



European Organization for Nuclear Research

Optimization of management processes

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1. Introduction

In this document, I am going to resume the main tasks that I carried out during the three months that I spent at CERN taking part into the Summer Student program. These tasks include making inventory, implementing *best practice* procedures to manage not only the spare parts but also the documentation and testing a web application.

2. The inventory

As a member of the Engineering department, one of my main tasks was to optimize maintenance activities; to accomplish this objective, I had to make an inventory of the stored spare parts which are used at the LHC, taking pictures¹ of each part and collecting its mandatory information (such as manufacturer, reference, quantity...). This can be a difficult task due to the fact that many mechanical parts don't have any code or reference to identify them; consequently there is no easy way to get information about some of them.

The data of the spare parts in the store was collected by a team of 4 workers; apart from identifying the list of tasks and helping to coordinate the assignments, I had to migrate the big amount of information that they collected to the database. Before migrating the information it was mandatory to check that it was correct², in order to make this process as automatic as possible, I created several SQL queries to make sure that the data was correct, generate a list of possible conflicts, move the information to the database and book identifier codes³.

3. Testing the web application

The next important assignment that I had to carry out was testing the web application which provides an interface to manage the spare parts of the stock.

After using the tool for a couple of weeks, I reported several bugs to the responsible for the application and, once he had solved them, I also provided a list of new use cases that would be useful for the management of the spare parts in the store. Currently, the workers are using these new functionalities.

4. Appendix

The following indications are a list of best practices to take inventory pictures:

Before starting to take the pictures of the spare parts, we have to prepare a proper place to work. The background of the pictures must be white; I recommend getting a matt and big enough white layer made of plastic preferably (so that you can clean it easily and is more resistant, just in case you have to put heavy pieces above it). We also need something to use as reference measure to know the size of the object (we will take the picture with it next to the spare part, so that you can get an accurate idea of the size of the object just looking at the picture); there are standard reference measures which you can look for on the internet and print them.

If we have to attach a sticker to the part (for example with an identifier code) this is the first step, so that we can see that information in the picture. Moreover, if it had a barcode or QR code, you would be able to get the details of the spare part easier.

We have to take a detail picture of each label or metal plate of the object, making sure that we can read in the picture all the information that contains. Afterwards we have to take a picture of each different side of the object and at least one more with enough angle to see the depth of the object in perspective.

¹ You can find a resume of the best practice procedure to take the pictures of the inventory in the appendix

² The codes weren't duplicated and all the constraints were satisfied

³ Each kind of spare part has a code which identifies it