Technical structure of a web based Process Capability Database

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A presentation of server the technical implementation of MPCD.

I. INTRODUCTION

A Process Capability Database is a database of measurement data of components. The objective of this technical setup is the make a wast amount of specific technical data comprehensive and easy to use. Statistical analysis tools are used compute trends and uncertainty of these. The results are presented in graphical illustration that is easy to interpertate.

II. VERSION CONTROL

Version Control is important when developing applications. In this project the ability to track changes, merge changes from multiple users and revert to previous editions has proven valuable.

All changes are submitted and uploaded to a Git repository at Github. From there the changes are distributed to the developers and can be directly pushed to the web server.

III. CLOUD HOSTED

A web based structure is build to ensure easy access.

The website is hosted in the cloud on Amazon AWS. The web server running the website is running on a using the scalable and flexible EC2. The database web server and database are separated on two different servers for increased flexibility and easier maintenance since amazon can take extra care storing backups of the database server.

Choosing hosting solution from a big company like amazon instead of managing an own server provides scalability, security and flexibility. This makes it easy to expand the by deploying servers in the US or increase performance to match demand.

IV. SWITCHING TO PYTHON SCIPTING

Initially much of the mathematic problems where solved and tested in Matlab. A commercial math-programming software. To create a viable solution, a programming language better suited for large scale operations had to be chosen which be capable of computing the statistics needed for this application.

Python is a fast, open source language which was chosen as engine for computing statistics. The python web-development framework called 'Django' was selected as base for a website.

Django allows for an app based structure. The project is split into apps for more reusability. Some apps are universal, such as 'data input' and 'tagging' where some of the analyzing apps are more specialized.

The maximize speed of view the data, much of the analysis is computed and saved to the database as soon at the data is imported. Only comparisons and other application requested by the user is computed upon request.

V. INTERFACE

Making the database as useful and easy to use is the key essentials.

Kern (2003); Thornton (2004) proposes interfaces for fast selection of the data of interest, but we still believe that the process it too complicated. To ease this process a tagging system has been implemented. The searchable tags of the names of processes and materials and synonyms makes it possible to ways of selecting other conventional drop-downs and tree structures.

To easy input data and attach the right information the input form has been optimised. Tags will be auto completed upon typing. Dates is pre-filled or chosen from a calendar. 'other' tags can be typed multiple in a text field and is recognised and split in to sortable, searchable items for finding the data later on.

Plots and graphs are made interactive with hover selections and popup explanation to increase understanding. This is done by using Google chart API, which allows fast and realtime rendering of the requested data.

Each of the different data view are presented in a simple template where data (supposed to be) selected by dragging and dropping the tag on to a area. Default value for Cpk can easy be change updating the plot for the specific value. or changing the unit scale from IT-grade to linear tolerance [mm]

VI. CONCLUSION

The setup in a full commercial developer framework with scalability, back up and version control manage-

ment. Capable of handling the task of making data available in a comprehensive manner.

The database cannot be control by a one line search as seen on google but a lot of aiding facilitation has been implemented to make it as functional and easy to use as possible.

REFERENCES

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