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## **GESTÃO INTEGRADA DE PROJECTOS**

Prática Integrada como Visão Holística do Projecto  
**(EXTENDED ABSTRACT)**

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### **JÚRI**

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## EXTENDED ABSTRACT

The weak or even inexistent communication between the different work teams involved in the project life cycle has been a problem that has increased over the past decades in the real estate industry.

With the emergence of specialties related to the design phase and its increases complexity of procedures we are now witnessing the execution of projects that result from the development of several isolated projects carried by different teams of architects, engineers and constructors. Because of their uncooperative work develop solutions that are less effective in terms of results and least efficient in terms of resources used.

In the current context of change that the real estate industry faces both internationally and nationally it seems appropriate to discuss the development of new systems of relationships between the various teams involved in a project through design phase which will improve the efficiency of the whole process and optimize results by adopting a holistic perspective of the project.

It aims to examine this issue framed in the perspective of integrated project management especially within the concept of Integrated Project Delivery (IPD), developed by The American Institute of Architects (AIA). The emergence of the IPD concept introduces the notion that the project delivery must be undertaken in an integrated way among the various teams and players involved so it will permit a greater degree of cooperation between the teams responsible for design which includes architects and engineers and between the design teams and the builder.

### DESIGN-BUILD

Associated with the IPD concept is the design-build contract model. This model allows the owner to set a contract with only one entity, arising from the relationship of the design with the construction (build). Applying this model will also allow the construction team to begin their participation in the project since the development of the design phase, contributing with technical expertise arising from their professional experience. This model also seeks to create better systems for collaboration between the various project teams which allows a reduction time and costs of changes throughout the process of the project delivery. This model contrasts with the design-bid-build according to which the builder is selected only after the project is finished.

In Portugal, with the introduction of the Law-Decree nº. 59/99 of 2 of March, was created a contracting model, called *concepção-construção* which resembles the design-build for allowing the construction team to participate in design phase. However this model moves away from the design-build advocated by the AIA because clearly enables the centralization, the figure of the builder, the project delivery. Thus, the builder may assume a role that will lead to control resources and focus on meeting deadlines and costs, reducing the weight attached to technical aspects developed by

the designers. After the repeal of this Law-Decree, introduced the Law-Decree n ° 18/2008 of 29 of January through which the builder is selected only after the design completed. This model is called the *concepção-concurso-construção* which can be equated in some sense to the design-bid-build.

In the contractual model of design-build identifies collaboration between the AIA and AGC (The Associated General Contractors of America) that will allow, through a sharing of knowledge and information among architects and builders to create regulatory documentation which will aim to a reduction of negative factors associated with participation of the constructor in the design phase.

With the development of the contractual model of design-build, arise the figure of designer-builder who presents himself as the center of the contractual relationships and establishes the contract with the owner and work with teams of design and construction. With the emergence of this new role the AIA values the existence of a central relationship that control more effectively and efficiently the whole project since the design phase.

In the identification of the team responsible for carrying out this task there will be an independent figure from both in the design team responsible for the design, and in the constructor team. This figure must meet certain knowledge requirements that cuts across all areas involved and is designated by developer-led.

The developer-led should examine comprehensively the entire project and to mediate conflicts in an objective way. It is these aspects that the main advantage lays in its existence.

## PROJECT MANAGEMENT

It is also considered appropriate to examine the figure of the developer-led based on the concepts of project management which although not directly related to the AIA reflects the importance given by the existence of a centralization of the relationship between different actors: architect, engineer, builder, owner and end user.

From the definition given by the PMI (Project Management Institute), it is responsibility of project manager, the identification of all stakeholders, the organization of the project team, the determination of project requirements, identification of all expectations and the perception of details. The management of all elements should be done under a holistic perspective.

Thus it is understood that it is the responsibility of the project manager to create relations between the various teams by eliminating barriers to communication. This requires a strong leadership, negotiation and decision skills, a comfortable knowledge across the areas involved and a solid knowledge about the practice project management.

Project Manager, will work with the design coordinator at the design phase, being responsible for creating a relation context between teams depending on the characteristics of each work, ensuring compatibility between documents and drawings required to characterize the build.

With the clear definition of the obligations of coordinator's design provided by the Law nº 31/2009 of 3 of July, article 9º, it appears that this responsibility that in the area of real estate industry is usually performed by the architect shall act as a increase of duties and therefore, takes more risks than any other team involved in this phase. With the existence of a project manager team, the duties of the coordinator will be more set in their professional sphere; it is responsible mainly for compatibility between projects. Between the coordinator and manager should then be a sharing of information deemed relevant, enhancing the application of methods that seek to monitor the development of projects that best meet customer needs while complying with the terms and costs initially foreseen.

## **INTEGRATED DESIGN PLANNING**

In choosing a management model is crucial to assessing the benefits to be achieved. The adoption of integrated project management seems to foster greater collaboration and information sharing between the various teams in the design phase, thus showing a huge advantage. With this model, is created a project organization that streamlines information sharing and consensus building among all participants

The manager's work thus assumes a greater relevance to the coordinator and therefore promote a cooperative work between the various teams. Implementation of this concept becomes possible to achieve an evolutionary analysis of the project enabler of the timely assessment of needs, cross-critical information to an efficient development of the project.

By contrast, a traditional planning, seek to detail as possible the project in design phase, resulting there by reducing the occurrence of conflicts between the work of each specialty. But because this plan does not seek to create systems that allow the crossover of information between disciplines, this could result in the need to re-work, which may have implications for the quality of the project, cost and time originally planned.

An integrated planning plan seek to be developed in general, reducing uncertainty, but would instead detailing the project as it progresses and new information becomes available. With this method the team players work together in defining the objectives of the project, the creation of the physical elements of the design and definition of costs and deadlines for their execution.

Apart from the aspects of greatest impact on the project related to collaboration among project teams, integrated planning developed by a multidisciplinary team is a process that allows for greater continuity of involvement and may extend beyond the completion of design and construction. Integrated teams can offer a wide number of services to its clients covering areas such as management or marketing developed in occupation phase, which allows to creating strategies for long term alliance with the client.

## BUILDING INFORMATION MODELING

With the introduction of organization models teams of a project, through communication networks such as the IPD it is possible and advantageous to apply a concept such as BIM (Building Information Modeling).

In the traditional method, technical drawings are developed in 2D and are created by different software, depending on the specialties of each working group. This situation creates difficulties in reconciling the information produced, poor interoperability between systems, resulting as an inhibiting factor for collaboration.

The BIM concept allows creating virtual model, shared through an extranet for all the working groups that are developing the model. Allows creating a common development environment with a global coordination to access the compatibility information produced as the project is developed. By applying the concept to computer programs, information on the geometric model is complemented by the addition of parameters about the physical, behavioral, functional and cost of the project.

While identifying the benefits associated with the use of BIM, this is a model still in development, dependent on changes that should exist at the level of the paradigm of organization and relationships of the different teams involved in a venture such as that provide an integrated management comes to the future with the development of the technology itself to introduce such concept.

## ROCKBUILDING, an example of integrated Project management.

With the analysis of the methods that allow an implementation of an integrated project management, was compared the theoretical aspects with the practical analysis of its application. In this sense, was studied the model of operation and performance of the portuguese company *Rockbuilding*, which supports the application of an integrated project management model.

The study allowed to identify the extent to which integrated project delivery model, developed by this company, approaches and where the distance from the model IPD advocated by the AIA.

The importance of their action is defined in the centralization of information of all teams involved in the project life cycle and its relationship with the owner. His actions seeks to promote a system of continuous communication between all stakeholders and reconciling the different phases of a project and specialties, providing the owner / developer the control of quality costs and deadlines throughout the development of the project.

Contrary to what the AIA on the use of a contractual model of design-build, the company follows a model of *concepção-concurso-construção*, where the constructor is defined only after the design is completed. The application of this model is seen by *Rockbuilding* as a strategic option in order to avoid a control of the builder on the design, which could compromise issues of aesthetics and

functionality of the project, due to an exaggerated focus on resources used. However, this company is recognized by the need for intervention by a team possessing a wealth of knowledge similar to the builder at the design phase. It's with the monitoring the inspection team at the design phase seeking to avoid inconsistencies between the design and construction, solving them as the design is developed.

The study sought to understand how the concept of integrated project delivery advocated by the AIA can be implemented in practice. Despite having been identified situations that deviate from the model, have generally identified common points, and highlighted the advantages of its application. However, we should emphasize the dynamic nature of the IPD concept discussed, a feature that requires a natural and necessary evolution according to reality where it applies and in accordance with the natural change of the same. In this sense, the paradigm must be understood as an orientation that is assumed to be evolutionary.