other special requirements. The company representatives sign off on the documentation which creates a record on what the company wants.
* **Project Schedule Document**
  + This document describes the scheduling for the whole project. It breaks down each phase into goals, and then each goal into tasks. Every task will have an estimate completion time. All the task’s time estimates will be added to make up the goal time estimate. All goal time estimates will be added to make up the project estimate completion time.
* **Wireframe Document**
  + This document is a low fidelity mockup that shows the company representatives the general flow the software will take. It also shows a general, rough layout of the GUI screens and a short description of each section and their functionality. This document will need to be signed off by the company representatives.
* **Prototype**
  + This prototype is a slightly higher fidelity mockup of the approved wireframe. It gives a better view of how the software is going to appear and the functionalities it is going to implement. The company representatives will also be able to test the prototype in a limited fashion. This will allow them to figure out if they have any changes that they would want to report.
* **Entity Diagram**
* This diagram shows the way the database, that the software is linking up to, will be setup. It will show the relationship that the database tables will have with each other. It will describe the contents of each table, including any foreign keys that will affect other tables.
* **Testing Plan Document**
  + This document focuses on the description of the different testing procedures that will be used on the development of the software. Some tests include the procedures used to test for bugs or errors. Some other tests include the procedures to test the software’s adherence to the requirements of the company.

## **Product Deliverables**

Product deliverables are things that are produced to be delivered to the company or its representatives.

* **Relational Database**
* This is the setup of the company’s database. The tables will be setup by inputting the required contents and linking the relationship between specific tables. The setup will follow the entity diagram.
* **Data Migration** 
  + This is the transfer of existing data from the company’s spreadsheet into the working database. This will lighten the learning load of the company’s employees and help smooth out the transition.
* **Completed Software Program**
  + This is the finished program that is to be delivered to the company. A packaged program will be delivered and installed into however many computers the company desires. The program will have been tested for bugs, mistakes, and adherence to the company’s requirements.
* **Employee Account Access**
  + This is the distribution of the employee’s username and password. This will provide them access to their own accounts in the software program.

# **Implementation**

Due to the nature of this project, there should not be a lot of obstacles. Nor should there be any complicated obstacles. So, the leaning of this project will help the timeline be short. This will benefit the company by receiving the software program in a very short amount of time.

We will setup appointments with company representatives so we will not interfere with the company’s operation. The meeting will most likely take all day, so the company would need to shift their operations to accommodate that. Everything will be discussed in the first meeting so no time will be wasted by physically going back and forth between locations. At any time during the development process, the company representatives will still be contacted by us concerning any questions we may have. They will be contacted by email. This will allow the representatives to reply whenever they have time to. If there is a critical question that is needed to be answered before we can continue, a phone call will be made. If ultimately, an email or phone call is not enough then a physical trip to the company location will be made. Certain things, however, will require physical trips to be made to their location.

While the software is being developed, the company will normally only be required to answer any questions that might arise. After the software is completed and ready for testing by the company, we will setup an environment that includes computers and relational databases. The number of computer setups will be determined by the number of company representatives. Testing goals, testing procedures, and expected testing outcomes will be documented. Tests will be setup. All will be done before the arrival of the representatives. Again, an appointment date and time that will benefit the company will be set. The representatives will arrive and be given a small briefing to enable a smooth testing session. The representatives will report anything they perceive that need to be addressed. After all testing tasks are completed, the testing will end.

When the software is being fixed according to the testing results, the company will only need to be contacted by email or phone calls. Any correction that requires a representative to be present, will wait until the next test appointment. This will help eliminate waste. This cycle will continue until there are no corrections to be made.

After this the software is ready to be deployed. We will go to the company and install the software on however many computers they wish. We will also setup their relational database system. This will be done in a manner that will not affect their business operations. The database will then be populated with the company’s existing spreadsheet data. At the same time, the employees will be given a briefing on how to operate the new software. This will be done as efficiently as possible since this will shut down their operations until they have learned how the new program performs. At this time the employees will also be given their usernames and passwords.

Following the days of usage by the company, we will monitor the software on a weekly basis to see if any issues arise. The issues will be assigned a severity level and dealt with accordingly. If the company encounters a critical error that will stop the company’s operation, we will immediately go to their location and work the problem. This will continue until the agreed upon separation date.

# **Validation and Verification**

During the development of the software program, we will use are own unit testing tools to make sure the software is performing as expected. The expectation stems from the approved requirement document that was made during the beginning of the project. Each feature in the program will be tested to see if the expected output is given. Each feature will be provided with sample data to use. The feature will then be tested in conjunction with other features to ensure proper coordination between them.

The testing that includes the representatives coming over and taking part in the testing tasks are part of the validation and verification process. It includes multiple representatives from multiple departments in the company. That way there will be different point of views operating the program. The first thing the representatives will do is fill out a questionnaire to find out how well they understand computers in general. They will then be given a briefing about how the testing is setup and what they can expect to do in the session. During that briefing, our employees will go over each questionnaire to get a sense on how much each representative knows about computers. This will help in the evaluation of each representative.

We will then take each representative and administer every previously prepared scenario to them. We will get their feedback in real time before, during, and after each scenario. After all scenarios are completed for each representative, they will be given a chance to report anything that they may have forgotten. They will also be given a chance to make any other suggestions that the testing did not cover. After that they will be given their feedback reports to look over and approve before the testing is completed. Their feedback will then be documented and passed on to the developers for corrective actions. This cycle will continue until there are no corrections to be made.

After the software is deployed and the company starts to operate with it, we will continue to monitor the program. The company will send us documented corrective feedback and we will correct each action. When the correction is made, we will follow up with a questionnaire that determines if the corrective action fixed the problem. This questionnaire will also be documented. This cycle will continue until the agreed upon separation date.

# **Environments and Costs**

## **Programming Environment**

This environment will be used to complete the software project.

* Windows 10 or higher
* IntelliJ IDEA 2021.1.3 x64
* MySQL Workbench 8.0

## **Environment Costs**

The cost of this project for Hardcore Book Publisher will mostly be a startup cost. This will mostly be the cost of hiring of us. Since the company has just been created, their clientele will be minimal. This means that they can have an onsite basic database server that should be able to keep up with their business operations. A basic database will be able to run on an inexpensive server. The cost of a regular computer with upgraded multiple storage hard drives, ram, fans, and processor power should be around $1,000. A program as simple as the free downloadable Microsoft SQL Server Management Studio can be used to connect with the sever using a GUI. The cost of running the server all the time will be determined by their electrical provider’s pricing rate. The only time this will not be sufficient is when their company grows into a substantial size. This will increase their clientele, which will increase the number of their appointments. This will then increase their data saved in their database. At that time the company should opt to look for third-party vendors. These vendors can manage the company’s database automatically online for a relatively low cost.

## **Human Resource Requirements**

This project will need a team that will consist of a project manager, a team lead, and two software developers. Since the requirements of this project is low and the company is small, the team lead and developers will also conduct the testing.

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| --- | --- | --- | --- |
| **Role** | **Rate** | **Estimated Time** | **Total** |
| Project Manager | $50/hour | 30 hours | $1,500 |
| Team Lead | $50/hour | 160 hours | $8,000 |
| Software Developer | $70/hour | 160 hours | $11,200 |
| Software Developer | $70/hour | 160 hours | $11,200 |

# **Project Timeline**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Phase | Milestone/Task | Deliverable | Description | Dates |
| Requirement | Task 1 | Requirement document | Meet with customer and discuss. | 11/1/2022 –  11/3/2022 |
| Design | Task 2 / Wireframe | Low fidelity wireframe | Create a wireframe that shows the look and flow according to the requirements. | 11/4/2022 – 11/7/2022 |
| Design | Task 3 / Prototype | Higher fidelity wireframe | This shows more details and is interactive. | 11/8/2022 –  11/10/2022 |
| Design | Task 4 / Entity Diagram | Diagram of database entities | Diagram showing the relation of database tables. | 11/11/2022 –  11/11/2022 |
| Developing | Task 4 | Finished software program | A completed program ready for testing. | 11/14/2022 –  11/18/2022 |
| Testing | Task 5 / Testing Preparations | Testing scenario setups | Scenarios will be created and computers setup. | 11/21/2022 –  11/21/2022 |
| Testing | Task 6 / Testing | Company representatives will run scenarios | Team Lead and developers will assist representatives and collect feedback. | 11/22/2022 –  11/22/2022 |
| Testing | Task 7 / Corrections | Developers will correct bugs and errors | Multiple testing sessions will take place until all problems are fixed. | 11/23/2022 –  11/25/2022 |
| Delivery | Task 8 / Client-Tracker© | Deliver corrected software program | Deliver, install, setup, and train employees on new software. | 11/28/2022 –  11/28/2022 |
| Maintenance | Task 9 / Maintenance | Software monitoring | Error reports taken and dealt with. | 11/29/2022+ |