

International Collaborative Construction Management

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Technion
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METU

Faculty

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Motivation

- Several American construction companies have reported the fact that their engineers and project managers are not prepared to deal with the requirements of the increasing globalization that is creating new opportunities with expanding markets all over the world.
- Construction companies, engineers and project managers are realizing that their domain knowledge on materials, equipments, construction techniques, management techniques and methods, and social skills are local and that when they are bidding and planning international projects to be built abroad they have to learn to work, collaborate and acquire information from local engineers and managers.

The Course

- Intended to provide a comprehensive overview of the life cycle of the facility development process and of relevant project management techniques.
- Students learn not only how to develop construction estimates, schedules, and risk management plans, but also, globalization issues, methods to work on multicultural teams, negotiation techniques, and methods to improve international collaboration enhanced by the use of Information Technology.
- Students work in international teams to collaborate from remote locations via the Internet taking maximum advantage of information technology using commercially available software.
- Students also report on lessons learned on working with different cultures.

Students Deliverables

- Weekly journal describing group interactions and assigned readings summaries;
- Formation and description of an international joint venture organizational structure and collaboration contracts;
- Project deliverables (e.g. estimate, risk assessment, and schedule) based on country-specific construction materials and processes;
- Group report; and
- Final individual paper describing the overall experience in working with multi-cultural construction project teams.

2007 Project

- The faculty defined the project deliverables during the first weeks of class, and students working on three different projects, one in Israel, one in Brazil, and one in Turkey were asked different deliverables, as follows:
 - Carmel Tunnel Project (Israel): bid proposal including construction methods, schedule and Budgets;
 - Santa Maria Residential Project (Brazil): production system design alternatives, financial feasibility analysis for the alternatives;
 - Eskisehir Light Rail Transit Project (Turkey): cost estimation, schedule of works and risk management plan.



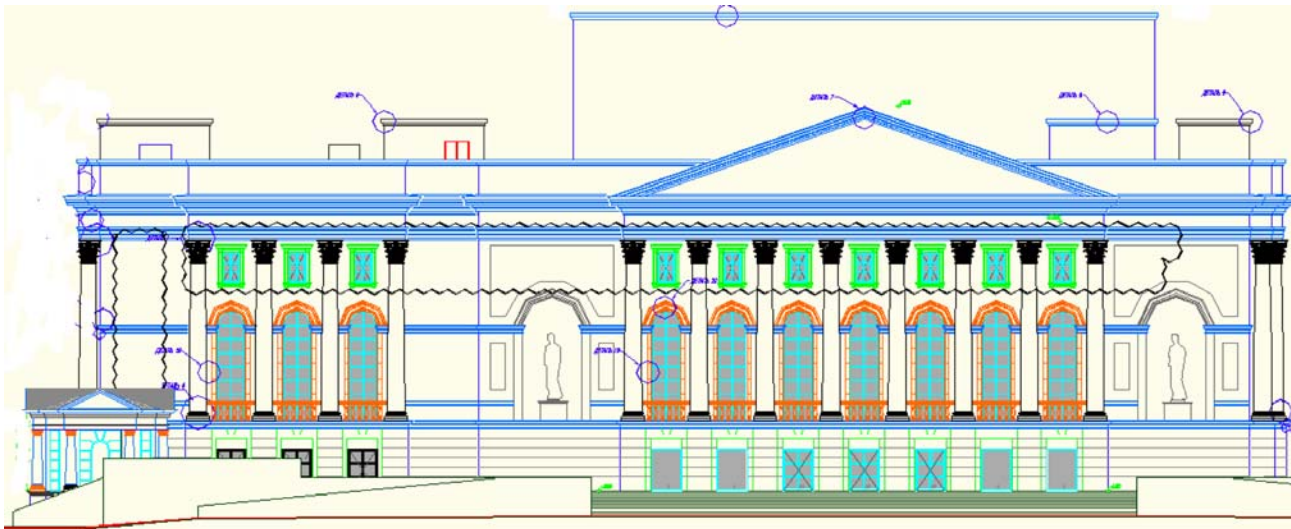
2008 Project

- Approximately 150,000 square feet core and shell office building.
- Each team had a designated **cost estimator** responsible for preparing a summarized comparison of the cost estimates created for the same building in different countries.
- The **scheduler** was responsible for preparing comparative project plans (schedules) that detail the phases of the project and their durations. A separate schedule was prepared for the construction project in each country based on local data about production rates, times required for securing building permits, inspections, etc.
- **Risk Manager** carried out risk assessment to select the best project (material, construction technology etc.) selected from the various alternatives generated for each country.



2009 Project

- Approximately 400,000 sf, 90' high Theater building. Main structural elements (beams and columns) of the building are concrete and the exterior enclosure is composed of CMU walls





Outcomes

- Enriching experience for both faculty and students.
- Students were able to be immersed in a diverse international working project context
- Challenges and lessons emerged as expected, as those related to time, cultural values, knowledge, language, and organizational.
- One positive finding was the fact that, differently from expected, technology for communication means was not a major challenge.
- As expected, students reported the negative impact of cultural differences in their final individual reports. It became apparent that students from different countries with different cultures have different mental models of the way in which collaborative groups should be structured, how they should function, how roles should be assigned within the group, and who should be responsible for ensuring that tasks are completed with the expected quality and on time.

Outcomes (cont.)

- We observed strong correlation between student teams that did not invest sufficient time to design a reasonable organization structure and to explicitly formulate how teamwork should be structured, on the one hand, and the incidence of problems in the collaboration.
- An issue that arose every year is concerned with different perceptions of time, punctuality and tardiness across cultures. Coordination of holidays proved to be difficult.
 - American students were upset with the low level of output delivered by the Brazilian students during the Carnival break in Brazil, but presented exactly the same behavior during the spring break in the US. American and Turkish students clashed because of different understanding of the importance of being punctual for meetings.

Outcomes (cont.)

- All communication and coursework was conducted in English, which required all of the other students to collaborate in their second language, and also required them to translate all of the technical material into English for the benefit of their American colleagues. Several documents, such as project documents and local publications of cost and productivity data, had to be translated. This double burden – of functioning in a foreign language, and the work of translation – was largely taken for granted by the American participants.
- Personality is also a key factor. In the few cases where individual students were unable or unwilling to fulfill their tasks, the resulting tensions caused the team more problems than the cultural differences did.
- Students became acutely aware of the differences in engineering practice and construction methods between the countries

Quotations from Students

- “For this [the final paper students wrote assessing the course] we are asked to reflect on the class over this past semester. My reflection is one of appreciation where I have once again regained my love for international awareness and work. Because of this class I was able to convey my international goals to the company I went to interview with today.”
- “Before this class I had no idea what went into an international project. But now I have generally understanding of what it takes. I know that communication is the key and having a strong local team is essential to the success of the project. This was a great learning experience and hopefully I get a chance to use what I have learned one day”.

Quotations from Students (cont.)

- “This semester has been a great opportunity to learn about other cultures by directly interacting and working with students from very different parts of the world. The structure of the class worked very well to have us understand what it is like to work on international teams for construction projects. The working setting gave us a much deeper understanding of each other’s cultures than if we were simply traveling on vacation to either Brazil or Turkey”.
- “The ICCM class truly has been a unique learning experience for me, and I am glad that I took the course. While the project did allow us to work on another civil engineering project and gain more experience, I feel the true value in the class was in attempting to work in an intercultural environment. Working with those in other countries was intensely more difficult than I anticipated it would be. I feel it has been a valuable learning experience. In the real world you will not always be working on projects with your chum from the cubicle next to yours, but will instead be working with individuals from either across the country or perhaps even the globe. This class gave me first hand experience as to what that experience is like, and I now feel prepared for that situation in the workplace, as opposed to where I was one semester ago, a naïve American”.

Quotations from Students (cont.)

- “ICCM was one of the most interesting class experiences I have ever had. It is something that I am very proud to have done, something that has been at times both rewarding and frustrating, something that has taught me a lot about myself and how to work with others. I truly wonder how the US will manage with the changing economy. Will the US maintain its international force or will it lose its financial stronghold? As we learned from the globalization readings, globalization is happening and one cannot fight it and must embrace it. I believe ICCM has given me a strong footing in the world of international collaboration (and also an excellent academic project to put on my CV)”.