Week 13 Function Points and estimation of UCs

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Function Points

Our goal for this week was to estimate the hours we have to spent for the remaining use cases we are planning to implement this semester. This allows us to schedule the use cases in the remaining two and a half months.

To achieve an estimation as accurate as possible, we calculated function points for each use case (those which are already implemented and those which are planned for this semester). To do so, we used the website Tiny Tools.

At first, we filled the second table regarding our whole project. You can find our input here:

Complexity Adjustment Table

ITEM	COMPLEXITY ADJUSTMENT QUESTIONS	SCALE No Influence 0	1	2	3	4	Essential 5
1	Does the system require reliable backup and recovery?	○	◉	○	○	○	○
2	Are data communications required?	○	○	○	○	○	◉
3	Are there distributed processing functions?	○	◉	○	○	○	○
4	Is performance critical?	◉	○	○	○	○	○
5	Will the system run in an existing, heavily utilized operational environment?	◉	○	○	○	○	○
6	Does the system require on-line data entry?	○	○	○	○	○	◉
7	Does the on-line data entry require the input transaction to be built over multiple screens or operations?	○	○	○	○	○	◉
8	Are the master files updated on-line?	○	○	○	○	○	◉
9	Are the inputs, outputs, files or inquiries complex?	○	○	○	◉	○	○
10	Is the internal processing complex?	○	○	◉	○	○	○
11	Is the code to be designed reusable?	○	○	◉	○	○	○
12	Are conversion and installation included in the design?	◉	○	○	○	○	○
13	Is the system designed for multiple installations in different organizations?	◉	○	○	○	○	○
14	Is the application designed to facilitate change and ease of use by the user?	◉	○	○	○	○	○

Domain Characteristic Table | FP Calculation

The next step was the Domain Characteristic Table. This one, we filled for each use case differently. But first, we put some thought into our project and the information needed for the calculation:

UC1 Create Book	**RET**	**DET**	**FTR**	**Resulting Complexity**	**Count**
External Inputs		0	2	average	2
External Outputs		0	0	low	0
External Queries		0	0	low	0
Internal Logical Files	0	1		low	1
External Interface Files	0	0		low	0
Function Points	*14.1*				

UC2 Read Book	**RET**	**DET**	**FTR**	**Resulting Complexity**	**Count**
External Inputs		0	0	low	0
External Outputs		25	0	complex	25
External Queries		1	2	average	3

Internal Logical Files	0	1		average	1
External Interface Files	0	0		low	0
Function Points	***185.2***				

UC3 Update Book	**RET**	**DET**	**FTR**	**Resulting Complexity**	**Count**
External Inputs		2	1	average	3
External Outputs		0	0	low	0
External Queries		1	2	low	3
Internal Logical Files	1	0		low	1
External Interface Files	0	0		low	0
Function Points	***26.3***				

UC4 Create Page	**RET**	**DET**	**FTR**	**Resulting Complexity**	**Count**
External Inputs		0	0	low	0
External Outputs		0	0	low	0
External Queries		1	3	average	4
Internal Logical Files	1	0		low	1
External Interface Files	0	0		low	0
Function Points	***21.6***				

UC5 Read Page	**RET**	**DET**	**FTR**	**Resulting Complexity**	**Count**
External Inputs		0	0	low	0
External Outputs		25	3	complex	28
External Queries		2	3	complex	5
Internal Logical Files	6	0		average	6
External Interface Files	0	0		low	0
Function Points	***259.4***				

UC6 Update Page	RET	DET	FTR	Resulting Complexity	Count
External Inputs		20	3	complex	23
External Outputs		0	0	low	0
External Queries		1	1	low	2
Internal Logical Files	6	0		average	6
External Interface Files	0	0		low	0
Function Points	***191.8***				

UC7 Share link	RET	DET	FTR	Resulting Complexity	Count
External Inputs		3	3	average	6
External Outputs		1	2	low	3
External Queries		2	3	average	5
Internal Logical Files	0	0		low	0
External Interface Files	0	0		low	0
Function Points	***52.6***				

UC8 Manage Page Decorations	RET	DET	FTR	Resulting Complexity	Count
External Inputs		5	3	complex	8
External Outputs		5	3	complex	8
External Queries		3	3	average	6
Internal Logical Files	6	0		average	6
External Interface Files	0	0		low	0
Function Points	***176.7***				

UC9 Manage Cover Decorations	RET	DET	FTR	Resulting Complexity	Count
External Inputs		5	2	average	7

External Outputs		6	2	complex	8
External Queries		2	2	low	4
Internal Logical Files	4	0		average	4
External Interface Files	0	0		low	0
Function Points	**127.8**				

Find the original table with more details here

Our already implemented use cases are:

- UC 1: Create Book
- UC 2: Read Book
- UC 3: Update Book
- UC 4: Create Book Entry (Page)
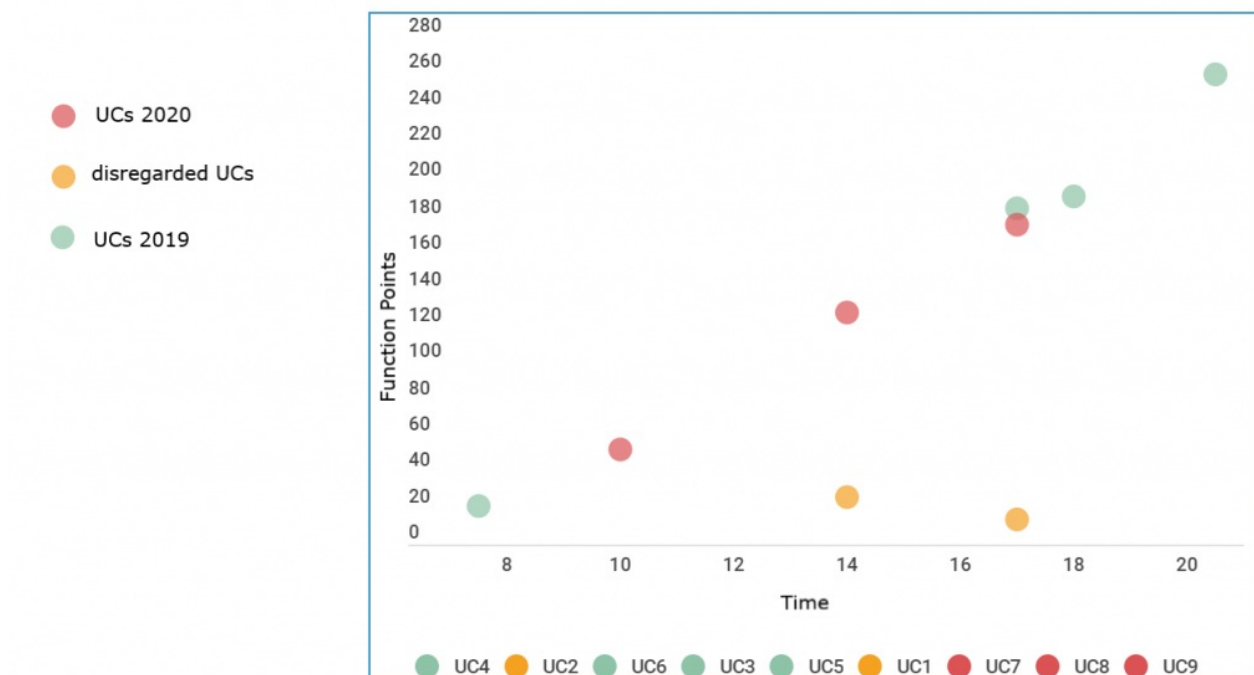- UC 5: Read Book Entry (Page)
- UC 6: Update Book Entry (Page)

Our use cases that are planned for this semester:

- UC 7: Share link, visibility & invite
- UC 8: Manage Page Decorations
- UC 9: Manage Cover Decorations
- UC 10: NavigateFooter
- UC 11: Navigate Header
- UC 12: Operate Account

Furthermore, we used the function points and the spent time for the already implemented use cases to draw the following diagram (click to enlarge):

Use Cases over spent time and FPs

In the subsequent diagram you can see the time we spent on use cases in 2019 . The green and yellow dots represent these use cases. The yellow use cases are our first and second use case. We used them to get our feet wet. They are outliers and were both disregarded in the estimation of our new use cases for 2020. In order to determine the time we will need to implement the new use cases only the green colored use case were taken into account.

According to this graph the implementation of our use cases will need approximately 41 hours.

Estimation of Use Cases for 2020	Estimated Time
UC7: Share link, visibility & invite	10
UC8: Manage Page Decorations	17
UC9: Manage Cover Decorations	14
Total	*41*

This implementation estimate does not include tests. While we have already set up SonarQube to get an idea of our test coverage, only rudimentary tests have been implemented. Thus, we will still need more time to implement tests for our new and old use cases. In accordance with our cumulative flow diagram from the last semester we will need approximately another 150 hours.

Thanks for reading and hopefully you will continue with us on our journey!