

Organically Integrated Project Delivery of a Mission-Drive Team

An exploratory study on managing the MOR Team TU Delft during the Solar Decathlon Europe 2019

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Msc. Architecture: Management in the Built Environment

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MOR

**3 first prizes
4 second prizes
1 third prize
1 second place overall
1 special award**

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Painting The Project's Picture



energy endeavour
FOUNDATION

COLLABORATION
REHABILITATION
INNOVATION
FUNCTIONALITY
ADAPTABILITY
DURABILITY
EFFICIENCY
RESILIENCY
MASSIFICATION
FRUGALITY

dep



solar
decaathlon
europe


SZENTENDRE
HUNGARY

19

The art of smart building.

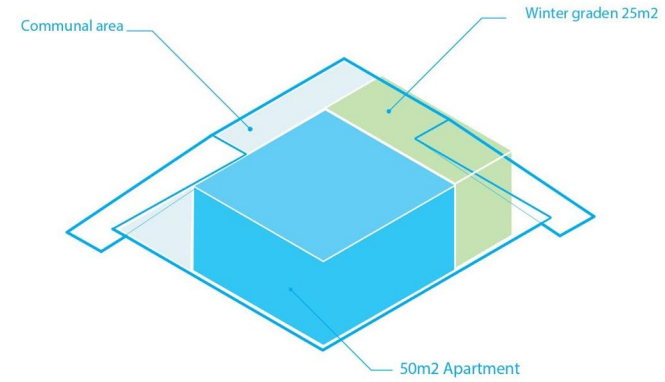
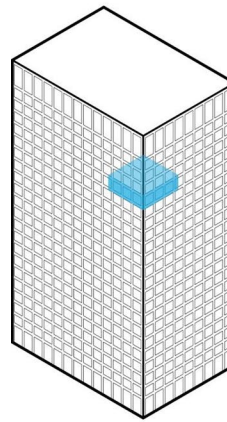


**WE ENVISION A FUTURE-PROOF BUILT
ENVIRONMENT THATS GIVES BACK TO
ITS SURROUNDING MORE THAN IT TAKES
AWAY FROM IT**

The background of the slide is a grayscale photograph of a city skyline. Three prominent, tall office buildings with grid-like window patterns are the central focus. The sky is overcast, and other smaller buildings are visible in the distance and foreground. The overall tone is professional and urban.

**WE DEVELOP A MODULAR DESIGN
STRATEGY TO TRANSFORM INEFFICIENT
OFFICE BUILDINGS INTO NET-POSITIVE
AND AFFORDABLE HOUSING FOR
STARTERS.**

AS A “CUTOUT” FROM THE TOWER





MOR MODULAR OFFICE RENOVATION

PHOTO

Volunteer-Students

- University students
- Usually master level
- Extracurricular activity
- In our case, some credits were available
- Rely only on the motivation
- We did the design
- We did the construction



Students | Countries Faculties

The team in numbers

- 52 Students
- 20 Nationalities
- 3 Faculties
- 8 Departments
- More than 80 partners
- 7 digits budget
- 22 Months

10 Committees

Engineering design

Organisational Committees

Architectural design

Functional design

- BPP (Building physics and performances)
- EMD (Electrical and mechanical design)
 - SD (Structural design)



Engineering design

Architectural design



- Architecture
- Neighborhood integration

- PR & Communications
- Partnerships and finance
- Project Management



Organisational Committees

Functional design



- Materials & Sustainability
 - Viability

Project Management Committee

Members and Tasks

- Kosmas (MBE)
 - Recruitment, Health and Safety Planning & Coordination, Team's management.
- Momir (BT)
 - Construction Management, Logistics, Health and Safety coordination
- Francesco (MBE)
 - Daily team's management, construction management, health and safety coordination, logistics, contest captain, rules compliance, project management, STL...

Team Roles

Team
Member

Committee
Leader

Contest
Champion

Construction
Manager

Faculty
Advisor

Team Partner

Board
Member

Safety Officer

Team Officers

Faculty
Advisor

Project
Manager

Project
Architect

Project
Engineer

Structural
Engineer

Electrical
Engineer

Student
Team Leader

Health &
Safety Team
Coordinator

Safety Officer

Site
Operations
Coordinator

Contest
Captain

Instrumenta-
tion Contact

Communica-
tion
Coordinator

Sponsorship
Manager

MOR Daily (weekly) Board



Project Engineer



Project Architect



Sponsorship manager



Communication manager



Team manager, Project Manager, Contest Captain, Construction Manager



2 Main faculty advisors

Management tools



Shared central drive



Slack as main mean of communication



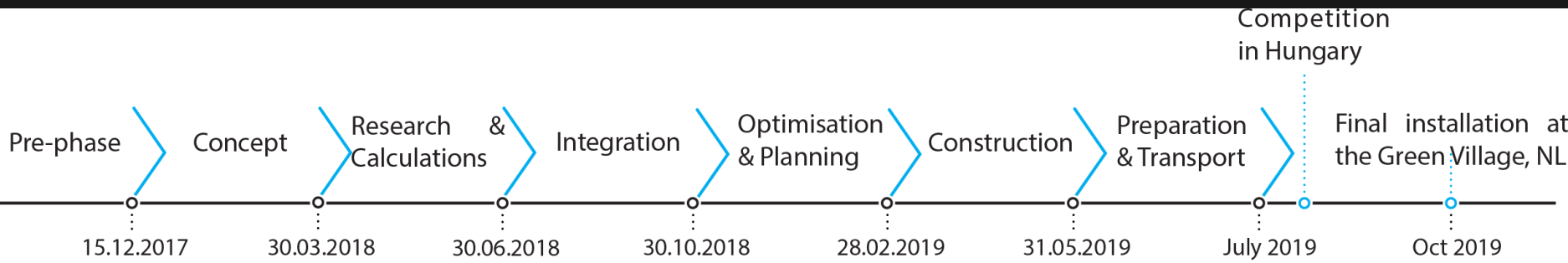
Asana (Used to)



Shared spreadsheets for scheduling (many of them)



BIM software



DESIGN DEVELOPMENT
 The team will determine the design of the concept which consists of the interior and exterior design of the building.

BUILDING INTEGRATION
 In the first phase, specific teams are re-searching and calculating about the different systems that will be included in the chosen concept. Second phase: integration of all the systems into the chosen existing building.

CONSTRUCTION PLANNING
 The site preparation and the materials & services procurement process must be prepared prior to the project. Using the BIM model, a 4D planning will be prepared, where every phase of the fabrication will be detailed.

FABRICATION
 Based on prior experience, two months are planned to fabricate all the building parts. These components will be simultaneously assembled in the Netherlands to allow for first adjustments.

NL DISASSEMBLY
 In the next phase, the disassembly of the project is taking place, followed by its transfer to the competition's site in Hungary. At the end of this task, the project will be ready to go.

This Study And It's Focus





In the context of **volunteer-student** led AEC projects,
what are the **characteristics** and functions of
COORDINATION, capable of improving the
performances of the team, and those covering these
roles?

Study Goals

Document	Document the management processes of the MOR Team
Provide	Provide valuable information and insights to current and perspective Solar Decathlon teams
Explore	Explore the possibility for future research

Type of study



QUALITATIVE



EXPLORATORY



CASE STUDY

A qualitative study, that follows an inductive approach to an exploratory case study, where patterns are deducted from collected data to generate possible research paths and insights.

Why this type of study



A research from the inside



Looks at interpreting and understanding processes



Specific and new field of study

Why this timeline



Focus on the design phase



From conceptual to final design



The competition days are the results of the previous 4 semester

The answer to the main research question comes from the study of **3 main topics** emerged during the study of the available data:

ORGANIZATION, MOTIVATION & MISSION



Collected Data & Research Process

Collected Data



PRIMARY DATA



REFLECTIONS &
DESCRIPTION



INTERVIEWS

Primary Data



Meetings minutes

Workshops reports & flipcharts

Shared spreadsheets

Team's publications

Personal notes

Reflections & Descriptions

- **Reflections:** reflections and description of events right after the competition. These sources were a first attempt at understanding the project in its entirety.
- **Description:** Reconstruction of the events 6 months after the events. The documents redacted in this phase are an objective account of events and facts, developed with the help of primary data and informal chats with my fellow team members.

Interviews



FORM: semi structured interviews that evolved into extended reflections of the interviewees on the topics emerged during the description of the events.



SAMPLE: Key team members that had to work with the actual coordination of the project: Project Architect, Project Engineer, Partnership Manager, HR&HS Manager, Construction Manager.

As well as two key committee members.

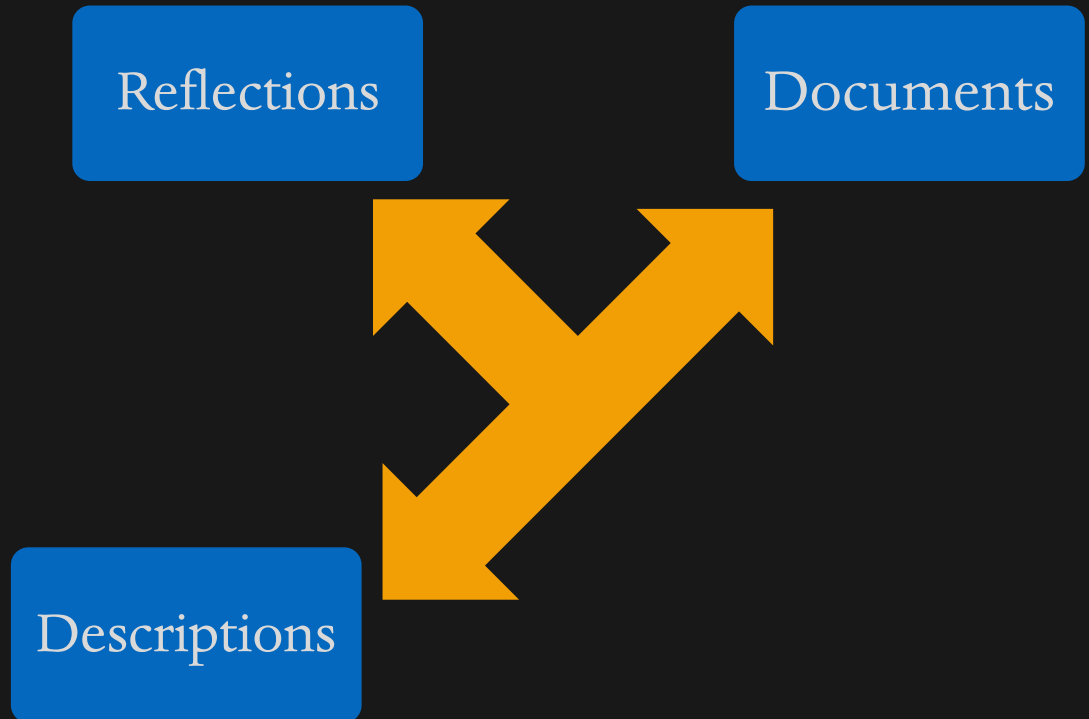
Data Study

- Documents and interviews were studied through **ATLAS.ti**
- The software was used to develop a series of **codes** in a **deductive** way.
- **MOST IMPORTANTLY** the software was used as tool to look at the entire picture, as a **virtual whiteboard** and aided when **interpreting the documents**

Code	Grouped Code Groups
Perception on the process	43 Opinions
Team coordination	40 Management Specific
Organization	38 Management Specific
Perception of managers/management	31 Management Specific
Lessons learned	27 Lessons
Team vibe	24 Opinions
Organization change (reasons)	24 Team changes
Decision making	23 Management Specific
Integrated/organic design process	22 Management Specific
Motivation to continue	21 Motivation
Management work	20 Management Specific
Management/leadership tools	20 Management Specific
Perspective change	18 Lessons
Phase change	16 Team changes
Interest in management	15 Management Specific
Leaders vs Followers	15 Management Specific
Organization phase 1 collaboartion	15 Management Specific
Get it done attitude	15 Opinions
Management expectations	14 Management Specific
Motivation effect of starting the construction	14 Motivation
Effect of construction on team processes	13 Opinions
Internal clashes	13 Opinions
Motivation to start/join the project	11 Motivation
Motivation of working on site	10 Motivation
Mission. Competition focus	10 Opinions
Collaboration with F.Advisors/partners	9 Lessons
Focus from design to construction	8 Team changes
Communication/Information sharing	7 Management Specific
Motivation for the design	7 Motivation
Project results	6 Lessons
Personal relations	6 Opinions
Mission project rather than competition	5 Opinions
Competition Rules role	4 Management Specific
Internal rules	4 Management Specific
Perception on the results	4 Opinions
Working space	3 Lessons
Motivation keeping each others going	1 Motivation

Research Process - Step 1

- Collection
- Development
- Study



Research Process - Step 2



Organisation | Motivation | Mission

Research Process - Step 3



Interviews

Research Process - Step 4





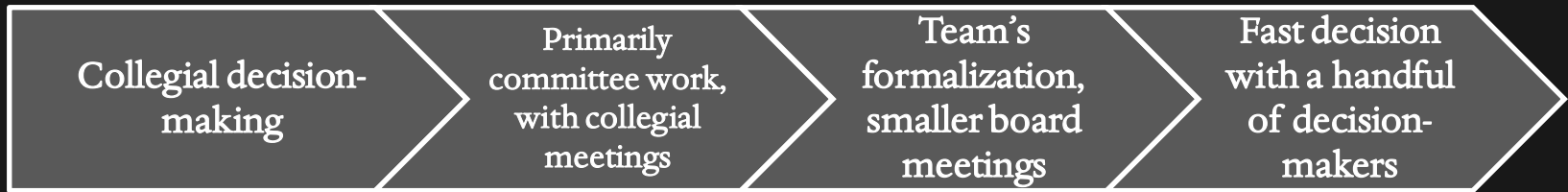
Research Results & Discussion

ORGANIZATION

Starting hypothesis:

The organization of the project reflects the attitude of the team. It changed throughout the project responding to specific needs and developing according to the project phase.

The structure was developed by the management team while looking at scientific literature.



- An organisational structure tailored to the needs of the team.
- An organisation evolving and adapting to changing and evolving needs of the team
- An evolving decision-making process
- An experimental attitude towards the team's organisation

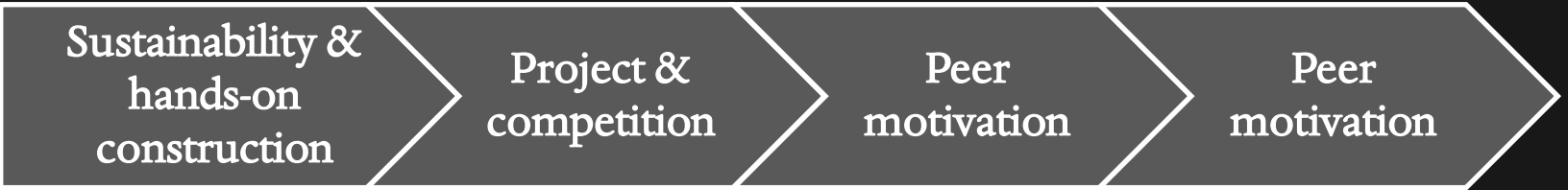
In conclusion an ORGANICALLY INTEGRATED PROJECT DELIVERY

MOTIVATION

Starting hypothesis:

The main motivation factors for the team members were firstly driven by the project itself and then by the personal interest on completing the project.

The competition brought us together but was soon put aside as a motivating factor.



- Combination of personal and team's motivation drivers
- Team's and project's mission as motivation drivers
- Different factors were coexisting at the same time
- Peer motivation emerged as a fundamental motivation driver
- As a consequence HR is a key role within such teams

In conclusion an EVOLVING COMBINATION OF MOTIVATION DRIVERS

MISSION

Starting hypothesis:

The team's mission changed throughout the project, at first focusing entirely on the design itself, then shifting towards complying to the competition's rules, and finally on the need to build it on time.

- Closely related with the motivation drivers
- Motivation & mission are interdependent
- Competition & project mission coexisted, varying of relevance between the two

In conclusion a VARIABLE GEOMETRY MISSION

EMERGED RESULTS



The importance of a shared common space



Advisors and their key mentoring role



Roles definitions

Adjusted definitions

- **Team Leader:** Or team manager, is the student tasked with the overall **coordination** of the team, overseeing its organisation, and drive towards the achievement of the project mission. Ensures that the organisation answers to the **needs of the team** and that information is shared appropriately.
- **Project Manager:** team member responsible for the overall **execution** of the project, ensuring its **progress** towards the achievement of the team's goals and its **efficiency**.

- **Project Architect:** team member responsible for the architectural design **management and coordination**. Ensures that the architecture divisions are **effectively reaching the goals** necessary to achieve the project mission.
- **Project Engineer:** team member responsible for the engineering design **management and coordination**. Ensures that the engineering divisions are **effectively reaching the goals** necessary to achieve the project mission.



Recommendations For Future Research

Recommendations for future research

The Solar Decathlon Teams are a laboratory
where it is possible to observe
management in action.

Comparable projects

Comparable timeline

Comparable organisations

- **EXPAND** the current research including a larger sample of team members interviewed
- **DEVELOP** more case studies on Solar Decathlon Teams



Reflection On The Research Process

Reflection on the research process

- The results exceeded my expectations.
- Research on a personal work is uncommon, difficult, doable.
- A Solar Decathlon is exhausting, but an unmatched learning experience.



Conclusions

In the context of volunteer-student led AEC projects the characteristics and functions of coordination, capable of improving the performances of the team, and those covering these roles are:

An organically integrated project delivery,
an evolving combination of motivation drivers,
and a variable geometry mission,
capable of EMPOWERING the team's MISSION DRIVEN
members



Thank you!

**TOGETHER
WE CAN DO
MOR**