



Authentication and Validation – Workflow Processes

João Rocha¹ 
Leonilde Reis² 

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Abstract: *All companies are dependent on Information Systems and Communication Technologies for business support to enhance/expand their processes. This article relates to a problem occurring in the field of documentation authentication, highlighting the concerns underlying the use of generic rather than nominal users; the non-establishment of workflow rules that are subject to process improvement, leading to an outdated process and subsequently compromising security rules caused by blocked processes or sharing access to an alternative process in the absence of key stakeholders. The adopted research methodology is Design Science Research, given its characteristics and suitability to the field of research. The main results are the review of the literature in the field of theme as well as incorporating the main causes for the breakdown of security policies caused by the need to follow up a workflow process in each Integrated Management system.*

1. INTRODUCTION

Information and Communication Technologies (ICT) support Information Systems (IS) in organizations, have implicit ability to process data and support storage but also have the potential of communication infrastructures that enable data transmission more quickly and fully integrated. In this sense, ICT by its exponential capacity of operation is assumed as a key pivot to modernize management processes, enhance the dematerialization of processes, and decentralize operational activities.

The dependence on ICT and IS, in some cases, is insufficiently measured, enhancing the organization's exposure to a set of threats and vulnerabilities (Reis & Silveira, 2020). The need to use ICT-supported IS (Russo & Reis, 2020) creates conditions capable of boosting business processes to allow the implementation of recovery procedures in which the added value of information should be perceived as business support. It is also a priority to “establish which IS should be developed and implemented faster, depending on the urgency of the needs, dependencies between themselves and the availability of resources (human, financial and material) necessary for this development and implementation” of the IS (Rodrigues, 2002).

In this domain of knowledge, the importance of introducing sustainability concerns is also emphasized, since sustainable development is considered to be multidimensional, as it leads to the economic, social, environmental, technical, and individual dimensions (Reis et al, 2021) that affect the environment and the stakeholders.

¹ Polytechnic Institute Setúbal – Portugal, Campus de IPS, Estefanilha, Setúbal, Portugal

² Polytechnic Institute Setúbal – Portugal, Campus de IPS, Estefanilha, Setúbal, Portugal

It should be noted that in this area of knowledge the various legal and regulatory provisions for the protection of personal data are of particular interest to defend the rights, freedoms, and guarantees of natural and corporate persons (Reis & Rocha, 2021a) but, is also a relevant that “the value of information does not measure by volume but by the quality that it has” arguing that “the only way to acquire knowledge is to hire the people who have it” and use that knowledge for the benefit of the organization (Devlin, 2000).

The main goal is to review the documentation related to the subject, identify the most common risks related to the violation of security policies and implement a process that will continuously review the procedures to assure segregation of duties and the improvement and purpose of the workflow in the IMS.

2. BACKGROUND

Organizational processes must be coated with integrity metrics even if digitally elaborated in the IS itself. Thus, the automation of workflow processes should also remain integrated since it is considered that secure methods of transmitting data through secure channels using the Virtual Private Network (VPN) and data encryption can contribute to the optimization of IS/ICT security strategies. In this sense, it is advocated that organizations should have secure authentication methods and techniques with the establishment of physical and logical security measures, but also the inclusion of password policies and document approval workflow in IMS.

It is relevant that those processes are analyzed and updated recurrently to check their relevance and adequation to the current reality taking into consideration future needs. It is important to establish an iterative process to maintain and control performances and goal achievements across all processes like a corrective method for processes management. Figure 1 presents the PDCA cycle following ISO9001 Standard (ISO/IEC 9001:2015) that establishes a way in which the processes must be designed/planned before executed and checked after. After that, the process must be analyzed to identify the need for changes.

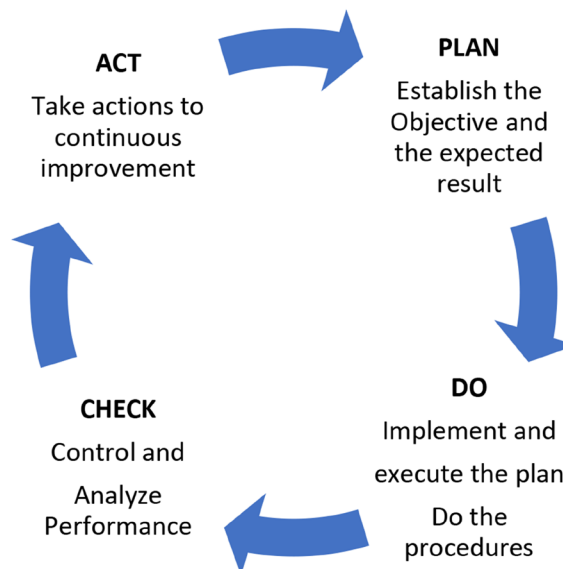


Figure 1. PDCA Cycle in ISO9001 Standard Practices (adapted from APCER, 2015)

The workflow procedure also needs to be improved and maintained, otherwise, over time, that specific workflow designed at some point was correct and current, but may now be outdated and needs to be redesigned. The Business Process Management Life Cycle is a “better way to understand the procedure and identify issues” (Dumas, 2013) and the output is the optimization of the current process adapting the workflow to the current needs.

3. INTRODUCTION TO AUTHENTICATION AND VALIDATION

Authentication and Validation are very important in all processes of any company independently of the sector in which it operates. That is the unique way to assure information quality. To get knowledge from the information is very important to keep a solid base of information as a resource to get knowledge (Devlin, 2000).

To optimize the processes to be more efficient, some companies invest in workflow solutions to optimize digital document approval. The process specifies different factors and paths of approval through the approval workflow. Those paths and stages are usually defined by users by following a sequential approach and defining accountability according to each business unit. Some of these procedures may be outdated and subject to certain risks that need to be mitigated.

3.1. Authentication

The workflow process should have a level of security underlying the specific needs of the business. It is considered that secure methods of transmitting data through Virtual Private Network (VPN) and data encryption can contribute to the optimization of IS/ICT security strategies. As more secure the procedure is, the less the system is exposed to risks and vulnerabilities that could comprise lead to possible fraud or affect the information quality. In a recent approach, security could be improved with the implementation of two-factor authentication solutions to reduce the risk (Dimitri, 2011).

The authentication process is as important as a key to the office. Maintaining the security of the office is important such as the networks and the systems within the company. The physical and the digital access to information of a system must not be seen as two different worlds, they should be seen from a global perspective.

3.2. Computer System Validation

Computer system validation is a process that enables the verification and validation of documents. These processes will be implemented and validated by the IS, in the same way, that the user did it manually. It will check the consistency and accuracy of the information in the document, but also log all actions performed during the workflow. In a deeper analysis of the problem, the risk of failure of the approval processes is reduced and possible fraud/security of information in the processes is mitigated.

This is the only way to ensure that workflows were correctly designed and compliant with the organization’s needs at the moment of design and that all sub-processes are fully tracked and registered and part of an audit process (Todorov, 2007).

Workflows always reflect the current procedures within an organization and the possible evolution of the workflow processes throughout the exploration of the systems must be considered,

encompassing the new needs and subsequent realities that evolve. Any procedure must always be checked. Today's reality may be obsolete tomorrow so, the workflow must also be checked in a continuous cycle of improvement.

3.3. Workflow Audit

Best practices must be applied to mitigate risks. One of the most relevant is the Segregation of Duties (SoD). Sarbanes-Oxley (SOX) explains some of the best practices that will help segregation of duties within an organization. Those best practices define rules to enforce the internal control procedures and the definition of responsibilities of different roles at a company, division, or department. Detecting and preventing corporative fraud must be one of the major objectives of the audit practice as risk mitigation during all the procedures (Chiu, 2017).

If a workflow procedure is designed with different sub-processes, each one with its owner must be completed without risk. So, those owners must be aware of the risk and check if the information through the process is correct in the system and assure that it is working in the company's best interest. The usage of emerging technology with some artificial intelligence to automate document approval procedures may also be used to audit procedures and maximize efficiency and effectiveness (Zhang, 2019).

This is the only way to guarantee that all flows are efficiently maintained and all processes are up to date. Impact on organizational activities through the implementation of the work process aims to reduce risk and establish control measures.

From another perspective, the workflow process must be available to audit procedures and assure all the information is added to the process and able to be used by any person in the process. That's the unique way process uses the information to build organizational knowledge about past and future improvements. With that, information will be used to PDCA Cycle on each process and subprocess.

4. FUTURE RESEARCH DIRECTIONS

It's also an issue when the process is not maintained during the time. A process could reach a bottleneck and the approval path is not completed. That could happen because the path does not correspond to the actual needs and the process updates were not being conducted to check for inconsistencies.

The organizations should have secure authentication methods and techniques with the establishment of physical and logical security measures, but also the inclusion of password policies and document approval workflows in IMS.

The design of a reference framework that fits the specific strategies of each organization and every dimension of sustainability is under development, focused on optimizing the level of digitization of the organization's processes and consequently the issues of Authentication and Validation of Workflows, (Reis, Rocha, 2021b). As well as knowing the good practices of various organizational contexts incorporating implicit constraints to the current pandemic context where some of those workflows may not be prepared for this new reality.

This is how we can mitigate the risks of outdated workflow procedures that were not properly maintained through time, assuring all workflow have a normal sequence, alternative flows and, all the procedure is also secure and protected.

5. CONCLUSION

The materialization of processes slows down organizations as IMS incorporates workflow functionalities to manage documents, information, and tasks among the various employees. In this sense, organizations define the rules of the various workflow processes and establish the hierarchy of processes, and actions and control the flow of action in the various phases of the process. To do this, it is necessary to ensure authentication that identifies unequivocally the user in the process and efficiently manages the process.

Users start to check the information in the document in the system and proceed with the respective approval following a previously defined workflow process. The definition of each of the workflows should reflect the reality of the organization and each of the approval flows defined for each of the processes described previously. This is a time-consuming process where it is necessary to validate and approve each of the defined flows and establish the precedence of this process for each step in the approval chain.

Each organization has different rules, the IS must reflect reality and must allow the definition of the process aligned internally for that organization in its current reality, as well as being open to the future needs where it can be necessary to change this process in a context of continuous improvement. If, for example, it is established that a supplier payment process can only be approved by two different persons for a list of department managers, a document in the payment stage must be used in the payment approval workflow process and must not be paid without these rules being fulfilled. A document must never be approved without following the compliance rules.

In a common objective of developing organizational activities, workflow processes aim at the dematerialization of processes with the establishment of authentication methods for accessing the system and definition of approval flows for the normal paths (recurring processes) but also for alternative processes (replacing the normal paths). Establishing an alternative process is defining another approach to the problem and mitigating the risk of non-compliance with the process due to the absence of an adequate one.

The segregation of duties aligned with well and detailed workflow procedures will mitigate the risk of fraud in processes and assure the procedure is recurrently analyzed and checked for improvements. It's also important to check the risk matrix and invest resources in a PDCA cycle to make sure all the procedures are updated and match the current reality and future requirements of the company.

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