GLOBALIZATION OF THE ENGINEERING AND CONSTRUCTION INDUSTRY

Session 1: Course Introduction

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7. Open Discussion on *The Lexus and the Olive Tree,* Chapters 1-3
   NOTE – copies of Thomas Friedman's book, *The Lexus and the Olive Tree*, are available at the MIT COOP. Please purchase a copy and read Chapters 1 and 2 before the first Session.

8. **Session 2** –
   20/20: Vision for the Future of the AEC Field

The Course will be taught by Professor Fred Moavenzadeh, Director of the Technology and Development Program at MIT, and Derish M. Wolff, the Chairman of Berger Group Holdings (information on both Professors is available on the MIT website http://web.mit.edu/1.463/www/ and information on the Berger Group is available at www.louisberger.com).

1. **Introduction**

Each student will introduce self, including background, prior schooling and work experience; future plans and ambitions; and what you hope to gain from the course. Students should also obtain a copy of Thomas Friedman's *"The Lexus and the Olive Tree"* at the MIT COOP and be prepared to briefly discuss Chapter 1, "The New System," pps. 3-15 and Chapter 2, "Information Arbitrage," pps. 17-27 in class during the first session.

2. **Course Structure and Lecture Outline**

We hope you will gain from this course a better understanding of the opportunities in the "International Built Environment" for professional growth and satisfaction. We are going to try to explore the "International Built Environment" in detail, how it functions, what are the managerial, entrepreneurial and professional opportunities, challenges and risks in it, especially growing crossover, concession and multi-disciplinary opportunities and understand "what makes this 'Built Environment' so different from other sectors."

The Built Environment is characterized by:

- an emphasis on projects and discrete investments,
- a large number of enterprises in the field with limited opportunity for successful vertical integration and the continued need for inter-enterprise coordination and collaboration, and
- limited economies of scale and excellent opportunities and rewards for individual entrepreneurs.

Historically, and certainly since the Civil War, the U.S. economy and society was a rich and open one with great opportunities. As a result, we have, perhaps, over-rewarded entrepreneurs, and while in the '90s professional managers did quite well in relation to entrepreneurs, investors, etc. and the borders between entrepreneurs and professional managers became less clear, until that time American society clearly favored entrepreneurs.

One valuable observation a former professor made was, "When you go down to Florida and see all the yachts, check the manifests to learn the names of the owners. You may, surprisingly, find that you never heard of most of these companies." Furthermore, the recent backlash over CEO and senior management salaries, perks, compensation and alleged abuses may, once again, favor entrepreneurs and owners or at least encourage greater scrutiny of professional managers.

3. **Course Format**

This course will, hopefully, assist you to better understand:

- the growing forces of globalization and privatization and the impact on the Built Environment;
- the skill sets you must acquire to successfully navigate and flourish in this emerging world;
- your career objectives and maybe even help you change them, while providing some essential and practical tools to move forward.

Some topics we will cover are being offered in other courses. This course will, hopefully, provide you with a broad overview and show how such topics specifically relate to an international career or practice.

The classroom style is participatory, modeled after an AEC corporate operating committee or management meeting. You will each be treated as promising managers recently appointed to the committee, so we hope you will all actively participate in class discussions.

- There will be no final examination
- Grading
  - 20% - attendance and classroom participation: since there is no final examination, attendance and class participation are quite important
  - 30% - homework: review of assigned readings, class presentations and outside research on session subjects will be encouraged
  - 50% - term paper and presentation: on "Establishing a Local Office, Investment or Concession" due at the twelfth session

- Required Reading

  - *"The Lexus and the Olive Tree - Understanding Globalization"* by Thomas Friedman

  - (1999, January). "Greatest Construction Projects." ENR (Engineering News Record), pp. 1-34.

  - "Empresas ICA and the Mexican Road Privatization Program," Harvard Business School Cases Case #9-793-028, Boston: Harvard Business School Publishing.

  - Flyvbjerg, Bent, Mette Skamris Holm and Soren Buhl (Summer 2002). "Underestimating Costs in Public Works Projects – Error or Lie?" APA Journal, pp. 279-295.

  - (October 18, 2005). "Transparency International Corruption Perceptions Index 2005."

  - (September 28, 2005). "Global Competitiveness Report 2005-2006," *Country Index Rankings*, World Economic Forum.

  - (January 18, 2001). "ENRON's Eight-Year Power Struggle in India" (edited) by Tony Allison. Asian Times.

  - "Measuring Productivity and Evaluating Innovation in the U.S. Construction Industry," Building Futures Council.

  - "VMS Asset Management Contract for Virginia's Interstate Highways."

    - Useful magazine and interesting supplementary reading includes:

  - Construction Business Review

  - Civil Engineer, American Society of Civil Engineers

  - The Harvard Business Review

  - Institutional Investor

  - ENR

4. **Term Project**

Later in the semester we will break into three-person teams to prepare a formal presentation and business plan for the "Board of Directors" of a hypothetical company (architect/engineering firm, constructor/design-builder, concessionaire, etc.) to justify funding and opening an office, investment or concession in a developing country. Copies of two such papers, "Skanska AB: An Analysis of Industry Opportunity in India" and "Opening an Office in Korea," are available at the close of this session.

Students may also prepare individual papers rather than a group business plan, if they prefer. By the end of Session 7, or earlier, if you identify a subject for an individual rather than team presentation, please let Professors Moavenzadeh or Wolff know.

Finally, remember a large number of successful careers and enterprises have been launched on such college papers and ideas (e.g., Fred Smith's FedEx, Edward Land's Polaroid, Mike Milliken's *Fallen Angels*, Saul Steinberg's Computer Leasing).

5. **Logistics**

Derish Wolff's email address is dwolff@louisberger.com.

Fred Moavenzadeh's email is severino@mit.edu.

The course website is http://web.mit.edu/1.463/www/.

- The notes for each upcoming session will be posted 4-5 days in advance on the website. Please read these before the class.

- Office meetings are encouraged and can be arranged via email.

There will be a sign-in attendance list before each class.

6. **The International AEC Field and the Built Environment**

Overview

When we were students, the two most attractive career opportunities were chemicals and packaged goods. Charles Luckman left an imminently successful architecture practice to sell soap and rose to the head of Lever Brothers. Fortunately, he also had the time and foresight to commission the Lever Building in New York City. Computers were an esoteric field; telecommunication and Wall Street finance, dull backwaters; electronics something discussed at Stanford, Cal Tech, Penn and here at MIT.

Given that caveat, let us try to explore the likely future of the architect/ engineering/construction fields, key elements in "the Built Environment," and our rapidly emerging global village. This is a field that will be challenging, exciting, rewarding, frustrating and, at times, disappointing – but never boring.

While not the second oldest profession in the world, construction, design and consulting is a long, if not always honored, practice. History reminds us of the accomplishments of the great architects/engineers with monumental works such as Phidias' Parthenon, Sinan's Great Mosques for Suleiman the Magnificent, Michelangelo and Leonardo da Vinci's brilliant endeavors, and the master builders of the great European cathedrals of the Middle Ages.

International consulting and construction is almost as old a profession. Phoenician designers and contractors assisted Solomon in the construction of his temple; Chinese urban planners designed the then-new Japanese capital at Kyoto; Italian architects and designers advised Mehmet the Conqueror on the rehabilitation of historic Constantinople into Istanbul; Tamerlane's Samarkand and the Taj Mahal were veritable "Boston Central Arteries" for architects, designers and construction managers, with the Mogul Emperor Shah Jehan drawing experts all the way from London and Italy for the Taj, under the original architect who was Persian.

Unfortunately, on a less positive note, the field has also been susceptible to the criticism of excessive reliance on foreign advisors. In fact, one could argue that the Maccabean Revolt in ancient Palestine was caused in part by the importation of Hellenic architects who thought they were modernizing and improving the ancient Hebrew temple, a feeling not shared by the more conservative Jews and a view supported by many present-day Islamic Fundamentalists.

7. **The International AEC Practice**

Overview

In recent history (1880-1960), American and British consulting engineering firms dominated the international engineering field. These firms had distinct advantages, the most obvious being the fact that in America and, to a lesser degree, Great Britain, there had traditionally been a separation of the role of the engineering consultant and architect from that of the contractor. In both countries, the practice was for a civil engineer or architect to be employed to prepare the plans which were then typically let by competitive bid.

As a result, from 1900 onward there developed a significant group of U.S. and British consulting engineering firms with experience in a multitude of civil engineering assignments, while in the balance of Europe many of the major assignments were either designed by in-house government agencies or contractors using design/build procedures.

This development was further encouraged in the U.S. by a political system where a large percentage of the construction work is given out by municipalities and state governments less likely to have sufficient staff to undertake the detailed design and construction of major public works than, say, a centralized public works body such as exists in France. Similarly, the British Colonial system encouraged the use of UK-based consultants to deal with specialized assignments, especially those related to water systems, railways and telecommunications throughout the Empire. Thus, experienced groups of consulting engineers arose in both countries.

The American firms, moreover, often had the added advantage of being the bearers of new technologies. This was especially true in the construction of large civil engineering works such as highways, railroads, canals and major dams. Here, the U.S., given its larger landmass in comparison with most European nations (excluding Russia), for a long time had greater experience and, in building the Panama Canal, had an early opportunity to showcase their new heavy construction equipment often borrowed from earlier agricultural mechanization. Thus it was not uncommon for foreign clients, even European nations, to call on U.S. consulting and construction firms for highly specialized civil engineering work. During World Wars I and II, the American reputation in these fields was further enhanced and with post-World War II developments including the Marshall Plan, a number of American engineering firms and contractors rapidly expanded overseas. The subsequent cold war-fostered military programs further encouraged U.S. firms to venture abroad. Thus, from a rather successful base in the first four decades of the 20th century, U.S. consultants and contractors were increasingly active in the '40s through the '60s, initially in rebuilding Europe and then meeting the growing cold war

needs of their military. U.S. architects, engineers and contractors also followed domestic clients such as IBM, General Motors, Ford, ITT and the U.S. oil giants abroad.

As a result, the U.S. engineering and architectural firms and, to a lesser extent, contractors, were able to set up permanent offices throughout the world where they undertook increasingly large numbers of local assignments, to supplement those stemming from various U.S. government-sponsored programs. This support from their government, especially the military, as well as the Marshall Plan, ICA and more recently, the U.S. AID programs, has been a major factor in the overseas expansion of U.S. engineering and construction firms.[1]

Thus, despite claims that they have not been favored by the U.S. government, the American consultants and contractors have been major beneficiaries of the expansion of U.S. government activities abroad. As a result of these factors, the U.S. engineering profession had reached a position of preeminence throughout most of the world by the mid-'60s.

This position, however, could not pass unnoticed by various foreign governments. These countries, in general, have followed two broad courses of action. The first was to encourage the expansion of turnkey or contractor-directed initiatives in which the contractors assumed the responsibilities of designing, managing and frequently financing civil engineering works. Many governments, especially the Italian, Spanish, French, Canadian and German, encouraged their domestic construction firms to go overseas under various export credit arrangements whereby the builder can offer terms not unlike those offered in support of the sale of machinery by the U.S. Export-Import Bank. For example, once a price to design and build a dam is negotiated, the sponsoring country's export promotion agency will guarantee the payment of all or part of the contract and thus the builder/promoter can more easily obtain financing for the project. As you can readily understand, such a tool in the hands of a skillful marketer was a potent factor and frequently led to the

[1] During this period, more than finance, developing countries frequently lacked the skills to identify, implement and successfully manage large-scale development projects. Since the largest consulting component of such projects was frequently the civil engineering work, this encouraged the increased use, initially of U.S. consulting engineers and subsequently consultants from a number of other OECD countries, on an ever-widening variety of projects. In pursuing and undertaking such assignments, engineering firms also had to expand their range of services and talents. For example, the Louis Berger Group initially limited itself to the design and supervision of construction of highways and runways. With the increasing demands placed upon our organization for assistance in the administration of large development projects, we found ourselves continually assuming new responsibilities. Now we are essentially an economically- and environmentally-oriented engineering firm offering such services as national, regional and urban planning; organizational and institutional development; identification and definition of projects; review of standards and design criteria; as well as traditional architect/engineering.

reduction of opportunities for American firms who were often unable to offer comparable government-supported financing. Developing countries attracted to such programs because of their flexibility and speed of implementation, have often fostered them in preference to design/bid/build programs requiring the preparation of designs and bid documents, and time-consuming bid procedures. In the '90s, as we will explore later, the growing number of private sector infrastructure initiatives also found design/build and turnkey delivery systems increasingly attractive, thus further reducing many traditional international markets for U.S. consulting firms and contractors.[2]

Secondly, realizing the advantage of their consultants being employed overseas, e.g., the first technical contact, greater familiarity with domestic and likelihood, therefore, to consciously or unconsciously favor and specify domestic goods and services, etc., many governments also encouraged their consultants to venture abroad. Accordingly, Norway, Sweden, Denmark, Finland, Holland, Germany, France, Belgium, Italy, Canada, Japan and even Spain, Austria, Taiwan, New Zealand and Australia developed programs in the late '60s and '70s designed to encourage the use of their consultants overseas.

One manifestation was the creation of technical consultants pools such as groups of Dutch (Nedeco), Swedish (Sweco), Norwegian (Norconsult), Finnish (Finnconsult), and Japanese (JOC) firms to market internationally under a single organization. State- and quasi-state-owned enterprises such as BCEOM, Systra, ADP and EDF (France); SweRoad, SwedeRail and Swedavia (Sweden); JARTS (Japan); Sinotech (Taiwan); Deconsult (Germany); HydroQuebec (Canada); were also encouraged to move abroad. Frequently, these groups were supported by grants to fund their consultant services or to market these services, usually in close coordination with their embassies. Thus, we have witnessed the rise of a number of major international consultants from outside the UK and the U.S. To name a few: Canada (SNC-Lavalin, Golder, Stantec); Netherlands (Arcadis, DHV, Haskoning); Finland (Jaakko Poyry, Finnconsult); Egypt (Dar Al Handassah); France (Systra, Sogreah, BCEOM); Germany (Lahmeyer, GKW, Dorsch, Gauff); Denmark (Carl Bro, Ramboll, Cowi); Belgium (Tractebel); Sweden (Sweco); Australia (SMEC); and Israel (Tahal); joined in recent years by three mega-Japanese consultancies – Pacific, Nippon Koei and Sanyo – funded by rapidly growing Japanese aid. So, clearly, international engineering consulting, as well as the construction field, is increasingly crowded and competitive.

[2] In the EPC fields dealing with process designs, chemical plants, etc., as well as power, however, U.S. firms such as Fluor, Bechtel, Foster Wheeler, Kellogg Brown & Root, Black & Veatch, Earth Tech, etc., have proved more resourceful in providing turnkey services and have maintained, and even increased, their market shares.

Recent Trends

Until recently, these international consultants and contractors could be divided into two categories - general consultants and contractors, and specialized firms. The general consultants and contractors strived to maintain permanent representation abroad by offering a wide range of engineering, architectural and construction services. The specialized firms frequently offer more detailed services in narrower, typically highly technical fields such as ports, hydroelectric design, nuclear power, etc. In consulting engineering, specialized firms frequently perform much of the design work in their home offices, while general firms are likely to execute a larger portion of the work in the host country. In the construction field, again, specialized firms were less likely to have permanent overseas offices. But, in recent years, the distinction is less significant, as most larger firms have expanded their range of engineering and construction services, often through mergers, to provide a wider range of services to international clients and ensure continuity and maintenance of permanent offices and presences.

As the new global economy emerges, many U.S. and, to a lesser extent, Canadian and UK firms also face daunting obstacles when they try to compete for international contracts because they have to compete with competitors who may be subsidized or heavily supported – Korean contractors backed by chaebols and supportive government banks; the German contractors backed not only by liberal government export credits but by the Universal German Banks; the French contractors with access to equally attractive export policies, bonding and often supportive French banks; the Japanese contractors armed with preferential (JBIC), vaunted technology, R&D programs and the support of giant trading companies; joined in recent years by newly rich and ambitious Spanish and Taiwanese, and low-cost Turkish, Chinese and Indian contractors; to say nothing of the leading Italian and Swedish contractors who were often the first to test many foreign markets.

The U.S. government response in the '80s was to try to discourage other countries from subsidizing construction and engineering exports rather than to proactively compete. Further, as befits a world leader, USAID, the principal U.S. international development agency, had focused, until recently, on basic human needs - poverty alleviation, health and humanitarianism - often at the expense of infrastructure investments. USAID has also focused, in most cases, on the poorer developing countries, while Japan and other OECD competitors have focused on the more attractive emerging markets - Brazil, Argentina, China, etc. But, in recent years, the U.S. government has increasingly focused on post-conflict reconstruction (e.g., Iraq, Afghanistan, Macedonia, Bosnia, El Salvador, etc.) offering new opportunity for U.S. designers and contractors

And, the U.S. government supports design and construction exports in a surprising number of other ways including the U.S. ExIm Bank, OPIC, TDA, along with State and Commerce Department staff, etc., while many of our leading international competitors also complain about lack of governmental support.

Regional Responses to Globalization

In addition to globalization, the last 50 years have witnessed the return of regional trading blocks on a scale not seen since the former Colonial periods. These include, in addition to the EU, NAFTA, Microsur, the Andean Pac, SADDC, and increasingly ASEAN and possibly APEC. Often globalization and the rise of these regional trading blocs are treated as similar phenomenon opening or expanding trade. But, these regional agreements are often accompanied by moves to:

- introduce internal standardization and harmonization,
- encourage adoption of preferred standards (ISO-9000 etc.),
- encourage pooling of regional or intra-market resources (Airbus), and
- limit access through registration and reciprocity requirements.

So, while regional trading groups share many characteristics with globalization, they also serve to restrict or regionalize globalization. In response and in search of a "level" international playing field, a number of international agencies or organizations have been created or strengthened, most prominently WTO and OECD, to foster and monitor growing international trade and, while espousing a common free trade philosophy, in practice they are often at loggerheads with the emerging regional economic organizations. But, even with these growing trading blocs, trade restrictions are declining and construction-related goods, services, knowledge, investments, and staff will likely travel with increased ease across national boundaries; and large multi-national construction and architect/engineering firms already increasingly compete head-to-head in the global marketplace. However, far more is at issue than just the growth of large multi-nationals operating worldwide from a national home base. In fact, we're witnessing a denationalization of the global economy where it is becoming increasingly difficult to determine a company product or the country of origin of goods and services. A good example is the mass transit system recently completed in Bangkok, Thailand. Funding for the project comes from the consortium of Canadian, European and Japanese financial institutions; the design is partially prepared in Hong Kong by British-owned firms; equipment is supplied from Europe, Japan and the U.S.; construction

labor comes from Thailand, Korea and India; and U.S./English/German engineering firms handle project management.

Future Opportunities

What are the opportunities in the new decade, and how attractive will the field prove to be? Most U.S. design and construction professionals are clearly entering the new millennium as lambs. Will we exit lions? Throughout the '70s, '80s and '90s, U.S. practitioners took a battering over a variety of legal and environmental issues and concerns. Those who tried to emulate earlier visionaries in the U.S. such as Dodge, Burnham, Roebbling, Robert Moses and Amann were no longer viewed as skilled master builders opening up and developing an empty continent to serve our "manifest destiny," but rather increasingly, as a danger to the environment and "quality of life" itself. In their places, new practitioners appeared skilled at successfully guiding projects and programs through growing regulatory mazes, often at the expense of the original project's integrity. Furthermore, during the '80s and '90s a number of professions - especially law, finance and management consulting - proved more attractive, enticing some of the most promising students while, at the same time, encroaching on traditional AEC practices. Even when attractive new programs arose such as infrastructure privatization, financial professionals all too often took the lead, as with the Channel Tunnel.

But, following this period of relative decline when construction professionals' range of command was increasingly constrained by these new disciplines - to name just a few, urban planners, environmentalists, construction and program managers, value engineers, safety, security and energy experts, risk managers and last, but not least, MBA's and lawyers - they can once again enter a period of growing significance, creativity and, we believe, intellectual and financial reward if one has the courage to seize the new moment.

As noted, the traditional U.S. master designers and builders, the "lions" of the first half of this century that were the driving force behind many major U.S., as well as global, projects too often fell, resisting the environmental concerns and regulations of the late '70s and '80s. But, there is growing recognition and concern over the role of "regulatory" architects, engineers and program managers who often replaced them.

This new group of architectural and engineering planners and managers were clearly more sensitive and better able to adapt to often-changing environmental and regulatory requirements. But, their solutions were cautious and expensive and, all too often, increased program and project costs through modifications and unanticipated enhancements, while sacrificing many of the original projects' goals and purposes.

Furthermore, the growing opportunities for nation building and emergency relief programs that we will discuss have, again, brought engineers and contractors to the center of the world's stage.

Thus, we must strive to be "lions" again by developing new consensus on development and the environment before ambitious projects are launched so that well thought-out projects and designs can be effectively prepared without the need for extensive redesign and costly modifications to dodge regulatory bullets.

Furthermore, with the emergence of the new IT/internet global village, the traditional construction professional's training and skill base is increasingly in demand. For example, internet/IT and electronics can powerfully magnify a designer's impact. No longer do engineers and architects' rites of passage require long periods of apprenticeship and modest salaries at the foot of a master. In recent years, the masters have been replaced by large regional, national and increasingly multinational practices and often more attractive multimedia and eCommerce enterprises allowing you to use the skills you develop here for even greater intellectual and cultural impact and reward.

You are entering your professional careers as part of this new globalism where you may find that you share more in common with engineering graduates from Tsinghua University in Beijing than with liberal arts graduates from Boston College. The increasingly connected IT world will facilitate this movement by encouraging remote and multiple office design and yes, even construction supervision.

To take advantage of the opportunities, what skills should you cultivate?

- A firm understanding of the multidisciplinary nature of 21st century design, construction and management practices, including the roles of IT, CADD, finance, the environment, social and legal issues

- An understanding of growing crossover opportunities in IT multimedia and other emerging fields. While the new economy is a much abused but still valid term, its full consequences remain unclear. The impact of IT and the new economy on the Built Environment has, as yet, been barely felt other than in improved communications and program management systems. A mature technology is one that is so widely accepted, it is only noticed when it is not functioning. Electricity and telephony are examples and computing and IT is now joining them. Like electricity, and steam before, computing and IT has matured and become an enabling technology, fostering and supporting development in other sectors. The early impact of computing, as rapid as it was unanticipated, has now passed. The innovation fostered will,

however, continue for decades as the increasingly eponymous computer addresses all sorts of functions such as appliances, construction, credit payments, etc., and IT will likely follow this same course. It took almost 30 years from the invention of the steam engine to its full blossoming in the first steam-powered ship and even more importantly, the railroad. And why, for example, did the steam-powered railroad prove so much more revolutionary than the ship?

The same slow adoption occurred with the commercialization of electricity. Steam-powered factory production dominated until the end of the First World War, while electric-powered manufacturing was not totally dominant until the 1920s.

So, it's still not clear how IT and the new economy will revolutionize the design, construction and property fields. Will small enterprises survive? Will they become greatly empowered by declining IT costs, or by the opportunity of forming broad internet alliances as some law and property firms are now exploring, offering lower cost while providing adequate scale and availability to clients?

- The ability to recognize and grasp the worldwide technical innovations emerging. You have heard a lot about multi-national or trans-national enterprises, international companies and more recently global companies. Those terms really apply to an organizational format and are generally geographically focused. The <u>new</u> boundaries are the markets, shared concerns and interests, <u>not</u> the national borders. In other words, <u>portions</u> of the AEC field, and many others, are not international, nor global; but rather, increasingly borderless. Many major European consultancies and contractors have successfully entered the North American market (Arup, Arcadis, Mott MacDonald, Hochteif, Skanska, Bouygues, Obayashi Gumi, Kumagai Gumi, etc.) and European and Asian contractors dominate international construction; while other areas, less sensitive to economies of scale and changing technologies, retain their traditional boundaries.[3]

[3] At present in the U.S., regional construction firms and, in many cases, design firms, have strong and successful franchises often based on a better understanding and control of costs, lower overheads and carefully cultivated alliances with preferred subcontractors and public and private clients. Thus, most of the "global" construction firms we can identify find it difficult to compete in hard number bidding in the U.S. without either buying regional firms (Skanska, Astaldi, Oderbruch, Hochtief) or joint venturing (Obayashi Gumi). But, there is a growing consensus that there will be a need for scale in the global community. Such trends may not, however, favor the large AECs from the developed or wealthier nations. There are, for example, frequent prophecies of doom for the middle-sized architect/engineer (interestingly, the definition of such firms is constantly changing), despite the fact that most surveys find that the profit margins for medium-sized U.S. and many European consultancies are higher than

- The ability and willingness, as noted, to assume important roles in project, program or concession packaging, management and development, and in the initiation of mega-projects. In this regard, you must refine and become more confident in your managerial and technical abilities and be prepared to face skirmishes and territorial arguments with other professionals. In other words, to once again become master builders with all that entails.

This is a two-way street. The aspiring master buildings must seek firms, organizations and mentors who will constantly test, encourage and support them. Don't automatically accept the traditional view of the need for extensive experience and training. Just think of Alexander the Great in this regard. Also, consider going out on your own.

Decide whether you want to develop outstanding technical skills in a narrow field of expertise even if non-traditional, or broader management and administrative skills, and select the type of firm or organization that best matches these goals. If you cannot be aggressively challenged, switch assignments or firms. Challenge your professors - including us - your superiors and employers to give you increased responsibility.

Sadly, in this regard, many of the founders of major design and construction firms forgot how young they were when they first began. The world is open as never before for the well-prepared and dedicated professional.

8. **Open Discussion**

Our initial discussion will be an open one, dealing with the central theme of the course – "Globalization" as described by Tom Friedman in *"The Lexus and the Olive Tree."*

- Is growing globalization essentially a financial issue, e.g., long-term capital management? 60-Second Funds? Free Market Capitalism? Or, is it also an issue for the Built Environment?

- What does Tom Friedman mean by weight vs. speed?

- How does globalization impact markets, the existing nation states, technologies and cultures?

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the larger consultancies because of the difficulties of establishing economies of scale, price preference or truly successful branding in the field.

9. **Session 2 -** 20/20: Vision for the Future of the AEC Field

In the next session, taught by Derish Wolff, we will discuss the ENR's "Greatest Construction Projects Over The Past 125 Years" from your course reading list and our vision for the future of the construction industry.

Each student should select one or more favorite project(s) to discuss in class and think about which projects are likely to be chosen over the next 20 years.

We also need two volunteers who will present their vision over the next 20 years of the future of the AEC community.

Read the Building Futures Council (BFC) report, *"Measuring Productivity and Evaluating Innovation in the U.S. Construction Industry."*

We will also read Chapters 3 and 4 from *"The Lexus and the Olive Tree."* For those who missed the first reading, please read Chapters 1 and 2 as well. Following the reading, please consider:

- What does Tom Friedman mean by democratization of finance?
    - What is MIDS?
    - What is the Golden Straight Jacket?
    - What is the Electronic Herd?