TALLINN UNIVERSITY OF TECHNOLOGY
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Net Asset Tracker

Web Applications with C# individual project

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MA

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Author's declaration of originality

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

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List of abbreviations and terms

DPI   Dots per inch

IA   Department of Computer Systems

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1 Introduction

Nowadays there are many ways to track personal finances. Many companies have developed different kinds of finance trackers, asset trackers, portfolio trackers, personal budget planners and other similar applications. The author has experience with many applications, including Yahoo Finance, Google Finance, Bilance, Swedbank Rahaplaneerija and Microsoft Excel based templates. Even though each of those have their own merits and demerits, either it's excessive or insufficient amount of functionality, presentation, pricing, or other factors have made the author quit those at some point. Therefore, eventually the author has always moved back to its personally created Excel based net asset tracker.

Aside the most important goal of this project, which is to learn how web applications are built with C# and take it as a nice project to achieve that, the main goal of this project is to build a simple and useful web application to replace mentioned Excel based net asset tracker. During this course, it is expected to develop at least the main functionalities to be able to start using it instead of current Excel based net asset tracker tool. Due to time constraint and a need to learn new technologies and practices, the scope of the project is limited and acts as a prototype for further development.

The potential of this project is to become a widely used net asset tracker which could fit to private users. Another way to attract potential growth is to accompany with larger companies, such as banks who have started to implement finance planning tools, which at least in Estonia are still in early phase with limited number of functionalities. As with many other examples of projects, good things may start simply with one's own need to resolve simple issues, eventually attracting others and growing into something larger.

2 Net asset tracker

Application general description, main functional requirements and visual ideas are described in this chapter.

As the outcome of current project is expected to be an actual useful prototype, only the main requirements are described and will be developed in this phase. Since the tool itself will be a used by the author, replacing his current Excel based net asset tracker, further developments are expected to be carried out based on actual needs in later phases. Initial scope must create logical foundation with structure supporting the possibility to scale further upon the wish and need.

2.1 Main requirements

In general, the main requirements consist of the following functionalities:

1. User can login.
2. User can add new portfolios.
3. User can add accounts to portfolio.
4. User can add assets to portfolio.
5. User can add liabilities (initially as negative assets) to portfolio.
6. User can add transactions to portfolio.
7. User has overview of added accounts, assets, transactions.
8. User has view of net assets.

Since sometimes users do not want to add any transactions to keep net asset tracking as simple as possible, one of the requirements is to be able to create overview of monthly-based timeline. As an example, the user opens application once in the end of the month, adds current prices for its assets and that sums up all its activity. In this way, the whole process of managing data entering takes maybe 1-2 minutes per month and the history as a table or a chart is visible.

There are many more ideas regarding different functionalities and some of those may be subject to be developed in the future, but to keep the scope as realistic as possible, it has been decided not to add more functionalities during initial phase.

2.2 Visual ideas

The user interface and user experience details will be described in more detailed manner during the development process. However, there are examples of simple views of current Excel based solution, which act as sources of possible solutions going forward.

Figure one is an example of chart which could be as a basis for one of the views users may see in application. On this example, the customer has securities, real estate, cash, and liabilities. In addition, there are total assets and net asset value calculated to have a summarized view.
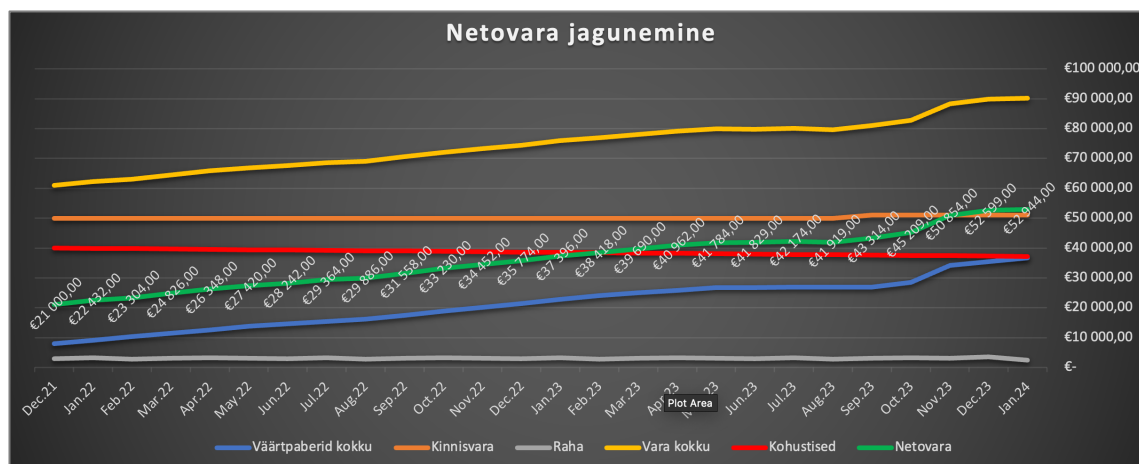

Figure 1. Simulation of net asset value distribution between assets and liabilities.

The following view has more specific details regarding assets with certain types. For example, the below view could be composed of types of pension funds, equities, bonds, and funds. Again, as on figure one, figure two has similar total securities chart line.
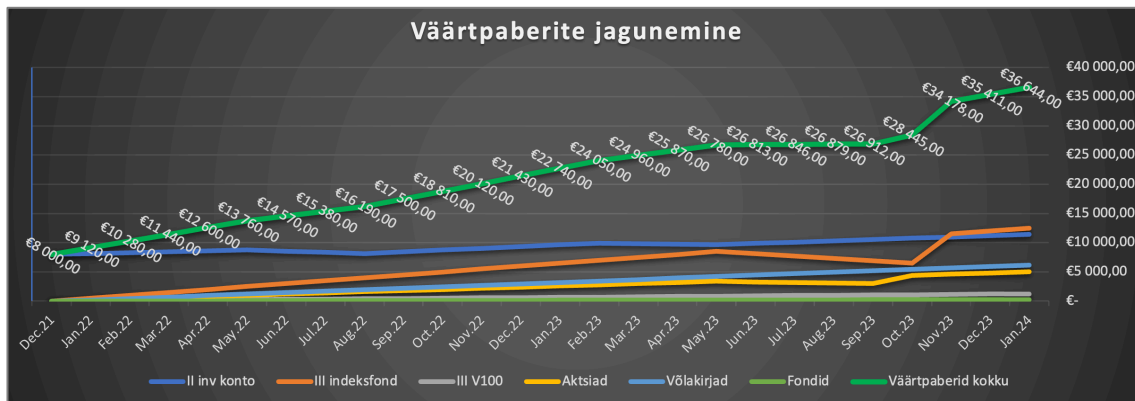
Figure 2. Simulation of securities distribution between different types of securities.

The third figure is an example of how a user may be able to use application in very simplistic and time-saving manner. There are list of assets and liabilities with monthly data entries. This data can be used for calculating net asset value, gain and yield.

	Jun.23	Jul.23	Aug.23	Sep.23	Oct.23	Nov.23	Dec.23	Jan.24
II inv konto	€ 9 873,00	€ 10 096,00	€ 10 319,00	€ 10 542,00	€ 10 765,00	€ 10 988,00	€ 11 211,00	€ 11 434,00
III indeksfond	€ 8 100,00	€ 7 700,00	€ 7 300,00	€ 6 900,00	€ 6 500,00	€ 11 500,00	€ 12 000,00	€ 12 500,00
III V100	€ 900,00	€ 950,00	€ 1 000,00	€ 1 050,00	€ 1 100,00	€ 1 150,00	€ 1 200,00	€ 1 250,00
Aktsiad	€ 3 300,00	€ 3 200,00	€ 3 100,00	€ 3 000,00	€ 4 400,00	€ 4 600,00	€ 4 800,00	€ 5 000,00
Võlakirjad	€ 4 450,00	€ 4 700,00	€ 4 950,00	€ 5 200,00	€ 5 450,00	€ 5 700,00	€ 5 950,00	€ 6 200,00
Fondid	€ 190,00	€ 200,00	€ 210,00	€ 220,00	€ 230,00	€ 240,00	€ 250,00	€ 260,00
Väärtpaberid kokku	€ 26 813,00	€ 26 846,00	€ 26 879,00	€ 26 912,00	€ 28 445,00	€ 34 178,00	€ 35 411,00	€ 36 644,00
Kinnisvara	€ 50 000,00	€ 50 000,00	€ 50 000,00	€ 51 000,00	€ 51 000,00	€ 51 000,00	€ 51 000,00	€ 51 000,00
Raha	€ 3 000,00	€ 3 200,00	€ 2 800,00	€ 3 050,00	€ 3 300,00	€ 3 100,00	€ 3 500,00	€ 2 500,00
Vara kokku	€ 79 813,00	€ 80 046,00	€ 79 679,00	€ 80 962,00	€ 82 745,00	€ 88 278,00	€ 89 911,00	€ 90 144,00
Kohustised	€ 37 984,00	€ 37 872,00	€ 37 760,00	€ 37 648,00	€ 37 536,00	€ 37 424,00	€ 37 312,00	€ 37 200,00
Netovara	€ 41 829,00	€ 42 174,00	€ 41 919,00	€ 43 314,00	€ 45 209,00	€ 50 854,00	€ 52 599,00	€ 52 944,00
Netovara vs eelm. kuu	0,11%	0,82%	-0,60%	3,33%	4,38%	12,49%	3,43%	0,66%
Netovara nominaalkasv	€ 45,00	€ 345,00	-€ 255,00	€ 1 395,00	€ 1 895,00	€ 5 645,00	€ 1 745,00	€ 345,00
Kodulaenu jääk	€ 37 984,00	€ 37 872,00	€ 37 760,00	€ 37 648,00	€ 37 536,00	€ 37 424,00	€ 37 312,00	€ 37 200,00
Kasv vs perioodi algus	49,85%	50,62%	49,60%	53,23%	55,89%	66,04%	62,14%	60,73%
Kasv vs perioodi algus	€ 20 829,00	€ 21 174,00	€ 20 919,00	€ 22 314,00	€ 24 209,00	€ 29 854,00	€ 31 599,00	€ 31 944,00

Figure 3. Simulation of monthly based asset and liability tracking.

The basis for web view for application main page could look similar to Figure 4, which contains the general overview as a chart with links to sub-pages.
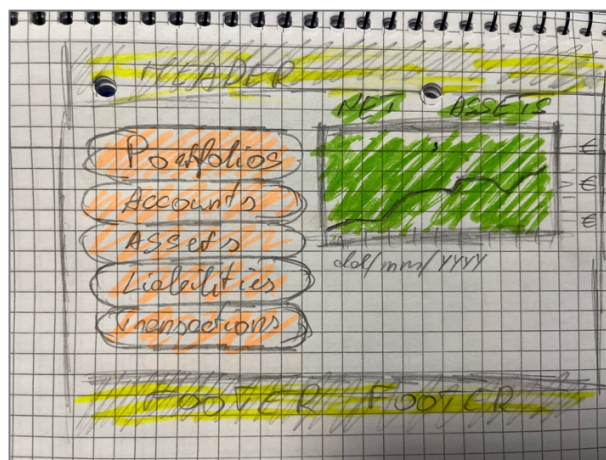

Figure 4. UI mock of main page.

When clicking on Figure 4 "Transactions" button, it should redirect to transactions page. Transaction page contains link for to actions – one for viewing existing transactions and the other one for adding new transaction. Draft for adding new transaction is presented on Figure 5.
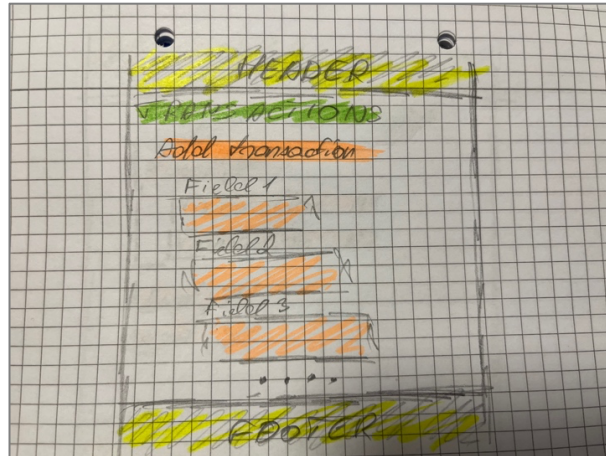

Figure 5. UI mock of add new transaction.

Another example is given for portfolio, where existing portfolios view is shown on Figure 6. In this view, it is yet to be decided whether the main view will contain either accounts or assets, and together with that, possibly transactions done in this account or with certain asset are shown.
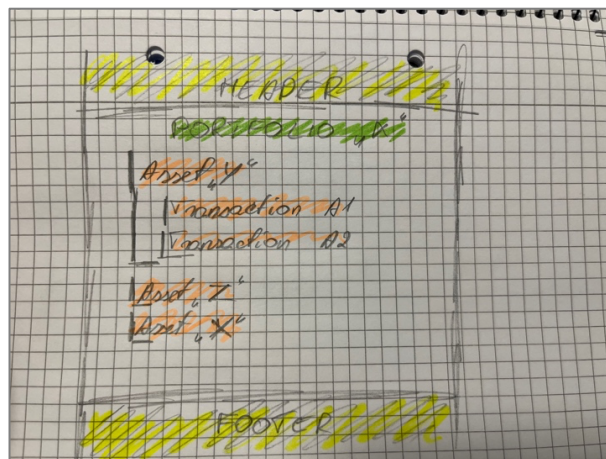

Figure 6. UI mock of portfolio view.

The mocks presented in current chapter act as initial basis for UI view for the end user. More specific details are to be updated in this document in accordance with the project progressing towards MVP solution.

2.3 Entity relationship diagram

I do not have much experience in database or designing entity relationship diagram besides some school homework. But the design is based on the functionalities and needs set out in main requirements chapter. In general, I believe that there would be no need for relationship directly between portfolio – asset and portfolio – liability as everything could be handled through transaction entity. The reason for having those relations though is the possibility for user to avoid using transactions and entering simply monthly based end asset values and liabilities remaining. I have faced myself problems with widely known net asset trackers and budget planners that they have been designed for certain way of usage, so they are lacking the flexibility. Some users may want to enter transactions and that is the reason why there are also relations between portfolio and transaction. To summarize, idea behind such design is to create more flexibility for users to choose in which way they would like to use this tool based on their needs and wishes.
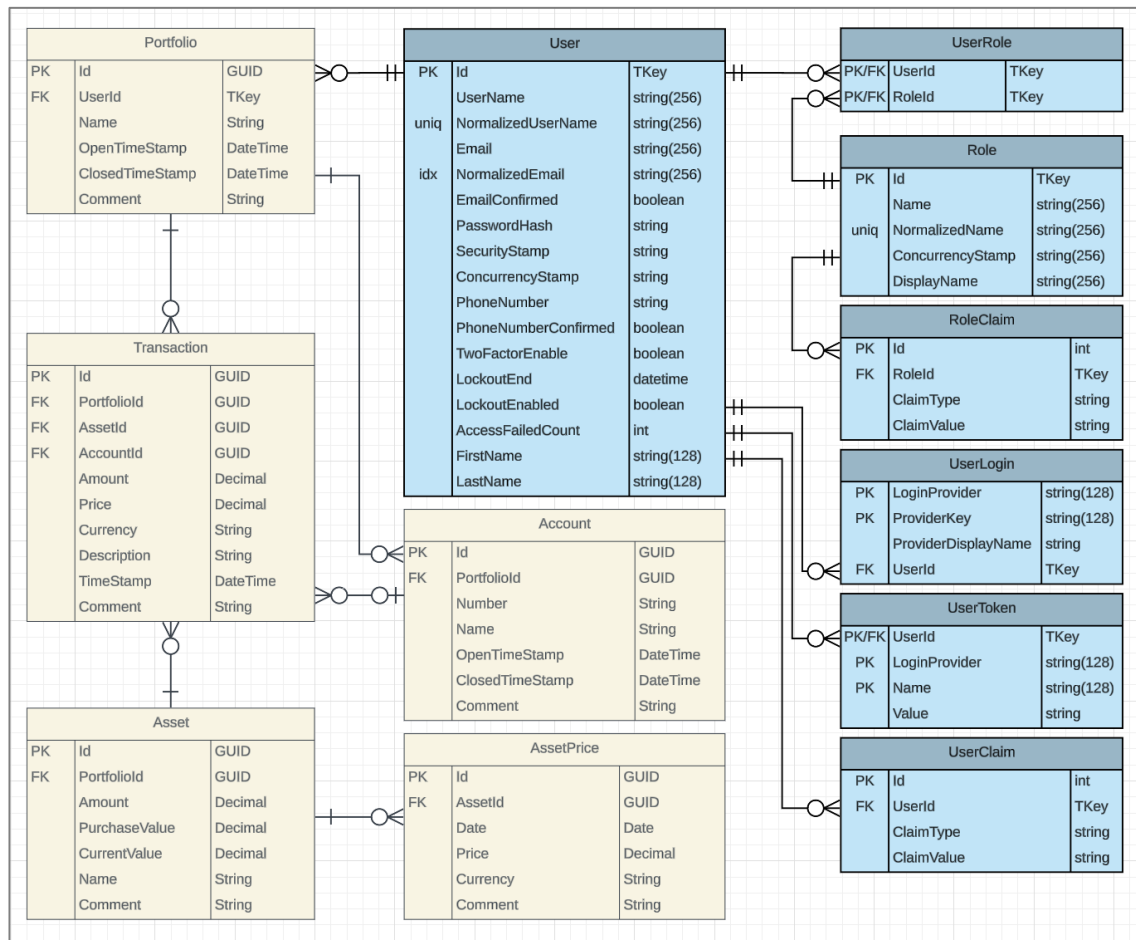

Figure 7. Entity relationship diagram.

3 Summary

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References

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