

**MANAGING FINANCES**

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**ASSIGNMENT TWO - DESIGN**

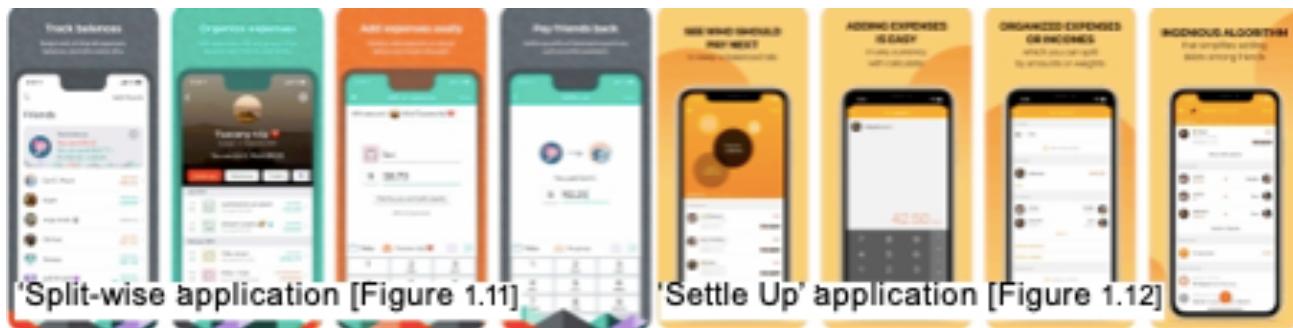
**SWEN303**

## Part 1: Introduction (UNCHANGED)

### **DESCRIPTION 1.0**

#### **Existing Solutions 1.1**

Various existing solutions act as a manager for shared and individual living costs (fixed and variable). Of those, 'Split-wise' and 'Settle up' are most commonly known to be most effective according to blogs Urban Jungle, Wired, and the balance.



Both solutions share similar interfaces and offerings. We can observe that these application allows users to create groups, allocate expenses (variable and fixed) and observe outstanding balances. Additionally, these successful solutions implement a minimalistic user interface that can be easily understood and navigated.

#### Opportunities for improvement in functionality based on existing solutions:

- >Pay bill directly within the application (Observed in 'Venmo' - Unavailable in New Zealand).
- >Use images of receipts to automatically upload expenses (Observed in Divvy (Used for tracking business expenses) and Split-wise premium user interface).
- >Set a recurring day in which reminders for payment is automatically sent out.
- >Observe relevant user information (e.g bank account number, payday) from users profile. >Manage personal as well as communal finances.

#### Opportunities for improvement in UI based on existing solutions:

- >'Settle Up' offers only a singular button for adding expenses and does not implement a navigation bar. As a result, adding an expense is complex compared to 'Split-wise' due to the various container pop-ups. Additionally, all the features displayed on a singular page make the UI unappealing. To improve upon this design, we should ensure that there is a navigation bar to separate and easily navigate to features. In addition, we should minimise any unnecessary pop-up containers to make the entry of an expense is quick and convenient.
- >'Split-wise' does not offer a feature that allows us to navigate past transactions easily. Instead, it has an activity feature that acts similarly to a news-feed.

To improve upon this design, we should reorganise to a more minimalistic list ordered by dates for ease of comprehension.

### **Business Objectives 1.2**

The main objective of a solution that manages shared and individual living costs is to make tracking shared and personal expenses more convenient. The solution must be easy to use and understand for users with varying degrees technological literacy. This objective can be effectively supplemented by a UI design that is attractive, cohesive and easy to navigate.

The secondary objective is accurately and easily record and distribute expenses to users. This objective means a solution needs to ensure that inputs from users are simple, removing the burden of financial literacy from users and transferring it to the functions of the solution. The UI for recording transactions must be minimalistic and intuitive to reduce the occurrence of error or user frustration.

The final objective is to track and settle outstanding balances and observe and edit past transactions. This objective allows users to correct an inaccurate transaction, understand how expenses occur and when they were settled. With the possibility of an extensive list of the recorded transactions, the UI supplementing this objective must be well organised and clear.

These objectives of a finance management solution can be more comprehensively met with additional features complemented by a UI that aligns with users' needs and activities. Maintaining user satisfaction and needs ensures the solution maintain/grows its market share and generates profit.

### **Significance to Stakeholder 1.3**

The finance manager solution is important to various groups and individuals worldwide. Our solution aims to target university students as outlined by the assignment specification.

It is common to see an influx of students living situations change yearly as they navigate living by themselves (halls and living at home) to sharing a space (flatting). As a result, they are now responsible for managing finances relating to themselves and others. This may be an overwhelming responsibility for many, with financial disputes potentially causing rifts within personal relationships.

University students want to create and track reoccurring (fixed expense) and one-off expenses (variable expense) and split expenses equally or unequally by percentages, shares, or exact amounts, accurately and conveniently, to reduce the strain finance management can cause.

As this is important to our users, we must ensure that we provide a working and attractive UI to maintain/grow our clientele. Having the user overwhelmed with information and inputs can cause users to turn to different solutions due to frustration, resulting in the loss of market shares. Therefore, we must ensure we are providing a user-friendly and intuitive solution for users of varying lifestyles to meet our objective.

In addition to the solution's significance to our primary stakeholder, it benefits parents, universities, landlords and government. This is because less resources (time and money) from these parties are consumed from a universities students incorrectly planed finances and conflicts within their living groups.

#### **Basic functions and significance:**

>Add expenses and distribute them to relevant parties.

Easily track expenses without confusion, conflict or disputes.

>Observe outstanding accounts and settle balances.

Allow payments to be completed within one transaction - reduces the need to transfer funds back and forth, which may cause loss of information (expenses left unpaid).

>Observe/modify past transactions.

Allow for correction of mistakes and ensures queries of expenses can be answered through historical transactions. This means users feel confident that mistakes do not result in financial ramification/inaccuracies.

## Part 2: Personas and Requirements (UNCHANGED)

### OVERVIEW 1.0

These personas were identified from four abstract user groups within our end-user group of university students; generated using the technique of abstraction (categorising users by their situation, behaviour and characteristics). We took the characteristics we identified in our research and applied them to different personas to ensure we would generate a comprehensive solution for our end users. This prevents generalisation, which may make the solution inaccessible for groups with diverse traits. Personas were then prioritised based on how their needs/circumstances aligned with the purpose of the solution, their likelihood of use (based on lifestyle and attitude towards finance management) and market potential (size of the market they represent).

Our Personas' (Timothy McDermott, Amelia Waldorf, Sarah Yu, Jack Apperly) attributes:

	Timothy	Amelia	Sarah	Jack
<b>Financial Literacy</b>	Low	High	Moderate	Low
<b>Flatting Experience</b>	Low	High	Moderate	Low
<b>Lifestyle (social)</b>	Moderate	High	Low	High
<b>Expense type</b>	Shared/Personal	Shared	Personal	Shared

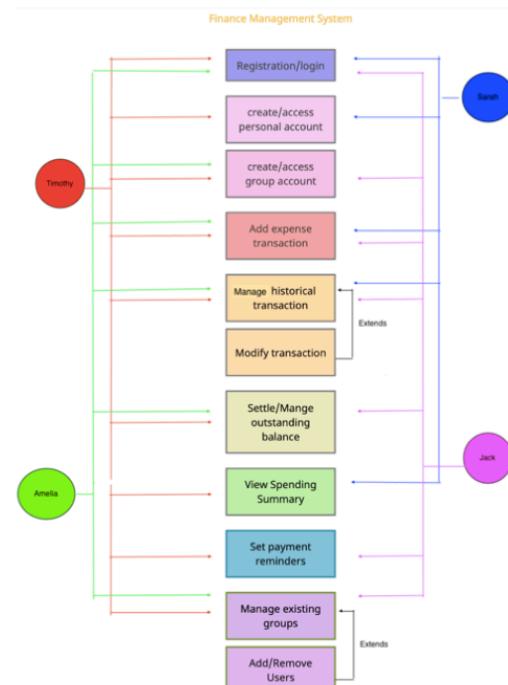
We experimented with existing solutions' 'Split-wise' and 'Settle up' to determine the task personas would perform when using the solution. We created Accounts via registration, created a group for communal expenses and explored existing functionality and features. When generating tasks, we have to consider the ability to manage personal expenses, which is not offered in existing solutions. We broke these features and functionality down into individual tasks and looked at the relationship between these tasks.

We represented these tasks with their relationships to each other and how personas interacted with them in a use-case diagram.

We prioritised the use case scenarios by looking at how critical they were to the system's functions and how they supplemented the purpose of our solution. Both components are equally crucial in our choice for prioritisation - this is because we do not fully comprehend the interactions of a use case without one another. For example, the task of registration appears to be an essential use-case scenario. However users are not visiting this service to register for an account.

Less critical system functions are given a lower priority, especially if they do not directly align with the solution's purpose. This is because the solution does not require these functions to operate and they are observed as additional features. For example, setting reoccurring payment reminders is given a lower priority as it doesn't significantly affect the solution's purpose.

In addition to system function and purpose, a factor that we used to evaluate the priority of a use case is how frequently each user would perform the task/use-case scenario. This determined tasks which affected the most users and thus creates the most value. For example, the ability to add expenses is given a higher priority since all users will add expenses as it is a core function of the application.



## Part 2: Personas

### TIMOTHY McDERMOTT 1.0

**Age:** 19

**Gender:** Male

**Occupation:** Victoria University of Wellington (VUW) student

**Location:** Wellington

**Nationality:** New Zealander



Timothy (Tim) grew up in Wellington. He has always been passionate about software development and pursued this academically at VUW. Tim has just entered his second year of study for a Bachelor of Software Engineering. Recently he has moved from living in halls (Capital Hall) to a five-bedroom flat with his friends in Newtown. Tim currently works part-time as a tutor (VUW) to finance his living cost.

### GOALS 1.1

>Complete his degree with a GPA over 8.0 (A)

>Save money to travel to Australia to visit his extended family

### CHALLENGES 1.2

Tim is the lead tenant and is in charge of paying for rent and utilities. Rent and utilities are automatically charged from his personal account, which he also uses to pay for personal expenses. This makes it hard for him to budget as his flatmates do not always pay their share of expenses on time and there are often disputes on outstanding balances owed to Tim. As a result, Tim sometimes has to use money from savings to ensure bills are paid. Managing flat finances has been a significant source of conflict within his flat group and has affected his ability to save.

### MOTIVATION 1.3

Tim wants a solution that will be easy to use and allow him to manage his own and his flat expenses. This is so he can use his time to concentrate on his studies and budget more effectively to save up and travel to Australia.

### FRUSTRATIONS 1.4

>Existing solutions do not offer the ability to track personal expenses and group expenses.

>Existing solutions UI are over complicated (various fields).

### NEEDS 1.5

>A solution that is easy to use with little/no financial calculation as Tim does not want to spend time calculating each flatmate's share of an expense.

>A solution must allow him to track personal and communal spending separately as to budget effectively and observe outstanding amounts owed by his flatmates.

>Works on different types of devices (Apple, Samsung Huawei) so he and his flatmates can work collaboratively to track expenses as they occur (Limits loss of information).

### EXPECTATIONS 1.6

Tim expects the solutions to be less time consuming and more accurate than manually tracking expenses. In addition, he wants the UI to be clear and easy to understand as he needs to communicate with a relatively large group (five people) and wants to prevent further conflict.

### COMPUTER SELF-EFFICACY 1.7

Tim is confident when performing a task on a new platform, often exploring technological solutions for his problems, but is less inclined to invest in time-consuming processes as he is a bit impatient. Tim will likely move onto a new solution that better meets his needs if something goes wrong. Currently, Tim uses split-wise but is unhappy with the solution as it does not offer personal finance management.

**AMELIA WALDORF 2.0****Age:** 22**Gender:** Female**Occupation:** Graduate architect**Location:** Wellington**Nationality:** New Zealander

Amelia Waldorf grew up in Nelson and moved to Wellington in 2018 to study at Victoria University of Wellington (VUW). She has recently finished her studies and has found a graduate role at a Wellington Architecture firm. She has a busy schedule and is often found at a local restaurant or bar after a long workday. She lives with a couple of friends in Thorndon - however, she is hardly home.

**GOALS 2.1**

- >Expand her social circles and grow her connections.
- >Move to Auckland in the next three years.
- >Maintain positive work-life balance.

**CHALLENGES 2.2**

Amelia has an active lifestyle. As a result, Amelia has found it hard to keep track of what is going on in her flat, resulting in her missing payments and being charged for communal expenses she had not agreed to/are aware of. Amelia would like a solution that would allow her to maintain her daily schedule without worrying about tracking expenses related to her flat.

**MOTIVATION 2.3**

Amelia wants to maintain a positive relationship with her flatmates as she strongly values her relationships. Therefore if a solution is present which allows her to manage her communal finances easily, she would actively pursue it. Additionally, she would like to move to Auckland in the future - having positive references from landlords for timely payment is also important to support this goal.

**FRUSTRATIONS 2.4**

- >Existing solutions do not offer the ability to view historical transactions easily.
- >Existing solutions do not allow for balances to be settled within the solution.

**NEEDS 2.5**

- >A solution that tracks expenses as they incur clearly and concisely with the ability to observe historical transactions.
- >A solution that allows for outstanding balances to be quickly observed and paid.
- >A solution that works on multiple types of the platform (laptop and phone) so she can track expenses when she is in the office and out socialising.

**EXPECTATIONS 2.6**

Amelia expects that the solution will keep her up to date with expenses and allow her to observe past expenses. In addition, she wants the solution to save time either by allowing her to settle balances directly within the app or to observe a user's bank account number without manually having to request it.

**COMPUTER SELF-EFFICACY 2.7**

Amelia is more comfortable using her mobile phone to access solutions either on a website or through an application but is open to using her laptop. She does not actively seek solutions and has not tried to manage her finance through a solution; instead, she pays for amounts requested by her flatmates on their group chat. However, she wants a more organised approach, so she does not mind tinkering with a solution to get familiar with it.

**SARAH YU 3.0****Age:** 21**Gender:** Female**Occupation:** Victoria University of Wellington (VUW) student**Location:** Wellington**Nationality:** Taiwanese

Sarah has recently moved to New Zealand. She is currently living in an un-catered hall of residence. She is finishing her Bachelor of Commerce, majoring in Economics. Previously, she lived in Taiwan and shared a small apartment with her friends, so living independently has been a significant change for her. She is excited to explore Wellington, make new friends and discover new opportunities in New Zealand.

**GOALS 3.1**

- >Improve her English language skills.
- >Finish her degree and return to Taiwan to help manage her family business.

**CHALLENGES 3.2**

Most of Sarah's living expenses are fixed (Rent, Electricity and Wifi); however, she is not familiar with her everyday expense (food, transport, clothes). Her parents send her a monthly sum at the start of each month, but she has found that she has gone over budget frequently and has to request more money which incurs an exchange fee. She would like something that she can easily track her living expense with to prevent incurring unnecessary costs.

**MOTIVATION 3.3**

Sarah appreciates everything her family has done to support her studies and wants to reduce any financial strain they may have. She is motivated to find a solution to ensure that the money she receives is being used towards her studies instead of careless fees.

**FRUSTRATIONS 3.4**

- >Existing solutions tend to depend on a lot of text that can be confusing and hard to use.
- >Existing solutions do not tend to report where expenses were allocated, which means expenses have to be categorised and added together manually.

**NEEDS 3.5**

- >A UI that is more visual (image/icon) than textual (text).
- >A graph or report on the category of where expenses were located and total monthly expenditure.
- >A solution that allows her to track her spending easily without being dependent on long and wordy instructions (limited language skills).

**EXPECTATIONS 3.6**

Sarah expects the solution to help her keep track of her spending, see where she is spending the most money and provide an appropriate budget for her parents. This should be easy to do without frustration or significant time consumption.

**COMPUTER SELF-EFFICACY 3.7**

Sarah likes solutions to be in the form of a website as her phone can sometimes be a bit unreliable. Sarah has tried to keep track of her finances using an excel sheet in the past but found it hard to keep up with and felt that the process was a bit confusing. Sarah enjoys aesthetic interfaces and is more likely to persist with complex solutions if they are organised and clean. However, she does not want to deal with solutions that are too wordy due to her limited English.

**JACK APPERLY 4.0****Age:** 19**Gender:** Male**Occupation:** Victoria University of Wellington (VUW) student**Location:** Wellington**Nationality:** New Zealander

Jack is a first-year student embarking on his academic journey at Victoria University of Wellington. He is pursuing a Bachelor's in Law. Jack grew up in Hawks bay - a smaller, more rural town than Wellington - therefore, he decided to live in a catered hall to meet new friends. He is looking forward to trying out the various restaurants and pubs as he is a 'foodie' and runs a food review blog on Instagram.

**GOALS 4.1**

- >Grow his food review Instagram account and become a micro-influencer.

- >Finish his Law degree with honours.

**CHALLENGES 4.2**

Jack is living in a catered Hall of residence. This means that most of his expenses were paid for in a lump sum. As a result, he only deals with shared expenses (food/drinks/activities) within his group of friends. These expenses occur frequently and are of a low monetary value; therefore, he has not tried to track them. He believes most solutions require a lot of work and does not want to bother his friends by frequently asking for small reimbursements (nonchalant about finance management).

**MOTIVATION 4.3**

Jack wants to grow his Instagram and part of this is creating content. Jack typically post content about outings with his friends and does this at least three times a week. This process is becoming costly as Jack does not want to follow up for payments from his friends. Therefore, he is spending more than he can afford with the allowance his parents provide. Jack does not want to pick up a part-time job as he is worried it will affect his studies.

**FRUSTRATIONS 4.4**

- >Existing solutions tend to have a lengthy setup process.

- >Existing solutions do not have a recurring reminder option - users have to request payments to each user with outstanding balances.

**NEEDS 4.5**

- >A solution that allows him to quickly add expenses quickly and easily without a lengthy setup process.

- >A solution that allows him to track outstanding balances, so he does not have to request a transfer after each transaction.

- >A solution that allows him to request payments (reminders) through the application - reduce the possibility of conflict and awkwardness.

**EXPECTATIONS 4.6**

Jack expects the solution to be easy to set up and use. The solution must have the ability to accumulate multiple transactions (show outstanding balances). Additionally, He wants to minimise interactions about settling balances outside of the app and instead wants the ability to set reoccurring reminders within the solution.

**COMPUTER SELF-EFFICACY 4.7**

Jack has a laid back attitude - he is happy to try whatever as long as it works and is quick. He is proficient with both a computer and a mobile phone. If Jack encounters a problem, he is likely to give up on it instead of persisting with finding a solution.

## Part 3: Scenarios, Usecases and Journey

### SCENARIO AND USECASES 1.0

#### Creating an expense 1.1

**User: Timothy, Amelia, Sarah, Jack      Activity Level: Very High (daily use)**

*All personas will do this. It is part of tracking both personal and communal expenditure.*

*Users will select the relevant account (personal/group) when an expense occurs and fill out the relevant section to record the expense.*

USER	SYSTEM
Choose add expense	
	Displays required information
User select relevant group (personal/communal), enters expense title, category, amount, relevant users and how expense is split (ratio, equal, specified amount)	
	Register expense
	Save it to relevant group financial records
	Notify relevant users of new expenses
	Display financial overview with new expense

#### Managing historical transaction (expense overview) 1.2

**User: Timothy, Amelia, Sarah, Jack      Activity Level: High (weekly use)**

*All personas will do this. It is part of tracking both personal and communal expenditure.*

*When users want to see the timeline of an account's financial history, modify a transaction or see upcoming expenses, they will view it in the solution.*

USER	SYSTEM
Choose a account to interact with (group/personal)	
	Present available functions associated with account (group/personal)
Choose to view expense overview	
	Get detail of account expenses
	Display past/upcoming expenses
	Display option to modify transactions

**Settle/Manage outstanding balance 1.3****User: Timothy, Amelia, Jack      Activity Level: High (weekly use)**

All personas' who use the solution to manage communal expenses in a group will use this. When users want to observe outstanding balances and settle debts, they will view it in the solution.

USER	SYSTEM
Choose a account to interact with (group)	
	Present available functions associated with account (group/personal)
Choose to view outstanding balance for each user in group	
	Display amount owed to/by each user in the group
	Display button next to each user balance to settle amount
	Display button next to each user to send out reminder
User press settle button next to relevant user account	
	Register amount settled
	Save it to relevant group financial records
	Notify relevant users that balance was settled
	Display financial overview with new expense

**Register/Login 1.4****User: Timothy, Amelia, Sarah, Jack      Activity Level: Very High (daily use)**

All persona's first impression of the application. Used to access solution features and data associated with a user.

USER	SYSTEM
Navigate to account management page	
	Display option to login/register
User select relevant option	
	Display required information
User fills in required info (dependent on login/registration)	
	Finish login/registration
	Display login/registration successful

**View spending summary 1.5****User: Timothy, Sarah      Activity Level: Moderate (weekly/monthly use)**

Persona's tracking their spending to budget their expenditure will use this. When users want to observe the expenditure of a group/personal account during a time period in an organised format (categories), they will view it in the solution.

USER	SYSTEM
Choose a account to interact with (group/personal)	
	Present available functions associated with account (group/personal)
Choose to view spending summary	
	Display spending summary on a month basis
	Display total of expense category
	Display graph of spending summary

**Set payment reminders 1.6****User: Timothy, Jack      Activity Level: Moderate (weekly/monthly use)**

Activity levels depend on whether users intend to send manual or automatic reminders. Persona's who require payments in a timely matter will use this. When a user wants to send out reminders formally, this will implement this function in the solution.

USER	SYSTEM
Choose a account to interact with (group)	
	Present available functions associated with account
Choose to view outstanding balance for each user in group	
	Display amount owed to/by each user in the group
	Display button next to each user balance to settle amount
	Display button next to each user to send out reminder
Select reminder button	
	Display option to send one off reminder/set reoccurring
Select relevant option (one off/reoccurring)	
	Display required information
User fills in required information	
	Finish payment reminder
	Display reminder successful
	Notify relevant users of outstanding expense

**Create/access Group account 1.7****User: Timothy, Amelia, Jack      Activity Level: Low (monthly/annual use)**

Persona's who use the solution to track communal expense will use this. Users tend to create groups upon account generation. Additional groups may be added when users change flats or become part of new social groups in the solution.

USER	SYSTEM
Navigate to group account page	
	Display option to manage existing groups
	Display option to add new group
Select add new group	
	Display required information
Enter group name and group members	
	Finish group setup
	Send invitation to relevant users
	Display group creation successful

**Create/access Personal account 1.8****User: Timothy, Sarah      Activity Level: Low (annual use)**

Persona's who use the solution to track personal expenses will use this. Users tend to create a personal account tracker upon account generation but is not mandatory. It can be later added if they decide they want to manage their personal expenses in the solution.

USER	SYSTEM
Navigate to personal account page	
	Display option to create account to track personal expenses
Select create	
	Finish personal account setup
	Display personal account creation successful

**JOURNEY 2.0****Scenario: Creating an expense 2.1****Persona: Jack      Expectation: Straight forward process with minimal textual fields**

	<b>Phase 1</b>	<b>Phase 2</b>	<b>Phase 3</b>	<b>Phase 4</b>
<b>Doing</b>	Received wifi bill. He opens the finance management solution.	Navigate to add expense page in solution and adds a new expense.	See that an expense was successfully entered and users have been notified.	Checks to make sure that the expense has been recorded correctly in the expense overview page.
<b>Thinking</b>	How do I let everyone know how much I am owed? How do I keep track of balances which have already been paid?	I hope I am doing this right. Will my flatmates get notified about this expense? I don't want to use money from my savings again.	Great, I know that everyone's been reminded of the expense.	I see the expense recorded. It's of the correct amount and is distributed to relevant users.
<b>Feeling</b>	Worried his flatmate will not pay on time / see his message in the group chat about the expense.	Anxious about if he is correctly entering an expense.	Satisfied about notifying his friends about the expense without extensive calculation.	Reassured that the expense was recorded correctly.

**Insights:** Adding an expense is the most fundamental function of the solution. It must be accessible for all users - accomodating all levels of financial/technical experience.

**Ownership:** Designers must ensure that the UI/UX is clean - dependant on icons and dropbox over textual inputs - this ensures its easily consumable. Marketers must communicate ease of use.

**Scenario: View past/future expense overview 2.2****Persona: Amelia      Expectation: Can modify expense from a month ago**

	<b>Phase 1</b>	<b>Phase 2</b>	<b>Phase 3</b>	<b>Phase 4</b>	<b>Phase 5</b>
<b>Doing</b>	Returned an item purchased by her group - she's received a partial refund. She opens the finance management solution.	Navigate to the expense overview page.	Finds original expense, select option to modify the expense.	See that the expense was successfully modify, the historical value and the modify value is recorded and users have been notified.	Checks to make sure the balance was correctly updated in the settle balance page.
<b>Thinking</b>	How do I let everyone know how much I owe them? Can I modify a past expense to reflect this refund?	Will the original transaction be here? Has it kept a record of all transactions?	Am I doing this right? What if I ruin the accuracy of the account?	That was pretty easy, I'm glad the process was easy to understand.	Wow, it did all the calculations for me. I can quickly find out how much I owe/am owed.
<b>Feeling</b>	Concerned her flatmates will not receive the correct amount owed to them.	Confused and a bit overwhelmed, she is worried locating the transaction may be complex.	Nervous, she is worried incorrect changes cannot/be difficult to remedy.	Proud that she was able to manage her finances herself.	Confident about her ability to take control of her finances.

**Insights:** Observing and modifying past/future transactions reassure and empower users to be confident with contributing to managing their finances. A clear overview limits potential user frustrations.

**Ownership:** Designers must ensure that the UI/UX is easy to navigate and transactions can be easily located. Marketers must communicate that errors are easily remedied - users can make mistakes without ramification.

**Scenario: View spending summary 2.3****Persona: Sarah****Expectation: Summary of spending which is easy to understand**

	<b>Phase 1</b>	<b>Phase 2</b>	<b>Phase 3</b>
<b>Doing</b>	It's nearly the end of the month, Sarah has to plan how much she will need to request from her parents. she opens the finance management solution.	Navigate to spending summary page from personal account.	Uses information to prepare a budget to present to her parents.
<b>Thinking</b>	This is so overwhelming - there's so many transactions - how do I categorise all of my expenses? This will take forever.	I can see how much I have spent in total and that sub total for each expense category.	This is so convenient - I'm more confident about my spending predictions because they are based on my past transactions.
<b>Feeling</b>	Stressed that she has to go through and calculate so many transactions.	Relived - having this calculated for me means it's a lot easier to budget for next month.	Happy that I am able to save my parents money from multiple currency exchange fees.

**Insights:** Having expenses summarised allows users to easily budget and modify spending behaviour to align with their goals. It must be easy to consume for a range of users integrating both financial and visual components.

**Ownership:** Designers must ensure that the UI/UX is organised to easily understand financial calculations and visual components (graphs) should be used to supplement user understanding. Marketers should communicate this feature as a supplement to better financial literacy for budgeters.

**Scenario: Send balance payment reminder 2.4****Persona: Jack****Expectation: Quick and formal process**

	<b>Phase 1</b>	<b>Phase 2</b>	<b>Phase 3</b>
<b>Doing</b>	It's the end of the week and Jack's friends haven't transferred him their outstanding balance. He opens the finance management solution.	Navigate to settle balance page and press remind button next to relevant user.	See that reminders are sent out to relevant users.
<b>Thinking</b>	Will it be awkward if I message them to pay me? It's a small amount but we go out every week and it's building up.	If I do this will they be notified? I'm worried I haven't done it right.	Great, I know that everyone's been reminded of the expense.
<b>Feeling</b>	Worried he might upset his new friends - messaging on social media can convey the wrong tone.	Anxious about if he is correctly using the remind button.	Satisfied about notifying his friends about the expense without having to go through a long process of creating a message and individually sending them to each friend.

**Insights:** Allowing users to remind others to pay outstanding balances allows users to easily manage their finance conveniently and prevents unnecessary misunderstanding (meets solution purpose).

**Ownership:** Designers must ensure that the ability to send reminders is quicker and more convenient than users sending out notifications through other platforms/solutions. Marketers should communicate the solution's commitment to its purpose with features such as payment reminders.

## Part 3: Design

### OVERVIEW 1.0

#### Style/Usability

When generating the style of the prototype, we researched various design theories (e.g. minimalism, white space, contemporary and skeuomorphic). Of these, we found that minimalism, flat design and white space were most applicable to our user's needs as we wanted to emphasise a simple, clean and calming design ('The More of Less').

The application's primary functions should be intuitive enough for people to use without needing an instruction manual or tutorial. From the interviews with multiple students from Victoria University, we found that they expect the solution will assist them in tracking multiple and frequent expenses and that it will be easy to use and accurate.

To refine our design, we explored the '[Material Design documentation](#)' created by Google. This allowed us to better understand how users interacted with interfaces and the importance of grid-based layouts, padding, and depth effects.

Additionally, we explored the different '[10 Usability Heuristics for User Interface Design](#)' published by Jacob Nielsen. This allowed us to better understand the importance of creating solutions that are 'useable' for our audience and how we could implement that.

#### Key design ideas implemented in our solution:

*Simple colour scheme, Simplified content, Consistent typefaces, Simple functionality and user interaction, Reduced wordiness and Reduced visual distractors.*

#### Usability Heuristic implemented in our solution:

>*Match between system and the real world: Simple, concise language allow users to navigate the functions of the solution easily. Icons are representative of real work actions it is associated with.*

>*Error prevention: limiting user inputs through buttons, drop boxes, and checkboxes where possible.*

>*Aesthetic and minimalist design: clean and consistent illustration used to attract our audience (university students), convey complex information and decrease stress associated with finance management without detraction from functionality.*

>*User control and freedom: We give users the option to return from any path where possible and modify any change submitted.*

>*Visibility of system status: text informs the user of their position in the system.*

>*Help users recognise, diagnose, and recover from errors: users are informed when inputs are invalid using symbols (!!).*

>*Consistency and standards: confirms user has taken the correct action with success screen (affirms positive actions), fields listed in the order in which they should be completed.*

>*Recognition rather than recall: Simplified complex system to depend on icons, simple text and reduced text inputs means that users do not have to remember information from one part of the interface to another, this is handled internally, and users are automatically guided through the process.*

#### Platform

Based on our user's intended use of the solution, we found that a mobile application was the most effective method of distributing our solution. With expenses occurring at various locations and times, access to a website is unlikely to be convenient for our users, which detracts from the core objective of the solution of convenience. For this reason, we decided to implement our solution in a mobile application allowing our users to quickly track expenses on the move.

#### Icons

Implementing the ideas we had learnt from the 'Material Design documentation' in Figma, we used the 'Iconify' plugin to generate icons and appropriately contrast them using colour to make our design readable, intuitive and easy to pick up. This ensured that users of various technical and language proficiency levels could access our solution by reducing wordiness (removing language barrier). We compared the icons used with '[Icon Usability](#)' published by Jacob Nielsen to ensure that they were to an appropriate standard.

#### Fonts

In order to cater for people with learning difficulties and visual deficiency, we did some research into which fonts are better for those with dyslexia and dyspraxia. In the end, the font we used was 'Titillium Web'. This font was selected based on its style and clarity. We believed that this would be sufficient in meeting the agreed style of minimalism while allowing for readability as it is a clear and structured font. Furthermore, in our prototype, we ensured that fonts were of at least 15pt to ensure that the solution would be accessible for all users.

FONT  
font

FONT  
font

## **Colour**

It is well known and proven that colours affect our mood. In the 21st century, we have a very fixed opinion on what emotions are associated with what colours. Our colour palette consists of five colours: Dark Green, Dark Grey, Light Green, Off White and Orange. The primary colours have the corresponding emotional associations: Green - Safety/Money, Orange - Energetic,

There are two primary colours in the palette (excluding greyscale). This was primarily because while it has been proven that the use of colours does help people retain information better, the overuse of colours can also overload people with information. Therefore, limiting ourselves to two primary colours prevents the pages from being cluttered and maintains the solution's primary purpose of easily and conveniently managing finances.

We decided to use 'light green' as the primary colour of the solution due to its association with money. We believe it will allow users to associate our application to finance management. Additionally, it is a non-aggressive colour, and we think it will act to calm users and finance management can be perceived as a stressful task.

### Color Styles

- finance
- finance1
- finance2
- finance3
- finance4

The accent colour 'orange' would be used in areas of the website in moderation to direct the user's attention instead of overwhelming the users. This colour was picked as it is a contrasting colour to green, allowing it to be an effective visual aid in directing users to observe important information, e.g. Icon in the navigation tab highlights orange to indicate where a user has navigated to.

We have picked a body colour for text boxes as 'off-white' and the text colour as 'Dark Green' and 'Dark Gray', rather than pure black and white. This is easier on the eyes of the user as the contrast between the two colours is reduced.



## **Navigation**

We decided to implement a navigation bar for ease of use. When observing other forms of navigation, such as a 'drop-down' tab, we found that it detracted from our minimalist style, confused users and introduced unnecessary wordiness. Using a navigation bar in combination with icons and colour allowed us to communicate to users more concisely, further driving our purpose of convenience and reducing language and visual impairment barriers.

## **Logo**

While a logo is beneficial for recognising the solution, we decided that it should only be displayed in the application image icon. This is because it unnecessarily consumed screen space and detracted from our minimalist design, reducing functionality and introducing wordiness. Furthermore, observing competitors' solutions 'Split-wise' and 'Settle-Up', they do not include their logo within the application, so we feel justified in not including a logo within the solution as it negatively affects our primary purpose.

## **Information Architecture**

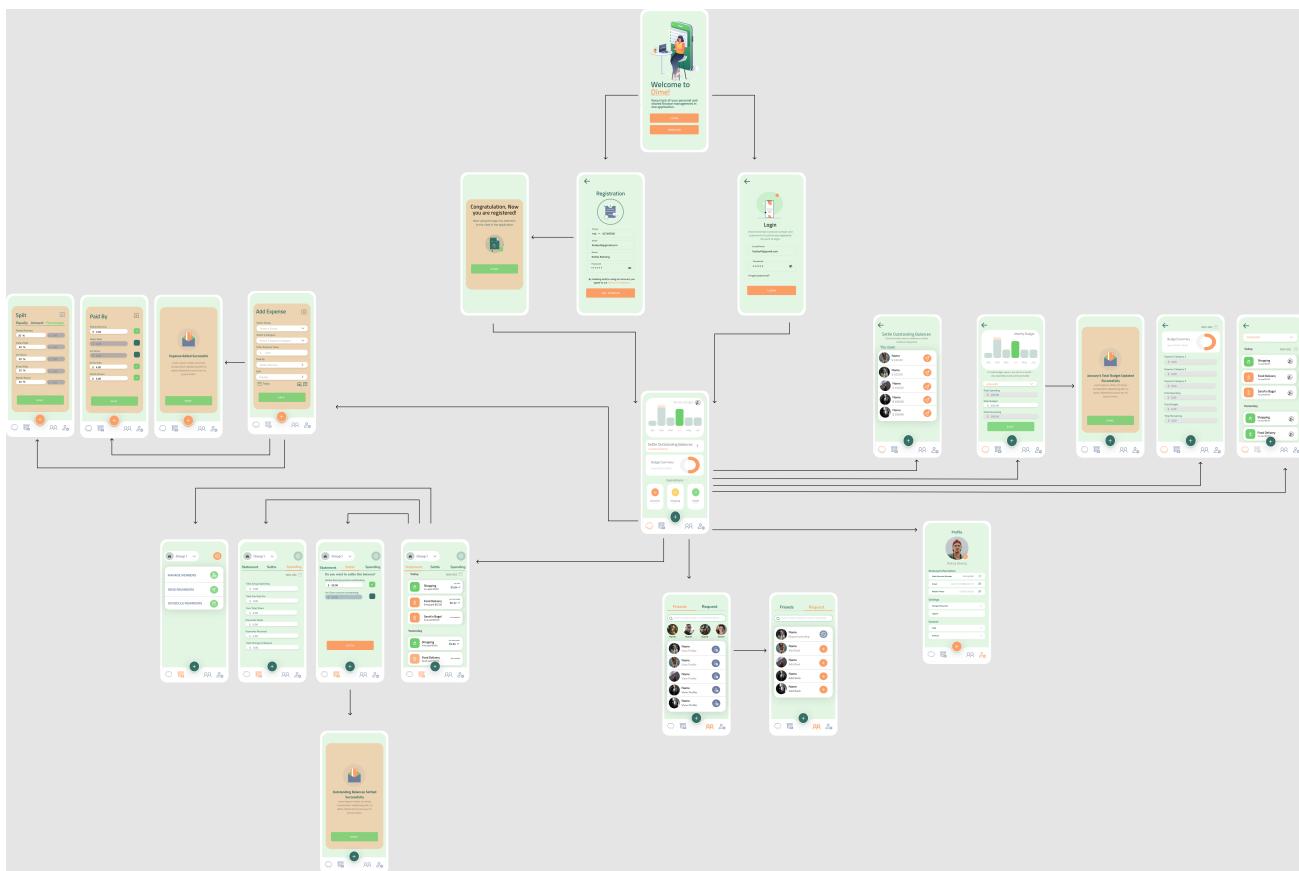
An organisational structure is how you define the relationships between pieces of content. Successful structures allow users to predict where they will find information on the site. We have used a hierarchical structure to allow users to determine where to find desired function/information in the solution allowing for intuitive navigation, convenience and ease of use.

Hierarchical Structures use a top-down approach or parent/child relationships between pieces of information. Users start with broader categories (parent) and then drill further down into the structure to find narrower, more detailed information/function (child). This can be observed in the navigation bar - the solution is separated into five parents Personal finance management, Group finance management, the addition of expense, Interaction management and Account management. From there, users can access the information/functions they require by navigating to the parent categories and navigating from the main pages of these categories to more specific services (e.g. To settle a balance owed to a creditor: Personal finance management -> Personal-Budget screen -> Personal-Balance screen).

## STORYBOARD 2.0

After a user logsins/registers, they are directed to the personal finance page. They can add expenses, manage group expenses, manage group users and manage their accounts. Small functions such as resetting passwords, reminder scheduling and adding/removing users from groups have not been depicted as it made the diagram too complex and diluted the length of discussions (due to assignment page limitations) for more critical functions. All tasks discussed have been depicted in the storyboard, and all needs discussed in the persona can be met using the provided screens.

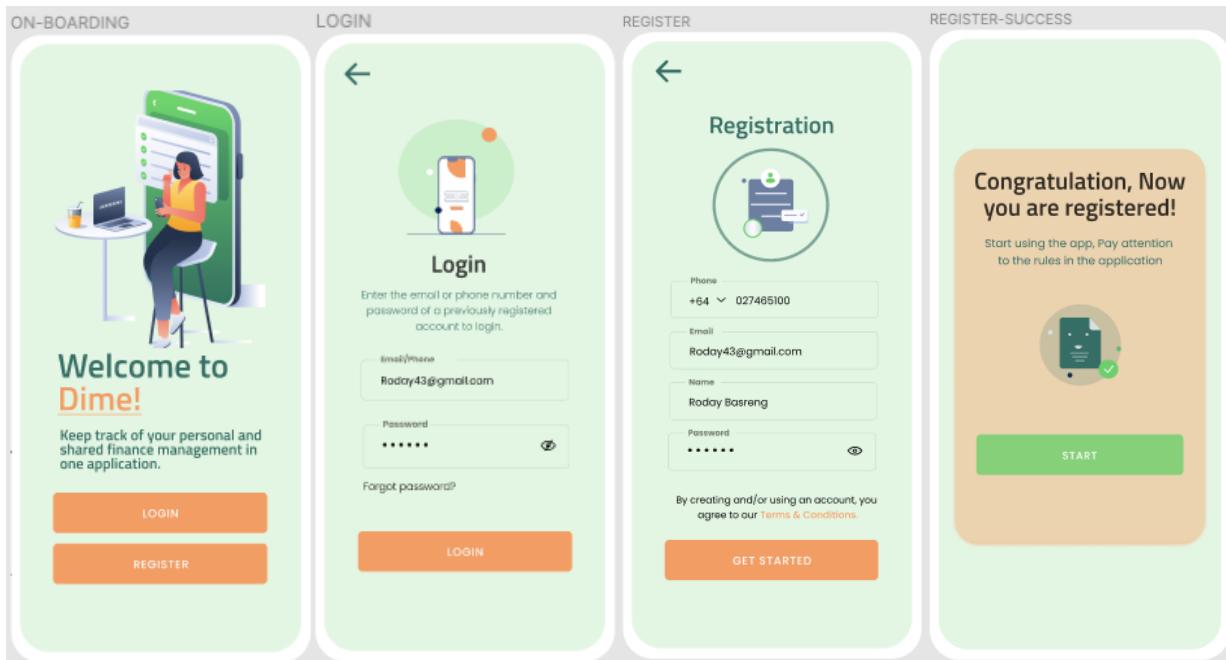
**For a better quality view and interactive demo: <https://www.figma.com/file/40UBD7fuEWi98bdIZnULKc/DIME?node-id=0%3A1>**



## DESIGNED PAGES 3.0

For a better quality view and interactive demo: <https://www.figma.com/file/40UBD7fuEWi98bdIznULKc/DIME?node-id=0%3A1>

### Register/Login



The login/registration screens are critical in establishing the first impression, communicating the solutions function and setting the application's theme. Therefore, we chose to limit the number of user inputs, providing options or entry of email or phone number for login and limiting the amount of information required to register to that which is necessary. This ensures we do not deter customers because of a lengthy registration/login process.

All of our screens in this function use a simplistic illustration to attract our audience of university students and decrease stress associated with finance management without detraction from functionality, large buttons to present available actions for users, the main colour theme and a clear, bold font with simple language to communicate our solutions' brand and summarise its use.

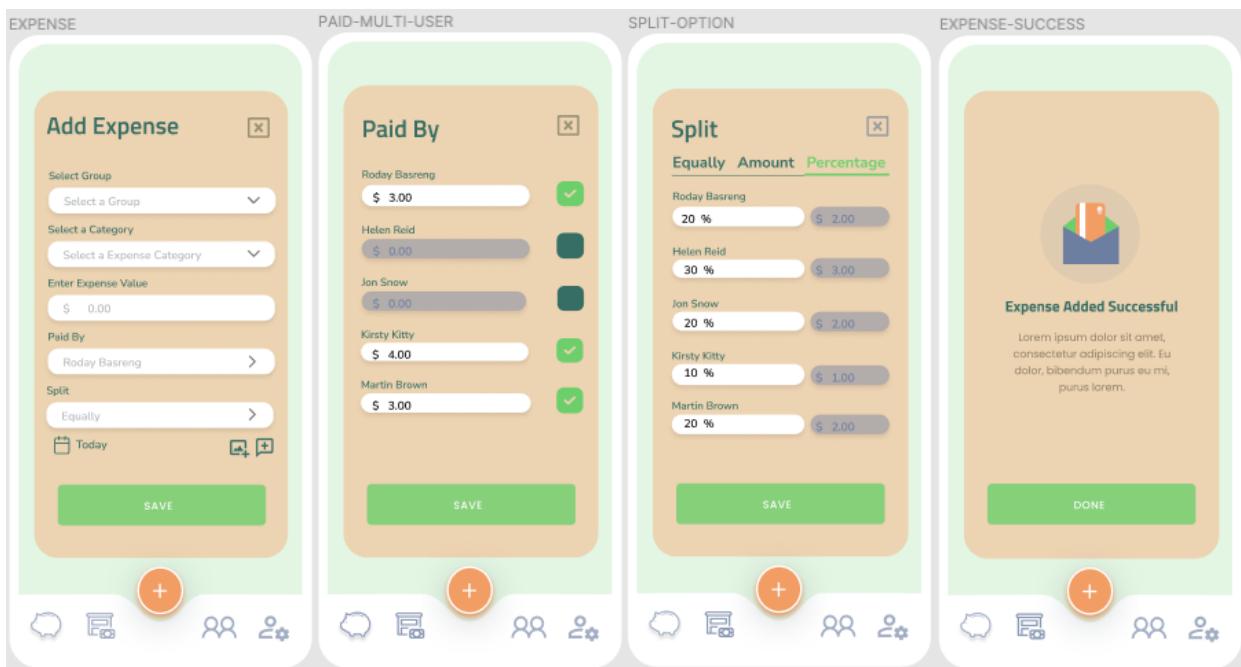
For our 'Onboarding' screen, users are able to 'Login' if they have an existing account or 'Register' to use the service.

For our 'Login' screen (which appears after 'login' is selected in the 'Onboarding' screen), we use a clear, bold font indicating the user's position in the system, instructions in simple language to assist in proceeding down this path in the system, text boxes with simple language indicating required field and options to return from this path in the system. Additionally, invalid inputs will result in the symbol '!!!' appearing next to the field (allows accessibility for red/green colour blind).

For our 'Registration' Screen (which appears after 'register' is selected in the 'Onboarding' screen), we use a clear, bold font indicating the user's position in the system, text boxes with simple language indicating the required field and options to return from this path in the system. Creating an account will transport users to the 'Register Success' page, confirming that they have successfully created an account. Additionally, invalid inputs will result in the symbol '!!!' appearing next to the field (allows accessibility for red/green colour blind users).

Successful login/registration will redirect users to the 'Personal Budget' screen.

## Expense



Adding an expense is a crucial function of the solution as our main purpose is to help users manage their expenses. This is used by all personas/users and thus needs to be accessible for users with varying financial, technological and language abilities. To make this process as convenient as possible, we minimise user text inputs and pop-ups and try to fill as many categories as possible using drop boxes. Our layout means that users do not have to remember information from one part of the interface to another, this is handled internally, and users are automatically guided through the process. After a user fills the necessary fields and saves the expense, it is added to the appropriate account, and the 'Expense-Success' screen is displayed. This ensures that our product can be used by an extensive range of users regardless of their skills.

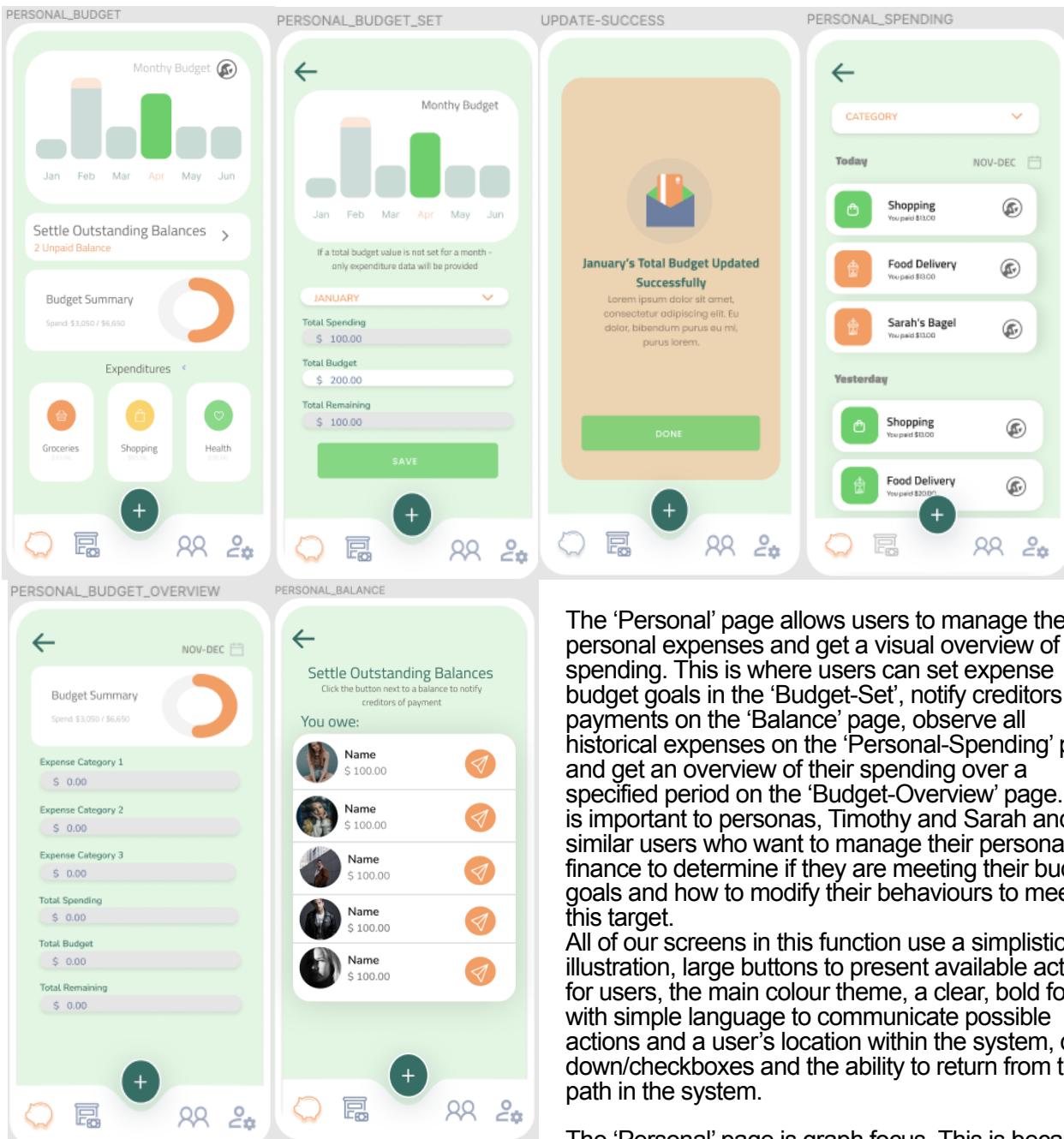
All of our screens in this function use a simplistic illustration, large buttons to present available actions for users, the main colour theme, a clear, bold font with simple language to communicate possible actions/ user's location within the system, drop-down/checkboxes and the ability to return from this path in the system.

Our 'Expense' screen relies on dropbox, text inputs and pop-up screens to collect the necessary information to submit an expense. Users must fill out the relevant fields, select whom the expense is paid by in the pop-up 'Paid-Multi-User' screen and select whom the expense is shared by in the 'Expense-Success' screen. Once this is completed, users will be able to save the expense. If successful, the users will be transported to the 'Expense-Success' screen; otherwise, incomplete fields will have the '!!!' symbol (allowing accessibility for red/green colour blind).

For our 'Paid-Multi-User' screen, users select relevant users (users based on the group selected in the 'Expense' screen) using the tick boxes and entering the amount paid by the user in the text field. Once completed, the user press 'save' and will be transported back to the updated 'Expense' screen.

For our 'Split-Option' screen, users select the relevant split method (equal, amount, percentage) and then select relevant users (users based on the group selected in the 'Expense' screen) using the tick boxes and entering the amount owed by each user in the text field. Once completed, the user press 'save' and will be transported back to the updated 'Expense' screen.

## Personal



and we did not want to overwhelm users with lengthy sentences, calculations or historical transactions which may deter them from our solution. Users are able to choose what they engage with by interacting with relevant graphs/buttons. However, this section can operate without user interactions (expenses are added from groups, graphs are updated automatically, and balances are resolved when creditors settle debt).

The ‘Budget-Set’ page lets users set a monthly budget (optional; if no budget is set, overspending is not indicated on the bar graph). This is done by selecting the relevant month in the drop-down box and entering the budget goal. After saving, the user is notified with the ‘Update-success’ page, and the graph is modified accordingly.

The ‘Personal’ page allows users to manage their personal expenses and get a visual overview of their spending. This is where users can set expense budget goals in the ‘Budget-Set’, notify creditors of payments on the ‘Balance’ page, observe all historical expenses on the ‘Personal-Spending’ page and get an overview of their spending over a specified period on the ‘Budget-Overview’ page. This is important to personas, Timothy and Sarah and similar users who want to manage their personal finance to determine if they are meeting their budget goals and how to modify their behaviours to meet this target.

All of our screens in this function use a simplistic illustration, large buttons to present available actions for users, the main colour theme, a clear, bold font with simple language to communicate possible actions and a user’s location within the system, dropdown/checkboxes and the ability to return from this path in the system.

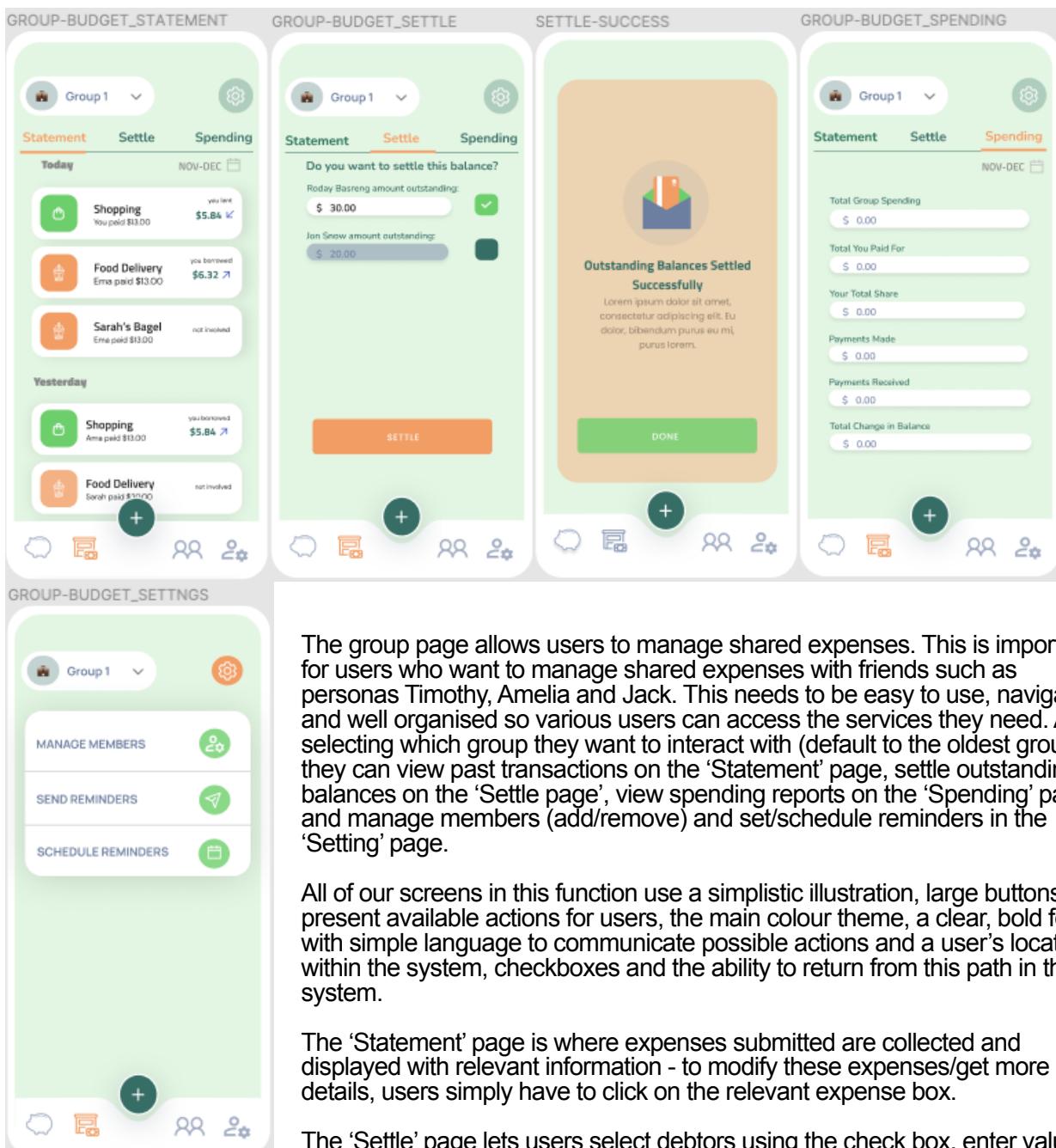
The ‘Personal’ page is graph focus. This is because it is the first page users are transported to after login, sentences, calculations or historical transactions

The ‘Spending’ page lets users view historical transactions based on category and dates and modify them if needed by selecting the button next to the transaction.

The ‘Budget-Overview’ page lets users view a summary of expenditures over a specified period (selected using the calendar).

The ‘Balance’ page lets users notify creditors that they have paid outstanding balances. Preferably we would want users to be able to pay creditors within the application, but we would need to assess the reality of this function’s implementation.

## Group



The group page allows users to manage shared expenses. This is important for users who want to manage shared expenses with friends such as personas Timothy, Amelia and Jack. This needs to be easy to use, navigate and well organised so various users can access the services they need. After selecting which group they want to interact with (default to the oldest group), they can view past transactions on the ‘Statement’ page, settle outstanding balances on the ‘Settle’ page, view spending reports on the ‘Spending’ page and manage members (add/remove) and set/schedule reminders in the ‘Setting’ page.

All of our screens in this function use a simplistic illustration, large buttons to present available actions for users, the main colour theme, a clear, bold font with simple language to communicate possible actions and a user’s location within the system, checkboxes and the ability to return from this path in the system.

The ‘Statement’ page is where expenses submitted are collected and displayed with relevant information - to modify these expenses/get more details, users simply have to click on the relevant expense box.

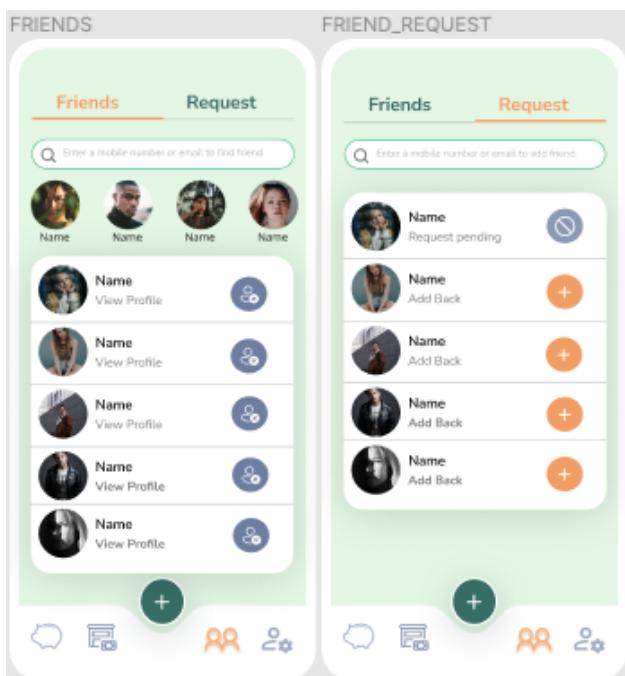
The ‘Settle’ page lets users select debtors using the check box, enter value input (for partial payment) and relieve them of the debt after payment using the settle button. When this action is successful, they receive a confirmation by

being transferred to the 'Settle-Success' screen. After confirming the notification, they are redirected to the updated 'Settle' page.

The 'Spending' page lets users overview expenses within the group and their contributions. The date range can be set using the calendar icon. Other than this, there are no user interactions on this page.

The 'Setting' page lets users manage relevant groups. Clicking on the buttons will guide users through the relevant process to make their desired changes.

## Friends



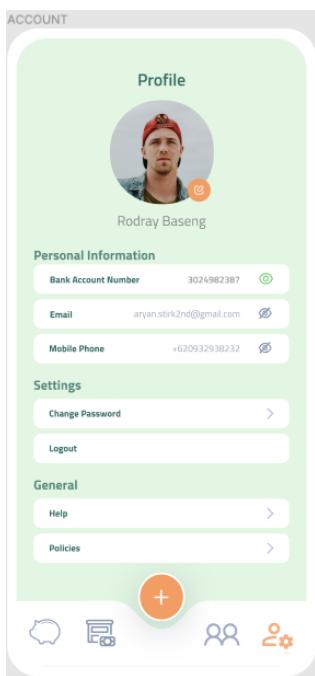
Allowing users to manage whom they interact with allows them to customise their experience and protects their privacy. This is important for users who want to manage shared expenses with friends such as personas Timothy, Amelia and Jack. This needs to be easy to use as this page service is a method to increase efficiency to meet our user's need for quick and straightforward use. Requesting users permission to add them to a group every time is time-consuming. Using the 'Friend' screen makes this process quicker. In this screen, users are able to manage whom they interact with; friends determine whom users can create groups with. This is necessary to the group expense function as we would not have a way to connect users and thus generate groups without it.

All of our screens in this function use large buttons to present available actions for users, the main colour theme, a clear, bold font with simple language to communicate possible actions and the ability to return from this path in the system.

The 'Friend' screen allows users to manage accepted requests from other users. A list of accounts that our users can interact with is displayed. Users can view the information these accounts have made publicly available (e.g. bank account number to make settlement easier) or remove unwanted accounts by tapping on their profile. To make finding accounts easier, we included a search bar where users can find friends with contact details or their names.

The 'Friend\_Request' screen allows users to add other accounts using their email/phone number (security/privacy). This is where users can add accounts who have requested them back or manage the request they have sent out themselves. To make finding accounts easier, we included a search bar where users can find friends with contact detail or their name. Once an account is added, it will automatically be removed from the 'Friend\_Request' screen and added to the 'Friend' screen.

## Account



Allowing users to manage their profiles allows them to customise their experience. They can decide what personal information is visible to their friends, adjust their settings and get assistance/information as required. We want this process to be as easy as possible, reducing complexities and unnecessary information to allow for quick access to personal data and account management. All solution users will use this service; thus, it must be easy to understand and intuitive.

All of our screens in this function use the main colour theme and a clear, bold font with simple language to communicate possible actions.

The 'Account' screen allows users to modify personal information and display it through a toggle button for ease of balance settlement (e.g. users do not have to request a bank account number externally and can display their bank account within the application). Pop-up screens allow users to navigate appropriate actions (not depicted) based on their needs.

## Part 4: Reflection

### DESIGN PROCESS 1.0

From our initial interview, we knew that our users are University Students who live a relatively active lifestyle with frequent small expenses (coffee, bus, food) and reoccurring more considerable expenses (rent, power, wifi). Some are personal, and some are shared. Therefore, they assume the solution will assist them in tracking these expenses and expect the solution to be easy to use and accurate.

We organised our task into categories, deriving parent fields to develop our hierarchical information architecture. This determined how users would navigate through our solution and how we would organise the way we would present functions/information to users.

Our wireframes were developed from parts of existing solutions that we observed as strengths, and we implemented improvements on where we found existing solutions to be weak (e.g. option to manage personal finances). In addition, we researched Material Design and Usability heuristics to support the creation of the initial wireframe to ensure they would be intuitive and user-orientated.

From here, we discussed with our initial user groups what they require from a finance management application. We found these user discussions extremely valuable as we identified essential functions which we overlooked, such as allowing a user to return from a path and design choices such as colour pallet similarities to existing solutions.

After implementing the changes suggested by our user group, we generated our final design by combining all of the determined components (e.g. icons, colour, method of navigation). We then assessed its completion based on the task we created to ensure sufficient coverage and the material design/usability heuristic to ensure that our application was intuitive and user-orientated.

### SKILLS?KNOWLEDGE GAINED 2.0

'Figma' was one of the skills that I had learnt during this process. After watching a few tutorials, I quickly developed an understanding of the functions of this application. I found it highly efficient in implementing the vision of the design, and it allowed us to change components throughout the development process quickly. If I were to repeat this process, I would spend more time correctly containerising components earlier on in the process to ensure ease of modification.

I gained knowledge on the importance of user feedback/communication. Our initial discussion with potential users allowed us to get a general idea of user expectations, and our second discussion allowed us to remedy weaknesses in our application. This was particularly important to us as we did not realise that the user group did not share our assumptions and their perspective generated valuable contributions. If I were to repeat this process, I would allow more time for additional user inputs.

I gained knowledge of the importance of information architecture. Without organising our tasks/functions early on, we would be at risk of creating an unintuitive application which would have detracted from our primary goal of creating a user-orientated solution. By organising the way our design would be laid out early in the design process, we were able to make navigation much easier for users. If I were to repeat this process, I would ask for user input to ensure our solution would meet their needs.

I gained knowledge on the importance of Task/Use-case/Journey. Preparing the task users to interact with gave us clarity on the solution's design as we knew what components were required to allow users to meet their needs and generate value. If I were to repeat this process, I would create more journeys as they allowed us to visualise users' interactions and test our design by following through this process through our screens.

I gained knowledge of the importance of Usability Heuristics. Using usability heuristic as a guide in our design development ensured we could create a user-orientated and intuitive product. It highlighted weaknesses in our design and important components we use in other applications which are easily overlooked (e.g. Back button). If I were to repeat this process again, I would try to include more usability heuristic components (e.g. customisation)

I gained knowledge on the importance of Design Components. Prior to this assignment, I did not realise the impact of our subconscious perception of small design components such as layout, colour and icons. The way these components interact together can influence the user's overall perception of a solution,

and I found that UI/UX was equally important as a solution's functions. If I were to repeat this process again, I would further research the relationship between small design components to create a more robust product.

## DESIGN EVALUATION 3.0

### Pros

- Minimalist design looks aesthetically pleasing and is simple to use for any type of user, including less technological capable personas.
- By following Material Design and centring our design around usability heuristics, users will be able to pick up Dime's user interface easily, as our main priority was creating an intuitive and convenient solution.
- Interface choice selected with the user in mind (mobile application instead of website).
- Encourages users to understand financial management better and saves time by simplifying complex calculations into easily consumed steps/visualisations - this is beneficial for engaging with the users who may be intimidated by finance management.
- Designed to be accessible by a range of users with visual impediments, e.g. font size suitable for users with dyslexia/dyspraxia, use of symbols to indicate error over colours.
- Reduced wordiness allows users with varying literacy comprehension to engage with the solution.
- All the icons used in the app are universally understood. Therefore, it should be clear what has been performed, what buttons to click, and the category they represent.
- The colours chosen were deliberate and all chosen to destress users or highlight a user's position in the system/indicate available actions. Therefore when a user is using the app, they are more confident in navigating through the functionalities.
- Ensured that the login/registration was as efficient as possible.
- Allow users to remedy any inputs at every stage of the process to instil confidence when navigating the application (give control).
- Very high task coverage (100%) all tasks discussed were depicted in the design.

### Cons

- Dark mode is an increasingly popular feature. Unfortunately, our design has yet to implement this.
- Should have a help button on every screen to increase accessibility
- More titles should be included in the 'Personal-budget' screen category to make navigation easier.
- There is not much variety in what people can do. Personalisation would increase the usability of our application.
- Lacks advanced features such as text reading aloud, which is an essential consideration for hearing-impaired students
- Potential for more explanation text to be included on every page.