**Interviewer**- Can you please introduce yourself and your role in your company?

**Interviewee**: My background is related to Computer Engineer. I'm a Computer Engineer and I have several years of experience of writing Software and designing Software as well. I am also leading several projects and my works relates to Software products. These products are sold in the worldwide market. I have wide experience in Software. I do not get the opportunity yet to use my knowledge in Machine Learning. There was in a course with Chalmers in the last year. It was a very important training in Machine Learning because there are several potentials for our products. I'm starting with these adventures I would say to apply these in technology. I follow the several events about that, but I couldn’t react to any application.

**Interviewer**: Do you consider yourself more of researcher or engineer?

**Interviewee**: That is the destiny of my career. I just jump in from pure product management from development. As a manager, my duty is to review the latest technology and its application in our business. I have to work on research part more. My development is gradually moving to research. In this situation, I can say that I am both.

**Interviewer**- What is your total work experience in this industry and how long are you in your current position?

**Interviewee**- I have been working for fifteen years in the industry. My current position depends in my company 10 years. It has been two years I am working in this latest position.

**Interviewer**-Can you please describe more about your responsibilities in your company?

**Interviewee**: In the part of the R&D department and the R&D department is the matric organization between projects and the rise. I am leading mechanical, electronics, embedded software, validation, test and competence as sort of line manager. My duties are as I said to look at the renovation of new technology basically and also to get the knowledge about our specific business in QA with assurance in titan especially. We have a very specific market segment and there are lots of specific norms or the concepts in technical solution.

**Interviewer**: Can you please describe your experience with non-functional requirements?

**Interviewee**: My experience in non-functional requirements is quite large. It doesn’t mean that we work with it enough. Let me explain why, as I said I manage the project, several software projects, the very lucky part was about non-functional requirements. And I arise this problem several times in my company, because who challenge the non-functional requirements needed skills and I would say dedicated effort for that. We are more focused on the quality of the functional requirements. So, we are focused on which functionality we are releasing on the market. So that we estimate seldom we measure it directly. For example, the scalability is very important because we have a software on server side and we have different devices which are connected, but how many devices can be correctly managed by the software with the specific characteristics, we do not have this kind of information so pointy. Maybe this is very important because when some customers experience any problem in that aspect, we cannot say it is a defect or it is a platform limitation about us. We are aware about non-functional requirements. Sometimes we analyze it but very seldom we take action to improve. But recently we are more focused on the security that is a very sensible aspect. Rece*ntly* we have initiative on going just to improve our project is according to a new norm E80724043 you know, 62443 is a norm dedicated for industrial cyber security.

**Interviewer**: Do you think non-functional requirement will play an important role for the success of the software? If yes, how?

**Interviewee**- Sure. Because they can’t compromise the effectiveness of the software. You can have very fantastic functionality, they can be very interesting but if the non-functional requirements are not fulfilled, then the user or the result can be compromised. So, you can have a fantastic algorithm, but you get result after one month after computation, maybe it will be a problem. If the data are not secured, then you will lose your business.

**Interviewer**- Do you think there are differences in non-functional requirements between genetic software which doesn’t have Machine Learning inside, and machine enabled software?

**Interviewee**- So what I can think, a complete software including a Machine Learning model, I will just consider adding new non-functional requirement. If I consider just Machine Learning model, maybe we can ignore some non-functional requirement. That is just I can realize.

**Interviewer**- Which non-functional requirements can be included in Machine Learning enabled software?

**Interviewee** I think it is important to expand the reliability. In which way your Machine Learning algorithm is able to predict the information, is a very important part. Because from this aspect, you can take decision and this software’s main goal is to take decision. The result of the software will impact on the business. So it is very critical. The level of reliability is really a part of software. But there is a different meaning. I would say it is more specific.

**Interviewer**- Except this reliability, do you think others can be more prominent or more important in Machine Learning context?

**Interviewee**- The performance is really important because it is very important to understand the speed for getting the results. In this case, I also consider the resources used for some specific applications. For example, we have the possibility we are thinking about to embed Machine Learning algorithm inside some devices. This is different scenario for working on a server. The Machine Learning should be used to choose which kind of resource device is needed to target which kind of devices. I think the level of the resources and the computing resources are important.

**Interviewer**- What do you think the resources means quality of the data or data here?

**Interviewee**- No. they are computational resources and the CPUs the power. The computation of power is needed. You need to take some choices about the target to run it inside or imbedded the device if you perform large amount of data of some computation. So, I think, it is important to set this requirement.

**Interviewer**- Do you think there are some non-functional requirements which are less important in Machine Learning context? In where those were more important than generic software?

**Interviewee**- The usability is more related to front end part. Machine Learning is more background component. If you need to be effective in Machine Learning, you want to collect the right information where the human is in the loop, it is not so important like traditional software.

Interviewer- Like usability, do you think any other non-functional requirement can be less important?

Interviewee- Sorry, from important part question, scalability and reusability are important part as well. If your Machine Learning algorithm is important for your business and this algorithm is scalable, you can relate data that you can feed this algorithm. If you add more input shouldn’t be explanation speed, it should not impact in the result. This algorithm could be useful to different products and this is the portability. These are still for the important part. Testability and integrity could be important. I doubt integrity could be important if it is feasible demand. I think this is more difficult to apply. The result should be reliable.

Flexibility is less applicable for because it is quite scope-based application. The technology is possible, but the specific implementation that you have normally is quite oriented to the result.

**Interviewer**- Do you think this non-functional requirement is for the whole system or just Machine Learning module data or for data?

**Interviewee**- If I have to consider a product, the product is including all the software normally. ML could be relevant part or marginal part. For that, the quality of Machine Learning model could have the effect on the quality of the whole software. The weight of this module depends on the importance of the prediction part. I am selling a product that is just assigned to generate the predictions and the qualities of the software are almost same for ML part. Otherwise, if my software is just like statistical database, but the prediction could be an extra feature. If the quality of prediction is not so good, as a customer you have to continue to buy who purchasedsoftware, may be this module will be less used. In other case, if the prediction is not reliable, as the main goal of software to make prediction, the customers may not buy. That is why we can say that it depends on the functions. The qualities in the same proportion of the functional data are transferred by ML part. The much important part of the software is characteristics and non-functional requirement, it will be the main part for all. As a computer engineer, I will consider this non-functional requirement for sure for this module alone for my design because I need usability, portability which are important for the design part as a developer or a designer or an architect. If I have to export this non-functional requirement to my user, I will export only those parts which are meaningful for my user. For example, usability does not matter for the customer. But instead of the computational resources, how many giga byte of RAM I need for this algorithm, this is important part if I want to run software that normally as very poor resources required. When I switch on the Machine Learning part, I need a boost resource which should be transferred to the final user.

Interviewer- In General which challenges do you experience in non-functional requirement for Machine Learning?

**Interviewee**- All these thoughts are just for preventive thinking because as I said we don’t have any application unfortunately. Non-functional requirement is sufficiently evaluated by government and we check afterword. Unfortunately saying I really like to experience this technology in our product. I am quite sure we will do it soon.

**Interviewer**- Do you measure the non-functional requirements over Machine Learning enable software?

**Interviewee**- As I said we do not have software on Machine Learning yet. But If I see this in perspective, I would like to measure it for sure.

**Interviewer**- According to your thinking or idea, how do you measure these non-functional requirements which you have mentioned in Machine Learning context?

**Interviewee**: I think that approach will be similar to the generic software. They will be specialized for Machine Learning, but the approach will be similar. I'm just thinking about the testability. I can test the Machine Learning algorithm. There are some specific ways for providing sample data for training and providing or using data finally for verification. There are some ways to rule this systematically and also maintainability. During the life cycle of our software, we have more data which can be used to train our model. It is important to release a new version of our model which is more expert. Finally, the knowledge that we have today, I will start the same matrix, are for the generic software.

**Interviewer**- According to your knowledge will you attempt for measuring those non-functional requirements over the whole system or just measuring only for Machine Learning model or measuring for data?

**Interviewee**- For the design part, when I have to choose the specific component that will embed in my system, I will be focused on the specific Machine Learning component. When this will be a package in the whole software, I will look at the entire non-functional requirement. In case it is not satisfactory, I will keep my eyes on it and I will dig it up to reach the ML model because there is a problem of course.

**Interviewer**-How you can capture this non-functional requirement for measuring?

**Interviewee**- I think for this model, we should develop specific code. But we didn’t do it. My idea is that we have to write specific software to measure. It is also important the work on the data, like which kind of data we are going to provide, how to filter the data before the data go for submission to our model and which kind of data you will use as reference both for training and for verification. I don’t have clear idea in mind how to work on that, but they are important.

**Interviewer**- Which challenges can be come when you measure the non-functional requirement over Machine Learning software?

**Interviewee**- The main challenge is to find an effective way to measures it.

**Interviewer:** Thank you.