

Configuration Items Selection Process Review

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Abstract:

Quick advances in technology, challenges related to globalization such as increased economic warfare among developed countries, outsourcing and offshoring, and a global over qualified and multilingual workforce are increasing the competitiveness of businesses.

In order to succeed in the rapidly evolving global manufacturing landscape, companies will need to embrace a targeted approach to some of the key elements of manufacturing competitiveness, including Configuration Management

Configuration Management has still a long way to evolve. This study reviews the current situation of the process of Configuration Management (CM) in such a competitive world. It focuses on one of the most important disciplines within CM, which is the Configuration Identification and more concretely the selection of CIs.

The contribution of this research is to explain: first, why CM has become more, rather than less, important in complex engineering in an era of globalization; and second, a review of the process to select the Configuration Items (CIs) which are key to manage the configuration of high tech engineering products. The investigation concludes by identifying the necessity of a scientific process for the CIs selection.

Keywords:

Configuration items (CI); Configuration identification; Configuration management (CM)

Introduction:

Introduction CM appeared in the United States department of defense in the 1950s as a technical management discipline for hardware material items and now is now a standard practice in virtually every industry.

This discipline was improved and implemented in the SW industry in the 80s and it was framed in Quality by the ISO 10007 in the 90s Configuration management (CM) is a systems engineering process

for establishing and maintaining consistency of a product's performance, functional, and physical attributes with its requirements, design, and operational information throughout its life. The purpose of the discipline of Configuration management is to plan, identify, control and track a products configuration during its lifecycle with minimum cost in a quick, methodical, accurate and well understood way.

CM Discipline:

CM highlights the functional relationship between parts, subsystems, and systems for effectively controlling system change. CM supports the verification of changes which are methodically considered to reduce negative results. Changes to the system are requested, analysed, and implemented applying a standardized, systematic procedure that guarantees coherence, and requested changes are assessed in terms of their foreseen influence on the whole system.

Definition of CI:

A Configuration Item (CI) can be defined as an item whose changes are controlled, which is subject to review and authorization, with CM applying version control and maintenance through a Product Lifecycle. CIs are the essential entities of configuration management. It may be a single part or line of software code or an assembly of parts of a whole software program or any compilation of them. They might vary a lot in complexity, size and type, from an aircraft, train, or tank, to an electronic system or software program. Aside of form, size or complexity, the configuration of a CI is documented and controlled. CI selection separates system components into traceable subsets for the intention of managing additional development. A Product Structure and the tools in which it is implemented serves the purpose of sharing product information across multiple functions and the corresponding stakeholders

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Conclusions

The main objective of this study is to review the CM discipline and to identify possible gaps in order to increase the competitiveness of high tech product manufacturers in such a key sector for the economy of any country. The discipline has been explained by a simple example, but containing all processes necessary for proper implementation of the CM. A questionnaire has been created to benchmark the discipline in order to obtain information to help organizations to improve the CM. The questionnaire will help CM practitioners think and communicate their expertise about some of the most common and important points. Experienced CM professionals were involved to ensure the usefulness and effectiveness of the study. This study identifies the importance of an accurate selection of CIs for the effective implementation of CM in high tech product manufacturers based on the views of experienced CM practitioners. Significant similarity is found in the CM practitioner's perception on the attributes suitable to select the CIs.

In spite of that, emphasis is made to reveal the lack of a scientific approach to select the CIs independently of practitioner's academic qualification, work experience, CM certification/training, and experience in stakeholders' departments. This research contributes to existing knowledge by identifying the necessity of a scientific approach to select the CIs as a necessary step for the effective implementation of CM within high tech industry

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