



STANDARDIZED AND MACHINE READABLE DATA FOR IMPROVING TRANSFER OF RESOURCES AND INDUSTRIAL COLLABORATION

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Abstract

The construction sector process is characterized by an intensive production of information due to the high number of requirements derived from building codes, standards and regulations. The proposed research aims to present a standardized data structure and related uses for collecting, sharing and exchanging information between stakeholders involved along the building process. The research is focused on the Italian context and has been developed defining a structured methodology. It includes the collection of requirements from several actors involved in the development of linked UNI standards (UNI 11337). The alignment to international product information requirements is also ensured, e.g. through the study of practical applications. The final result is the definition of criteria for the unification of terminology, organization, collection and exchange of information for the Architecture, Engineering and Construction (AEC) sector structured in a web-based portal where all the information is machine readable. This allows better collaboration along the process promoting the diffusion of industrial symbiosis between stakeholders.

Objectives

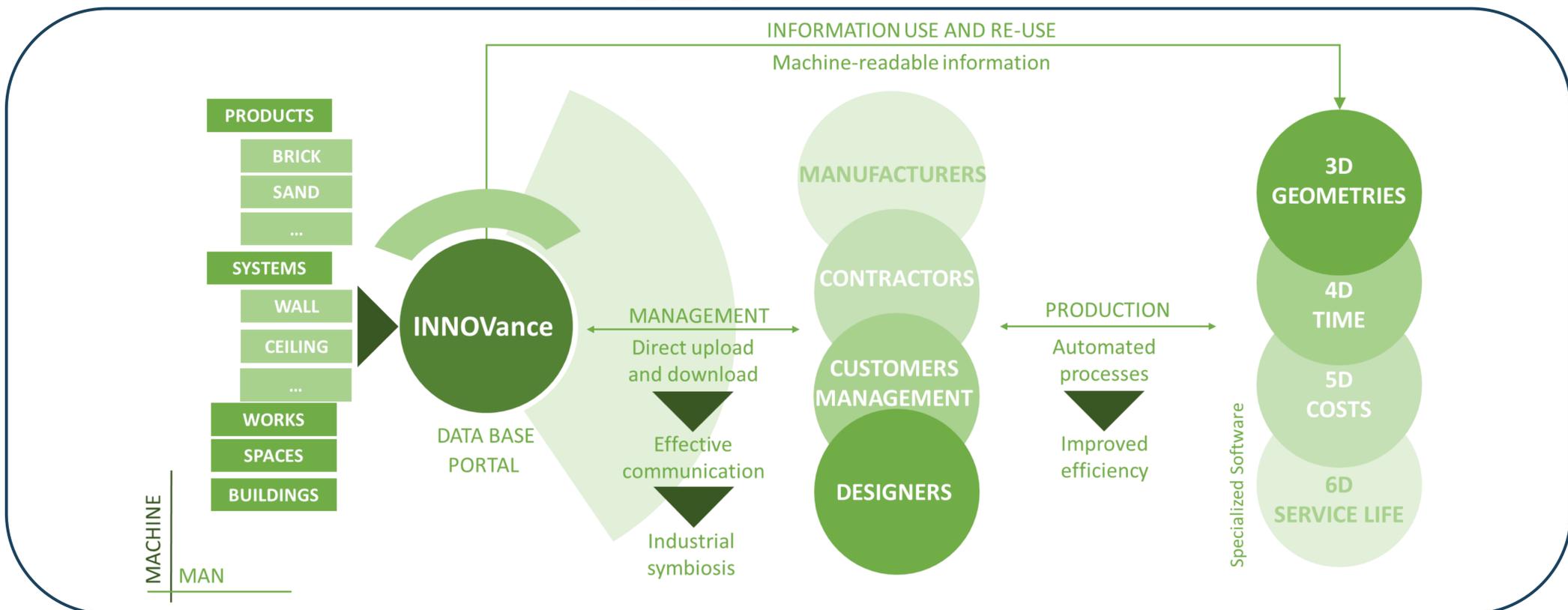
- Definition of a standardized structure for collecting, sharing and exchanging information
- Development of a central web-portal for collecting, using and re-using information in a machine readable format
- Definition of informative flows for the establishment of industrial symbiosis through a shared digital environment

Conclusions

The whole supply chain can take advantages of the availability of a defined data structure and of its implementation in a BIM-based platform to support web-based collaborative design and construction. Particularly, different manufacturers have the possibility to upload complete information of their products, designers can easily compare characteristics and performances of similar products, construction companies have access to information concerning the installation and the maintenance of selected products. Moreover, such structure can promote the development of dedicated applications able to use and re-use the information in order to automate the process. These applications can be developed thanks to the data structure proposed that makes data accessible in an electronic way. The proposed structure applies to the information flow of the construction process and affects all subjects and phases related to it. Therefore, the results of the project support collaborative design and construction, providing a shared database and promoting the usability of data and information through dedicated applications.

Methods

- Analysis of the Italian building sector for identifying main criticalities to be solved and essential information to be collected, shared and exchanged
- Establishment of working groups at the Italian standardization organization (UNI) and participation at a national research project (INNOVance) for considering perspectives of different actors
- Application phase for highlighting the critical role of the proposed methodological approach in the use of information



Results

The collaboration between several stakeholders and the involvement of different teams in a national research project result in the definition of criteria for the unification of terminology, organization, collection and exchange of information for the AEC sector. Two main results have been achieved:

- an unambiguous classification system
- models for performance-based computational digital technical datasheets

Both the classification system and the models for technical datasheets have been proposed for different technical solutions adopted in the building process including technical information about construction products and technological solutions.

Particularly, standard criteria have been identified to describe construction products, qualitative and quantitative terms. Once defined the models for construction products, a comparable structure has been developed also for technological solutions, providing datasheets for layers and technological systems. As demonstrated through the proposed exploration of use, such structure is critical to provide an easily accessible source of data, directly usable from machines. This feature improves effective communication between industries with different information needs widening the opportunity of industrial symbiosis.

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