



# FINANCIAL BUSINESS PLAN

**MEng Year 3**

**Department of Electronics  
University of York**

**Software Engineering Group 4**

### Document Control

Version	Modified By	Date	Section Modified	Remarks
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## 1. Introduction

Codev are seeking bank loan for the duration of the development in relation to all development costs of our project Scran-Plan, alongside analysis of development costs, deployment costs have also been analysed briefly to give eventual revenue model context. Funding for deployment costs will be sought during a seed funding round following the development of the application Scran-Plan. A large appendix has been added to the end of the document consisting of all relevant evidence passed from other members of the development team.

The following document relies on a bank loan to the amount of £45,000 for the total cost of development.

### 1.1. Product Summary



*Figure 1: Scran Plan logo*

Scran-Plan is a revolutionary social way to cook and prepare food. Targeting students but not limiting ourselves to this market, we are giving individuals a way to plan their meals in advance. With this, users will know exactly what they need to purchase, taking all ingredients the user already has into account, to cut down on food waste and increase cooking efficiency. Building a database of XML presentation style recipes, laid out in steps; users can cruise through this database, filtered to the user's desires, deciding what they want to eat in any given time frame. With the social element thrown in, users can add and share recommendations and recipes with friends, add their own recipes and build up a chef profile. Think Strava of cooking, Goodreads of good food and Google Calendar of meal planning!

## 2. Development Costs

Development costs include the full period between September 30th, 2019 and June 21st, 2020 where a team of 7 contractors, Codev, have rented office premises to develop the project Scran-Plan.

### 2.1. Current Liabilities

1. Labour rates of £12.50 for all 7 contractors for all hours worked based on checked and approved timesheets (Spreadsheet note 6).
2. 1,400sq ft of office space rented out at £23.50 per sq. ft per annum, totalling £24,042.31 for the entire 38-week development period, paid on 9 specific dates as laid out in the spreadsheet (25/10/2019, 15/11/2019, 06/12/2019, 31/01/2020, 21/02/2020, 13/03/2020, 08/05/2020, 29/05/2020, 19/06/2020) (Spreadsheet note 3).
3. Utilities charge of £50 per week and IT infrastructure of £100 per week, totalling £1,900.00 and £3,800.00 respectively for the entire 38-week development period. Both payments are paid on 6 specific dates as laid out in the spreadsheet (08/11/2019, 06/12/2019, 14/02/2020, 13/03/2020, 22/05/2020, 19/06/2020) (Spreadsheet notes 4 and 5 respectively).

### 2.2. Labour Costs to Date

A total of 221.75 hours has been used between the 30<sup>th</sup> September 2019 and 2<sup>nd</sup> of February 2020, between the 7 team members. These hours have gone into building the company and establishing the product to be developed along with all preparation necessary to begin development.

### 2.3. Spending to Date

Week number	1	2	3	4	5	6
Week dates	Sep. 30, 2019-Oct. 6, 2019	Oct. 7, 2019-Oct. 13, 2019	Oct. 14, 2019-Oct. 20, 2019	Oct. 21, 2019-Oct. 27, 2019	Oct. 28, 2019-Nov. 3, 2019	Nov. 4, 2019-Nov. 10, 2019
Term week	1	2	3	4	5	6
Project Iteration Stage	Preparation	Preparation	Preparation	Preparation	Preparation	Preparation
Num weekly hours	0	0	0	7	8.25	8.25
IN						
Loans (Note 1)						
Module sales (Note 2)						
OUT						
Premises Rent (Note 3)				(£2,530.77)		
Utilities Rent (Note 4)						(£300.00)
IT infrastructure (Note 5)						(£600.00)
Cost of Labour (Note 6)	£0.00	£0.00	£0.00	(£87.50)	(£103.13)	(£103.13)
Weekly interest (Note 7)	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Module purchases (Note 8)						
Creditors						
Long term loans (Note 9)	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Owed on contracts (Note 10)	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Opening Balance	£0.00	£0.00	£0.00	£0.00	(£2,618.27)	(£2,721.39)
OUT total	£0.00	£0.00	£0.00	(£2,618.27)	(£103.13)	(£1,003.13)
IN total	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Closing Balance	£0.00	£0.00	£0.00	(£2,618.27)	(£2,721.39)	(£3,724.52)

Week number	7	8	9	10	11	12
Week dates	Nov. 11, 2019-Nov. 17, 2019	Nov. 18, 2019-Nov. 24, 2019	Nov. 25, 2019-Dec. 1, 2019	Dec. 2, 2019-Dec. 8, 2019	Dec. 9, 2019-Dec. 15, 2019	Dec. 16, 2019-Dec. 22, 2019
Term week	7	8	9	10	Christmas	Christmas
Project Iteration Stage	Preparation	Preparation	Preparation	Preparation	Preparation	Preparation
Num weekly hours	8.5	7.75	20.25	14	0	0
IN						
Loans (Note 1)						
Module sales (Note 2)						
OUT						
Premises Rent (Note 3)	(£1,898.08)			(£1,898.08)		
Utilities Rent (Note 4)				(£200.00)		
IT infrastructure (Note 5)				(£400.00)		
Cost of Labour (Note 6)	(£106.25)	(£96.88)	(£253.13)	(£175.00)	£0.00	£0.00
Weekly interest (Note 7)	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Module purchases (Note 8)						
Creditors						
Long term loans (Note 9)	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Owed on contracts (Note 10)	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Opening Balance	(£3,724.52)	(£5,728.85)	(£5,825.72)	(£6,078.85)	(£8,751.92)	(£8,751.92)
OUT total	(£2,004.33)	(£96.88)	(£253.13)	(£2,673.08)	£0.00	£0.00
IN total	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Closing Balance	(£5,728.85)	(£5,825.72)	(£6,078.85)	(£8,751.92)	(£8,751.92)	(£8,751.92)

Week number	13	14	15	16	17	18
Week dates	Dec. 23, 2019-Dec. 29, 2019	Dec. 30, 2019-Jan. 5, 2020	Jan. 6, 2020-Jan. 12, 2020	Jan. 13, 2020-Jan. 19, 2020	Jan. 20, 2020-Jan. 26, 2020	Jan. 27, 2020-Feb. 2, 2020
Term week	Christmas	Christmas	1	2	3	4
Project Iteration Stage	Preparation	Preparation	Preparation	Preparation	Preparation	Preparation
Num weekly hours	0	0	0	45.25	67.5	35
IN						
Loans (Note 1)						
Module sales (Note 2)						
OUT						
Premises Rent (Note 3)						(£5,061.54)
Utilities Rent (Note 4)						
IT infrastructure (Note 5)						
Cost of Labour (Note 6)	£0.00	£0.00	£0.00	(£565.63)	(£843.75)	(£437.50)
Weekly interest (Note 7)	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Module purchases (Note 8)						
Creditors						
Long term loans (Note 9)	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Owed on contracts (Note 10)	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Opening Balance	(£8,751.92)	(£8,751.92)	(£8,751.92)	(£8,751.92)	(£9,317.55)	(£10,161.30)
OUT total	£0.00	£0.00	£0.00	(£565.63)	(£843.75)	(£5,499.04)
IN total	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Closing Balance	(£8,751.92)	(£8,751.92)	(£8,751.92)	(£9,317.55)	(£10,161.30)	(£15,660.34)

## 2.4. Important Development Assumptions

### 2.4.1. Server and Backend Assumptions

We will be using the Google Firestore as our server and application backend. During development with all the resources that are given for free, we will not need to spend a penny for the entire development period. We will only need to start spending money on the Firestore following the launch when we have an active user base. Details of this can be found in deployment costs.

### 2.4.2. Module Purchases/Sales Assumptions

(Spreadsheet notes 8 and 2 respectively)

We are budgeting to purchase two Java programming modules at 200 GBP each in order to speed up the development of the project from other likeminded software companies. This budget was agreed as a group as a maximum we wish to spend on each module purchased. These will be paid out as:

- 25% of contract value payable upon placement of contract (25/02/2020) (Spreadsheet note 8)
- 50% of contract value payable upon handover of module code (Push for 2 weeks later, 10/03/2020) (Spreadsheet note 10 until paid in note 8)
- 25% of contract value payable upon purchaser group acceptance of module, this acceptance will come for modules purchased once the code has been through our own code review process (Push for 3 days later, 13/03/2020) (Spreadsheet note 10 until paid in note 8)

We are unable to guarantee the sale of any modules, however if any sales are made, all revenue made from sales will be distributed to any unexpected costs or paid back to the financial backer to reduce interest payments.

### 2.4.3. Loan Interest Assumptions

(Spreadsheet note 7)

We are expecting to pay, from current banking interest rates, an interest rate of 16.86% APR on all loans borrowed from the bank. These estimations have been taken out, weekly, starting the week of the 10<sup>th</sup> of February. We are expecting to pay interest on all money owed each week, and we are expecting any money borrowed from the bank to be paid in two stage payments, the first as previously mentioned starting the week of the 10<sup>th</sup> of February 2020 and the second on the 13<sup>th</sup> of April 2020.

### 2.4.4. Labour Assumptions

(Spreadsheet note 6)

All labour assumptions were agreed as a group for how much time we expect to be spent on each activity throughout the development of the product. Each hour has the same labour rate of £12.50.

#### 2.4.4.1. Module purchases/sales negotiations and contract write up

4 hours has been allocated to prepare and conduct any negotiations for the sale and purchase of programming modules, added to Week 4, iteration 1 (Feb. 24, 2020-Mar. 1, 2020).

#### 2.4.4.2. User story assumptions - pair programming

Each user story has had a number of hours estimated to develop it. As we plan on doing most of our development as pair-programmers, this estimate is given for the time taken for a pair to complete the story. Due to this all estimates in hours associated with user stories are doubled in length to include labour hours for each member of the pair programming team. A single share allocation of user story time shall refer to our estimated time, a double share allocation shall refer to the doubled time estimate of each user story, this estimated user time will be used to estimate the amount of time taken for other activities that requires labour.

#### 2.4.4.3. Management assumptions

2 hours a week has been allocated to management of the team, this includes time to write up minutes following a meeting, preparation of each meeting, signing off weekly timesheets and all management of allocation of work and decisions.



#### 2.4.4.4. Finance assumptions

2 hours a week has been allocated to conducting finances for the company, this includes the checking of time sheets, management of all payments internal and external, putting together of financial documents, research into potential company revenue/spending and any further financial assistance or advice needed within the company.

8 hours is also allocated for completion of financial business plan in iteration 1, week 1 (Week February 10<sup>th</sup> - 16<sup>th</sup> 2020).

5.25 hours is finally allocated for completion of the Financial Performance Review along with the Profit and loss statement into the week before the final presentation (May 25, 2020-May 31, 2020).

#### 2.4.4.5. Design assumptions

25% of a single share allocation of user story estimates has been added for design. This gives time for our lead designer to put the team's thoughts together in a single theme document, build diagrams for each page and meet with the lead programmer to ensure the theme is being interpreted correctly by the programmers.

#### 2.4.4.6. Code review assumptions

25% of a single share allocation of user story estimates has been added for code review. This gives the software and testing management necessary time to review all code sent from all stories to ensure all code is up to the standard the company expects.

0.75 hours will also be added to Week 6 of iteration 1 (Mar. 9, 2020-Mar. 15, 2020), before us as the purchaser group accept modules purchased, for the modules in question to go through our own code review process.

#### 2.4.4.7. Tender presentation assumptions

Following the week of Feb. 10, 2020-Feb. 16, 2020, the company has tender presentations to pitch the application proposal to lenders and so 6 hours has been added for each member of the team to prepare for this presentation.

#### 2.4.4.8. XML standards assumptions

On the 13/02/2020 several software companies that are all working on interactive software that can play/display multimedia presentations, will agree on market wide standards for the XML format of these presentations. To ensure Codev has their say in these standards we have allocated 6 hours to send a representative to these meetings and ensure this document satisfies the needs of the project.

#### 2.4.4.9. Final demonstration and sales presentation

On the 01/06/2020 the team has a demonstration and sales presentation to seek further funding/investment towards the project that will accompany the launch of the product. For this, 11 hours has been budgeted per person to prepare, demonstrate and present this presentation.

#### 2.4.4.10. Weekly meeting assumptions

1 hour per group member per week will be added to all weeks within an iteration period.

## 2.5. Labour Estimations Projections

2.5.1. Iteration 1, February 3<sup>rd</sup>, 2020 – March 15<sup>th</sup>, 2020 (6-week iteration due to tender presentations) (User story numbers, titles and statistic estimations found in appendix A)

#### Launch Screen and Login

User Stories: A1 (1.5), A2 (1.5), C20 (2.5) Total hours: 5.5

#### Main Home Screen

User Stories: C1 (3), C2 (1), C3 (2), C6 (3), C7 (2.5), C18 (4.5) Total hours: 16

#### User Profiles + Privacy

User Stories: A3 (2), A4 (1), A5 (2), A11 (5) Total hours: 10

#### Launch Presentation

User Stories: B1 (2), B2 (2.5), B3 (2.5), B4 (3), B6(4) Total hours: 14

#### Enable Meal Planner:



User Stories: C4 (2.5), C5 (1.5), C14 (4), C17 (2), C21 (4), C22 (2), C34 (1)      Total hours: 17

Total estimated programming time per pair programmer for first iteration: 62.5 hours

### **Total hours for iteration 1**

For both pair programmers: 125 hours

25% of estimate added for code review and the same added for design: 31.25 hours

2 hours added per week for finance and 2 more each week for management: 24 hours

1 hour per person per week added for meetings: 42 hours

6 hours added per person for tender presentation preparation: 42 hours

An extra 8 hours added to week 1 for completion of the Financial Business Plan (Week February 3<sup>rd</sup> - 9<sup>th</sup> 2020).

6 hours will also be added to the week of 13/02/2020 for XML standards agreements (Week February 10<sup>th</sup> - 16<sup>th</sup> 2020).

4 hours will also be allocated for contract negotiation and filing (Feb. 24, 2020-Mar. 1, 2020).

0.75 hours will be added for testing modules build by other companies to determine if they meet specification as set out in contracts (Mar. 9, 2020-Mar. 15, 2020).

Total hours of iteration 1: 283 hours

### **Iteration 1 weekly breakdown**

#### **Week 1 (Feb. 3, 2020-Feb. 9, 2020)**

##### Launch Screen and Login

User Stories: A1 (1.5), A2 (1.5), C20 (2.5)

##### Main Home Screen

User Stories: C1 (3), C2 (1), C3 (2),

Story total hours: 11.5

Added for pair-programming, design and code review: 17.25

Added for finance and management: 4

Added for meetings: 7

Added for financial business plan: 8

Total for week 1: 47.75

#### **Week 2 (Feb. 10, 2020-Feb. 16, 2020)**

Tender presentation: 42

Added for finance and management: 4

Added for meetings: 7

Added for XML standards agreement: 6

Total for week 2: 59

#### **Week 3 (Feb. 17, 2020-Feb. 23, 2020)**

##### Main Home Screen

User Stories: C6 (3), C7 (2.5), C18 (4.5)

##### User Profiles + Privacy

User Stories: A3 (2), A5 (2), A11 (5)



Story total hours: 19  
Added for pair-programming, design and code review: 28.5  
Added for finance and management: 4  
Added for meetings: 7

Total for week 3: 58.5

**Week 4 (Feb. 24, 2020-Mar. 1, 2020)**

User Profiles + Privacy

User Stories: A4 (1)

Launch Presentation

User Stories: B1 (2), B2 (2.5), B3 (2.5), B4 (3)

Story total hours: 11  
Added for pair-programming, design and code review: 16.5  
Added for finance and management: 4  
Added for meetings: 7  
Added for contract negotiation: 4

Total for week 4: 42.5

**Week 5 (Mar. 2, 2020-Mar. 8, 2020)**

Launch Presentation

User Stories: B6(4)

Enable Meal Planner:

User Stories: C4 (2.5), C5 (1.5), C14 (4), C17 (2)

Story total hours: 14  
Added for pair-programming, design and code review: 21  
Added for finance and management: 4  
Added for meetings: 7

Total for week 5: 46

**Week 6 (Mar. 9, 2020-Mar. 15, 2020)**

Enable Meal Planner:

C21 (4), C22 (2), C34 (1)

Story total hours: 7  
Added for pair-programming, design and code review: 10.5  
Added for finance and management: 4  
Added for meetings: 7  
Added for purchased module testing: 0.75

Total for week 6: 29.25

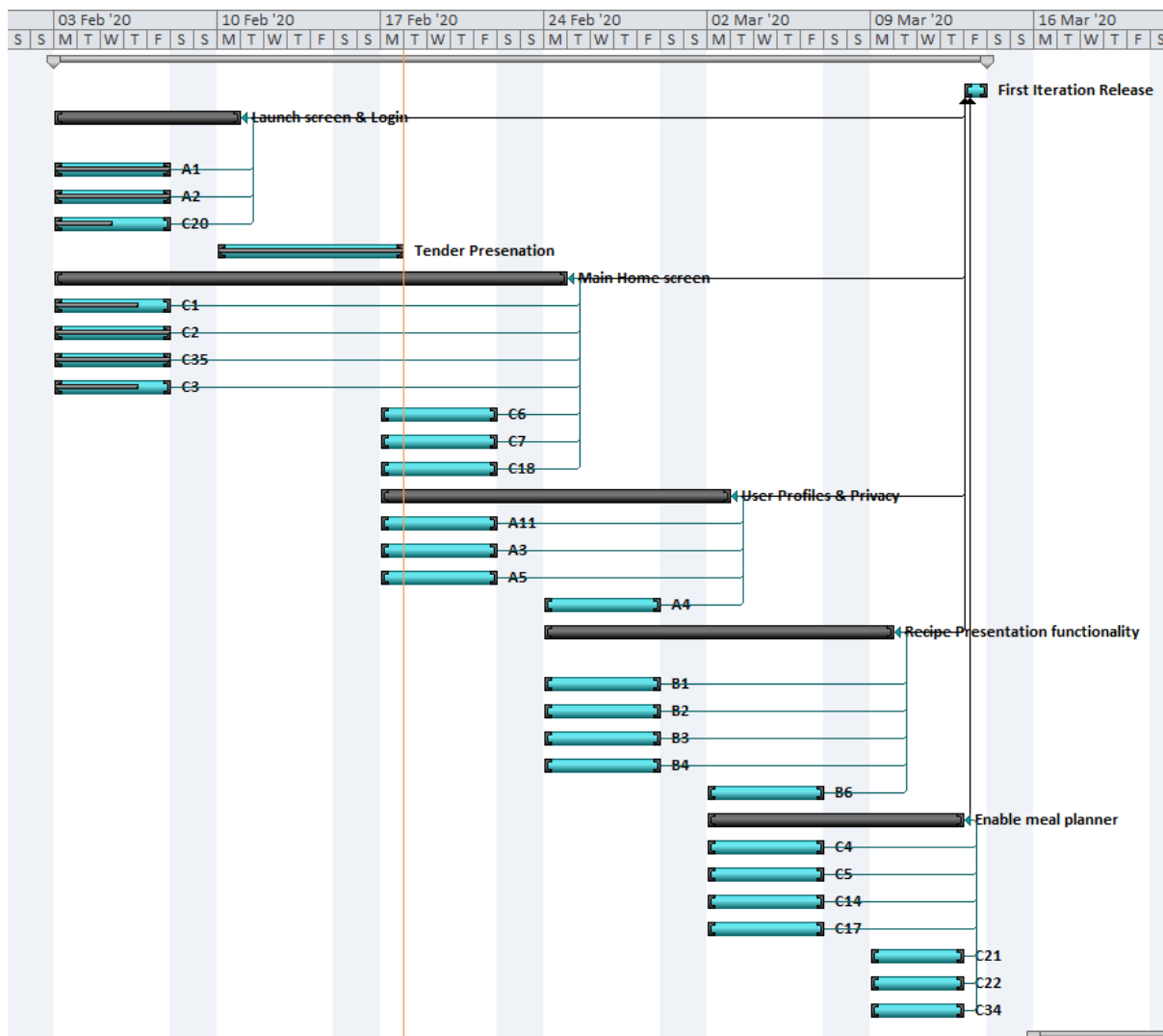


Figure 2: Iteration 1 user story break down, taken from Microsoft Project plan put together by project lead James Pearson (19/02/2020).

## 2.5.2. Iteration 2, March 16<sup>th</sup>, 2020 – April 13<sup>th</sup>, 2020 (standard 5-week iteration)

### Social Aspect (Timeline, friends, etc.)

User Stories: C16 (4.5), C26 (5), C29 (5), C27 (3), C28 (4), C31 (2.5)

Total hours: 24

### Gold membership (Get rid of ads, extra features)

User Stories: A9 (4), C19 (3)

Total hours: 7

### Recipe sorting, filters and search functionality

User Stories: C13 (3)

Total hours: 3

### Recipe and Ingredient Information

User Stories: C12 (5)

Total hours: 5

### Healthy living system

User Stories: C32 (5), A13 (6)

Total hours: 11

### User created recipes

User Stories: A12 (7)

Total hours: 7

Total estimated programming time of iteration: 57 hours

### **Total hours for iteration 2**

For both pair programmers: 114 hours

25% of estimate added for code review and the same added for design: 28.5 hours

2 hours added per week for finance and 2 more each week for management: 20 hours

1 hour per person per week added for meetings: 35 hours

Total hours of iteration 2: 197.5 hours

### **Iteration 2 weekly breakdown**

#### **Week 1 (Mar. 16, 2020-Mar. 22, 2020)**

Social Aspect (Timeline, friends, etc.)

User Stories: C16 (4.5), C26 (5), C29 (5)

Story total hours: 14.5

Added for pair-programming, design and code review: 21.75

Added for finance and management: 4

Added for meetings: 7

Total for week 1: 47.25

#### **Week 2 (Mar. 23, 2020-Mar. 29, 2020)**

Social Aspect (Timeline, friends, etc.)

User Stories: C27 (3), C28 (4), C31 (2.5)

Story total hours: 9.5

Added for pair-programming, design and code review: 14.25

Added for finance and management: 4

Added for meetings: 7

Total for week 2: 34.75

#### **Week 3 (Mar. 30, 2020-Apr. 5, 2020)**

Gold membership (Get rid of ads, extra features)

User Stories: A9 (4), C19 (3)

Story total hours: 7

Added for pair-programming, design and code review: 10.5

Added for finance and management: 4

Added for meetings: 7

Total for week 3: 28.5

#### **Week 4 (Apr. 6, 2020-Apr. 12, 2020)**

Recipe sorting, filters and search functionality

User Stories: C13 (3)

Recipe and Ingredient Information

User Stories: C12 (5)

Healthy living system

User Stories: C32 (5)

Story total hours: 13

Added for pair-programming, design and code review: 19.5

Added for finance and management: 4

Added for meetings: 7

Total for week 4 43.5

#### **Week 5 (Apr. 13, 2020-Apr. 19, 2020)**

Healthy living system

User Stories: A13 (6)  
User created recipes  
 User Stories: A12 (7)

Story total hours: 13  
 Added for pair-programming, design and code review: 19.5  
 Added for finance and management: 4  
 Added for meetings: 7

Total for week 5: 43.5

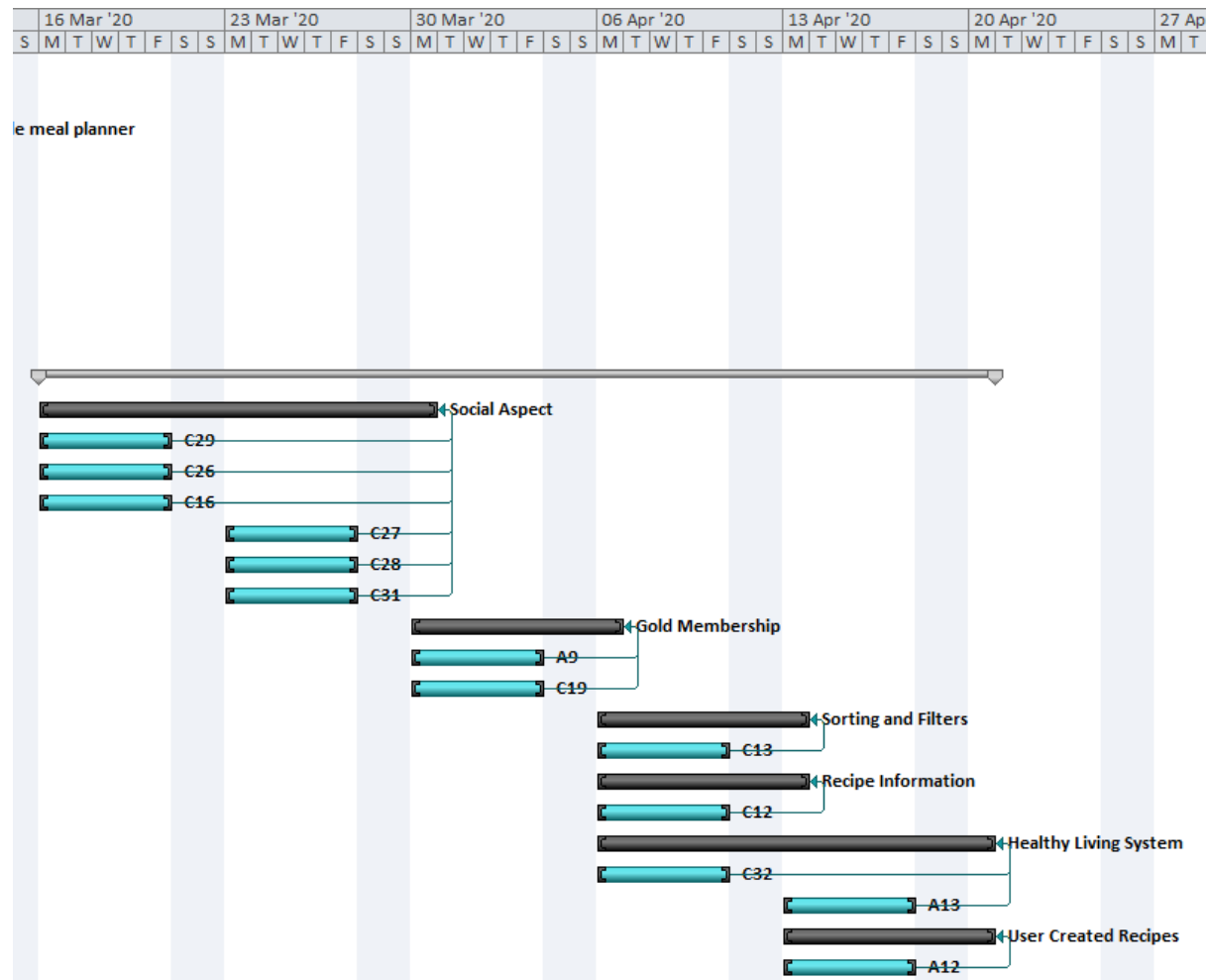


Figure 3: Iteration 2 user story break down, taken from Microsoft Project plan put together by project lead James Pearson (19/02/2020).

### 2.5.3. Iteration 3 April 20<sup>th</sup>, 2020 – May 24<sup>th</sup>, 2020 (standard 5-week iteration)

#### Measuring System

User Stories: C10 (1.5) Total hours: 1.5

#### Recipe rating and reviews

User Stories: C9 (2.5), C11 (3.5), C23 (3), A8 (3), C30 (3) Total hours: 15

#### Recipe suggestions

User Stories: B5 (3.5), C25 (5) Total hours: 8.5

#### Icons for ingredients and recipes

User Stories: A14 (1.5) Total hours: 1.5

#### Chef stars and badges

User Stories: A8 (3), A10 (3) Total hours: 6

#### Fav Recipe

User stories: C8 (3.5), C15 (1.5)

Total hours: 5

#### Reporting of content

User Stories: C23 (3)

Total hours: 3

#### Notification System

User Stories: A6 (10), A7 (1)

Total hours: 11

#### Personal interaction

User Stories: C24 (2)

Total hours: 2

Total estimated programming time of iteration: 53.5 hours

### **Total hours for iteration 3**

For both pair programmers: 107 hours

25% of estimate added for code review and the same added for design: 26.75 hours

2 hours added per week for finance and 2 more each week for management: 20 hours

1 hours per person per week added for meetings: 35 hours

**Total hours of iteration 2: 188.75 hours**

### **Iteration 3 weekly breakdown**

#### **Week 1 (Apr. 20, 2020-Apr. 26, 2020)**

##### Measuring System

User Stories: C10 (1.5)

##### Recipe rating and reviews

User Stories: C9 (2.5), C11 (3.5), C23 (3)

Story total hours: 10.5

Added for pair-programming, design and code review: 15.75

Added for finance and management: 4

Added for meetings: 7

Total for week 1: 37.25

#### **Week 2 (Apr. 27, 2020-May 3, 2020)**

##### Recipe rating and reviews

User Stories: A8 (3), C30 (3)

##### Recipe suggestions

User Stories: B5 (3.5), C25 (5)

Story total hours: 14.5

Added for pair-programming, design and code review: 21.75

Added for finance and management: 4

Added for meetings: 7

Total for week 2: 47.25

#### **Week 3 (May 4, 2020-May 10, 2020)**

##### Icons for ingredients and recipes

User Stories: A14 (1.5)

##### Chef stars and badges

User Stories: A8 (3), A10 (3)

Story total hours: 7.5

Added for pair-programming, design and code review: 11.25



Added for finance and management: 4  
Added for meetings: 7

Total for week 3: 29.75

**Week 4 (May 11, 2020-May 17, 2020)**

Fav Recipe

User stories: C8 (3.5), C15 (1.5)

Reporting of content

User Stories: C23 (3)

Story total hours: 8  
Added for pair-programming, design and code review: 12  
Added for finance and management: 4  
Added for meetings: 7

Total for week 4: 31

**Week 5 (May 18, 2020-May 24, 2020)**

Notification System

User Stories: A6 (10), A7 (1)

Personal interaction

User Stories: C24 (2)

Story total hours: 13  
Added for pair-programming, design and code review: 19.5  
Added for finance and management: 4  
Added for meetings: 7

Total for week 5: 43.5



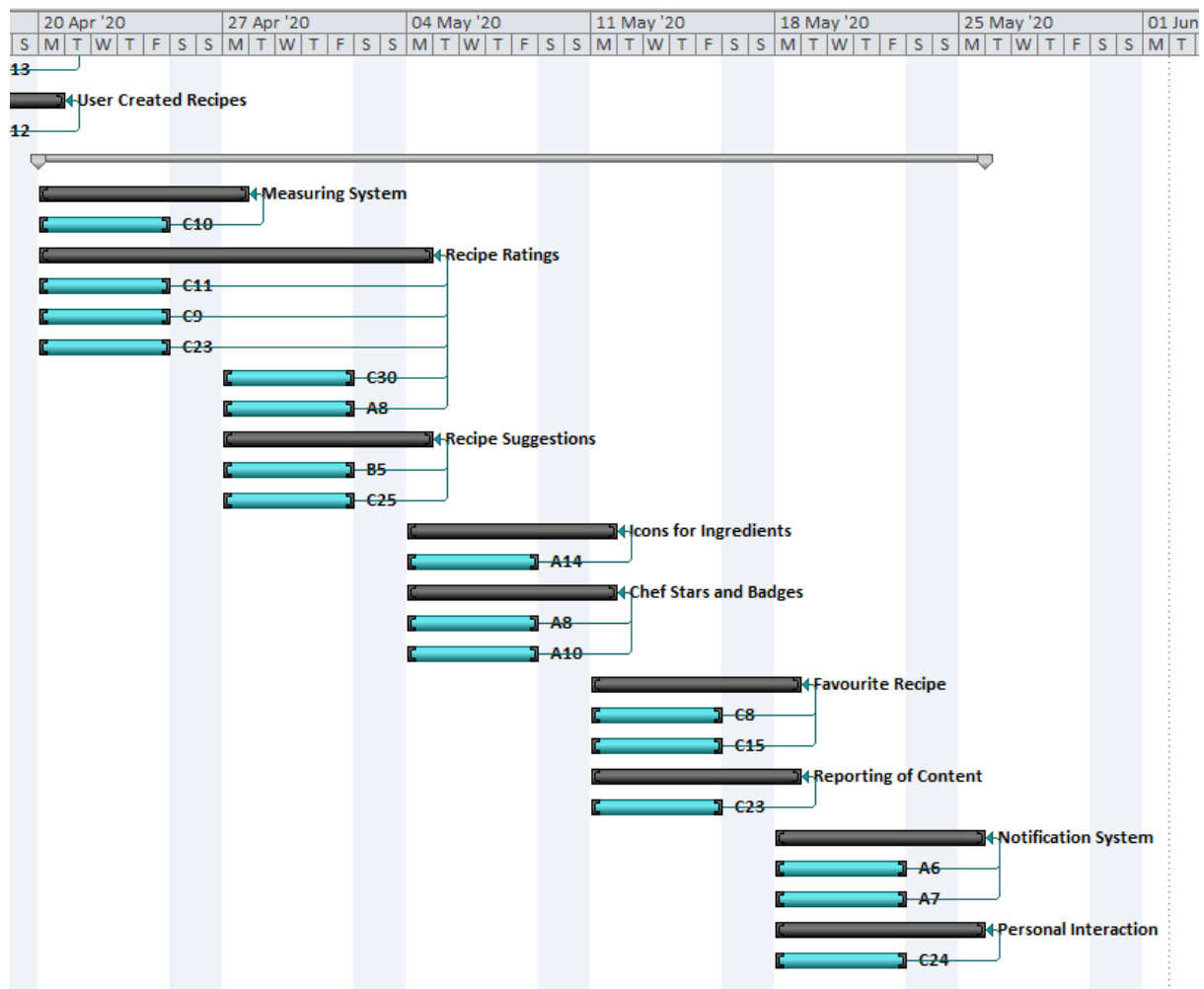


Figure 4: Iteration 3 user story break down, taken from Microsoft Project plan put together by project lead James Pearson (19/02/2020).

2.5.4. Final demonstration and sales presentation preparation week in conjunction with presentation and hand-in week (May 25<sup>th</sup>, 2020 – June 7<sup>th</sup>, 2020)  
11 hours per person: 77 hours

**Total for presentation and finalisation: 77 hours**

**Week 1 total (May 25, 2020-May 31, 2020):**

10 hours per person for presentation preparation

5.25 hours added for completion of final financial performance review along with profit and loss

**75.25 hours total**

**Week 2 total (June 1, 2020-June 7, 2020):**

1 hour per person for presentation

**7 hours total**

## 2.6. The Cash Flow Projection Spreadsheet for Remainder of Development

Week number	19	20	21	22	23	24
Week dates	Feb. 3, 2020-Feb. 9, 2020	Feb. 10, 2020-Feb. 16, 2020	Feb. 17, 2020-Feb. 23, 2020	Feb. 24, 2020-Mar. 1, 2020	Mar. 2, 2020-Mar. 8, 2020	Mar. 9, 2020-Mar. 15, 2020
Term week	5	6	7	8	9	10
Project Iteration Stage	Iteration 1, week 1	Iteration 1, week 2	Iteration 1, week 3	Iteration 1, week 4	Iteration 1, week 5	Iteration 1, week 6
Num weekly hours	47.75	59	58.5	42.5	46	29.25
IN						
Loans (Note 1)		£28,243.15				
Module sales (Note 2)						
OUT						
Premises Rent (Note 3)			(£1,898.08)			(£1,898.08)
Utilities Rent (Note 4)		(£500.00)				(£200.00)
IT infrastructure (Note 5)		(£1,000.00)				(£400.00)
Cost of Labour (Note 6)	(£596.88)	(£737.50)	(£731.25)	(£531.25)	(£575.00)	(£365.63)
Weekly interest (Note 7)	£0.00	(£91.57)	(£91.57)	(£91.57)	(£91.57)	(£91.57)
Module purchases (Note 8)				(£100.00)		(£300.00)
Creditors						
Long term loans (Note 9)	£0.00	£28,243.15	£28,243.15	£28,243.15	£28,243.15	£28,243.15
Owed on contracts (Note 10)	£0.00	£0.00	£0.00	£300.00	£300.00	£0.00
Opening Balance	(£15,660.34)	(£16,257.21)	£9,656.86	£6,935.96	£6,213.14	£5,546.57
OUT total	(£596.88)	(£2,329.07)	(£2,720.90)	(£722.82)	(£666.57)	(£3,255.27)
IN total	£0.00	£28,243.15	£0.00	£0.00	£0.00	£0.00
Closing Balance	(£16,257.21)	£9,656.86	£6,935.96	£6,213.14	£5,546.57	£2,291.29

Week number	25	26	27	28	29	30
Week dates	Mar. 16, 2020-Mar. 22, 2020	Mar. 23, 2020-Mar. 29, 2020	Mar. 30, 2020-Apr. 5, 2020	Apr. 6, 2020-Apr. 12, 2020	Apr. 13, 2020-Apr. 19, 2020	Apr. 20, 2020-Apr. 26, 2020
Term week	Easter	Easter	Easter	Easter	1	2
Project Iteration Stage	Iteration 2, week 1	Iteration 2, week 2	Iteration 2, week 3	Iteration 2, week 4	Iteration 2, week 5	Iteration 3, week 1
Num weekly hours	47.25	34.75	28.5	43.5	43.5	37.25
IN						
Loans (Note 1)					£16,334.28	
Module sales (Note 2)						
OUT						
Premises Rent (Note 3)						
Utilities Rent (Note 4)						
IT infrastructure (Note 5)						
Cost of Labour (Note 6)	(£590.63)	(£434.38)	(£356.25)	(£543.75)	(£543.75)	(£465.63)
Weekly interest (Note 7)	(£91.57)	(£91.57)	(£91.57)	(£91.57)	(£144.53)	(£144.53)
Module purchases (Note 8)						
Creditors						
Long term loans (Note 9)	£28,243.15	£28,243.15	£28,243.15	£28,243.15	£44,577.43	£44,577.43
Owed on contracts (Note 10)	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Opening Balance	£2,291.29	£1,609.09	£1,083.15	£635.32	(£0.00)	£15,646.00
OUT total	(£682.20)	(£525.95)	(£447.82)	(£635.32)	(£688.28)	(£610.16)
IN total	£0.00	£0.00	£0.00	£0.00	£16,334.28	£0.00
Closing Balance	£1,609.09	£1,083.15	£635.32	(£0.00)	£15,646.00	£15,035.84

Week number	31	32	33	34	35	36
Week dates	Apr. 27, 2020-May 3, 2020	May 4, 2020-May 10, 2020	May 11, 2020-May 17, 2020	May 18, 2020-May 24, 2020	May 25, 2020-May 31, 2020	June 1, 2020-June 7, 2020
Term week	3	4	5	6	7	8
Project Iteration Stage	Iteration 3, week 2	Iteration 3, week 3	Iteration 3, week 4	Iteration 3, week 5	Presentation preparation	Presentation & hand in
Num weekly hours	47.25	29.75	31	43.5	75.25	7
IN						
Loans (Note 1)						
Module sales (Note 2)						
OUT						
Premises Rent (Note 3)		(£5,061.54)			(£1,898.08)	
Utilities Rent (Note 4)				(£500.00)		
IT infrastructure (Note 5)				(£1,000.00)		
Cost of Labour (Note 6)	(£590.63)	(£371.88)	(£387.50)	(£543.75)	(£940.63)	(£87.50)
Weekly interest (Note 7)	(£144.53)	(£144.53)	(£144.53)	(£144.53)	(£144.53)	(£144.53)
Module purchases (Note 8)						
Creditors						
Long term loans (Note 9)	£44,577.43	£44,577.43	£44,577.43	£44,577.43	£44,577.43	£44,577.43
Owed on contracts (Note 10)	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Opening Balance	£15,035.84	£14,300.68	£8,722.73	£8,190.70	£6,002.41	£3,019.18
OUT total	(£735.16)	(£5,577.95)	(£532.03)	(£2,188.28)	(£2,983.24)	(£232.03)
IN total	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Closing Balance	£14,300.68	£8,722.73	£8,190.70	£6,002.41	£3,019.18	£2,787.14

Week number	37	38
Week dates	June 8, 2020-June 14, 2020	June 15, 2020-June 21, 2020
Term week	9	10
Project Iteration Stage		
Num weekly hours	0	0
IN		
Loans (Note 1)		
Module sales (Note 2)		
OUT		
Premises Rent (Note 3)		(£1,898.08)
Utilities Rent (Note 4)		(£200.00)
IT infrastructure (Note 5)		(£400.00)
Cost of Labour (Note 6)	£0.00	£0.00
Weekly interest (Note 7)	(£144.53)	(£144.53)
Module purchases (Note 8)		
Creditors		
Long term loans (Note 9)	£44,577.43	£44,577.43
Owed on contracts (Note 10)	£0.00	£0.00
Opening Balance	£2,787.14	£2,642.61
OUT total	(£144.53)	(£2,642.61)
IN total	£0.00	£0.00
Closing Balance	£2,642.61	£0.00

## 2.7. Total Borrowing Required for Development

### Total Predicted Development Costs

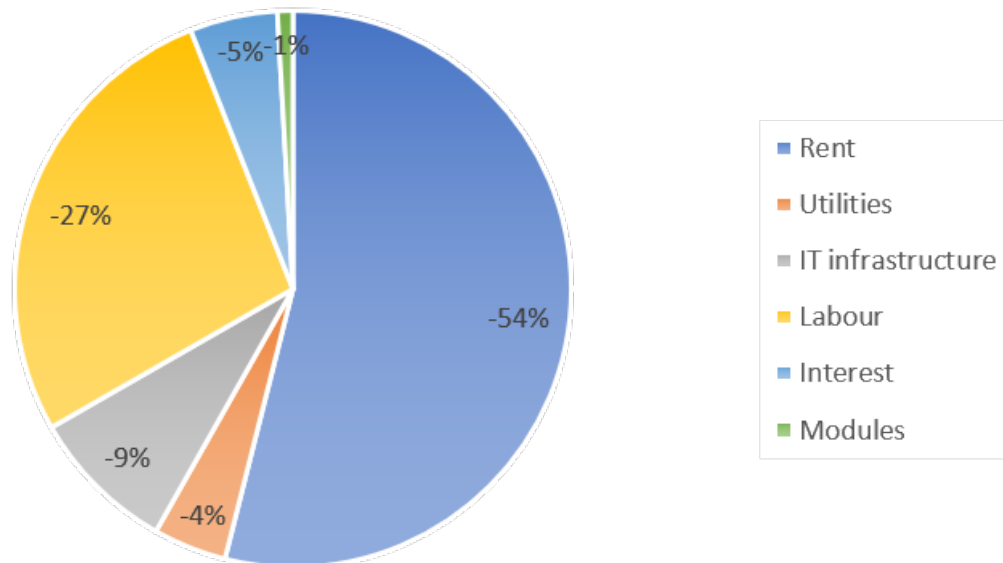


Figure 5: Pie chart showing all spending throughout the development phase of the project.

Total cost of development: £44,577.43 (Spreadsheet note 9 for total owed at any time).

Taking all prior finances, liabilities and predicted expenditure, a totalled borrowed amount of £44,577.43 paid in two instalments. Presuming these instalments are paid firstly on the week of Feb. 10, 2020-Feb. 16, 2020 to the amount of £28,243.15 and the second paid on the week of Apr. 13, 2020-Apr. 19, 2020 to the amount of £16,334.28. This will see the company right through the development process without going back into our overdraft until we are able to acquire further borrowing or investment for deployment and any further development on the week of June 15, 2020-June 21, 2020 (Spreadsheet note 1).

## 2.8. Overhead Recovery Rate of Development

Using the full absorption costing method, an overhead recovery rate can be calculated for the total cost of development:

Budgeted overhead which considers the full cost of development. This will include rent, utilities, IT infrastructure, interest on loans and module purchases.

Then using total labour hours as a cost driver

$$\frac{\text{Budgetted overhead}}{\text{Budgetted cost driver}} = \text{predetermined overhead rate}$$

$$\frac{£32,411.80}{973.25 \text{ hours}} = 33.3 : 1 \text{ overhead rate}$$

This gives us a predetermined overhead recovery rate of:

**£33.30 to every hour spent on the project.**

## 3. Deployment Potential and Costs

### 3.1. Important Deployment Assumptions

#### 3.1.1. Marketing

From the marketing research added to appendix A and completed by our Marketing Manager, we have assessed that each ad campaign will cost £2849.00 consisting of the following price breakdown.

Type of marketing	Price
Flyers for 100 universities	£1500
3 hours of work	£24.63
Banner	£25
Poster printing (ten per university)	£300
Social media ads & work	£500
Influencers pay	£500
<b>Total</b>	<b>£2849</b>

This research estimates that the first ad campaign following launch will generate our first 500 users. It states that our second ad campaign will generate 2000 users and the third, 5000 users.

#### 3.1.2. Cloud Storage and Backend

Having a google backend will free up the cost of having a permanent company residence and the maintenance of IT infrastructure. It would mean that the individuals that are self-employed and contracted to work for the company can do so from home for any updates and further development of the application following the initial development process.

As stated in appendix A, where a cloud storage cost analysis has been undertaken by our XML and Server Manager, we have established an estimate of the cost of the Firestore entering a 12-month period following our second ad campaign where we have 2000 users and estimating a growth past 2000 users of 10% a month over a 12-month period:

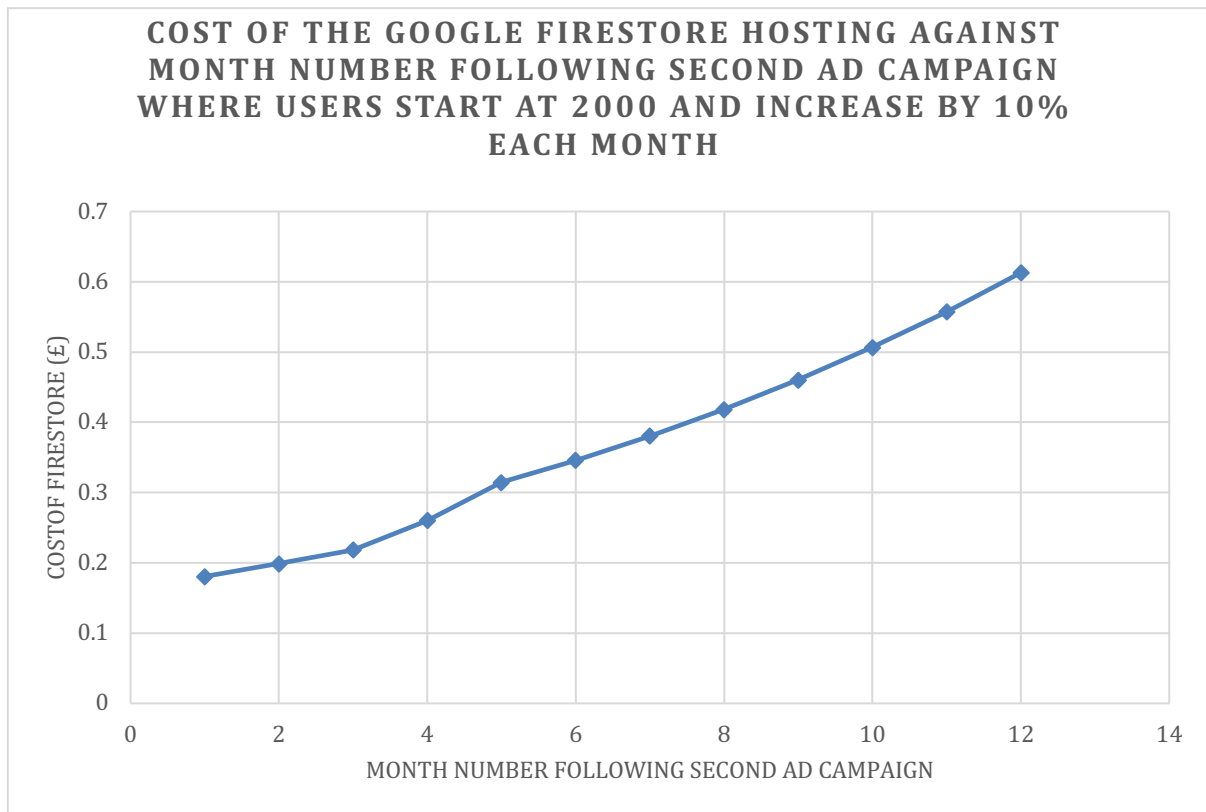


Figure 6: Graph taken from research on cloud storage cost analysis conducted by our XML and Server Manage, Jun Ma.

From this graph, we can see that current estimations of Firestore costs of users transitioning between 2000 and 5706 have very minor effects to cost ranging between 0.2 GBP and 0.7 GBP per month. These results tell us that the Firestore is very viable as a backend solution to the company that negates the need for a premise following the development period.

### 3.1.3. Further Labour Assumptions

Probably further labour requirements include:

- Hiring of chefs to build up the initial recipe database.
- Several freelance developers to maintain updates and functionality.
- Maintain marketing freelancers for deployment of ad campaigns.

### 3.1.4. Extra Deployment Costs

Probable further other costs include:

- Purchase of initial recipe database or hiring chefs to put one together.
- Payment to deploy application to Google Play (25 USD per application).
- Development of IOS version given android success, alternatively migrate across to a Flutter development environment to have Android and IOS in a single code base.

## 3.2. Company Revenue Model

For application monetization we are looking to offer the application as a Freemium service.

Free users will have access to the basic application that will display with adverts, there will be two places where advertisements will be placed:

1. Banner advertising between sections within the list view and horizontal scroll view of any page incorporating lists of meals or other content such as the social feed.
2. Full screen video adverts following a successful meal preparation or prior to preparing a meal.

With the current concept, a premium service will be available that incorporates the full free application with added benefits:

- Zero advertising.
- Profile and general app customisation not available to other users such as alterations to colour schemes.
- A badge and visible profile recognition for users that are premium members.
- Access to notifications on meals cooked (such as when food will be going out of date).
- Access to a premium only area which includes:
  - Diet analytics.
  - Selection of health plans to suggest meals for a desired diet goal.
  - Progress chart where user health details can be recorded, and goals can be tracked.

The initial proposal of the premium service will be available as a 3-day trial, following on from this trial users will have to options to pay for either a membership in the following timescales:

- Monthly,
- Quarterly,
- Yearly,
- Lifetime access.

**For the premium service to be a viable option we must meet or exceed all advertising monetization capability.**

Other revenue options:

- Building a shop that sells branded clothing and cooking equipment (premium users would get a discount if this was implemented).
- Approach supermarkets and offer a service to price up all ingredients to their supermarket.
- Approach supermarkets for exclusive advertising with that specific supermarket as part of an app partnership monetisation model (can be used in conjunction with ingredients pricing).

### 3.2.1. Admob Revenue

Admob income is very difficult to estimate. As we are working with an application that is available in every country in the world and we need to rely on daily active users making impressions and clicks with the advertising.

As we are aiming at students in the UK, we shall make a simplification here and specify that our average daily user is more likely to be from a tier 1 country (i.e. US, UK, Canada and Australia). Due to this we will estimate the average cost per click (CPC) to be around £0.27, we will estimate the click through rate (CTR) of our users to be around 1.1%. We will then estimate that our users will see roughly 4 pages of the application on each visit. This will give us an average Cost Per Thousand (CPM), which means the cost per 1000 pageviews, of £2.94.

Using these assumptions, we can estimate potential revenue produced with free daily active users from ADMOB:

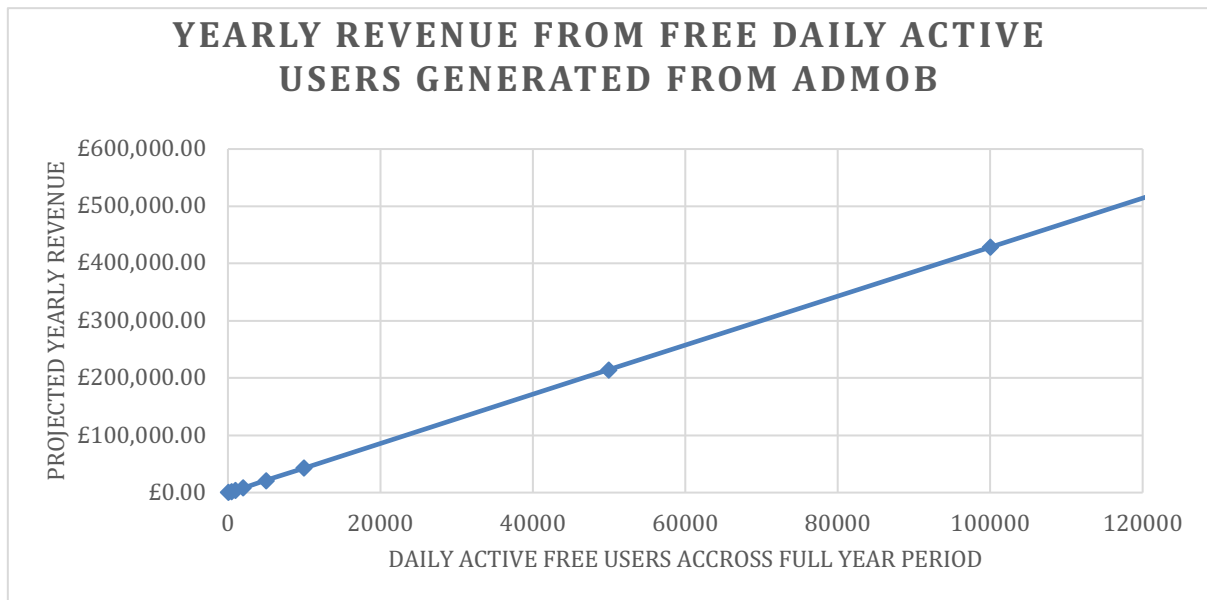


Figure 7: Graph showing potential revenue generated from ADMOB.

### 3.2.2. Premium User Revenue

Preliminary product pricing estimates for premium users with estimated percentage of users in each bracket.

	Value	% User Estimate
Monthly	£1.00	50%
Quarterly	£2.50	20%
Yearly	£7.50	20%
Lifetime access	£20.00	10%

(% User Estimate - refers to estimates number of users who select this payment method)

Using this preliminary pricing plan, we can estimate revenue produced from premium users:

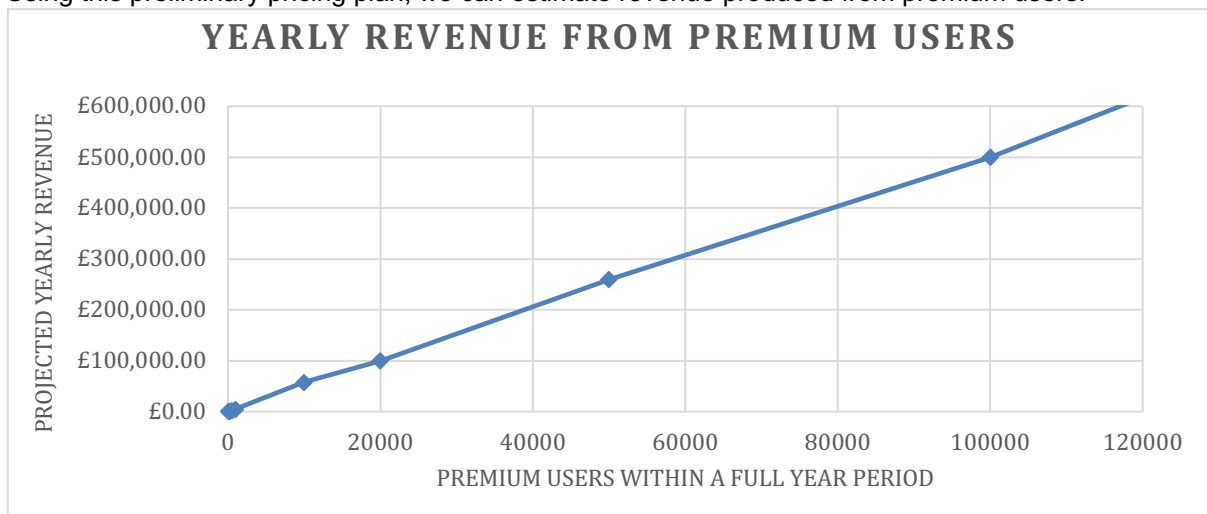


Figure 8: Graph showing potential revenue generated from premium users.

### 3.2.3. Summary of Revenue Model

Although no revenue is assured, revenue remains purely a matter of generating an active user base. This revenue model serves to highlight the potential of the Scran-Plan project, given development funding.



## 4. Financial Needs Summary

Having a bank investment of £45,000 will see Codev through until the end of our 38-week development period. This funding will cover all costs associated with the primary development and set the stage for a strong investment opportunity from which the bank will be able to recover all lent funding. In an age when social applications are thriving, Scran-Plan has the potential to bring enormous real value to its customers and thrive on a global scene.

## 5. Appendix A: Relevant Evidence

### 5.1. User stories (Only number, story and estimates)

*(User stories written by all members of the team, requirements and tests have been taken out of document.)*

Server Side		
Story ID	Story	Estimates
A1	Author: James Pearson, Joe Butler As a user I should be able to register an account for the app upon opening for the first time and then retrieve my new associated user profile information from the servers Firebase authentication system	Value:100 Risk:30 Time:1.5
A2	Author: Joe Butler As a user I should be able to login to my account upon app launch or log out whilst using the app from the user profile section, either retrieving or removing a reference to an instance of my accounts information from the servers Firebase authentication system	Value:100 Risk:95 Time: 1.5
A3	Author: James Pearson, Joe Butler as a user I should be able to change my password from the user profile page to be checked and updated from the servers Firebase authentication system	Value:96 Risk:30 Time: 2
A4	Author: James Pearson, Joe Butler As a team member I should be able to retrieve basic user information for a user from the server (excluding email and password info)	Value:97 Risk:23 Time: 1
A5	Author: James Pearson, Joe Butler As a user I should be able to delete all associated user info from the server immediately in the event I wish to remove all personal data	Value:100 Risk:55 Time:2
A6	Author: James Pearson, Joe Butler As a user I should be able to receive notifications from the server to my device about interesting or relevant recipes when appropriate	Value: 36 Risk: 95 Time: 10
A7	Author: Jun Ma, Joe Butler As a user I should be able to choose if I should receive notifications for interesting or relevant recipes from the user profile page	Value: 45 Risk:35 Time:1

A8	Author: James Pearson, Joe Butler As a user I should receive Chef Stars based upon ratings given on my submitted recipes from other user accounts	Value: 50 Risk: 59 Time: 3
A9	Author: Becky, Joe Butler As a user I want to upgrade the application to receive extra benefits (remove ads, extra features...) through a secure payment wall or through a rewards scheme	Value: 95 Risk: 60 Time: 4
A10	Author: James C As a user, I receive badges attached to my profile through achievements gained in the application	Value: 45 Risk: 55 Time: 3
A11	Author: Louis As a user, I want to be able to customise my profile so I decide i what other users can see when they view my profile through recipes and comments	Value: 80 Risk: 65 Time: 5
A12	Author: Louis As a user, I want to be able to create recipes and create each step as though I am creating a presentation that will be saved to presentation bank along with my personal profile so I can earn my chef stars and share my knowledge.	Value: 90 Risk: 70 Time: 7
A13	Author: Becky As a user, I want to be able to track my eating habits on my profile. With the possibility of weight tracking and information regarding if I hit my goals for food groups. This is so I can use the app as a health app as well as food app.	Value: 50 Risk: 75 Time: 6
A14	Author: James C As a user, I want to see custom icons attached to ingredients when viewing a recipe	Value: 70 Risk: 20 Time: 1.5

### XML Presentation

Story ID	Story	Estimates
B1	Author: Louis As a user, I can enter the presentation from the meal info page to find out how to cook it	Value: 90 Risk: 25 Time: 2
B2	Author: Louis As a user, I would like the presentation to be in single instruction format with the ability to go forward and backwards in steps so I can see what I need to do at each part of the meal preparation process	Value: 95 Risk: 25 Time: 2.5
B3	Author: Louis As a user, I would like to have a key to see where I am in the meal making process and to jump to steps to ensure I prepare the meal correctly.	Value: 75 Risk: 25 Time: 2.5
B4	Author: Louis As a user, I want to be able to enter the presentation for the meal I have selected for today in my plan so I can immediately start cooking when I am ready	Value: 76 Risk: 31 Time: 3
B5	Author: Becky As a user, I want to be able to see similar meals to the ones I have selected, with similar ingredients so I can plan my meals more efficiently and not have to buy lots of different types of ingredients	Value: 69 Risk: 40 Time: 3.5
B6	Author: Louis As a user, I want to be able to save comments to an individual step of a recipe so I can give other users pointers through the cook	Value: 52 Risk: 55 Time: 4

User Interaction		
Story ID	Story	Estimates
C1	Author: James P As a user I can swipe up/down and left/right on the main home screen so that I can view all of the recipes on offer	Value:100 Risk:15 Time:3
C2	Author: James P As a user I can click the tabs on the main home screen so that I can easily navigate to main menu screen, timeline and the users profile	Value:84 Risk:15 Time:1
C3	Author: James P As a user I can tap a recipe on screen so that I can view its contents	Value:100 Risk:8 Time:2
C4	Author: Louis As a user who buys all the weekly food shopping at one time, I am able to create a meal plan to know exactly what ingredients I am going to need for the plan duration	Value: 80 Risk: 20 Time: 2.5
C5	Author: Becky As a user who has a lot of store cupboard ingredients, I can tap what ingredients I need to add to a shopping list so I can build a shopping list based on the recipes without including ingredients I already have.	Value: 80 Risk: 30 Time: 1.5
C6	Author: James C As a user with dietary needs I can tap a filter button to filter recipes several different ways to cater to my dietary/ religious/ price/ nutritional needs	Value: 90 Risk: 20 Time: 3
C7	Author: James C As a user I can tap the sort button to sort recipes into chosen orders	Value: 80 Risk: 26 Time:2.5
C8	Author: Becky As a user I can tap a button on the recipes I liked so I can have a list of the recipes I would want to make again	Value:75 Risk: 50 Time:3.5

C9	Author: James C As a user I can tap a rating under recipes to give them a star rating out of 5	Value: 85 Risk: 34 Time: 2.5
C10	Author: James C As a user I can tap a button to change the unit of measurement of given ingredients	Value: 73 Risk: 20 Time: 1.5
C11	Author: Becky As a user I can add comments and reviews on other recipes so other users can see my opinions on the recipe	Value:79 Risk:49 Time:3.5
C12	Author: Becky As a user I can see the Price and nutrition value of a recipe so I can choose a recipe accordingly	Value:80 Risk:80 Time:5
C13	Author: Louis, Jun As a user, I want to be able to select liked or disliked ingredients from an ingredients list and then I can get a new list based on my selection so that the plan can be better for me.	Value: 52 Risk: 38 Time: 3
C14	Author: Louis, Becky, James C As a user I recipes to display information including typical expiry date and methods on how to keep the recipes fresh so I know how many days it will last before going off.	Value: 60 Risk: 50 Time: 4
C15	Author: Jun As a user, I want to delete my disliked meals in the plan instead of some substitutions of these meals so that I can be more satisfied with the completed plan.	Value:80 Risk:22 Time:1.5

C16	Author: James C As a user, I want to be able to post, comment and like/dislike other posts on the timeline	Value: 66 Risk: 66 Time: 4.5
C17	Author: James C As a user, I want to be able to select a timeframe to see certain recipes, such as breakfast, lunch or dinner	Value: 83 Risk: 12 Time: 2
C18	Author: Jun As a user, I want to be able to search the keywords about food ingredients or cooking methods so that I can find the wanted recipes.	Value: 87 Risk: 60 Time: 4.5
C19	Author: James C As a user, I want the option of not paying for the app and just seeing a small number of adverts while I traverse the application because I do not want to spend money.	Value: 92 Risk: 26 Time: 3
C20	Author: James C As a user, I want to input the majority of my customisation options during the first-time setup in the initial launch screen	Value: 74 Risk: 41 Time: 2.5
C21	Author: Louis As a user, I want there to be timers and alerts for when food is going out of date that display as notifications, so I waste less food.	Value: 38 Risk: 60 Time: 4
C22	Author: Louis As a user, I want recommended storage and reheating instructions for each meal to make the process easier.	Value: 60 Risk: 29 Time: 2
C23	Author: Louis As a user, I want to be able to report any recipes, comments or reviews that breach the terms and conditions, or I deem to be inappropriate.	Value: 94 Risk: 22 Time: 3

C24	Author: Louis As a user, I want to be able to view all recipes, reviews and comments I have made within the app.	Value: 72 Risk: 15 Time: 2
C25	Author: Nathan As a user, I want suggested recipes based on categories of recipes I've made before	Value: 55 Risk: 69 Time: 5
C26	Author: James C & Louis As a user, I want to be able to send my friends messages and recipes so they can share in the ones I enjoy.	Value: 79 Risk: 51 Time: 5
C27	Author: Louis As a user, I want to add my friends who already have the app along with invite my friends to get the app so we can share content within the app.	Value: 76 Risk: 47 Time: 3
C28	Author: Louis As a user, I want to see what the trending recipes are and what are the trending recipes that have a star rating of # stars and above.	Value: 56 Risk: 49 Time: 4
C29	Author: Louis As a user, I want to see what my friends have been cooking and the reviews they leave of what they have been cooking in some sort of timeline or data feed.	Value: 86 Risk: 57 Time :5
C30	Author: Louis As a user, I want to be able to post questions about a recipe that anyone can answer but the author is prompted to answer, I would then like the ability to choose the best answer or vote for the best answer so I can find out the information I need about a recipe.	Value: 59 Risk: 38 Time: 3



C31	<p>Author: Becky</p> <p>As a user, I want to be able to share healthy eating and cooking tips on my timeline; I want my friends to be able to comment on these tips so others can see if they are useful and I am able to share my knowledge with the community.</p>	<p>Value: 60</p> <p>Risk: 36</p> <p>Time:2.5</p>
C32	<p>Author: Jun</p> <p>As a user, I can choose a target weight and how long I get it and I want to get a recommended plan about calorie intake so that I can achieve my target weight.</p>	<p>Value:54</p> <p>Risk: 59</p> <p>Time: 5</p>
C33	<p>Author: Joe Butler</p> <p>As a user, I should be aware of the apps privacy policy &amp; terms and conditions, available to view within any modern internet browser or in app with data coming from our own XML servers and understand exactly how my data, including my bank details (if appropriate) are handled/used</p>	<p>Value: 100</p> <p>Risk: 45</p> <p>Time 0.5</p>
C34	<p>Author: James C</p> <p>As a user, I want to be able to see the number of portions a recipe will provide me with and change this number to scale the ingredient measurements so that I can cook for the week ahead</p>	<p>Value:70</p> <p>Risk:30</p> <p>Time:1</p>

## 5.2. Marketing Ad Campaign Estimate

(Written by Marketing Manager Becky Anderson)

### **Marketing Finance**

Our marketing aims at students that want to cook easier, cheaper and healthier meals. This document contains information on how the company will market the application. There will be a marketing campaign for each iteration of the application meaning a total of 3 ad campaigns.

### **Outreach initiatives**

Contacting influencers and bloggers to secure honest helpful reviews. Paying influencers that have a following particularly within the student community allows a large outreach and can gain interest.

The following are some typical prices for advertising through influencers. (TARA JOHNSON | JAN 24, 2020) (Available at: <https://tinuiti.com/blog/paid-social/how-much-do-influencers-charge/>)

- **Facebook influencer pricing:** \$25 per 1000 followers
- **Instagram Influencer pricing:** \$10 per 1000 followers
- **Snapchat Influencer pricing:** \$10 per 1000 followers
- **YouTube Influencer pricing:** \$20 per 1000 followers

“Micro” influencers (10,000 followers or less) have a very dedicated following and tend to have higher interaction from their following. They are also cheaper to work with, so we would target these people.

### **Social media**

Most companies have a social media budget that covers people working on marketing and paid advertising through social media

Promotion on social media, Facebook, Twitter, Pinterest and other platforms are available at a small cost.

We will be focusing on Instagram as this platform is the most popular for university students.

The level of interest/interaction is Instagram, Facebook, Twitter, Pinterest, Snapchat in that order.

All social media is free to set up, however advertising through these social media does cost. Most social media set up with the CPM (cost per thousand impressions) model. You pay for every 1000 views of your ad. There is also the CPC (cost per click) model that allows you only to pay when people click on your advert however the prices are slightly higher, you only pay for interested users.

Businesses can create Instagram adverts that appear as sponsored posts in users' feeds. We can expect to pay £5 for every 1000 views for photo ads and more for 1000 views of a video. Facebook works in a very similar way.

Setting a £500 budget for social media per iteration gives us the money to pay somebody to be in charge of social media and also the cost of advertising.

### **Campus based advertising**

Our main marketing strategy will be campus-based advertising. This is due to the number of students we would meet in a small amount of time. Setting up at freshers fairs across the country is a good way of increasing interest and getting our name out there.

1000 flyers for an average £15. In a variety of campus events. Have to hire someone to do the advertising, wage of £8.21 an hour. 7 Foot roller banner for £25 which can be reused in every event.

We would want to go to a lot of universities around the country advertising.

Poster printing- To place at universities when on campus. 100 for £30

#### **Estimate users & Time scale**

Following the first ad campaign - hope to generate 500 daily active users.

Following the second ad campaign - hope to have 2000 daily active users.

Following the third ad campaign - hope to have 5000 daily active users.

#### **Total budget**

<u>Type of marketing</u>	<u>Price</u>
Flyers for 100 universities	£1500
3 hours of work	£24.63
banner	£25
Poster printing (ten per university)	£300
Social media ads & work	£500
Influencers pay	£500
<b>Total</b>	<b>£2849</b>

## 5.2. Backend and Server Cost Analysis

(Written by XML and Server Manager Jun Ma)

### **Cost of Firebase**

Assume users are N, daily active users (DAU) are 10% of total app installations.

Prefer Cloud Firestore to Realtime Database (for the reason

<https://firebase.google.com/docs/database/rtdb-vs-firestore?authuser=1&hl=en>)

### **Products of Firebase:**

Phone Auth:

10,000 verifications/month are free and \$0.06/verification for extra

Cloud Firestore:

Document reads:

Each DAU reads 40 recipes each time on average.

Half of DAU read one time a day.

Quarter of DAU read at two different times a day.

Quarter of DAU read three different times a day

Estimate 100 reads for users in each use and 140 reads for those liking chatting with others.

$1.75 * 0.1 * N * 100 * 30 + 0.25 * 0.1 * N * 40 * 30 = 555 * N$  times/month

15,000,000 reads/month for free and \$0.06/100K for extra

Free reads are enough to use

Document writes:

Quarter of DAUs like sharing their experience with their friends, 20 messages for each chat.

$0.25 * 0.1 * N * 20 * 30 = 15 * N$  times/month

Quarter of DAUs write a comment on the chosen recipe a day on average.

$0.25 * 0.1 * N * 30 = 0.75 * N$  times/ month

Total times =  $15.75 N$  times/ month

600,000 writes/month for free and \$0.18/100K for extra

Free writes are enough to use

Store:

Record the read XML files after each operation and store the chat messages.

$(45 * N + 15.75 * N) \text{ times} * 2\text{KB} = 121.5 * N \text{ KB}$

$0.25 * N * 20 * 30 * 1\text{GiB} / 20\text{M} = 7.5 * 10^{-6} * N \text{ GiB}$

1GiB for free and \$0.18/GiB for extra

$1.233714294 * 10^{-4} \text{ GiB/month}$  for each user

Free when we have 8106 users or less

Storage:

Mainly aimed at recipes:

1000 recipes are stored in the app and each active user uploads 3 recipes per month on average.

Each recipe is an appropriate 2 KB xml file with 5 photos (2MB per photo) and on average. One in

ten recipes have a 2-minute video. (27MB per video)

$(1000 + 3 * 0.1 * N) * 2\text{KB} = (2000 + 0.6 * N) \text{ KB}$

$(1000 + 3 * 0.1 * N) * 5 * 2\text{MB} = (10000 + 3 * N) \text{ MB}$

$(100 + 0.6 * 0.1 * N) * 27\text{MB} = (1350 + 1.62 * N)\text{MB}$

Total stored  $\approx (11352 + 4.62 N) \text{ MB}$

Upload  $3 * 0.1 * N$  times/month

5G free space stored and \$0.026/GB for extra and free 20K/day uploading is enough

4.62 MB/month for each user

Each user clicks 3 wanted recipes and decides one of them after comparison on average.

Download  $(1.5 * 0.1 * N * 3 * 30) \text{ times} * 2\text{KB} = 27 N \text{ KB}$

Free 30 GB/month is enough

#### Cloud Functions:

##### Main use:

- Notify users when something interesting happens
- Perform database sanitization and maintenance
- Execute intensive tasks in the cloud instead of in your app
- Integrate with third-party service and AIPs

Invocation: 2,000,000 invocations for free, the number of times a function is invoked \$0.40/million  
 GB-seconds: 400,000 GB-seconds for free, time with 1 GB of memory provisioned  
 \$0.0025/thousand

CPU-seconds: 200,000 CPU-seconds, time with 1 GHz CPU provisioned \$0.01/thousand

Networking (egress): 5GB for free, outbound data transfer \$0.12/GB

Free part may satisfy our request.

#### Firestore Test Lab:

Free time may be enough to use.

30 virtual device hours for about 21,600 tests and 15 physical hours for about 10,800 tests.

#### Assumptions

The recipes start in 1000 and each active user will upload three recipes per month. A recipe includes an appropriate 2 KB xml file and 5 photos (2MB per photo) on average. One in ten recipes have a 2-minute video. (27MB per video)

Assume daily active users (DAU) are 10% of total app installations. Each DAU reads 10 recipes before making a decision. In one day, half of DAUs use our app one time, quarter of them use it two times and the rest use it three times. Quarter of DAUs like sharing their experience with their friends, assuming 20 messages for each chat and write a comment on the chosen recipe.

#### Cost Estimation

Assume users as 500, 1000, 2000, 3000, 4000 and 5000. So DAU is 50, 100, 200, 300, 400 and 500 respectively. Estimate the cost for the first three months.

The starting recipes are 1000. Pay \$0.158234 for them while using up the free storage. Free verifications are 10,000 and enough to use. The free part of reading and writing are also enough to use. Mainly we need to pay for the storage and Cloud Firestore which stores the data used. Each user will consume 4.62 MB/month in recipes storage and  $1.233714294 \times 10^{-4}$  GiB/month in Cloud Firestore. The Cloud Firestore has 1GiB for free, so it's free when we have 8106 users or less in the first month.

##### 500 users:

for first month, \$0.05865234375 for storage, free for Cloud Firestore;  
 for second month, \$0.1173046875 for storage, free for Cloud Firestore;  
 for third month, \$0.1759570313 for storage, free for Cloud Firestore;  
 Total spending = \$0.3519140626

##### 1000 users:

for first month, \$0.1173046875 for storage, free for Cloud Firestore;  
 for second month, \$0.234609375 for storage, free for Cloud Firestore;  
 for third month, \$0.3519140625 for storage, free for Cloud Firestore;  
 Total spending = \$0.703828125

##### 2000 users:

for first month, \$0.234609375 for storage, free for Cloud Firestore;  
 for second month, \$0.46921875 for storage, free for Cloud Firestore;  
 for third month, \$0.703828125 for storage, free for Cloud Firestore;

Total spending = \$1.40765625

3000 users:

for first month, \$0.3519140625 for storage, free for Cloud Firestore;  
for second month, \$0.703828125 for storage, free for Cloud Firestore;  
for third month, \$1.055742188 for storage, \$0.1985293042 for Cloud Firestore;  
Total spending = \$2.310013679

4000 users:

for first month, \$0.46921875 for storage, free for Cloud Firestore;  
for second month, \$0.9384375 for storage, free for Cloud Firestore;  
for third month, \$1.40765625 for storage, \$0.0864735023 for Cloud Firestore;  
Total spending = \$2.901786002

5000 users:

for first month, \$0.5865234375 for storage, free for Cloud Firestore;  
for second month, \$1.173046875 for storage, \$0.04205978771 for Cloud Firestore;  
for third month, \$1.759570313 for storage, \$0.1530940742 for Cloud Firestore;  
Total spending = \$3.714294487

Real time GBP:USD = 1:1.3

Assume each month's user as A.

For storage, the cost is  $A * 4.62\text{MB} * \$0.026/1024\text{MB} * 1\text{GB}$

For Cloud Firestore, if the sum of each month's user < 8106, it's free. If the sum of each month's user > 8106, the cost is  $(\text{sum} - 8106) * 1.233714294 * 10^{-4}\text{GiB} * \$0.18$  in the first month that sum is more than 8106 and the cost is  $A * 1.233714294 * 10^{-4}\text{GiB} * \$0.18$  in the next months.

Month Number	Number of Users (Increase by 10% each month)	Cost of Month (USD)	Cost of Month (GBP)
1	2000	0.234609375	0.18064922
2	2200	0.2580703125	0.19871414
3	2420	0.2838773438	0.21858555
4	2662	0.3383803423	0.26055286
5	2928	0.4084898032	0.31453715
6	3221	0.4493666858	0.34601235
7	3543	0.4942894032	0.38060284
8	3897	0.5436764901	0.4186309
9	4287	0.5980859925	0.46052621
10	4716	0.6579364452	0.50661106
11	5187	0.7236463828	0.55720771
12	5706	0.7960528746	0.61296071

(Real time GBP : USD = 1:1.3 [xe.com, 6<sup>Th</sup> February 2020])

