

Columbia

Columbia University  
Graduate School of Architecture, Planning & Preservation

## **IT and The Real Estate Enterprise** **Syllabus**

Spring 2017

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Classes: Thursday

March 09<sup>th</sup> thru April 27<sup>th</sup>

### **Course Description**

The real estate enterprise more and more is driven by technology from end to end. What's more, real disruption from technology has yet to occur in real estate. There are movements, but no clear big thing yet. The technology that drives the real estate enterprise covers a wide space, from the systems in the buildings that run the plant and allow visitors in the building, to the operational systems for leasing, management and construction, to the billing, accounting and corporate reporting systems that drive acquisitions and investor reporting.

This course will cover at a high level a number of aspects of the space. We will cover conceptual issues in data processing, networks and design, as understanding the "data transport layer" at a high level is important, particularly in a world where the cloud will ultimately dominate where applications will be housed.

The space is made up of a wide variety of systems that provide niche portions of the functionality required in the enterprise. We will spend time covering the various sectors of the space, identifying the current players in each sector. This will provide a good perspective in understanding the state of the industry and possible areas where innovation may (or should) arrive. We will have a number of the technology vendors come and speak about what they see as challenges and opportunities in the space.

We will examine the real estate data model which is interesting as compared to other industries. The real estate industry has a data model which is extremely complex but does not contain a glut of data itself. The complexity of the data points in a lease and their impact on the relationship with the customer make it important to cover this topic.

We will look at understanding the various systems at a high level both to see the data model in action and cover the integration needs between the disparate systems that run the enterprise. The "stack" of software that runs a particular enterprise requires careful integration or inefficiencies grow quickly.

Finally, we want to try to figure out is/are the disruptor(s) among us, or what they might look like. Real estate has always been a laggard industry in technology (hard assets, moves slowly). This may in fact give us an advantage; having seen other industries moved and moving might give an opportunity to make a more educated guess at what is to come.

## **Prerequisites, Requirements and Assignments**

This is mostly a discussion course, there are no prerequisites. Attendance is therefore mandatory. A course outline describes what will be covered each week, each week covering a different aspect or topic. There will be supporting materials provided, and there may be a little research in advance of the class.

Participation in class is important, as it is best if the lectures are interactive and steered by particular interests of the students. There is no basic technology knowledge requirement as we will not go that deep, but it is probably best that the student has an interest and curiosity in how the gears turn that run the enterprise.

Each student will pick a topic which we will assist in curating to do a more extensive project. The project is due at the end of the semester and will be a significant part of the grade. The project can be varied from an extensive survey of a product or group of products, to mock up designs of systems, to training and usage of various software products.

### **Course Grading Criteria**

- Attendance 35 points
- Participation 35 points
- Term Project 30 points

### **Course Details**

The following sets out an outline of the topics to be covered. The timeline will be presented as we get closer to the sessions, as we may vary our speed based on interest in various topics.

#### ➤ **Week 1 (3/09/17) - The Enterprise - A Tour of the Organization**

- We will look at the various departments within the enterprise (executive, capital markets, property management, operations, etc.) and their various needs and connections.
- We will then start to look at “the wheel” (of applications) that surrounds the enterprise, and the connectivity between the applications that run the enterprise.
- We will look at the basic players in the market; assignments will be given after to survey parts of the space.

#### ➤ **Week 2 (3/23/17) - The Wheel, The Real Estate Data Model**

- We will continue the discussion of the wheel, and start to look at the data model that drives the industry. We then overlay the data model and the wheel and see the areas of integration required.
- The need for openness and standards will be discussed, and the pros and cons of a best of breed approach versus a single provider approach. What are the situations and variables that would dictate one versus the other?

➤ **Week 3 (3/30/17) – Integration Levels, What is the goal state?**

- In a perfect system, no data would be entered twice, and all functions from end to end would consume and produce data from a shared data model that spans a number of systems. How possible is that to achieve? What are the precise benefits?
- We will look at the full lifecycle of data, from lease prospect to budget to financial statement. It does all fit together in a somewhat closed loop.
- If we reach that state of perfect integration, is what we are looking for merely operational efficiencies. While that saves money, it is not transformational. We'll take efficiency, but we seek transformational change. What is that, what might that be?

➤ **Week 4 (4/6/17) – The Network**

- We will take a brief detour and talk about the network which is pretty important as it is the transport layer for all of the functionality being discussed.
- Understanding a bit about LAN/WAN design issues, bandwidth, and particularly security considerations is becoming more and more important. Add to that the fact that the data center is slowly evaporating into the cloud, which makes network design and security issues more difficult.

➤ **Week 5 (4/13/17) – Building Management Systems, IP Backbones**

- Building automation systems are a fast evolving part of the space. The number of data points in a building is growing rapidly; arguably we have found our place in the business where “big data” applies.
- Collecting and storing this data, using it to provide operational efficiency is driving much of the change. This carries with it additional connectivity and security concerns.
- Whether these systems need to connect to the corporate network is an ongoing question. The question continues to be when will the corporate systems use or need the data being collected by the BMS systems.

➤ **Week 6 (4/20/17) The Future, what will it be?**

- At this point we have taken a really quick tour of the space, the systems, and looked at a perfectly integrated state. That puts us at the edge of where we could be today.
- What will be transformative to the real estate industry? Is it possible that this industry will escape it?
- Will how we fundamentally transact business change?
- Will how we sell and provision space change?
- Will the list of goods and services change much?
- Will the industry have a Kodak moment?

➤ **Week 7 (4/27/17) Final**

- Project Presentations