Normalized Enterprises Architectures: Portugal's Public Procurement System Application

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Abstract : The Normalized Systems Theory, which is designed to be applied to software architectures, provides a set of theorems, elements and rules, with the purpose of enabling evolution in Information Systems, as well as ensuring that they are ready for change. In order to make that possible, this work's solution is to apply the Normalized Systems Theory to the domain of enterprise architectures, using Archimate. This application is achieved through the adaptation of the elements of this theory, making them artifacts of the modeling language. The theorems are applied through the identification of the viewpoints to be used in the architectures, as well as the transformation of the theory's encapsulation rules into architectural rules. This way, it is possible to create normalized enterprise architectures, thus fulfilling the needs and requirements of the business. This solution was demonstrated using the Portuguese Public Procurement System. The Portuguese government aims to make this system as fair as possible, allowing every organization to have the same business opportunities. The aim is for every economic operator to have access to all public tenders, which are published in any of the 6 existing platforms, independently of where they are registered. In order to make this possible, we applied our solution to the construction of two different architectures, which are able of fulfilling the requirements of the Portuguese government. One of those architectures, TO-BE A, has a Message Broker that performs the communication between the platforms. The other, TO-BE B, represents the scenario in which the platforms communicate with each other directly. Apart from these 2 architectures, we also represent the AS-IS architecture that demonstrates the current behavior of the Public Procurement Systems. Our evaluation is based on a comparison between the AS-IS and the TO-BE architectures, regarding the fulfillment of the rules and theorems of the Normalized Systems Theory and some quality metrics.

Conference Title : ICCM 2017 : International Conference on Conceptual Modeling

Conference Location : Rome, Italy

Conference Dates : March 05-06, 2017