

Development of Python based Statistical Process Control Software

A Statistical Process Control (SPC), is a technique which involves comparing the output of the process or a service with a standard and taking remedial actions in case of a discrepancy between the two. A process quality is a true measure of the one's ability to produce a quality product. The measurement of this quality is a proper function of Quality Control and SPC. SPC implements various statistical charts also known as Control Charts, such as Process Performance chart, Process Capability Chart, Histogram, Cause and effect diagrams, moving range charts, run charts etc to maintain the quality. It also includes workers as an essential part of quality control to take critical decisions to maintain the quality.

SPC plays a vital role in gauge check industries where variations in size and shape of a 'workpiece', even at a micrometer level can cause loss in quality. To maintain such a high accuracy, a thoroughly implemented electronics is developed but to reduce human errors, and to provide visual inspection while measurement is carried out, process control software is used.

Current software systems though provide a solution for quality measurement, they are available at a very high cost, also the development of such softwares is a very complex task. Another major drawback is that, they are implemented on PC's only, which makes it even more difficult to have such quality control softwares present in small scale industries. Few, provide over the web but the cost remains very high. Present development is carried out using either .NET or Java technology, which makes development of efficient quality control tools a complex task. Also, the cost of setting up a development platform is very high thus final implementation of SPC softwares is a costly affair for small scale industries.

In this paper we propose a system, which is both an affordable solution for small scale industries as well as an efficient quality control tool, based on open source technology using Python and Python based plotting libraries. Also, other open source tools such as an open source database can be used. Being an open source technology based product the development is relatively easy and cost of implementation becomes much lower than traditional software systems. As Python emphasizes code readability, and its syntax allows programmers to express concepts in fewer lines of code the development will be both efficient and affordable, and at the same time maintaining the code will not be a strenuous task.