2023

Project and Design Management

~30 YEARS OF RESEARCH

Silvio Melhado

 1

1

Almost 30 years of Project and Design Management Research

 2

2


1994
PhD on Design Quality Management
THE TIME TUNNEL
© Silvio Melhado 2023
3

3


1994
PhD on Design Quality Management
ondas da qualidade
A SATISFAÇÃO DOS CLIENTES
2
Ações na Constr. Civil:
© Silvio Melhado 2023
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4

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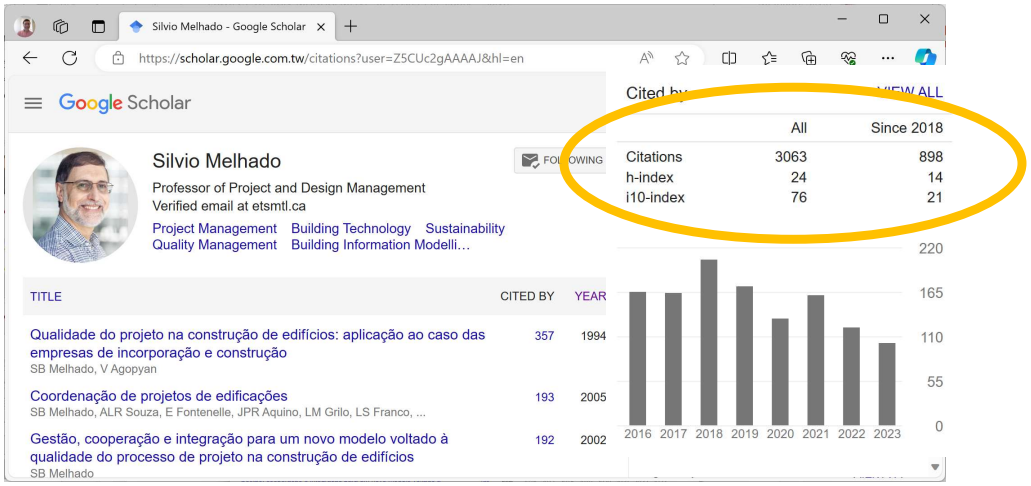
Google Scholar



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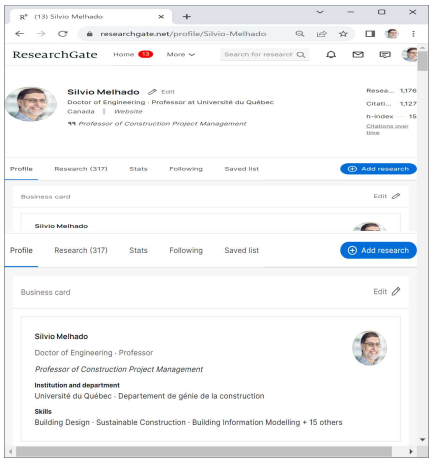
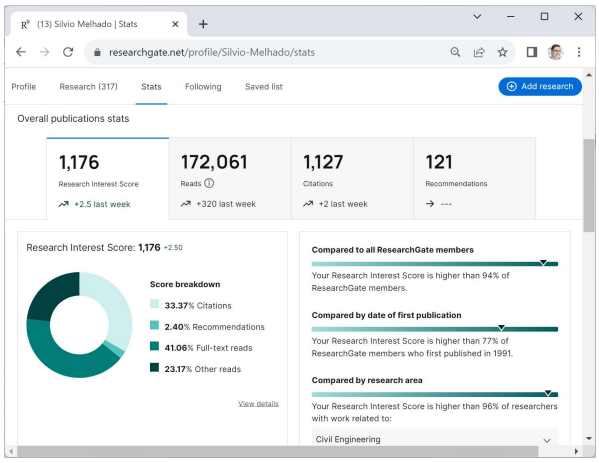
ResearchGate





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Main publication results

- ***320** conference articles*
- ***58** journal papers*
- ***27** books, book chapters, guides*
- ***186** supervisions accomplished*
- ***1** book translation*

 8

8

Main publication results

- ***27** books, book chapters, guides*

 9

9

Main publication results

- ***186** supervisions*

	Total
M.Sc	92
Ph.D	11
Post-doctorate supervision	4
Other	79

 10

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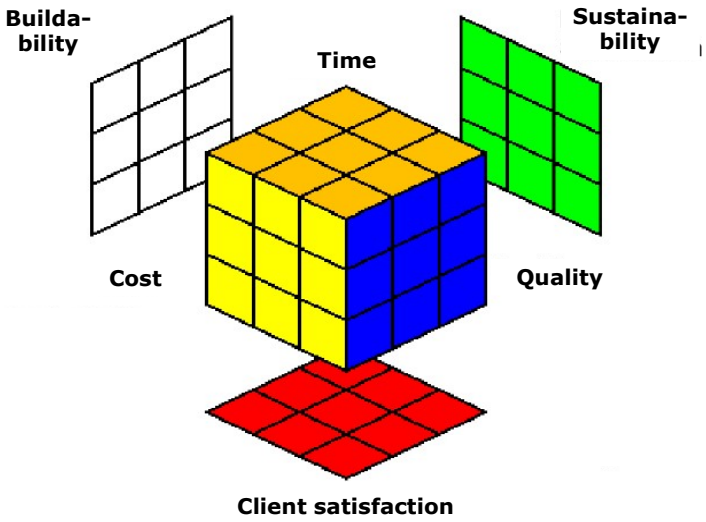
Design management aims



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Main research subjects

- **Concurrent design for building projects**
- **Design for production**
- **Design management – modelling, planning and assessment**
- **Design management and Building Information Modelling**
- **Design firms' management systems**
- **Other recent research subjects**

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Teses.usp.br

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Concurrent design for building projects

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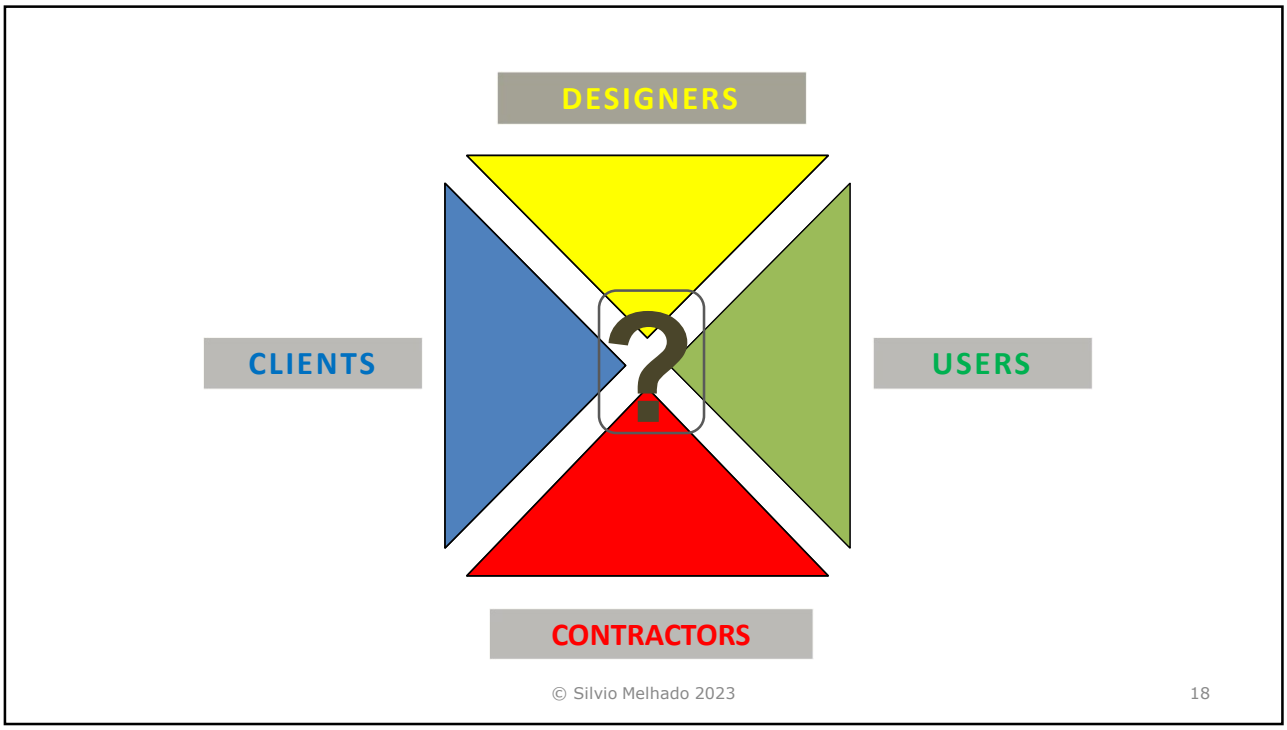
DESIGNERS
CLIENTS
USERS
CONTRACTORS
© Silvio Melhado 2023
18

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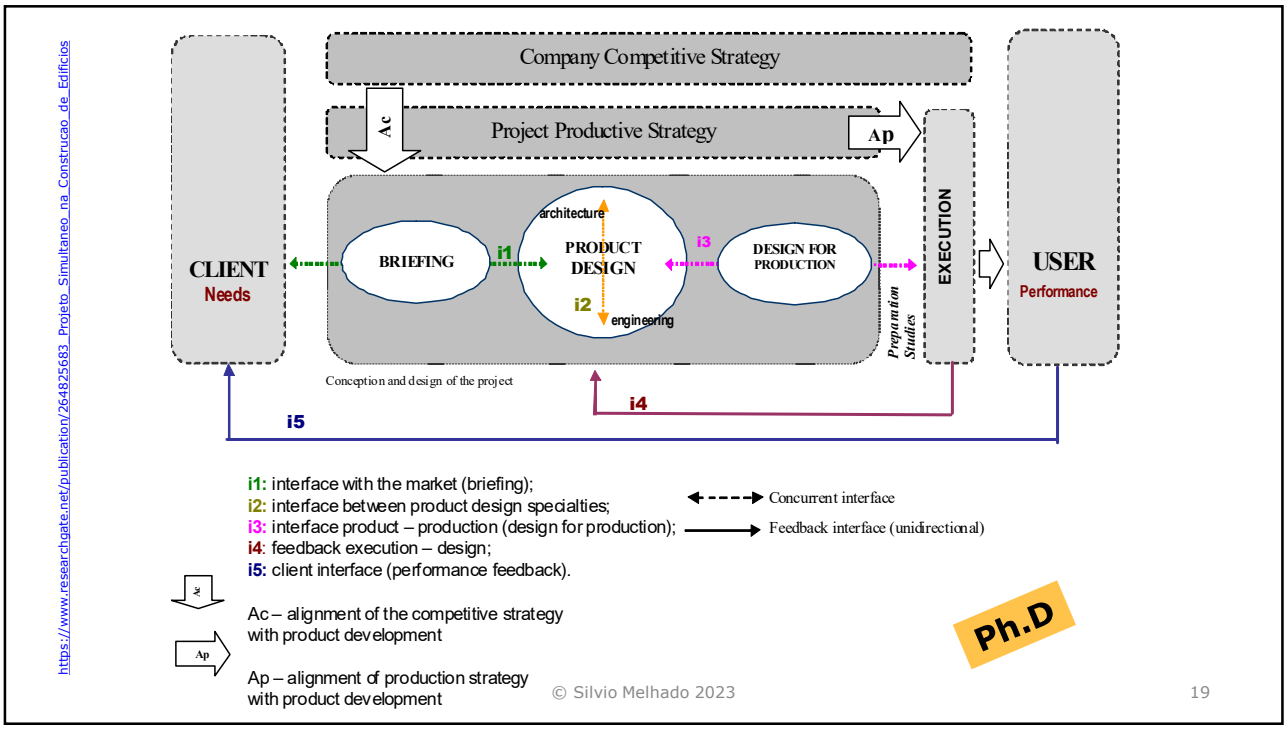
https://www.researchgate.net/publication/264825683_Projeto_Simultaneo_na_Construcao_de_Edificios
Company Competitive Strategy
Project Productive Strategy
Ac
Ap
CLIENT
Needs
BRIEFING
i1
architecture
PRODUCT
DESIGN
i2
engineering
i3
DESIGN FOR
PRODUCTION
Preparation
Studies
EXECUTION
USER
Performance
Conception and design of the project
i4
i5
i1: interface with the market (briefing);
i2: interface between product design specialties;
i3: interface product – production (design for production);
i4: feedback execution – design;
i5: client interface (performance feedback).
Concurrent interface
Feedback interface (unidirectional)
Ac – alignment of the competitive strategy with product development
Ap – alignment of production strategy with product development
Ph.D
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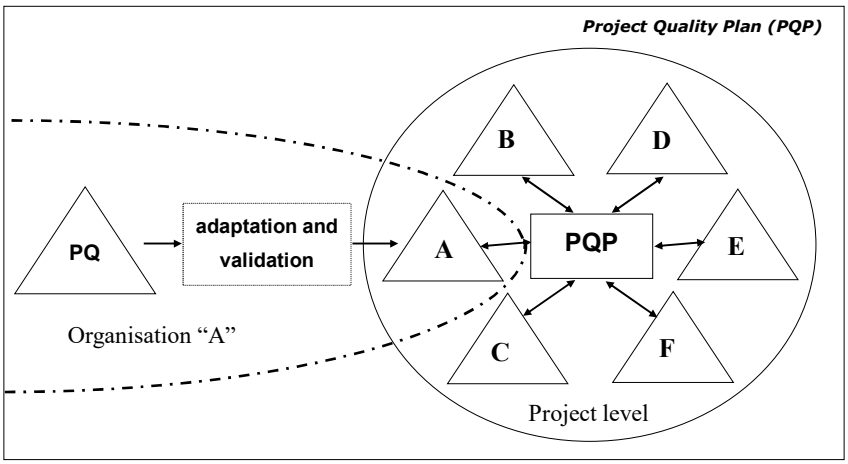
Project-based quality management

M.Sc

https://doi.org/10.11606/D.3.2003.tde-17082004-130721



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Design for production

21

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https://www.researchgate.net/publication/346717476_O_PROJETO_PARA_PRODUCAO_COMO_FERRAMENTA_DE_GESTAO_DA_QUALIDADE_APLICACAO_AS_LAJES_DE_CONCRETO_ARMADO_DE_EDIFICIOS

https://www.researchgate.net/publication/278676517_A_insercao_do_projeto_dos_revestimentos_de_argamassa_de_fachada_no_processo_de_projeto_do_edificio

https://www.researchgate.net/publication/283222763_Consideracoes_Gerais_sobre_os_Sistemas_de_Impermeabilizacao_dos_Pisos_do_Pavimento-Tipo_de_Edificios

The *Design for production* is based on concurrent design principles. It helps to improve buildability of the main building works:

- Formwork
- Concrete levelling and finishing
- Masonry partitions vs. plumbing
- Facade coverings
- etc.

M.Sc
M.Sc
M.Sc

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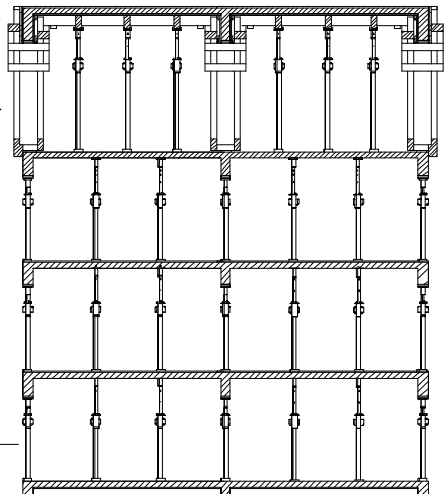

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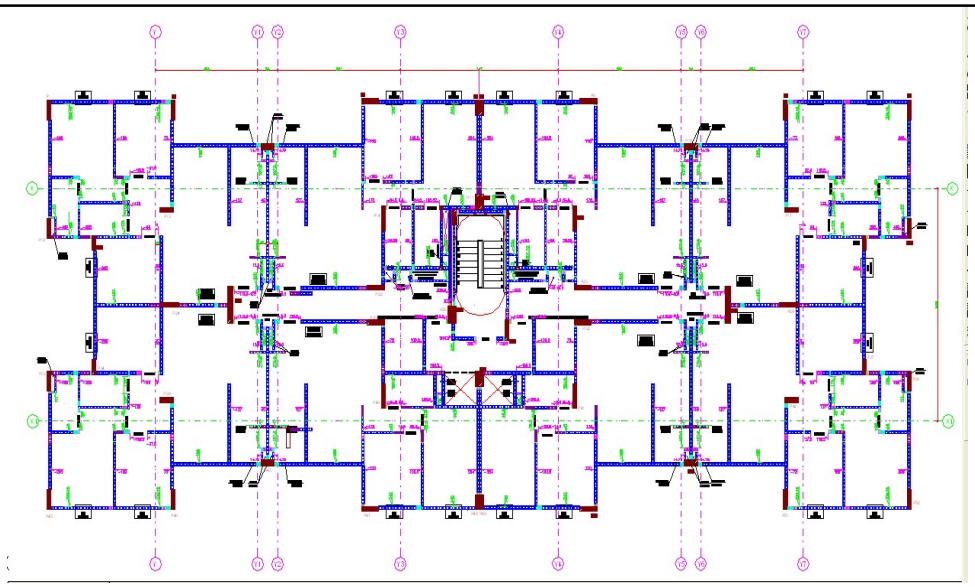

Floor axis plan - source: Mecatron Arquitetura

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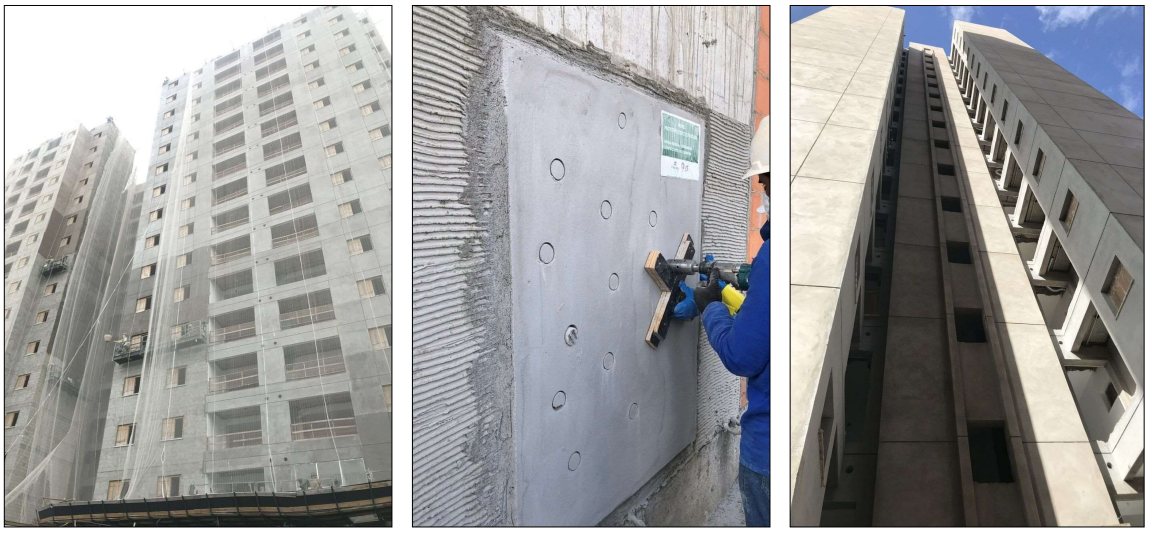

Source: Luciana Maciel

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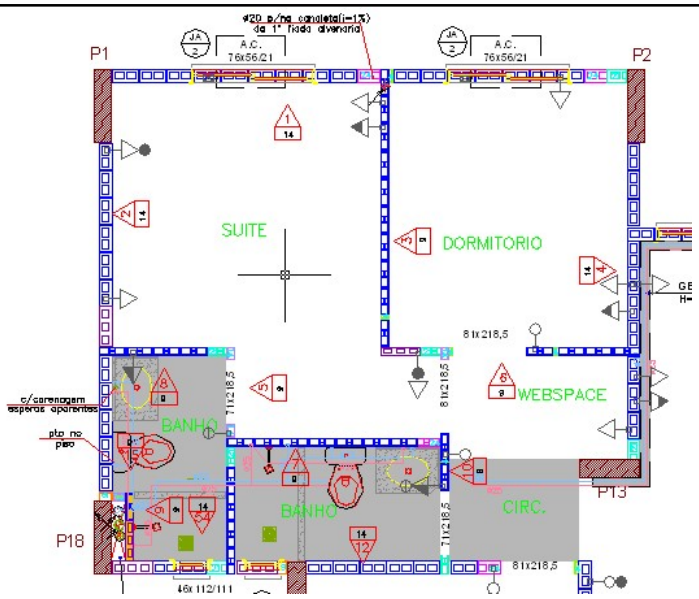

1st line masonry plan - source: Mecatron Arquitetura

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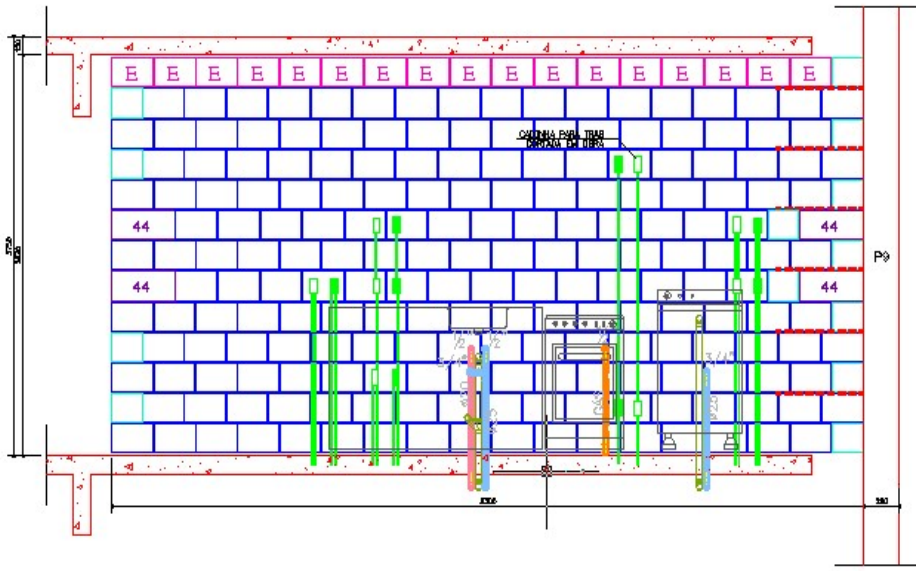

Detailed view of walls - source: Mecatron Arquitetura

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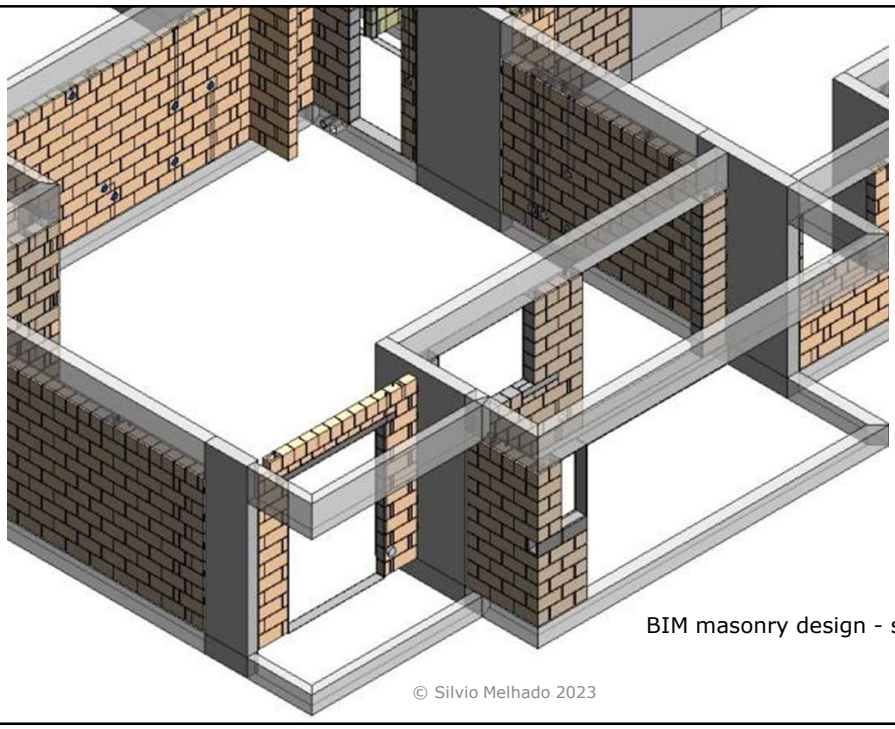

BIM masonry design - source: ARCO R.C.

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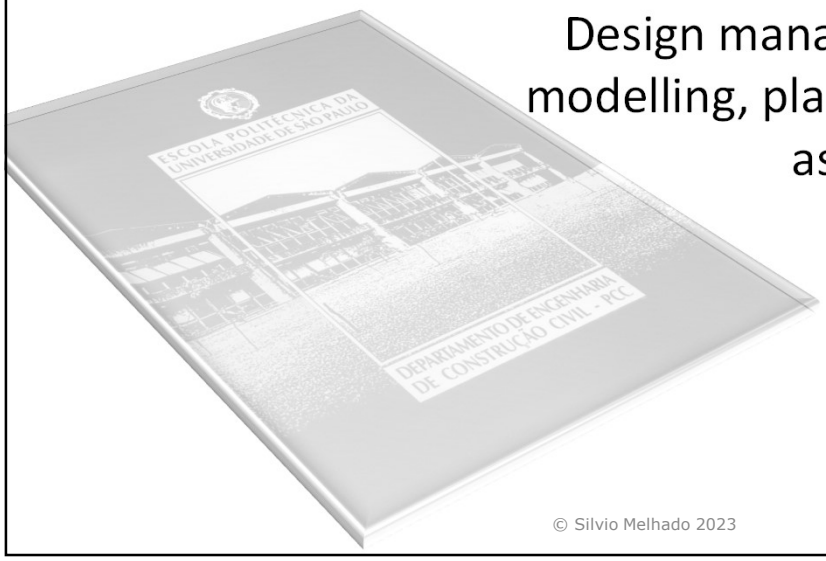

Design management – modelling, planning and assessment

 32

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Design planning with the Design Structure Matrix (DSM)

https://doi.org/10.11606/D.3.2012.tde-04062013-143901
https://doi.org/10.11606/D.3.2006.tde-08032007-164926

M.Sc M.Sc

Number of tasks in the DSM : 17 <note> new index used!

Task Name	Level		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Desenho dos equipamentos de ar condicionado [F]	1	1		1								Block1								1
Cálculo da rede de dutos [H]	1	2						1	1											2
Cálculo da laje do mezanino [I]	1	3		1		1														3
Cálculo da estrutura metálica de piso do mezanino [K]	1	4	1	1	1															4
Cálculo do dimensionamento das colunas [L]	1	5				1														5
Desenho das alvenarias [M]	1	6		1			1		1											6
Cálculo dos acionamentos elétricos [P]	1	7		1																7
Cálculo da laje de piso [A]	2	8						1	1											8
Desenho das estruturas metálicas [N]	2	9				1	1													9
Desenho dos acionamentos elétricos [Q]	2	10							1											10
Cálculo das fundações [C]	3	11					1			1										11
Desenho da rede de dutos [G]	3	12	1	1							1									12
Detalhamento das estruturas metálicas [O]	3	13				1	1				1									13
Desenho das fundações [D]	4	14											1		1					14
Desenho da laje do mezanino [J]	4	15	1		1						1			1						15
Desenho das proteções das colunas metálicas [E]	5	16						1							1	1				16
Desenho da laje de piso [B]	6	17						1		1		1						1		17
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	

(Manzione, 2005)

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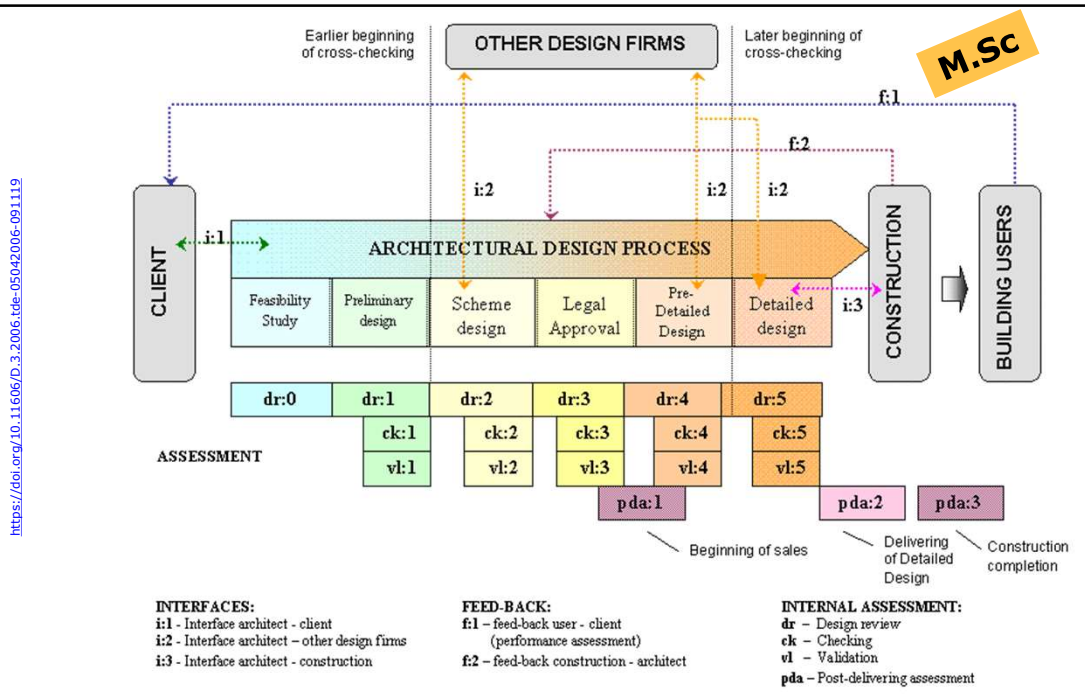
https://doi.org/10.11606/D.3.2006.tde-05042006-091119



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Design coordination scope

essential as a basis for design agreements

A ten-year work involving several institutions having as a result a description of each design activity for the main design specialties and also for design coordination

http://www.manuaisdeescopo.com.br/

36

36

https://doi.org/10.11606/D.3.2011.tde-03042012-083157

M.Sc

Design scope handbooks

37

37

http://www.manuaisdeescopo.com.br/

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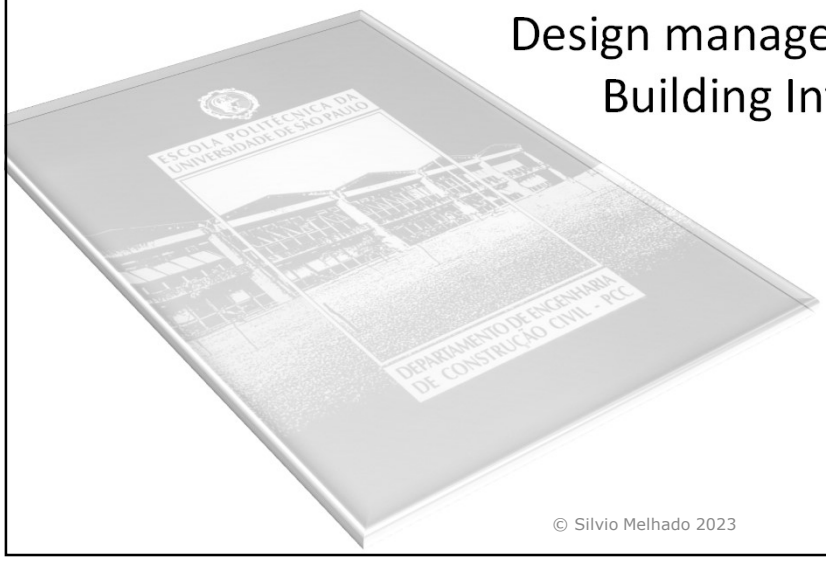

Design management and Building Information Modelling

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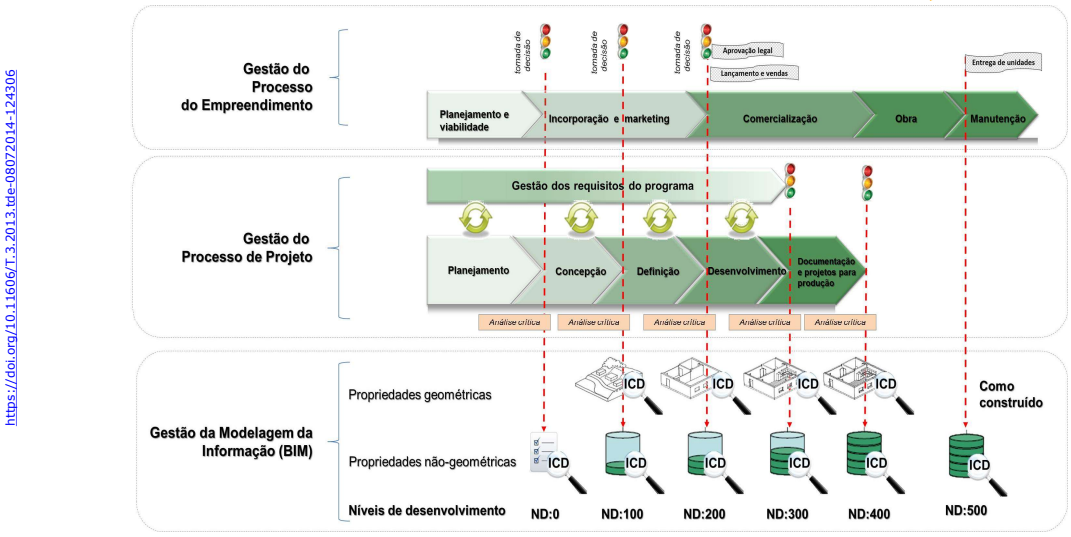
Design stages after BIM implementation

Ph.D



https://doi.org/10.11606/T.3.2013.tde-08072014-124306

MANZIONE (2013)

41

BIM implementation in Real Estate Development Companies

Ph.D

https://doi.org/10.11606/T.3.2016.tde-11052016-115144

The Design Management Guide

- *5 design phases: conception, definition, detailing, construction, and operation*
- *Four categories of tasks:*
  a) Product; b) Management;
  c) Collaboration and
  d) Modelling Support
- *Focus on the Design Manager responsibilities*

(SOUZA, 2015)

 42

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Design firms' management systems

 46

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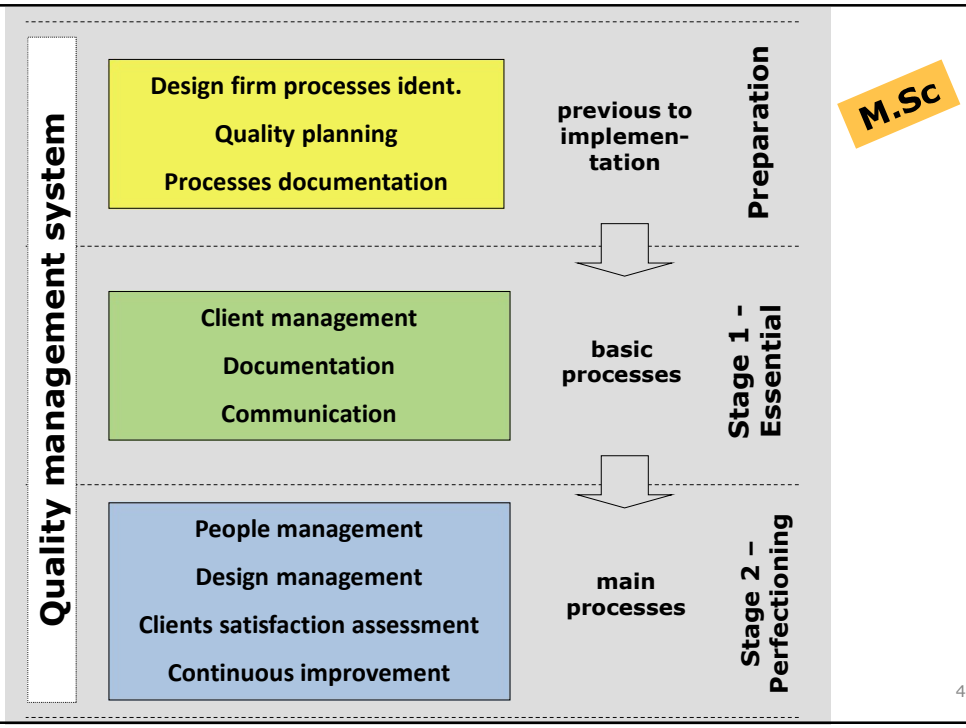

49

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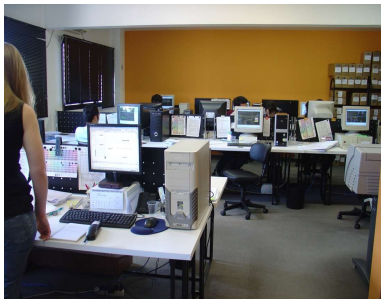
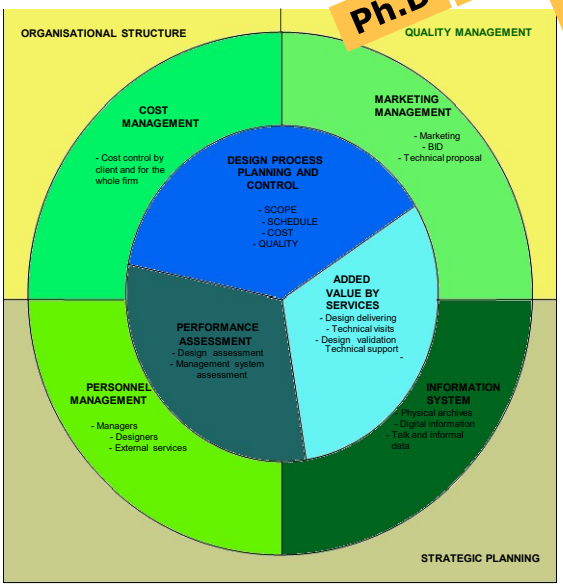
Management model for design firms

Ph.D Ph.D M.Sc Post-Doc.

https://doi.org/10.11606/T.3.2016.tde-01072016-113416
https://doi.org/10.11606/T.3.2005.tde-15062005-112500
https://doi.org/10.11606/D.3.2009.tde-20072009-145610



Oliveira; Melhado (2006)



50

Samples of other recent research

53

- **Designing for rehabilitation: interface with construction stage**

M.Sc

https://doi.org/10.11606/D.3.2008.tde-17042009-162021

Discusses the rehabilitation projects interfaces between design and construction and the role of design co-ordination. Results of case studies carried out in two rehabilitation projects, in São Paulo-Brazil and in Lyon-France.

 54

54

- **Guidelines for design of office buildings**

M.Sc

https://doi.org/10.11606/D.3.2010.tde-19102010-163058

The aim was to investigate what critical information from several design specialties should be defined during the conceptual phase and its correct insertion sequence in the design process. The research was based on the case study method and a design information flow is proposed.

 55

55

- **Methodology for design of lightweight facades**

Ph.D

https://doi.org/10.11606/T.3.2009.tde-08092010-125813

A methodology for designing lightweight facade systems, applicable either to new construction or to building renovation, discussing management and technology aspects.
The research work was based on case studies realized in Brazil and in France.

 56

56

- **The façade design management – case studies**

M.Sc

https://doi.org/10.11606/D.3.2012.tde-06062013-163302

The complexity of the façade subsystem is related to the difficulty of managing all the stages that take place before its assemblage. The work proposes recommendations to all the phases of the façade design process of multi-storey commercial buildings.

 57

57

Method of cost management in the early stages of building design

M.Sc

https://doi.org/10.11606/D.3.2011.tde-06052011-134259

The Real Estate companies profit depend on the accuracy of the cost defined at the early design stages. This work presents a simple and effective cost parameterization method to make engineering value analysis that is able to support design decisions, contributing for risk control.

 58

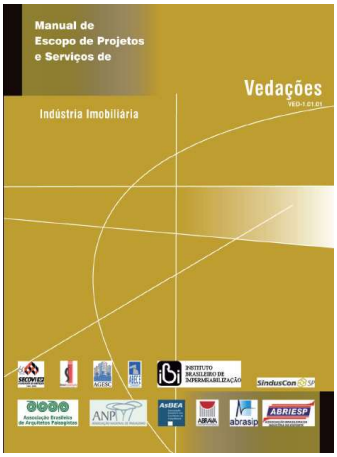
58

Design scope of partition walls and façade coverings

M.Sc

https://doi.org/10.11606/D.3.2011.tde-03042012-083157

Some researchers have demonstrated the relevance of design for production in the building industry; however, the content of those designs wasn't defined by academics or professionals. The work describes design for production scopes of partition walls and facade coverings.



 59

59

Knowledge management in construction companies – case studies

M.Sc

https://doi.org/10.11606/D.3.2012.tde-11062012-220005

The case studies have show contractors performance in the design management. The knowledge management practices discussed include: communication and information; feedback mechanisms; information to the construction site; techniques to capture and store knowledge.

 60

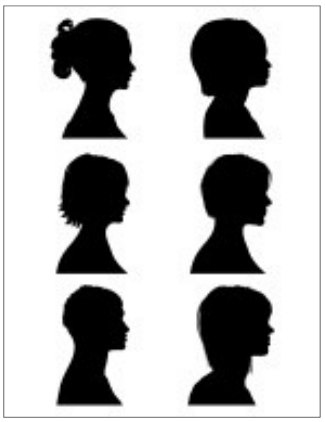
60

The design manager profile in the Brazilian building sector

Ph.D

https://doi.org/10.11606/T.3.2012.tde-20092012-113647

This thesis discussed the profile, the activities and the autonomy for the design manager in the context of the Brazilian building sector. The Delphi method was adopted in the research and its three stages involved 28 managers from the ten most relevant states of Brazil.



 61

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Collaborative design contracts for Building Information Modelling

M.Sc

https://doi.org/10.11606/D.3.2013.tde-14122014-112835

The American Institute of Architects proposes a contractual model called Integrated Project Delivery. This research aims to analyze the implementation of this dynamics in Brazil. As methodology, two structured surveys were analyzed and a case study was carried out on a real estate company.

 62

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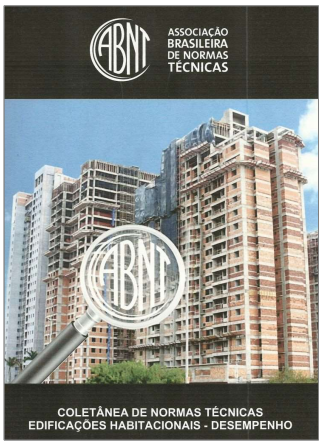
The impact of performance standards on the building design process

M.Sc

https://doi.org/10.11606/D.3.2016.tde-19072016-083350

The research aims to identify the impacts caused by the Brazilian "Performance Standard", as it is known the NBR 15.575, on the design process.
The methods of case study and research-action have been applied, in order to describe how the design process has been changed by real estate and construction companies.



 63

63

https://doi.org/10.11606/T.3.2009.tde-08092010-125813

Sustainable building design as a new demand for architectural firms

Ph.D

Design highly influences the environmental performance of the buildings, but the new requests of sustainability are also a challenge to designers. This research aims to analyse how architectural firms have been reorganised facing up to those demands of more sustainable design solutions.

64

https://doi.org/10.11606/D.3.2016.tde-24082016-085010

Sustainability requirements for infrastructure construction firms

M.Sc

The infrastructure industry has a role with regard to their economic importance and magnitude of environmental and social impacts caused by its large projects. This research aimed to define the sustainability requirements applicable to construction companies from the infrastructure sector.

65

The implementation of BIM in a Brazilian Public Bank

M.Sc

https://doi.org/10.11606/D.3.2016.tde-23082016-152604

Caixa Econômica Federal is the most important bank in the Brazilian Construction industry. It has a technical department that manually performs feasibility analysis and verify the budgetary and financial development of building projects. New tools and modelling guidelines have been proposed to enhance its technical practices.

 66

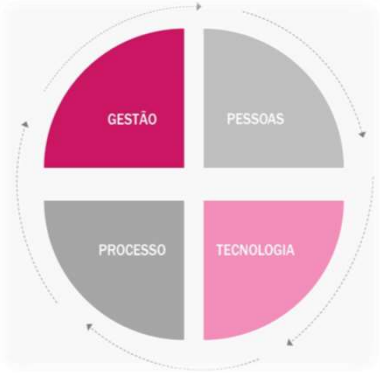
66

The implementation of BIM in the Brazilian Architectural Firms

M.Sc

https://doi.org/10.11606/D.3.2017.tde-13032017-100600

Based on three case studies, this research aims to present an overview of the Brazilian architectural firms which are using BIM and evaluate their maturity stages related to processes, people and technology.



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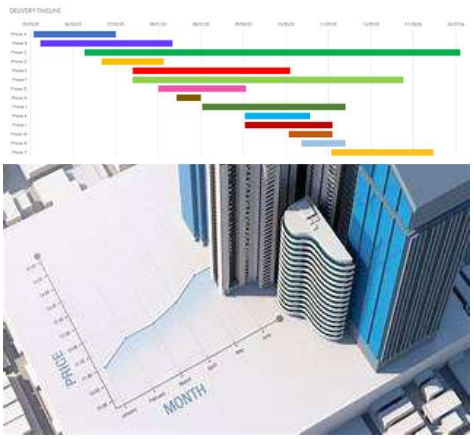
67

https://doi.org/10.11606/T.3.2017.tde-18072017-110219

Method of planning and scheduling for real estate projects

Ph.D

This research analyze the main causes of delay in construction projects and proposes a structured method to improve the time planning and control tools. A field survey with 50 real estate construction projects identified the main factors influencing the delays.

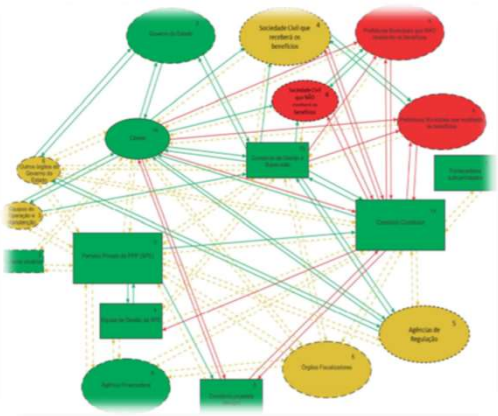


https://doi.org/10.11606/D.3.2019.tde-07052019-091445

Project Management Methods for Infrastructure Projects

M.Sc

Using a case study approach, this study examines two large infrastructure projects in the Metropolitan Region of São Paulo, and discuss the influence of their main stakeholders and the applicability of project management methods.



- **Project management in infrastructure projects and foreign construction companies**

M.Sc

https://doi.org/10.11606/D.3.2019.tde-29052019-071741

The participation of foreign construction companies in Brazil has grown significantly and an efficient set of project management methods is required for their success. The work is based on case studies of recent projects.

 70

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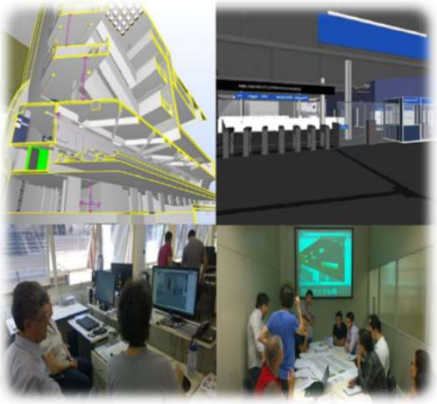
- **The adoption of BIM in the Brazilian Infrastructure Companies**

M.Sc

https://doi.org/10.11606/D.3.2020.tde-04092020-103026

The thesis reports the distinct experiences of five large infrastructure companies of São Paulo city during its BIM adoption process and proposes a practical procedure to BIM adoption in the infrastructure companies.



 71

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Critical success factors for BIM in the design and construction interface

Ph.D

https://doi.org/10.11606/T.3.2022.tde-22052023-082246

The aim was to identify critical success factors for BIM in the design and construction interface and the research methods mixed qualitative and quantitative approaches: two exploratory surveys, bibliometrics, content analysis, and multi-case studies.

72

MORE RECENT WORKS..

M.Sc M.Sc M.Sc M.Sc Ph.D

- Model checking of performance requirements
- BIM implementation in a Brazilian real estate and construction firm
- Ethical integrity in construction firms
- BIM and risk management
- IPD contract suitability in Brazilian building projects...

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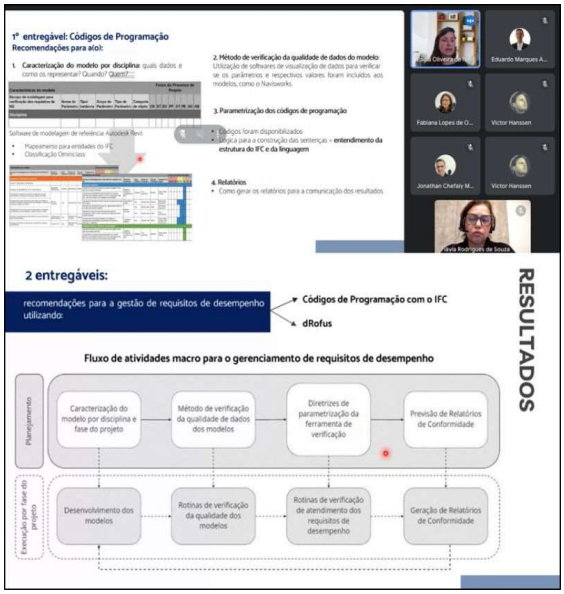

 74

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Other results...

 75

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Books

 76

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Postgraduate certificate in construction project management (**GPC** EaD)

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GESTÃO DE PROJETOS NA CONSTRUÇÃO – EaD
Postgraduate certificate in construction project management (GPC EaD)
© Silvio Melhado 2023
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GESTÃO DE PROJETOS NA CONSTRUÇÃO – EaD
Postgraduate certificate in construction project management (GPC EaD)
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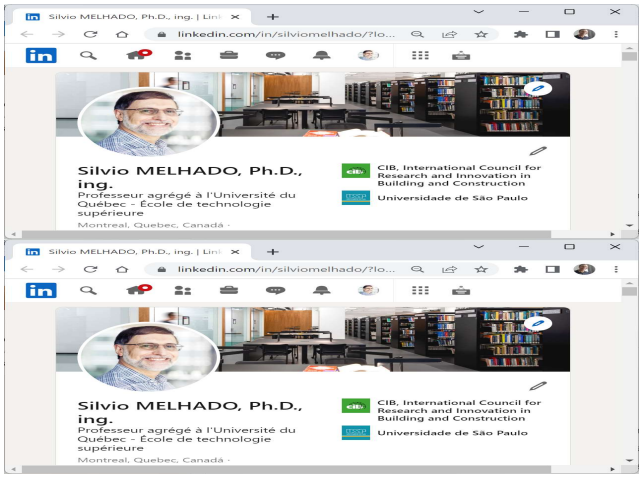
Linkedin profile



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Thanks!
Merci!
Obrigado!

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