Development and Implementation of Mistake Proofing Tools for Input Validation Process

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Abstract *— Vast work has been done in the past on automation of process, mostly on the manufacturing industry, but not so for information technology. The aim of this article is to provide a solution that satisfies quality standards, but also reduce turnaround time for the input validation process. Informal survey showed that, given the repetitive nature of the input validation process, it could be automated. The tool selected for automation was a script written in Python Programming Language. It was observed that the tool decreases both time and costs in about 90% in performing the input validation task.*

Key Terms *— mistake proofing, process automation, process improvement, Python,*

INTRODUCTION

A vast amount of work has been done on automation of process, mostly on the manufacturing industry. With the invention of computers, not only mechanical labor can be automated, but also tasks such as complex calculations and thorough documentation. This article focuses on the latter and for the purpose of this article, such computer tasks will be referred as information technology tasks (ITTs).

Automation of ITTs can be used on the customer service industry. It was observed that for an undisclosed customer services company, an input validation process was required to ensure the quality of the outputs. As a downside, this input validation process also added turnaround time. The aim of this article is to provide a solution that satisfies quality standards, but also reduce turnaround time for the input validation process.

LITERATURE REVIEW

Automation of ITTs: Good for the employer and the employee

There have been debates whether automation of ITTs will produce unemployment for IT staff. A survey revealed that 42% of the population surveyed thought that their role would change with the times; 37% thought that automation would bring advantages to their position; and only 3% thought that they would lose their job as a direct result of increased automation [1]. This figure seems rather positive and may not reflect other populations on other industries. The purpose of automation is to reduce time and let talented employees to perform other tasks [1].

Why Python Programming Language?

There were various options available to automate ITTs. The intended population using the automation tool will be mostly an engineer group. This group is composed entirely by mechanical engineers with some background in computer programming. While being very powerful, Python excels on readability. On the industry, it was observed that engineers without proper programming background, learned to develop scripts without much explication, but rather learning to simple examples [2].

Creating Mistake-Proofing Tools

Mistake-proofing tools are used extensively. You may have seen them when creating a new account on a website and the website prompts to re-type the email address or password. These tools are in place specifically where users are prone to made

mistakes. Inasmuch that is considered that mistake-proofing should be the cornerstone of quality management systems [3].

ANALYSIS

The first step in order to achieve automation for the input validation process was to evaluate the current process. To understand the current process, an informal survey to peers was performed to collect feedback of the current process, how to improve it and which tools to use. As for the current process, peers expressed that the nature of this process is repetitive and that this process occurred often. It is because of the nature of the task automation was proposed to management.

The tool selected for automation was a script written in Python Programming Language. As stated on the Literature Review, there were many reasons to select Python. Among them, is the fact that is open source and that is center in readability. The latter, is extremely important as it enables peers to modify the script and for further development.

Challenges come inherently with automation. The input validation process was scrutinized to follow a programmable logic. It was consulted with peers what constrains the process should have and what was required from the user to operate the script. A minimal intervention approach from the user was selected to be optimum for the task. A comprehensible set of instructions were developed to assist the users.

RESULTS

After an in-house analysis of the tool effectiveness, it was observed that the tool decreases both time and costs in about 90% in performing the input validation task. Figure 1 and 2 shows the aforementioned results. This number is high due to the fact of the minimal intervention approach. Even though the Python script requires some setup, similar setup was required to perform the task in the first place.

After completing and testing the script, the final product was presented to customer and the customer was delighted. It was submitted to the approval committee and it was approved also.

Customer did however express his thought on negative impacts automation could bring. He provided feedback as to incorporate a mechanism that forced the user to go through the result package and review it. This feedback was taken into consideration and it was agree to mark every output as “pending for review” and it was up to the user to manually remove it when package was reviewed.

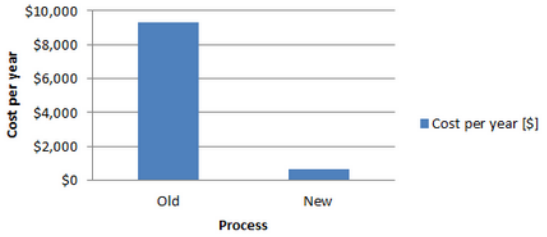

Figure 1
Cost per year of the input validation process

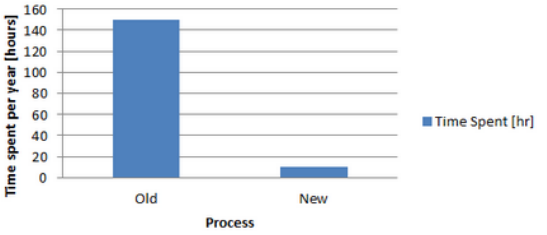

Figure 2
Time spent per year on input validation process

DISCUSSION

As mentioned on the Literature Review, this automation is key to improve repetitive tasks. The tool created enables the user to focus his attention on other tasks that require analysis instead of mechanical repetition. A curious and unanticipated effect of the tool is the awareness of programming tools such as Python in peers. The fact that Python is readable, encouraged peers to start creating their own tools.

CONCLUSIONS

Input validation process was improved in 90% with the use of Python Programing Language to create a script to automate this task. This motivated

other peers to use scripting tools such as Python to create their own tools. The tool will be monitored to ensure that it meets the quality standards and that it continues to produce favorable results in the future.

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