



POLITECNICO
MILANO 1863

ABC^{PhD} DOCTORAL PROGRAM
IN ARCHITECTURE BUILT ENVIRONMENT
AND CONSTRUCTION ENGINEERING

ABC^{PhD} CALL4SCHOLARSHIP 32b

Research topic T6: USE OF BIM FOR CONSTRUCTION
MANAGEMENT IN PROJECT CONTROL

(32b-T6 – BIM 4 Construction Project Control)

ABC PhD Program – CALL 4 SCHOLARSHIPS 32b

Thematic Scholarship 32b-T6 “BIM 4 Construction Project Control”



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GARIBALDI
COSTRUZIONI & RESTAURI

Funding and management of the thematic scholarships

- Number of scholarships: 1 (one)
- Monthly net income: €. 1.016,37 (max 36 months)
[In case of a change of the welfare rates during the three-year period, the amount could be slightly modified]
- Additional support: Funding for educational activities^(*) : €. 1.370 per student [for the 2nd and 3rd year]
- Starting of PhD activity: 1/11/2016
- Deadline for application to the call: 9/09/2016
- Research Director: prof. Enrico De Angelis
- Research Group: proff. Enrico De Angelis, Gianni Utica.
- Funding and cooperating Institutions: the scholarship is co-funded by Politecnico di Milano, Department ABC and Impresa Garibaldi S.r.l.

(*) (purchase of study books and material, funding for participation in courses, summer schools, workshops, conferences)

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Context of the research activity

Construction Industry is a complex and fragmented sector where several independent professionals are involved during the different process phases of an infrastructure, building life cycle, from its design to its disposal, through the management of the construction site and maintenance activities.

The independence of all these actors and the usual absence of centralized information management, often generates inconsistencies among all the documents produced during this process: lacks and errors that may cause defects, delays, increase of costs, safety and security risks. This situation needs a change of attitude that, now, may be supported by a renewal of the tools that are used during all the life cycle phases, from the very beginning and, in particular, during the construction phase, in order to reduce these risks, enabling the collection of data within a Document Management System that allow planning, programming and control its consistency and completeness as well as the adequacy of all design and management choices, as well as an efficient management of construction phases.

Such a control system is a key point in the correct management of any project, but it is much more important when this refers to conservation, restoration and reuse works.

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Motivation and objectives of the research

The objective of this PhD position is to deepen the knowledge about the digitalization of construction management. The PhD Candidate will investigate the different aspects of construction management and project control, facing:

- the reason why the digitalization of the process is necessary and which are its advantages and the impact that the digitalization will have on the quality of the project;
- the question of construction industry digitalization, from the point of view of the Contractor;
- the advantage in terms of time and cost of the flexibility of digital models;
- technical and operative aspects which lead to the sharing of information between the actors involved and to the update of information, in real time, on the digital model;

The research work of the Candidate will be focused in the development of a control system within a Contractor organization, reengineering its procedures and optimizing formats, data collection, management and analytical processes used to predict, understand and constructively influence the planning and cost estimating of a construction project.

A special focus will be devoted to the understanding of the most effective governance, management and decision making strategies.

The research activities will be applied to a specific case study: the restoration of the Teatro Lirico di Milano.

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Methods and techniques that will be used to carry out the research

The research activity may provide dynamic relationships with companies working in the industry with the formulation of questionnaires and interviews with companies operating in the Milano context. In addition, the doctoral school delivers the following classes related to the subject of the research:

- Dealing with uncertainty in construction (management);
- Research in building process management;
- Information technology for planning, architectural design and built environment management;
- Cultural heritage and built environment surveying, modelling and monitoring.

Educational objectives

At the end of the doctoral programme, the Candidate will know in deep the topic of construction management in project control.

It is expected that the candidate will develop a BIM based methodology aimed at the optimization of the construction processes using models and real time simulations.

The Candidate will be able to manage and control the operations of the main firm and of all of the subcontractors that are involved in the restoration of the Lyrical Theatre of Milan.

It is expected that the candidate will develop a publication record in recognized international journals and conferences.

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Skills of the candidate

At the end of the research project the candidate will have acquired skills and expertise to operate in the fields of:

1. building information modelling;
2. resource analysis, budget and timelines;
3. construction document preparation;
4. project execution phase;
5. construction cost and time estimating.

Job opportunities

Nowadays the construction industry requires qualified professionals with experience in construction supervision and management of construction documents. Such skills, when integrated with the mastery of informative tools and techniques such as Building Information Modelling and project management further facilitates the entry into a more and more demanding professional world with regard to the digitization of the building process.