## Criterion A: Planning

### The scenario

The client and adviser, Mr Sunil Tewari, is the owner and CEO of Mansa Construction Pty. Ltd, which is a housing construction company that operates in Sydney, New South Wales (NSW), Australia.

In NSW, contractors working on a building site must have appropriate and up-to-date certification. Certification includes a valid and up-to-date Australian Business Number (ABN) and Service NSW licence. Otherwise, the company hiring the contractor has to pay the contractor’s business and income taxes. This has substantial implications on my client, as he would have to pay “tens of thousands of dollars in contractor’s taxes every year”.

Currently, there is no easy way to check whether a contractor has appropriately valid certification to work. The current system involves the client’s wife logging each contractor in a spreadsheet weekly and confirming contractor’s status’ weekly, is stored on a cloud drive account once confirmed. “It’s not ideal” the client states, and if she didn’t have to do this task, she could allocate “time to do [...] productive things in the company.”

### Rationale for proposed solution

In “Interview 1”, we discussed possible solutions to use fewer human resources. The main goal we established was it should store and validate certification on a site-by-site basis. Supplementary goals we established were that the “security” should be maintained, and it should be easy to use – as losing data would be a great detriment for operations and cause them to “receive [big fines]”. As the client already has a pre-established cloud storage workflow that works “well”, just the downloading of data is sufficient. This would allow the client to access their important information if there is a hardware failure/breakage. It should be available for use “on the go”- as they currently use mobile devices “when calling contractors and clients”. Also, a “to-do list” for further items of action to be noted is required.

In “Interview 2” we discussed the implementation details of a solution. Often the client is away from his computer and accessing/validifying contractor’s information “on the go” is ideal. A front-end website (developed in HTML, CSS & JavaScript) functional on both a phone and laptop would ensure this workflow is possible. The client could create a project on their main computer and save it to the cloud to download on their phone, etc. The use of Java in the backend will allow for the storage and sorting of data for project database management and searching. Java also allows for data collection from ABN and Service NSW APIs, and for the importing and formatting of collected data to a CSV document.

### Success criteria

* Saves information for contractors per building project for multiple building projects
  + Client can log a title or address, description, image of the project, future items to do about the project
  + Client can get appropriate information from Service NSW and ABN APIs
    - Name
    - Contracted field
    - Service NSW licence number
    - Service NSW licence expiry
    - ABN
    - ABN expiry date
* Search the list of projects to find the desired one
* Show a list of short-term concerns with certifications at a glance for future action
* Looks appropriate and functions well on mobile devices *and* desktop; performs well on both
* Be able to download data into a spreadsheet format for storage in already-established cloud storage system as a CSV file

## Criterion B: Solution overview

### Record of tasks

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **#** | **Planned action** | **Planned outcome** | **Time estimated** | **Target completion date** | **Criterion** | |
| 1 | Initial meeting with client, learning about situation and current system | Talk to the client about the project, learn about the requirements of the supervisor | 1 day |  | | A |
| 2 | Discussion with advisor about client, scope of project | Advisor approves the project in its current scope, and confirms my ability start prototyping | 1 day |  | |  |
| 3 | Prototyping user interface designs, researching underlying technologies | Start working through project requirements, start prototyping a GUI that fits with requirements | 5 days |  | | A & B |
| 4 | Second meeting with client, finalising prototype designs | Talk with supervisor about the first prototypes of GUI for further prototyping | 1 day |  | | A & B |
| 5 | Create UML diagrams and flow charts | Develop how the backend of the program will work in according to newly found requirements | 1 week |  | | B & C |
| 6 | Initial creation of documents for development & API authorisation | Begin the creation of the documents for development and commit to GitHub. | 2 days |  | | C |
| 7 | Development of the website, developing user interface and user experience | Work through developing the HTML, CSS, and JavaScript | 3 weeks |  | | C |
| 8 | Development of the Java backend database management | Work through developing the backend in Java using the earlier created UML diagram | 4 weeks |  | | C |
| 9 | Field test with client in a project environment; implementation of solution | See if the program works in a real-life situation with the program, and adjust according to new needs in the program | 2 days |  | | D / E |
| 10 | Interview with client to see if developments are ok, and final adjustments to use cases | Take the developments from the field test, adjust the project, and talk to client about the final project for use | 5 days |  | | C / E |
| 11 | Creation of video with the project in use | Create a video to demonstrate how the project works for the supervisor and advisor | 2 days |  | | D |
| 12 | Final interview and reflection with client, as well as personal reflection | Confirm if the project is up to the standard that both the advisor and supervisor | 1 day |  | | E |

### Design overview

Figure 1: Initial Main View



Figure 2: Initial In-depth Project View

A screenshot of a cell phone

Description automatically generated

Figure 3: Initial Add New Project View

A screenshot of a cell phone

Description automatically generated

Figure 4: Initial Mobile View

A screenshot of a cell phone

Description automatically generated

Figure 5: Final Main View

A close up of a device

Description automatically generated

Figure 6: Final In-depth Project View

A screenshot of a cell phone

Description automatically generated

Figure 7: Final Add New Project View

A screenshot of a cell phone

Description automatically generated

Figure 8: Final Mobile View

### UML diagram

A screenshot of a cell phone

Description automatically generated

### Functionality of classes

|  |  |
| --- | --- |
| **Function name** | **Function purpose** |
| + listTodoItemSpecifications() |  |
| + getClientName() |  |
| + listSpecifications() |  |
| + listContractors() |  |
| + listTodoItems() |  |
| + getLicenceID() |  |
| + getLicenceNumber() |  |
| + listContractorSpecifications() |  |

## Criterion C: Development

## Appendix

#### Interview 1

**Me:** Good afternoon, in this interview we should be able to establish a general idea of the problem and a solution that would fix it.

**Client:** Absolutely, good afternoon. Essentially, when working on a project, we hire a lot of contractors for every purpose, you know- tiling, electrical work, plumbing, and whatever else. Each one of those contractors has to have appropriate certification to be able to work, otherwise we get charged for the taxes they have to pay. There’s no way currently to easily be able to check whether a contractor has valid certification, and that’s the problem.

**Me:** What certification do you have to manage for the contractors? What is your current method of managing these contracts?

**Client:** The certification includes an ABN [Australian Business Number] that hasn’t expired and isn’t fake, as well as a NSW [New South Wales] Service licence for whatever job they’ve got to do. Currently, my wife inputs everything into a spreadsheet application after checking everything on a weekly basis. It’s not ideal, because if she forgets to check everything for one week when we’re on holidays or something we could receive a big fine – it would be like tens of thousands of dollars a year if at its worst. If she was free to not do this task, she could use that time to do actually productive things in the company.

**Me:** How do you use your current system? Would it have to be available to be used on the go, or would something like a stationary desktop application be more appropriate? How do you use your current system?

**Client:** I haven’t thought about that- we mainly use our current system on our laptops at home and bring them out to sites when we have to meet a new contractor. It would be quite useful to have a solution on the go, on our phones. We currently use our phones a great deal when calling contractors and clients for our company, so a way to use the solution on our mobile devices would be nice.

**Me:** A mobile system sounds doable and a nice solution to your problem. I imagine that you would also want it to run on your computer at home as well?

**Client:** That would be nice so that we could rely on both platforms, and it wouldn’t take that much time to learn over our current system.

**Me:** Do you have any other concerns with the operation of the solution? Anything else that you want me to consider when developing it?

**Client:** Yeah, a few things. I think it would have to be easy to use for people of our age, and something that we could learn to use in a short amount of time. We’re constantly getting new clients and building more houses, so the less time it takes to learn, the more time we can save and devote to building better houses. Also, it has to be secure and not lose its data or be compromised or something like that. One benefit of our current system is that it’s backed up on the cloud, and secure. We always know that it’s going to be there and that we’re not going to lose our information.

**Me:** Absolutely, I imagine that you might want a similar cloud-based system with the new solution as well. Anything else to add to the solution?

**Client:** ...Oh- like a small to-do list for each project so that we have actionable points to plan out our projects and any further action to do with contractors. And, yeah, I think we’re good.

**Me:** A to-do list sounds like a good idea. Thanks for your time, we will schedule a meeting after I’ve made some concept designs and mock-ups.

**Client:** Thanks, until next time.

#### Interview 2

**Me:** Thanks for making time again. I have come back with mock diagrams using all the information you gave me last interview, and here they are.

\*Refer to Figure 1 in Mock Diagrams – Appendix\*

**Me:** Would something like this be appropriate for the main view on a laptop?

**Client:** Yeah, this looks nice. I think it contains everything that we would need to use. Is this just the only screen? Or does something happen if you click on one of the project boxes?

**Me:** So this is just the main screen that’s used to give you information about everything that’s stored on the website, and then you will be able to click on each of the projects to get a better view of them and edit whatever you need to.

**Client:** Brilliant. If we’re talking about looking at everything from a glance, would it be possible to get a box up the top or somewhere that rounds up all possible problems in each of the projects? Like if a contractor was to have an item of certification expire soon?

**Me:** Yes, that would be a great idea. I will put that in the final mock-up. I could probably implement upcoming to-do items as well if you want those throughout the project too- I believe I did not add those in the mock-ups.

**Client:** That would be great, cheers.

\*Refer to changes in blue in Figure 5 in Mock Diagrams - Appendix\*

**Me:** Onto the next, this is the screen that you will get after clicking on any particular project.

\*Refer to Figure 2 in Mock Diagrams - Appendix\*

**Me:** This is what it would look like when you click on a specific project. If you want me to add time stamps for each to-do item that would be possible in the to-do items box.

**Client:** Yep, that would be good. Also, we need to go through what information to display in the contractor’s box. Do you know what you can find online and where to find it?

**Me:** Yes, I had a look through all of the websites and APIs that could lend data, and I think that getting the expiry date of their NSW Services licence and ABN. What else would be required?

**Client:** Something like the role or job that they’re registered to do, because if they do something else that they don’t have a proper license for the same tax issues come into play.

**Me:** Oh, ok. I will make a note of all of those for the final mock-ups. Anything else on this page?

**Client:** Nothing else, onto the next one.

\*Refer to changes in blue in Figure 6 in Mock Diagrams - Appendix\*

\*Refer to Figure 3 in Mock Diagrams - Appendix\*

**Me:** This is the screen that you would get when you add a new project from the main screen that we looked at earlier. As you said, the dates have to be added to the to-do list section. Anything else you can see that you would want?

**Client:** Again, with the contractor’s section, could we be a little more specific? Like, could you get it to give me a list of everyone with a specific name, Service NSW or ABN? Other than that, and the date added thing, it looks good.

**Me:** I do not think that we would easily be able to get API calls on the go for the ABN because of the way the government has structured the API, but I think that should be fine to do with the Service NSW and names.

**Client:** Ok, that’s alright.

\*Refer to changes in blue in Figure 7 in Mock Diagrams - Appendix\*

**Me:** The final mock-up is just of what I think it would look on your phone if you wanted to go mobile. There’s no real difference between this and the main view, just optimised to look better on a smaller screen.

**Client:** Yeah that looks fine. I imagine that the rest of the functionality will do the same thing, like adding new projects and all that?

**Me:** Yes, that’s the aim.

**Client:** Too easy.

**Me:** As for the logistics with how to develop it, I’m planning on developing a website. That way it will be accessible to you both on your laptop and on your phone easily, and I have previous experience developing- so debugging and development will take less time.

**Client:** What about cyber-attacks and other things with compromising data? As I think I said in the first interview, if we lose our data then we’re screwed.

**Me:** I was thinking about that. I’ll try my best to make the website as secure as possible, and I have had previous experience working on websites so that shouldn’t be too hard to cover. There are backup methods of security that we will have to use, however. Can you think of a way that you would use to do that?

**Client:** ... Could we download the data or something so that we could store it in the cloud?

**Me:** Yes, something like implementing a download as spreadsheet system could be implemented. Would you prefer to use that over a system inbuilt into the app?

**Client:** We’ve got our current system that works well managing cloud storage of data, so I don’t think that we need an implementation of it directly in the app. Other than that, ...I’ve got nothing.

**Me:** Alright, thanks for that. We’ll schedule another interview when I’ve finished development.

**Client:** Alright, cheers.