2.2. Redesign Motivation

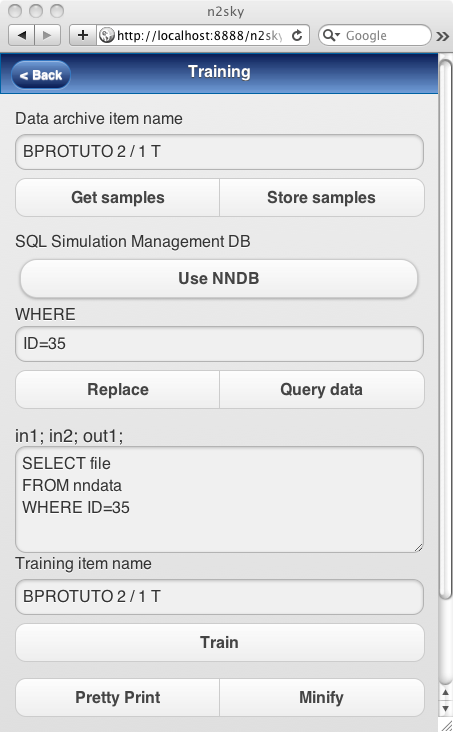
Application redesign is a project, which takes a lot of work. But at some point every designer faced a refactoring project. It has a lot to do with user experience. Bad user experience will make users stop use an application and leave negative feedback on application in general.

2.2.8. Redesign process:

There is data, information and user experience of previous version of N2Sky to work with. Making redesign it is already known who the users are and what they trying to achieve. Using this information it is possible to build an aims for a future user interface and user experience.

**Finding problems**

N2Sky user interface is not intuitive understandable.

After signing in user getting subscription form, paradigm service and paradigm metadata views without any field description. Small titles unfortunately not always self-describing. Application in general oriented on the group of users, who are came from IT area. In some forms they can type queries, but the fields are not type safe and there is no autocomplete.

Representation of neural network’s trained model is not readable. The model represented as a raw JSON or XML file, user can not download it. The last point is a design in general that does not look up-to-date and user attractive.

**User interviews and Questionnaire**

User insights are very important. It helps to understand a nature of the problem. But if user find something confusing, the interviewer need to dig deeper to stress the importance of particular insight. Unfortunately there were no analytics data and any reviews regarding UI and UX, so with a small group of colleges the current UI of N2Sky was reviewed.

The following questions were derived (Q1-Q5):

* Q1: “How N2Sky can help you with a developing of your neural network?”
* Q2: “What was the most difficult part by creating a new model?”
* Q3: “Did you face any problems during spawning your neural network? If yes, then what kind?”
* Q4: “Did you find out something new, when other users were performing testing against your neural network? ”
* Q5: “What did you miss during using an N2Sky?”

Answers

**Current application design mapping**

After studying the answers it is possible to highlight weak parts of application. This approach will show a big picture of the current application design:

* Arbitrary user needs to know multiple technologies and programming languages just simply to reuse existing neural network.
* Too much information on every view. The purpose of view is overloaded. Each view has too much functionality, which makes user to loose a focus.
* Application works relatively slow. Even if there some processes behind happening, the user des not know it.

Important is to face the problems, but does not “reinvent the wheel”. As Joel Spolsky the founder of Netscape and CEO of Stack Overflow said, “…throwing away the whole program is a dangerous folly”. That is why it was decided to consider the problems of current N2Sky design and reuse working ideas in refactored system.

Application Maintenance

N2Sky was monolithic standalone application, which included all services in one and was deployed as a whole. The application was not distributed. In case if one of the services doesn’t work correct, the whole application is not usable.

Originally the previous version of N2Sky was written fully on Java. There were hundreds classes, providers and services in one project. Developer will spend hours to maintain this kind of project. To find an issue in a big application is always a challenge. Small changes are causes a subsequence changes. If the software breaks after change, than it will additional high effort to fixed it. As Robert Cecil Martin wrote in his book “Clean Code”: “The code is hard to understand. Therefore, any change takes additional time to first reengineer the code and is more likely to result in defects due to not understanding the side effects” [https://www.amazon.com/Clean-Code-Handbook-Software-Craftsmanship/dp/0132350882]. He categorizes this kind of code into “Smell” code. Unfortunately N2Sky from maintain perspective had all problems, which Mr. Martin described.

That is why N2Sky is shifted from monolithic system to container based system with an independent micro services which located on cloud environment.

The frontend and frontend services are lightweight and easy to maintain parts of the big application. If something goes wrong, the developer knows exactly where is the problem. It is close to impossible to break something else during fixing because of independence of services.

Additionally there are monitoring and alerting systems which are supporting developers during maintenance. Early it was not possible to say if application works correctly or even it still running. Users could get a bad experience while they using an application in case if it does not work correctly. But now it is possible not only notify an application administrator about some problems, but also to predict potential threads.

2.2.1 Refactoring the User Interface

User Interface (UI), an abbreviation of user interface, allows the interaction of a user with a program through graphical visualization made by text, icons, buttons and pictures. While deciding the design of a user interface there are some highly recommended features also known as heuristics which was invented by Jakob Nielsen. It was decided to apply the following 10 general principals of interaction design to N2Sky:

1. **Simple and natural dialogue.** N2Sky will have an simple UI which is understandable for any user, even if the user is not an expert. Every icon and every navigation or action button will be self-describing. The application will follow the slogan “less is more”. No more overloaded views. The idea of N2Sky UI design is that one particular view is responsible for one particular function or group of functions which a coupled tight together.
2. **Speak the users’ language.**  Developing N2Sky was concentrated on user perspective. There is no technical jargon for arbitrary user.
3. **Minimize user memory load.** There is no multiple options, functions or menus on one view. There is also no multiple ways to do the same thing. N2Sky teach user how to make things done with a one existing and convenient workflow.
4. **Consistency.** N2Sky has similar layouts, fonts, colors, icons types structures and organization throw entire application. The user should get the same visual experience on every view.
5. **Feedback.** Every action, process or even error will be notified. User will know exactly what is happening with a system with clear and understandable messages.
6. **Clearly marked exits.** Every push to action button has short and clear caption.
7. **Shortcuts.** N2Sky has multiple user types. One of the types is the expert users, which are advanced user in neural network and artificial intelligence topics. For this kind of user is provided more technical jargon, but this UI is separated with an arbitrary users.
8. **Good error messages.** Every notification is clear inclusive an error massage if occurs. Every message has a prices and simple description.
9. **Prevent errors.** In N2Sky implemented logical structure of UI components. There are constrains which are helps user in workflow. For example user will always get a default value of any input.
10. **Help and documentation.** N2Sky will have tutorials, that describe the user workflow. The expert users will also get a API documentation with a detailed description and sample requests.

Each and every one of these heuristics is connected to a crucial idea that is usability. By mentioning this idea, a straightforward relation with the UX follows since this is also one of the key concept that grows along the rapid development of technology. UX is known as user experience and it describes the perspective and feelings a user gets when interacting with product. It deepens into such aspect as the users inner circumstances and the nature of the created design. The goal is to achieve such a system that offers distinguished user experience and accomplishes the most of aspects. As above mentioned, usability. (1)  
Putting both of UI and UX in a comparison, to all appearances the user interface is the target on the appearance and functionality of the product and its tangible details. Furthermore, the user experience is the general experience that the user manages throughout the whole use. (2)  
UI will concentrate on the appearance and design of the product, rather than the functionality. The intent of it relies in the visual design and layout. UI covers issues such as how a button is supposed to look like, how the errors are going to appear or is it visually comprehensible meaning which colors or font type shall be used for a better perceptibility of the product. (6)  
UX points its focus on the involvement of the user while interacting. It is measured by a variety of tests and researches done to achieve a higher satisfaction on the users side. (4)  
Though their differences, the only matter which relates both UI and UX is their priority, in other words, the user. When expanding the concept of both these definitions it can be concluded that one co-exists with the other. There would not be user interface without user experience and vice versa.

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