WEEK 13 – Function Points

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This week, we had a closer look at our UCs by using a method called Function Point Analysis. To get insight into the complexity of our UCs, we calculated the so-called Function Points. A Function Point is a unit to express the amount of functionality an application or a single component provides to its user.

By using the spent time records of the UCs from last semester, we are able to estimate the remaining time we will need to finish the remaining UCs.

Before we started to calculate the Function Points of all the UCs, we had a look at our application and its boundary.
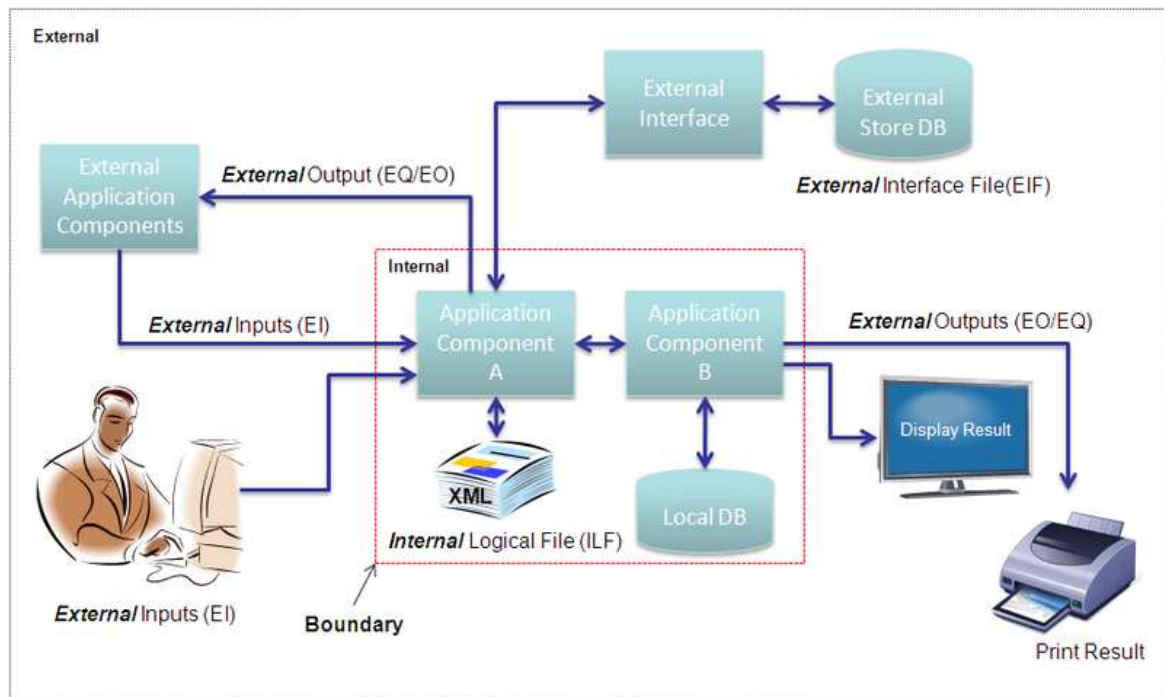
According to the picture above, we defined what is internal and external to the Plandora application (e.g. Firebase is an external component).

To understand how the Function Point calculation works, it is important to know about RETs (Record element type), DETs (Data element type) and FTRs (File type reference).

In the diagram below, the big circles of the Groups represent the FTRs. The tables, for example Customer or Product, are called RETs and the elements in the tables (e.g. FirstName) are DETs.
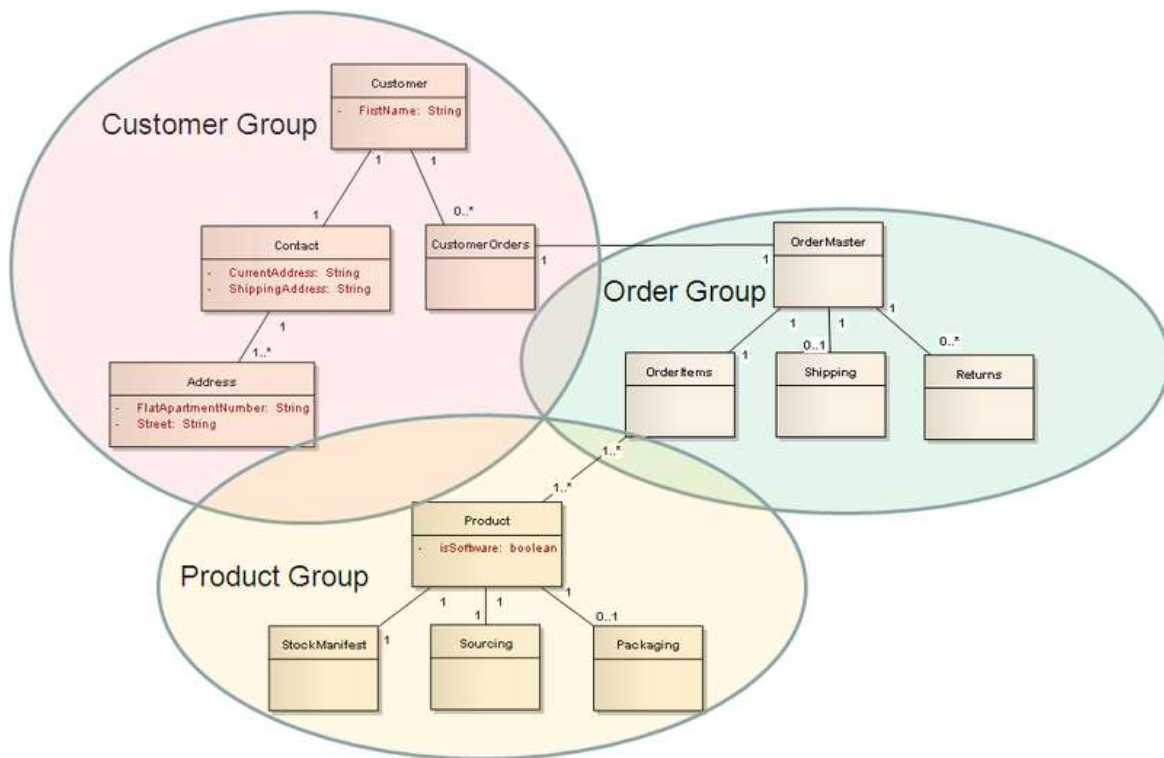
We then had a look at our UCs and identified those RETs, DETs and FTRs.

For the actual calculation of the Function Points, we used **TINY TOOLS [Function Point Calculator] < http://groups.umd.umich.edu/cis/course.des/cis525/js/f00/harvey/FP_Calc.html?tCountVal=0#FPCalc>**

The following example shows how a function point calculation, in this case the of our 'Create Event' UC, looks like:

Domain Characteristic Table

MEASUREMENT PARAMETER	COUNT (value >= 0)	WEIGHTING FACTOR		
		Simple	Average	Complex
Number of User Input	8	○	●	○
Number of User Outputs	1	●	○	○
Number of User Inquiries	4	●	○	○
Number of Files	2	●	○	○
Number of External Interfaces	0	●	○	○

Complexity Adjustment Table | FP Calculation

The given count as well as the weighting factor of a single UC depends on its behavior and its complexity. A more detailed view of these properties can be found in this Google Spreadsheet:

https://docs.google.com/spreadsheets/d/1xB-1eW9DN8HkiAXldcOu7Vhz7nFOFEJBaI42RIKl0XQ/edit#gid=0 < https://docs.google.com/spreadsheets/d/1xB-1eW9DN8HkiAXldcOu7Vhz7nFOFEJBaI42RIKl0XQ/edit#gid=0>

The actual function point calculation is also influenced by general requirements of the whole application. To take these in consideration we filled out a complexity adjustment table as follows:

Complexity Adjustment Table

ITEM	COMPLEXITY ADJUSTMENT QUESTIONS	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

< https://cdn.discordapp.com/attachments/760409169437130773/832212320863649883/unknown.png>

In the next step we gathered all finished UCs to visualize the correlation between the amount of function points and the time we spent on them. The diagram is also used to estimate the time required for future UCs. It is shown below:
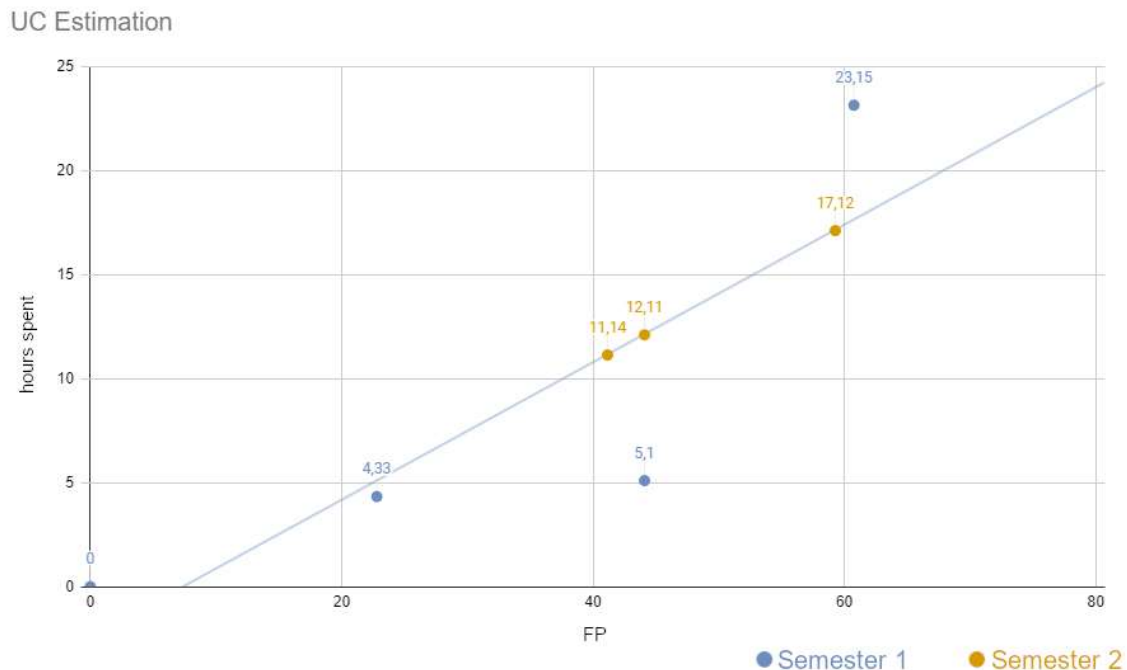

The blue dots represent finished UCs while the yellow dots are estimations for future UCs. The blue graph shows the linear regression of the funtion point calculation based on the old UCs.

The outlier of the UC "Create Event" (23.15h – 60.76 FPs) was one of our first ones. Because of that and the circumstance that there were many edge cases we had to deal with, it was harder to implement than expected.

Having gained experience from the previous UCs, we needed less time than expected for implementing the UC "Sign in/Sign up" (5.1h – 44.1 FPs).

To get a better estimation of the overall workload (UC Estimation + everything else, e.g. documentation, homework, final presentation), we used the current cumulative flow diagram. Right now, the total amount of time spent is 13w 2d 4h 55m, which equals roughly 475h. We expect at least(!) the same amount of workload this semester, so another 475h for the whole project.

Altogether, we expect the project to require around 950-1000h with 475 to 525 remaining hours this semester, keeping in mind that this calculation is very vague and deviations should be expected.
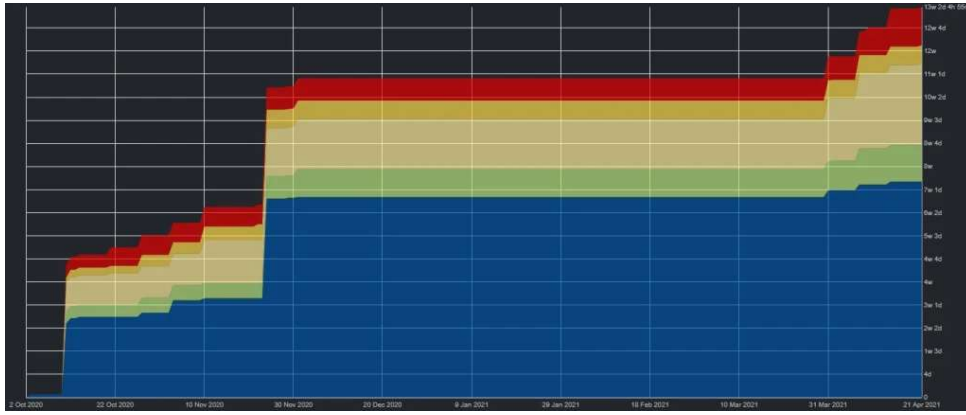
Feel free to leave a comment! If you have any questions or suggestions, let us know!

Best regards

Plandora Team

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