جامعة نيويورك أبوظبي

NYU | ABU DHABI

CS-UH 2012: Software Engineering

Project Report - Communication and Planning

Course Project: Deliverable 2 - Group 8

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Requirement Gathering

All the requirements, functional and non-functional listed in the System Requirement Specifications document for the finance tracker and budgeting web application have been prepared as per the needs of the student users. In order to plan the product, the team researched extensively on the internet - online forums, articles, posts, and survey results - to inquire about what students want to see in budgeting and finance tracking tools. All the information was noted and then utilized to prepare a set of functional requirements for our product. Most information received from online forums was from Reddit and Red Flag Forums where people mostly discussed the applications or their current ways of tracking their finances. They also mentioned their previous experiences with different methods and applications and what made them switch. Generally, the ease of use, layout, and advanced features were found out to be the most prominent reasons for the switch.

Additionally, we reviewed many articles e.g theBalance, usnews, grow to help us streamline our motivation for the project, the expectations from the project and necessary functionalities. Considering the popular opinion around personal finance tracking and budgeting and its importance in our daily lives, especially college students, we formulated our non-functional requirements accordingly. We also researched the NYUAD existing Facebook help group. There were some threads about personal finance tracking. The posts and comments on them helped us understand the needs of college students in general from a finance tracking tool. As students ourselves, with our previous experiences with finance tracking and budgeting, it was helpful to discuss our personal experiences and draw out expectations from the product. This helped to formulate the non-functional requirements. Information regarding the importance of personal finance tracking especially for college students was heavily stressed in the analysis of many surveys taken across the US. One such study reported how around 74% of college students across the US agreed or strongly agreed that they are stressed and worried about handling their finances in general. Learning about such studies and their analysis helped us draw the expectations from the product we are developing and helped us improve our product's relationship with our stakeholders.

Fellow students and friends were surveyed about their current budgeting and finance tracking tools. Their concerns with existing tools were collected and used to add new functionality to our product. Their requirements for such a tool were noted and assisted us to finalize the requirements of our product. The questions of the survey and the summary of responses can be found in Appendix. A total of 45 responses were recorded for the survey.

Additionally, we reviewed many existing mobile and web applications such as Mint, YNAB, Fudget etc that served a similar purpose. We carefully analyzed their functionality and researched reviews regarding them on app stores, online forums, and expert articles. Concerns in the reviews and our own analysis helped us further to finalize our requirements for this product.

While gathering requirements through the processes of inception, elicitation, and elaboration, we made sure to negotiate these requirements with our audiences mentioned above and amongst ourselves to align well with time constraints and the technical constraints that developers will be facing in the implementation process. To manage all the gathered requirements, we asked the survey respondents to volunteer to specify their requirements and elaborate on their responses. Eight students volunteered and helped us shortlist the requirements. After validating all the requirements, they are finally included in the SRS document.

Technical Feasibility

Users' and developers' familiarity with the business area

The business area is finance tracking and budgeting web applications. As students themselves, the team members have a good understanding of what to expect and what to implement. However, not having designed such a large-scale project in this business area, the team members are not experts in it. There would be troubles and changes in the work plan and design during the implementation due to this.

Familiarity with technology

The technical tools we will use in this project are

- Programming languages such as Python
- IDE such as Visual Studio Code and Google Colabratory
- Web development languages such as HTML, CSS, Javascript
- Website hosting platforms such as GitHub

The team is much more experienced in python programming but has limited experience in web development technologies.

Project Size

It is 2 persons for approximately 2 months

Conclusion

The risk at this stage is very high due to the team's modest familiarity with the web application development process. High familiarity of the developers with the business area would be helpful in a smoother development process.

Economic Feasibility

Costs	**Period**									**Total**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	
Stipend	20	20	20	20	20	8	8	8	8	132
H/W & S/W	50	0	0	0	0	0	0	0	0	50
Training	10	10	10	10	10	0	0	0	0	50
Support & maintenance	0	0	0	0	20	20	10	10	10	70
Total Costs	80	30	30	30	50	28	28	28	28	302
Benefits										
Increase # of users	0	0	0	0	0	100	500	1000	2000	3600
Decrease costs	0	0	0	0	0	20	20	20	20	80
Total benefits	0	0	0	0	0	120	520	1020	2020	3680
NCF	(80)	(30)	(30)	(30)	(50)	92	492	992	1992	3378
CNCF	(80)	(110)	(140)	(170)	(220)	(128)	364	1356	3348	6726

Numbers are in thousands of DHS

NCF: Net Cash Flow

CNCF: Cumulative Net Cash Flow

One period corresponds to two weeks

First five-period timeline is product design process

H/w and S/w correspond to Hardware and Software respectively

The return on investment (ROI)

$$\text{ROI} = \frac{(Total\ Benefits - Total\ Costs)}{Total\ Costs} = \frac{3680 - 302}{302} = \frac{3378}{302} = 11.2\%$$

The break-even point (BEP)

$$\text{BEP} = \frac{(period.NCF - CNCF)}{period.NCF} = \frac{492 - 364}{492} = 0.26 = 26\%$$

Intangible values

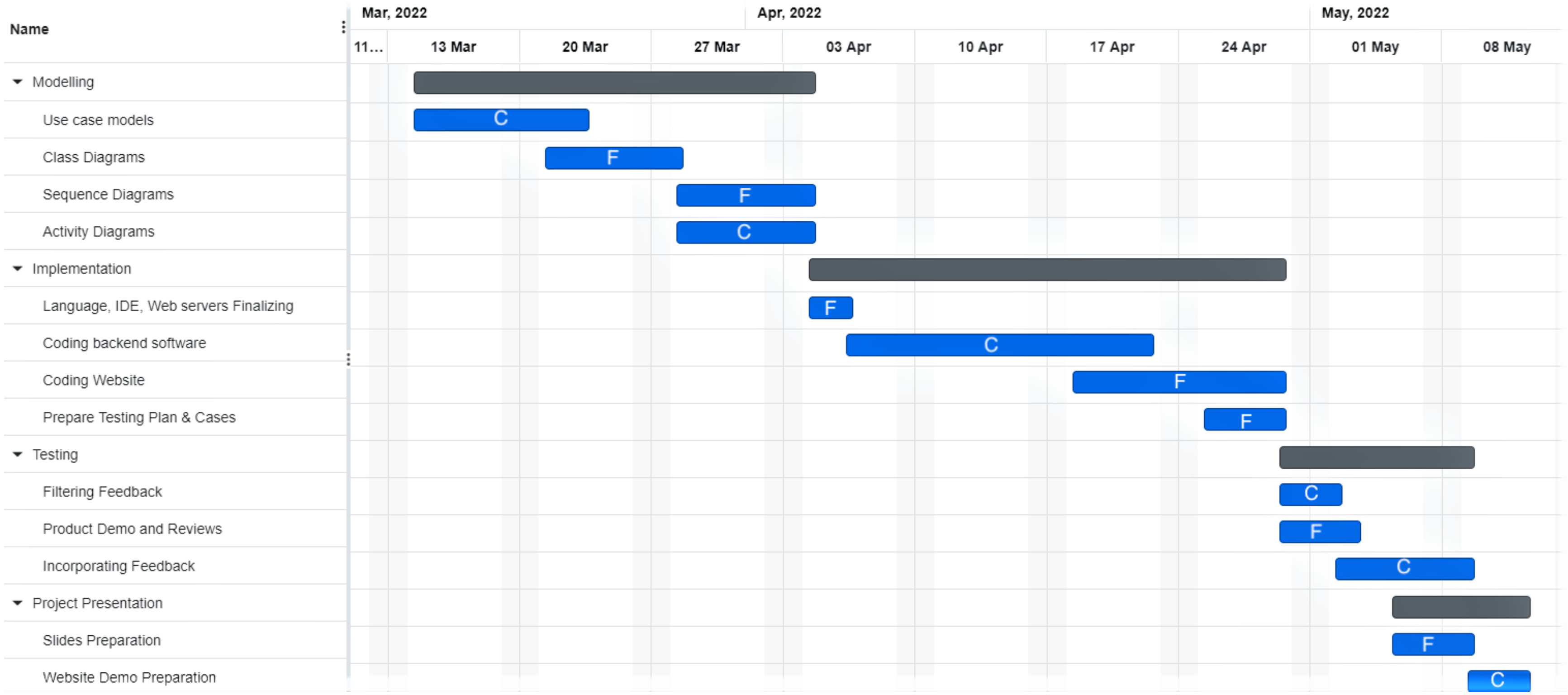
The product developed will increase user satisfaction by providing free and simple to use expense tracker. This will make them financially responsible.

Conclusion

The ROI is good for this new university compared with the other new universities, and the BEP is reasonable, so the risk is low.

GANTT Chart

Note: All the aspects of this project were worked on and finalized together. The only separate work would be initiating the progress on a particular part of the project. The person who initiated the task is mentioned on the chart. F for Fatima and C for Chinonyerem.



Process Model Choice

Owing to the dynamic nature of this course project, the team plans to follow a scrum work model. The agility of the scrum model would allow us to fulfill the project requirements as soon as possible. With the constantly evolving design and functionality of the product based on frequent testing and feedback, it will be appropriate to follow a scrum methodology. For this project, it is only two developers and it will be much easier to follow along with the sprint structure of the scrum. For our project, we will be modifying the scrum workflow to have a sprint lasting a week - 7 days.

During a sprint session, the team will be meeting three times a week. In each meeting, for approximately 15 minutes, the team will discuss the previous progress and how to progress forward. This will be followed by a two-hour session where the team will be working together on the issues every individual is facing and resolving them. This time will also be utilized for individual progress. Between every two team meeting sessions, individuals will work on their assigned tasks and complete the deadlines. This process model will allow every team member to learn from each other and this would ensure better organization and timely completion of the project. Meeting frequently and resolving issues as soon as possible will allow faster progress. As university students ourselves, this work plan will allow us to better schedule our work on the course progress and not hinder other course requirements.

System Size Effort and Time Approximation

Function Point Estimation

Functionality	Input	Output	Queries	File	Program interface
Create account/login	2	1	2	1	1
Create journal	2	1	2	1	0
Create transaction	2	1	2	1	0
Edit transaction	2	1	1	1	0
Delete transaction	1	0	2	1	0
Log out	1	1	1	1	0
Delete account	1	0	1	1	1

	Complexity				
Description	Total #	Low	Medium	High	Total
Inputs	**11**	8* 3	1*4	2*6	**40**
Outputs	**5**	2*4	2*5	1*7	**25**
Queries	**11**	9*7	1*10	1*15	**88**
Files	**7**	6*7	1*10	0*15	**52**
Program interface	**2**	1*5	1*7	0*10	**12**
Total Unadjusted Function Point (TUFP) =					217

The total processing complexity (PC)

Tasks	Complexity
Data communication	3
Team cohesion	1
Familiarity with technology	3
On-line data entry	2
Total Processing Complexity (TPC)=	9

The adjusted processing complexity (APC)

APC=0.65 + (0.01 * TPC)

APC=0.65 + (0.01 * 9)= 0.74

The total adjusted function points (TAFP)

TAFP=TUFP * APC

TAFP= 246*0.74= 160.58

Converting Function Points to Line Of Code (LOC)

Language/Tool	**Number of LOC / FP**
Python	53.3

100% will be done in Python

Number of lines of code (LOC)

= TAFP * # of(LOC\FP) * %

For Python = (160.58) *(53.3)*(100/100)= 8558.914

So the total LOC = 8558.914 LOC

Estimating the effort

Effort = 2.4 * $(LOC/1000)^{1.05}$

$=2.4*(8558.914/1000)^{1.05}$

=22.869192 person months

Estimating the schedule time

Time = 2.5 * $(effort)^{0.38}$

$=2.5* (22.87)^{0.38}$

=8.21 months

Estimating the number of persons

average of # of persons = effort/time

= 22.87 /8.21

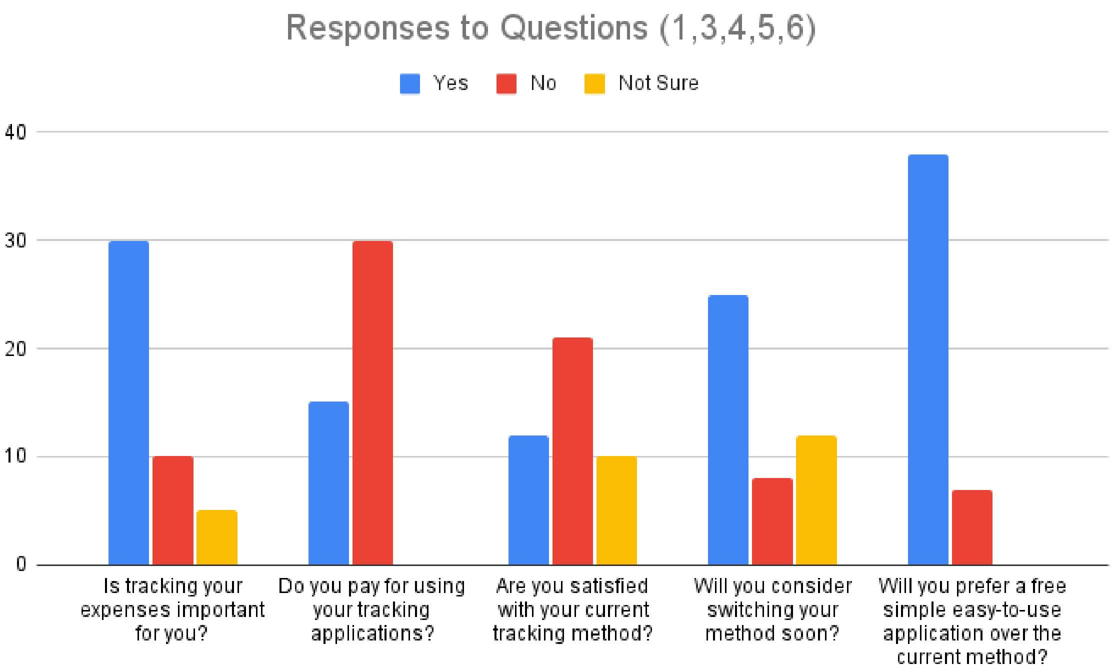
= 2.78 person

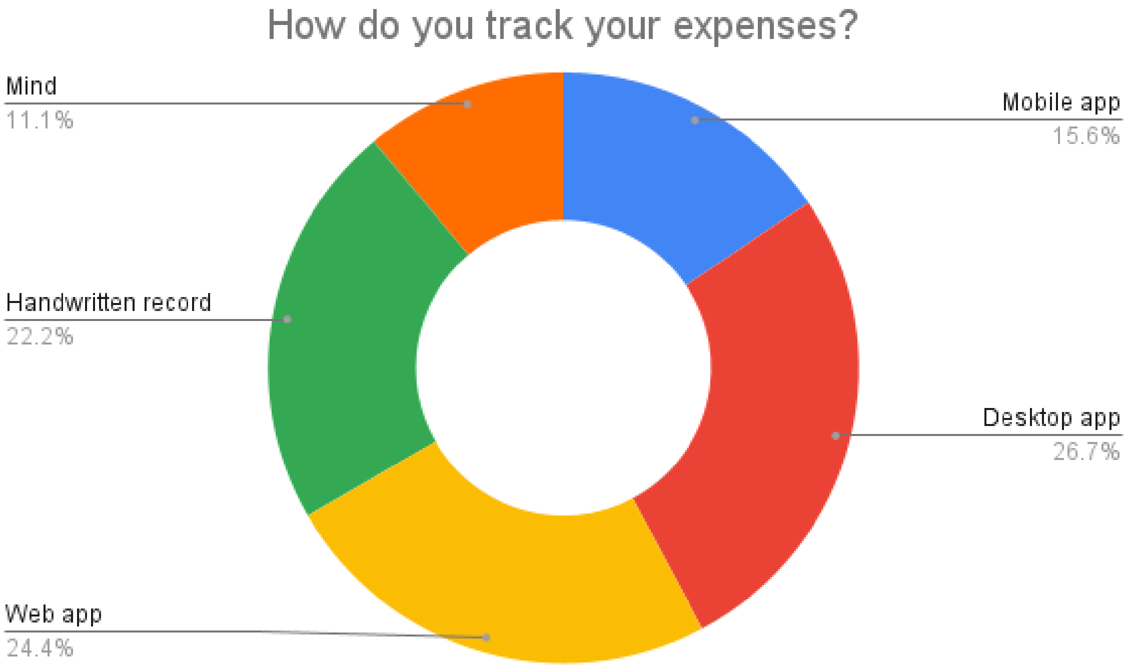
Appendix

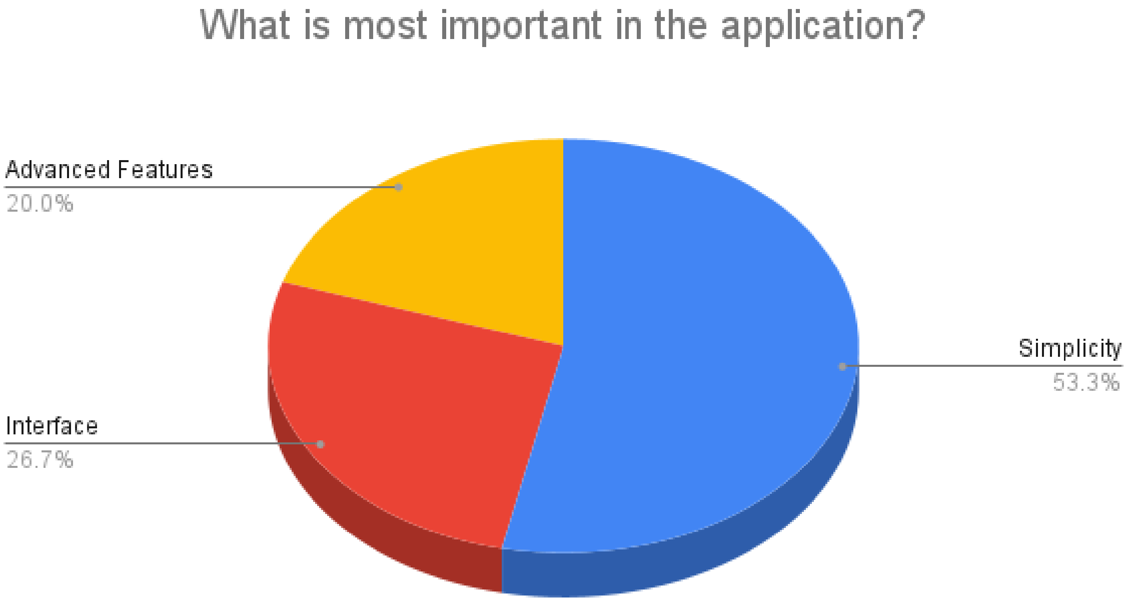
Interview Questions

1. Is tracking your expenses important for you? (Yes, No, Not Sure)
2. How do you track your expenses? (Mobile app, Desktop app, Web app, Handwritten record, Mind)
3. Do you pay for using your tracking applications? (Yes, No)
4. Are you satisfied with your current tracking method? (Yes, No, Not Sure)
5. Will you consider switching your method soon? (Yes, No, Not Sure)
6. Will you prefer a free simple easy-to-use application over the current method? (Yes, No)
7. What is most important in the application? (Simplicity, Interface, Advanced Features)

Summary of Results




How do you track your expenses?
Mind
11.1%
Mobile app
15.6%
Handwritten record
22.2%
Desktop app
26.7%
Web app
24.4%


What is most important in the application?
Advanced Features
20.0%
Simplicity
53.3%
Interface
26.7%