2017-2018 Distinguished Professor

Renee Cheng
32253

EXHIBITS

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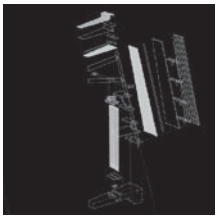

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EXHIBIT I

TITLE: CASE STUDIES

DATE: 1996-PRESENT

ROLE: PRINCIPAL INVESTIGATOR

COLLABORATORS: PROFESSIONAL OFFICES, RESEARCH ASSISTANTS

The world of innovative architectural design is an interconnected network of professionals willing to take risks. They consciously seek to transform themselves, their profession and the process of building buildings. Documenting the work of these professionals requires sifting through a wide range of materials, including: drawings, details, diagrams, sketches, interviews and thousands of images of the project under construction. Through this process, one hopes to gain insight into a specific office or identify threads that link projects across different authors, scales, building types or construction systems.

I closely followed the work of Frank O. Gehry and Associates done during 1989-2002, when he was transitioning from models and hand drawings to 3D software adapted from the aerospace industry. I followed three seminal projects, the Weisman Art Museum, Experience Music Project and the Disney Concert Hall. The Weisman Art Museum (Minneapolis, 1989), one of the last of the office's hand-drawn buildings with some 3D modeling. Experience Music Project (EMP, Seattle, 1999) was the first post-Bilbao project, fully digital in representation and the first in the office to bridge the gap between electronic drawings and data files needed to drive Computer Aided Manufacturing equipment (CAD-CAM). Disney Concert Hall (Los Angeles, 2004), extensively used CAD-CAM, testing a new interface between the contractor, Mortenson Construction, and Gehry's office.

Sharples, Holden and Pasquerelli (SHoP), a small firm who seeks to restructure their partnership with contractors and fabricators, documenting projects with parts inventories and assembly instructions. Full sized prints from digital models as templates are seen in PS1 summer project (Dunescape, **Fig 01**, New York, 2000) and Camera Obscura (**Fig 02**, New York, 2004). Porter House (Fig 03, New York, 2003), used many of the same documentation techniques but was one of the first large scale collaborations with a developer.

The design engineering firm Tripyramid is exemplified by the sophisticated glass details for a series of Apple stores done in collaboration with the architects Bohlin, Cynwinski Jackson (**Fig 04**, 2002-4) and a tour-de-force glass stair with ARO architects (SoHo Loft, Fig 05, New York, 2000). The Kimmel Center (with Rafael Vinoly, Philadelphia, 2001), used an exemplary collaboration cycle, passing digital and quick 3D printed models between the architects and Tripyramid, the engineers and fabricators. Similar collaborative media was used at the Mori Art Center done with Gluckman Mayner Architects (**Fig 06**, Tokyo, 2003). I compare this with the work of Bernhard Franken, whose BMW pavilions were produced in a completely digital process (**Fig 07**, Germany, 2000-2002).

The firm of Kieran Timberlake Associates (KTA) have increasingly delved into collaboration with manufacturers, imagining plausible futures using current technology. An example is the SmartWrap pavilion (**Fig 08**, Philadelphia, 2003) which proposed an enclosure system embedded with sensors and solar collectors. Building prototypes and off-site manufactured structures are

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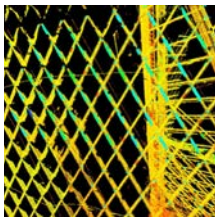

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another thread I have followed, using the work of KTA and Lazoroffice as contrasting examples. KTA is developing prototype banks and homes, leveraging Revit and other Building Information Modeling software to track data and develop mass customization. Lazoroffice uses their experience in furniture design and manufacturing to develop what can be marketed as large-scale life-style products. (Flatpak houses, **Fig 10**, 2004-present)

"As-built" or survey information has been greatly facilitated by GIS and mapping of 3D points in space. Point cloud data is typically used for forms such as caves or man-made tunnels, but the Seattle Public Library (**Fig 11**, OMA, Seattle, 2004) and Experience Music Project both utilized point cloud surveying techniques to generate data needed to locate utilities and check geometry of frame and cladding during construction.

While geometric complexity is palpable and measurable, programmatic demands or technical performance (light, sound, heat) are equally complex and rich. This is the newest area of my research and there are limited case studies in this category, but they include acoustical studies for the Greater London Authority (**Fig 12**, Norman Foster, London 2002) and Disney Concert Hall (**Fig 13**), experiments in wind farming off the facades of tall buildings begun by SOM, passive and active environmental systems in the Phoenix Federal Courthouse (**Fig 14**, Richard Meier, Phoenix 2000) and the Calgary Institute for Sustainable Energy (KTA, Calgary, expected 2009).

There are times when I use my contacts in these offices to quickly take a snap shot of how offices are addressing a particular issue. For example, I recently floated a query: "by what metrics does your office demonstrate value or expertise". The dozen or so answers ranged from detailed texts with specific project examples to short, philosophical replies. While this is not systematic research, it can take the pulse of leading practitioners operating in that zone of risk and experimentation that is essential to the future of the profession.

My most recent work has been focused on Integrated Project Delivery (IPD) through an advisory role in the 2007 AIA-CC effort and leading the 2011 AIA/AIA-MN/UMN interactive case studies explained in exhibit 2. IPD is in an early stage of adoption and case studies play a key role in understanding its potential for the industry. Earlier case studies looked primarily at design and construction with representation as a key intermediary. Inherently of interest IPD cases are project delivery methods, legal and contractual strategies, commercial strategies in addition to representation.

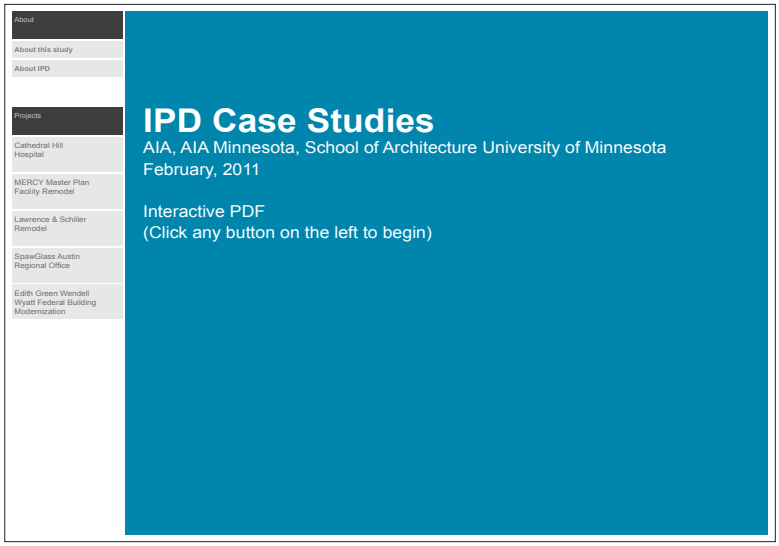
EXHIBIT 2

TITLE: IPD CASE STUDIES

DATE: FEBRUARY, 2011

ROLE: PRINCIPAL RESEARCHER

COLLABORATORS: AIA NATIONAL, AIA-MN, RESEARCH ASSISTANTS



INTRODUCTION

This study is the latest in a series of AIA reports on Integrated Project Delivery (IPD). Whereas previous case study efforts were limited to the handful of projects executing IPD, this effort is framed broadly, choosing projects of various program types, sizes, team composition and locations. Additionally, this set of case examples documents a wide range of team experience, from teams with quite a bit of IPD experience to those who are using their project as a learning experience.

Documenting how IPD has been adapted and applied to each of the projects in this study demonstrates that IPD is a method, not a contractual structure or management formula. By comparing this set of projects according to how they followed or adapted IPD contractual and behavioral principles, we can see how some aspects of IPD have had greater impact than others.

IPD is being implemented in increasingly diverse settings, allowing us to better understand where it is most effective. Its difficult to predict the role of IPD in the future, possibly it will become the default method of delivery for all projects or it may become a specialized method used only in particular conditions. By studying a range of projects, we can better understand how IPD compares with traditional project delivery methods for different project and team types and envision its continued development. The outcome of this project is a matrix that can be used as a learning tool by anyone interested in IPD. Profiling of the projects allows viewers to see how projects that might be similar to their own profile carried out their work. The matrix content gives specific information about contractual language, tools used to implement project goals and challenges confronted by the teams.

IPD MOTIVATIONS

IPD offers many potential advantages over a traditional design-bid-build delivery model, but each team needs to determine why IPD is appropriate for them. We developed a method to profile each case in terms of their motivations for using IPD. For example the design complexity of the project might be high, therefore requiring earlier involvement of trade expertise. We have seen teams find their initial reasons for choosing IPD are evolving as they better understand IPD's benefits and challenges. In some cases, great value has been found in unanticipated areas. We grouped motivations into five categories:

1. Market advantage: Choosing to use IPD can give market advantage. IPD may give the firms valuable experience upon which to market themselves as industry leaders. Improving the delivery may also be a market advantage if measureable results can be attained. For serial owners, savings on one project done in IPD can be leveraged across many buildings. The healthcare sector trends show that IPD may become an expected standard delivery method.
2. Cost predictability: All projects would like to meet budget, however, for some the predictability of cost is a notably driving factor.
3. Schedule predictability: Similar to cost, all projects share the goal of meeting their planned schedule, but for some projects this is a major factor.
4. Risk Management: Reducing or managing risk can be tied with cost or schedule, but also may include transactional risk inherent to project type, site or other conditions. If risk management is a critical factor, the increased communication in IPD may be of particular advantage.
5. Design Complexity: A high degree of complexity will usually demand integration of expertise and require a level of coordination that is achievable in an IPD environment.

The tactics for achieving the goals in each of these areas may or may not be exclusive to IPD, however, for projects that have strong motivations in several categories, IPD may offer an advantage over traditional delivery. Collaboration and integration can occur in any project delivery method, however, IPD sets up structures that make it more likely to occur than not. In particular, study participants noted good collaboration in design-build is raised to an even higher level in IPD. This improvement can be credited to a variety of sources, but most cited was the early involvement of a larger and more diverse set of expertise areas, including trade contractors.

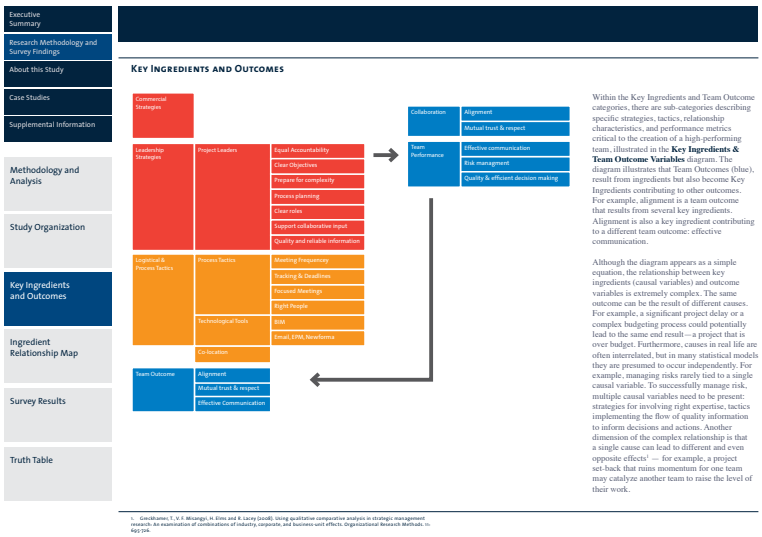
EXHIBIT 3

TITLE: CASE STUDIES

DATE: FEBRUARY, 2011

ROLE: PRINCIPAL RESEARCHER

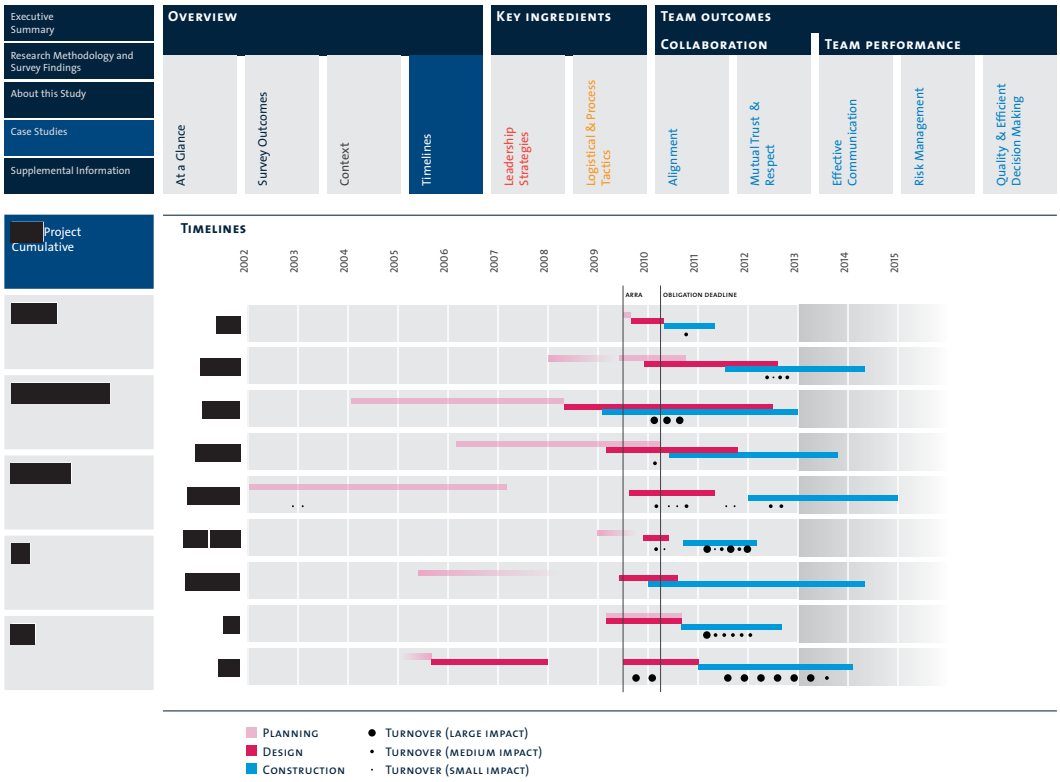
COLLABORATORS: NAME WITHHELD AT REQUEST OF PARTNER, RESEARCH ASSISTANTS



INTRODUCTION

The Research Partner simultaneously embarked on eleven major modernization projects totaling in excess of $700 Million. The simultaneous start of multiple large-scale projects, operating with shared High Performance/Green Building goals, provided a unique opportunity to compare and contrast projects. The goal of this study was to identify factors that had strong positive or negative effects on the collaborative culture of the project teams. The comparison of design and construction projects is inherently complicated by circumstances unique to each project. Given the potentially endless number of factors that can impact project delivery, this report focuses on selected team-performance outcomes and highlights the presence or absence of "ingredients" that influenced those outcomes.

The information reported here represents a snapshot of each project and is not intended to be a complete project review, performance review of individuals, or an assessment of the construction program. Information collected and reported represents a range of team-member perceptions. For the five projects studied in depth, core team members were interviewed during the summer of 2012. A questionnaire was sent in December 2012 to a wide range of project participants from all eleven teams. The interviews and questionnaires were intentionally timed to occur during an active period of project delivery in order to capture the most candid attitudes and perceptions, avoiding the positive bias that can occur after a project is completed. Variation in the project phase at the time of interviews and questionnaires created some imbalance in the results, as some teams were closer to finishing their project than others. Interviews and questionnaires were not intended to capture the entire project-delivery process, only a snapshot at different points in time.



The timelines in the Case Study section of the report graphically indicate the stage of each project when the information was gathered.

Although the baseline level of complexity for all the projects is relatively high, there were variations in the nature and scope of projects. Our survey data indicates that lower-risk projects required fewer resources and could rely primarily on logistical and process tactics to achieve success. Higher-risk projects required multiple types of tactics and strategies to work in concert—for example, leadership and commercial strategies, logistical and process tactics, and high levels of team collaboration and performance. In general, we found the most successful team-performance outcomes were achieved when leaders "managed globally" by fully internalizing –corporate program goals and embracing the challenges inherent to them. Those leaders who relied on typical project management methods were slow to understand the unique nature of the program constraints and requirements. The complicated and dynamic nature of the construction program placed project teams in situations where varying degrees of resilience were revealed. In the cases where leaders underestimated the demands of the program, project teams were rarely clear on goals and had difficulty navigating the client's needs and changing objectives. In teams where project leaders acknowledged the complexity, changing demands were well communicated and teams adapted and realigned as the project evolved. While the exact situation presented by this particular construction program is unlikely to occur again, these cases allow us to precisely define key ingredients that most actively contribute to success in a complex and challenging environment.

EXHIBIT 4

TITLE: LATROBE PRIZE FINALIST

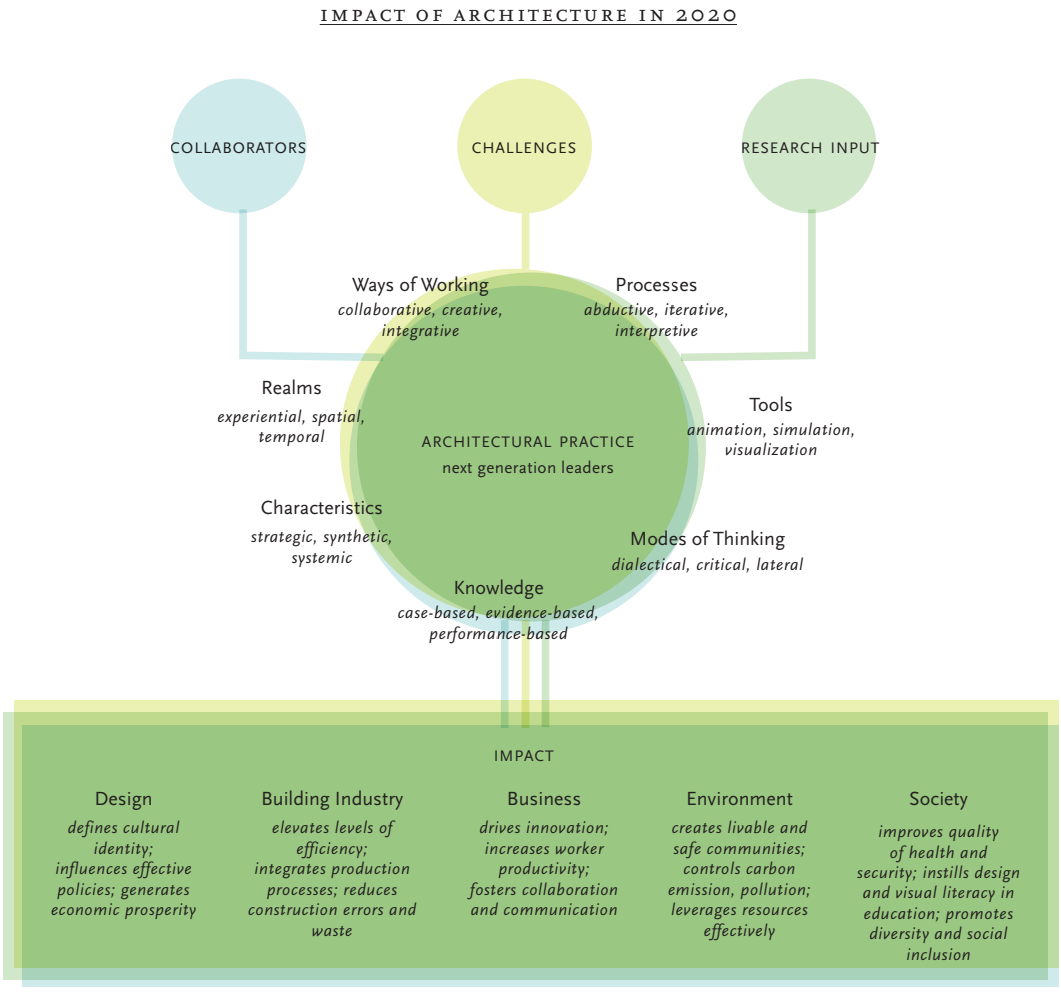
DATE: SPRING 2009

ROLE: CO-PRINCIPAL INVESTIGATOR

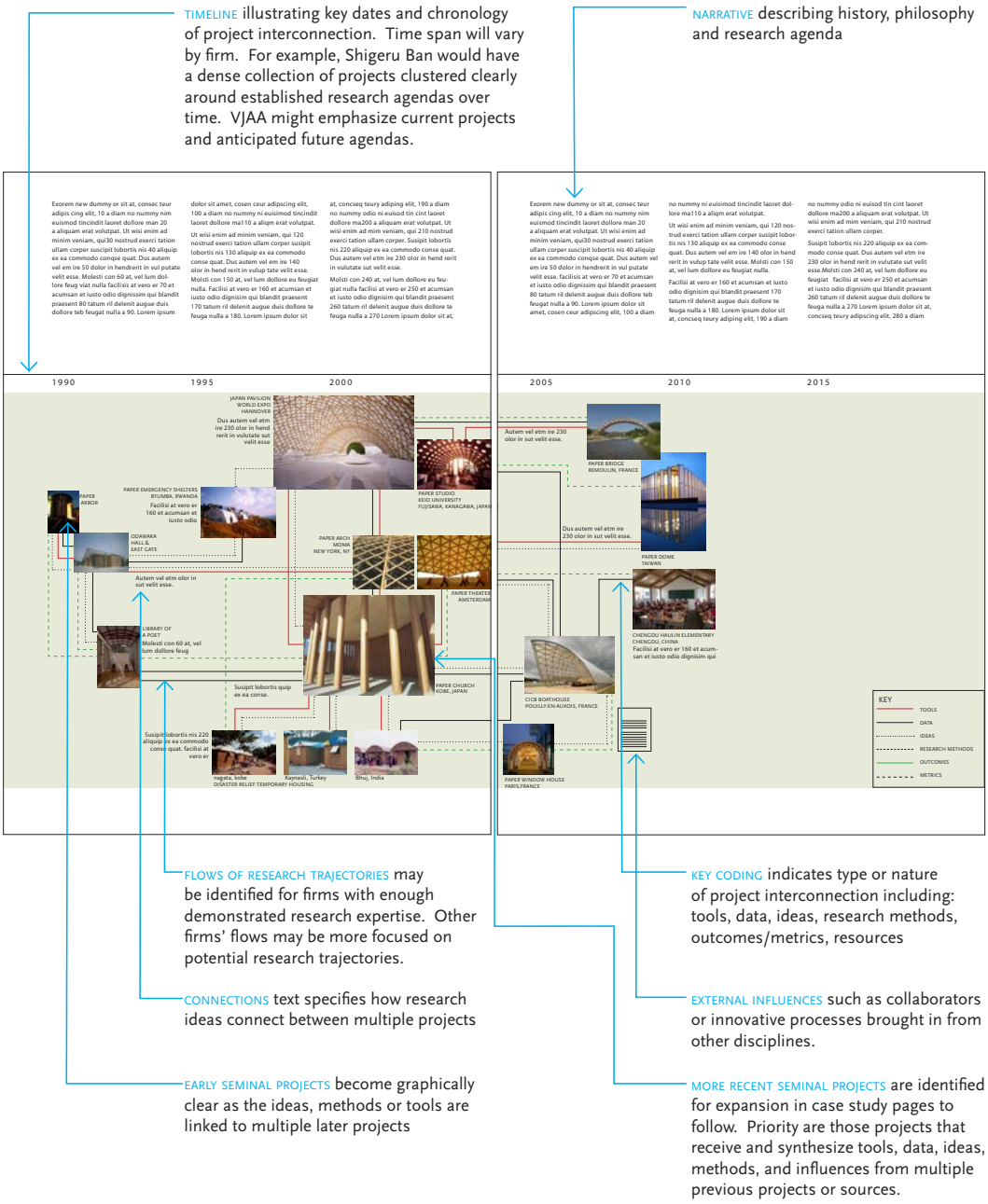
COLLABORATOR: LAURA LEE, FAIA

Next Generation Practice _ Next Generation Leadership
A Research-Based Practice Manual

The key to the future of the profession of architecture – data-enabled, expertise-driven and highly-integrated – is collaborative disciplinary-specific research. Currently, only a few practices conduct research in-house using interdisciplinary teams and project-centered knowledge to build the firm's expertise. To expand its relevance and leverage its design strength, the profession needs an established knowledge base characterized by open exchange between educational institutions, research enterprises and diverse practices. To maximize the impact of the profession, a road map is needed – defining integrated research, its value and mechanisms.



TIMELINE / CONTEXT OF PRACTICE-BASED RESEARCH



To enable change, we propose a dynamic, interactive, multi-layered Research-based Practice Manual with case studies from current leading edge practices that, together, form a broad constellation of methods, tools and ways of working which are transferable to any practice seeking to incorporate research. We intend for this manual to instigate a deep-seated cultural shift, enabling the profession to find common ground with expertise-based fields in humanistic and scientific traditions.

EXHIBIT 5

TITLE: SUGGESTIONS FOR AN INTEGRATIVE EDUCATION

DATE: 2006

ROLE: AUTHOR

The AIA Report on Integrated Practice was launched at the 2006 AIA convention in Los Angeles. At this relatively early stage in the national discussion on Integrated Practice (IP) and Building Information Modeling (BIM), many professionals were vocal in their demands for the academy to provide them with BIM-trained graduates. As one of two academics invited to contribute to the collection of 11 essays, my role was to examine the role of architectural education in meeting the changing demands of the profession while maintaining focus on design education. The essay sparked a great deal of debate during its launch, and in the ensuing year the essay was excerpted in a popular web publication on technology, *AECBytes*. It was also selected as a reference for the 2007 Cranbrook teachers conference on the topic of education in the 21st century. It has been used by the AIA Board Knowledge Committee as preparatory material for their 2007 discussions on integrated practice.

Research and writing about emerging technologies often favors fashionable novelty over balanced perspective. The intention of this essay was to place BIM in context of the long history of architectural education, and focus on its potential for lasting value in teaching representation, construction and practice.

EXHIBIT 6

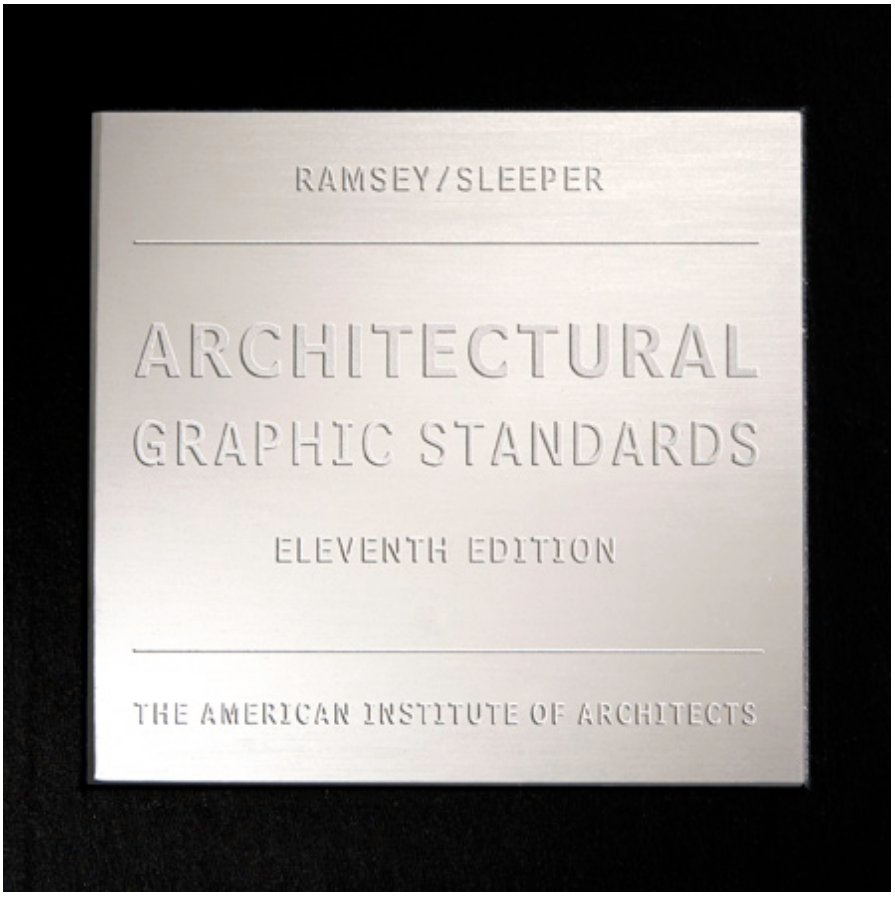
TITLE: COMPUTING TECHNOLOGIES, CHAPTER 14 IN ARCHITECTURAL GRAPHIC STANDARDS

DATE: 2007

ROLE: CHAPTER EDITOR AND ADVISORY BOARD MEMBER

The invitation to reshape the venerable reference, Architectural Graphic Standards was intriguing because of the multivalent role I was asked to play, the caliber of the participants and the commitment from the publisher and editor-in-chief for a major re-visioning of the book. I took a dual role of Advisory Board member and editor of one of the three new chapters. The charge to update one of the most established and comprehensive resources used by the architectural profession was both challenging and rewarding. The Board struggled with fundamental decisions regarding the book's role in the current environment of digital resources and the legal implications of creating "standards" in a world where mass-customization is possible. The topic of my chapter, "Computing Technologies", included a range of emerging technologies, from computer driven manufacturing to representation using database technologies. This chapter was one of the most actively discussed in the Advisory Board meetings and its topic is mentioned in four of the eight introductory essays to the new edition.

As chapter editor, I commissioned, guided and edited contributions to the chapter. I also guided the choices of case examples – several drawn from documentation already initiated in my own research.



EDITOR OF CHAPTER 14
Renée Cheng,
University of Minnesota

CONTRIBUTORS
Computer-aided design and computer-aided manufacturing (CAD/CAM): Kimo Griggs, with the help of Kenneth Kao. Material based on and excerpted from Digital Design and Manufacturing: CAD/CAM Applications in Architecture and Design, by Daniel Schodek, Martin Bechthold, James Kimo Griggs, Kenneth Kao, and Marco Steinberg (Hoboken, NJ: John Wiley & Sons, Inc., 2004) Examples written by Marc Swackhamer. Building information modeling (BIM): Lachmi Khemlani. Example written by Marc Swackhamer.

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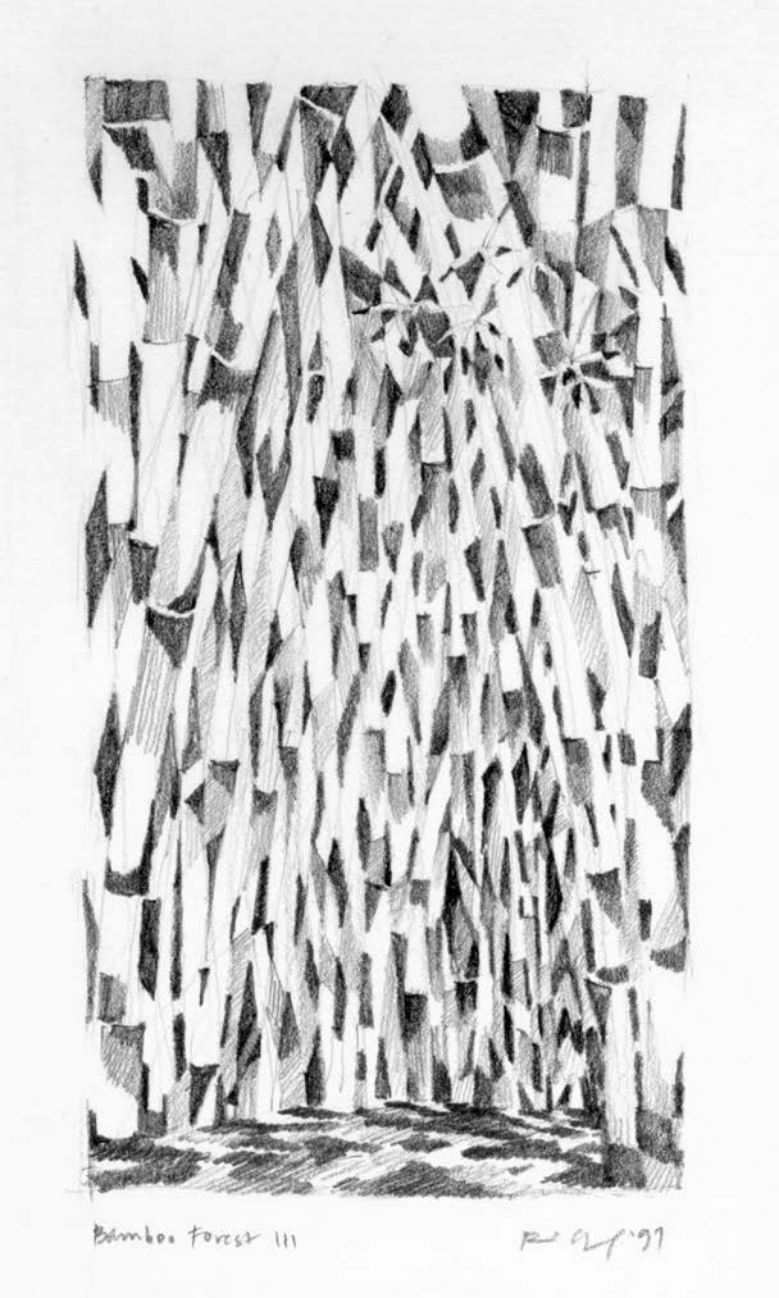
EXHIBIT 7

TITLE: SKETCHES

DATE: 2007-2011

ROLE: AUTHOR/ARTIST

Sketches included here have been exhibited and/or published



Bamboo Forest III, 1997, Third Place Art by Architects, New Mexico

St John's Abbey Church, 2006, published in Father Hilary Thimmesh's memoir "Marcel Breuer and a Committee of Twelve Plan a Church", St. John's Liturgical Press, 2011

EXHIBIT 8

TITLE: ACSA SERVICE & AWARDS

DATE: AS NOTED

ROLE: AS NOTED

ACSA Annual Meeting

Co-Chair with Patrick Tripeny

SALT LAKE CITY, UTAH, MARCH 2006

As Co-Chairs of the meeting, my colleague and I were responsible for establishing the overall theme of the conference (Getting Real: Design Ethos Now), identifying ten topics and five special sessions and guiding their sub-themes to contribute to the larger theme. We also invited the two keynote speakers, Cameron Sinclair (founder of Architecture For Humanity) and Shigeru Ban (of Shigeru Ban, Architects, Japan). The annual event is the largest national gathering of architectural educators, attended by approximately 400 participants, the paper acceptance rate in 2006 was 39%. Through my initiative and leadership, we held a BIM/IPD session, the first ever for this academic group. At this time, the majority of educators had never heard of the terms and were completely unaware of potential consequences to education. The session was successful in starting active dialogue and was one of the most well attended and provocative sessions at the conference.

ACSA/AIAS New Faculty Teaching Award

1997 Award Winner

This is a highly competitive national teaching award open to faculty in their first five years of teaching. Based on only two years of teaching at the University of Arizona, I was recognized for the ambition of my teaching agenda and demonstrated excellence of the results. At that time, the focus of my teaching was the connection between construction and design. Building technology curricula in the late 1990's was notoriously dry and disconnected with design. My case studies and highly interactive student exercises allowed students to see how the poetry of design was intricately connected with the realities of construction. Multiple subsequent teaching awards by the UA School (elected by the students) and AIA-Arizona testify to the impact of my teaching.

EXHIBIT 9

TITLE: SELECTED AIA SERVICE & AWARDS

DATE: AS NOTED

ROLE: AS NOTED

AIA Board Knowledge Committee (BoKnoCo)

2007-9 Research Sub-committee Member, case study focus

As a member of the AIA Board Knowledge Committee, I have been involved with a number of discussions regarding "knowledge", a term inclusive of, but not limited to, academic definitions of research. The Research Sub-committee, building on AIA initiatives established in the previous year, provided oversight of this research summit and a new grant initiative, the Upjohn Research Grants.

AIA Integrated Project Delivery Discussion Group (IPDIG) and Center for Integrated Practice (CIP)

2009-2011 Case study focus, representative to IPD guide update group

After completing service on BoKnoCo, I served for 2 years on IPDiG, with a focus on research and case studies. During this time, IPDiG took on a number of initiatives, advising AIA national on position statements for interoperability and definition of IPD. I served on the sub-group working on the revision of the IPD Guide and advised on the first set of IPD case studies completed by AIA-CC. The group reformulated as the Center for Integrated Practice and I continued to serve as educator member. Since transitioning off the group, I serve in an advisory role for case studies and IPD education and surveys.

AIA Education Honor

2008 co-author of An Incomplete Curriculum for Change, University of Minnesota

An innovative approach to professional education, noted by the jury for its "out of the box thinking" was the result of a series of faculty discussions and curricular change processes I led as Head. Strategically tapping the best ideas from our "next gen" faculty and students, I created a process that included senior faculty, students, staff and administration to create a new professional curriculum that builds on tradition, expects change and embraces challenge.

President AIA Minnesota

2008 President-elect, 2009 President, 2010 Past-president

Nominated by the AIA Minnesota Board and elected by the membership, I was the first full time academic honored to serve in this professional organisation. My presidency occured during rapid economic decline where many firms and members faced significant challenges. Leadership during these years kept focus on core strengths and change needs for member value. Working closely with the AIA-MN executive, board and members I supported a number of initiatives that served membership while maintaining fiscal health of the component. My membership on the Board continues, providing continuity for many of the efforts that connect School with AIA.

EXHIBIT IO

TITLE: PROFESSIONAL PRACTICE COURSE

DATE: 2009-PRESENT

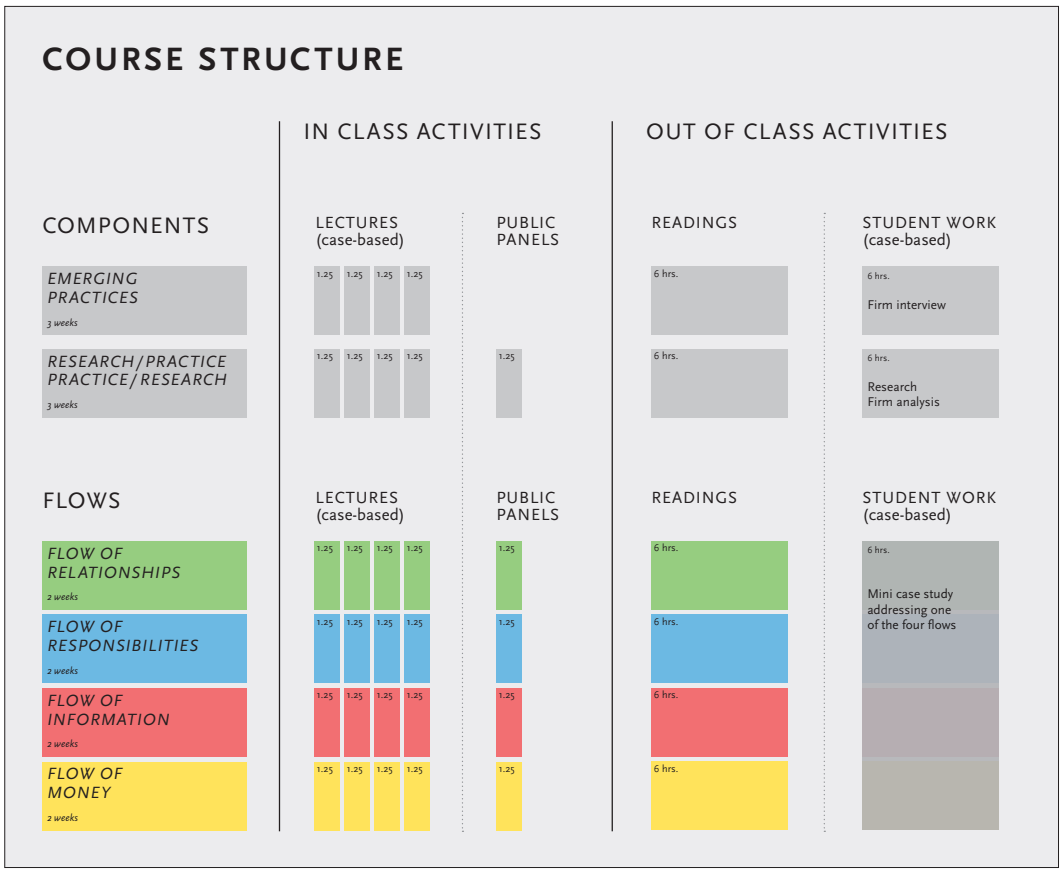
ROLE: COURSE AUTHOR / PROFESSOR

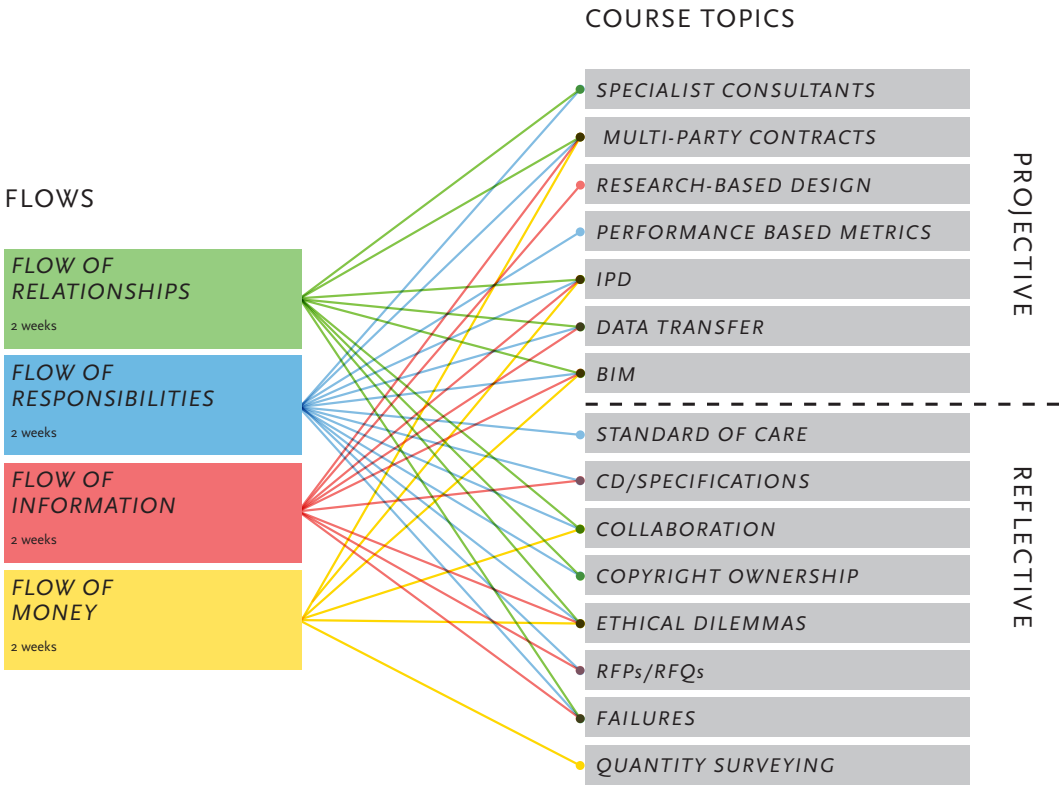
COLLABORATORS: LAURA LEE, FAIA COURSE CO-AUTHOR, VINCE JAMES, FAIA CO-TEACHER

Undergoing profound change and pursuing experimental innovation, the profession has come to lead the academy. Practice education has not fully grappled with data-based technology, collaborative project delivery methods, performace-based directives and shifts in stakeholder relationships within the building industry.

SIGNIFICANCE OF THIS REQUIRED PROFESSIONAL PRACTICE COURSE IN M.ARCH CURRICULUM

Schools today are educating the architects who will reach their prime in 2025. Professional practice classes must address the fluid state of current practice and anticipate future change. This course weaves themes of change in each element of its structure. New practices are constantly juxtaposed with established methods and students challenged to anticipate what might likely evolve in the future. Most importantly, the course demands that students project forward their ideal profession, articulating their best ideas for the future. By asking students to understand their individual practice goals in context with their ideas for the whole of architecture, we teach future architects to lead better practices.





POTENTIAL TO BE A MODEL

Considering how rapidly the profession is changing, it would be irresponsible to teach students only about practices of the past. Most schools have a required professional practice class but few have been able to address current topics affecting architecture. Unfortunately, the course material and structure of most professional practice classes today bear all too much similarity to those of courses from many decades ago. This course provides a model for a contemporary professional practice class, respectful of the past but looking to the future and demanding students take ownership of their roles in shaping it. Many aspects of the course can be easily implemented in other schools or expanded to continuing education; however, the greatest value of the course can be found in its manner of embracing change and orientation towards creating future architect/leaders.

COURSE DESCRIPTION

In this course, practice issues are grouped into four main areas or "flows": flow of relationships, flow of responsibilities, flow of information, and flow of money. Setting up these flows are two broad components, one providing context of past and future practice and the other on research. Course material is largely presented through case studies, using primary source project documentation. Similarly, student work is case-based, completed after interviewing practitioners about the firm's philosophy, business structure and documenting a case study project. Within each flow is a set of lectures covering case study examples, readings and a panel discussion. Students complete one small exercise for each topic and then choose one for in-depth study. The chosen focus area becomes the basis for students' case study project.

EXHIBIT IO

TITLE: BUILDING STORIES COURSE

DATE: 2009-PRESENT

ROLE: COURSE AUTHOR, COURSE COORDINATOR

COLLABORATORS: LAURA LEE FAIA, COURSE CO-AUTHOR, PRACTITIONER INSTRUCTORS

Building stories is a professional practice elective taken by students in their first or second year of the professional program. Highly regarded and among the most popular courses in the school, each offering taps a different set of knowledgable practitioners in an engagin format.

BUILDING STORIES

Each class session, the practitioner tells a story from a project, leaving off at a decision moment while giving the students all the information they had at that time. The following week, students propose solutions and the practitioner reveals what actually happened.

Building Stories, an elective architecture course, uses a cliff-hanger format. Some of the most fascinating stories from architecture fall within areas that are notoriously difficult to teach in a classroom setting: financial, contractual, personnel, management, constructional etc. Stories demonstrate how topics that may appear to students to be separate from design are in fact tightly intertwined.

This professional practice elective has been offered to M.Arch students since 2009. Building Stories meets twice per week for seven weeks, falling within the School's spring modular system. Two architects, one coming each Tuesday, the other each Thursday, do not need to coordinate with each other but are loosely linked by themes such as global practice or practice management. Student journals require synthesis of issues and independent connections made between architects. Non-faculty practitioners who have detailed knowledge of the project join discussions. By placing the students in the shoes of the architect, Building Stories makes the minutiae of architectural practice mesmerizing.

THE CLIFF-HANGER

The cliff-hanger is a storytelling format employed by penny-dreadfuls, pulp-fiction, and action movies.

While stories from practice may lack car chases, they are full of charged human situations, financial drama and passionate design advocacy. These stories, told well, showcase critical thinking architects use to make complex and difficult decisions.

STUDENTS NEED TO KNOW ...

Building Stories students are on the edge of their seats, fully engaged in discussion by fervently debating issues of architecture, design and practice.

Most architects have one or two very knowledgeable colleagues they turn to for advice on project management, contracts or conflict resolution. Most will also be able to name a few architects who are natural teachers, who can explain even complex things to a relative novice. Unfortunately for the schools, the overlap between these two sets is extremely small, explaining why there are so few excellent professional practice teachers. Compounding this problem is the fact that teaching is hard. Teaching when the students have no immediate "need to know" is practically impossible. If a student needs to know the size of a structural member or the rise-to-run ratio of an ADA compliant ramp in order to advance their design, they are extremely receptive to anyone providing tools or information that will meet their need. Building Stories places students in the position where they urgently need to know how to address difficult issues in architecture.

COURSE STRUCTURE

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7
INTRODUCTION Objectives and Expectations CASE CONTEXT	CASE ISSUE #1 Assignment Questions and Deliverables	6 STUDENT PRESENTATIONS Discussion	CASE ISSUE #2 Assignment Questions and Deliverables	6 STUDENT PRESENTATIONS Discussion	CASE ISSUE #3 Assignment Questions and Deliverables	4 STUDENT PRESENTATIONS Discussion
ILLUSTRATED NOTEBOOK ASSIGNMENT						
CASE STORY #1 In-class example How to set up a problem Propose a solution CASE STORY #2	3 STUDENT PRESENTATIONS Discussion CASE STORY #3	3 STUDENT PRESENTATIONS Discussion CASE STORY #4	3 STUDENT PRESENTATIONS Discussion CASE STORY #5	3 STUDENT PRESENTATIONS Discussion CASE STORY #6	3 STUDENT PRESENTATIONS Discussion CASE STORY #7	3 STUDENT PRESENTATIONS Discussion WRAP UP

ONE FORMAT / MANY STORIES

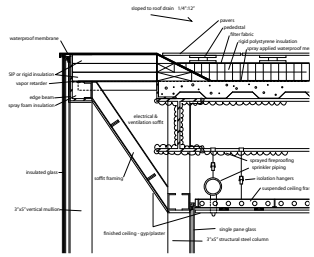
Building Stories is a framework that can support a variety of project stories told from a variety of points of view.

STORY #1: THE DETAILS

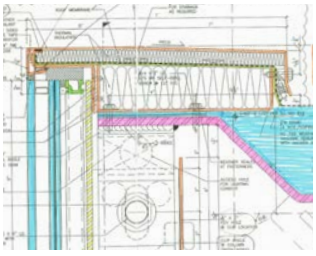
PLOT: Architect 1, specialist in detailing of high profile design projects, covered construction conflict resolution. Each session addressed a different detail condition. Students were given the design intention, climate information, primary materials, structural dimensions and HVAC clearances. Students researched manufacturers and precedent studies to produce wall sections. Sections were reviewed according to criteria of design consistency, appropriate thermal and water management. Group discussed cost, material specification, construction sequence, tolerances, trade sequence and other issues related to construction and design. After reviewing the student's work, the practitioner revealed the actual completed detail. Non-faculty partner of Architect 1 actively participated in developing course material and plans to attend discussions this spring.

CLIFF-HANGER: In a high profile museum project, the design intent calls for a connection between roof and glass wall with minimal visible flashing. Working within given dimensions for structure and HVAC, how do you design the parapet providing thermal breaks and guiding water out of the building?

STUDENT PROPOSAL:



ACTUAL RESOLUTION:

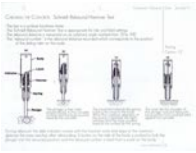


STORY #2: DEVELOPING WORLD

PLOT: Architect 3 owned a small US firm working in developing countries. Stories from this session focused on a full range of issues in pre-design, project and practice management and entrepreneurship. Each class covered different design issues and construction issues. Non-faculty partner in the firm consults on story development and attends some discussions. Design case example: a church for a remote pilgrimage site in Madagascar regularly housing 500 people expanding to provide covered space for 2000. Students proposed ways that a low cost building could use limited materials, skills and transport. Discussion included project financing, risk management and entrepreneurship. Construction cases included examples below. Discussions cover design in the developing world has relatively low cost of labor, high cost of materials/transport, unstable governments, and politics of NGO's.

CLIFF-HANGER: Construction case: your clerk of the works stopped work on a project due to poor concrete, creating a "big scene." The project donor pays for your trip to see if the project is still viable. Once you are there, what do you do to keep the project on track while fulfilling your responsibility to see the building is meeting safety standards?

STUDENT PROPOSAL: Students had to outline the plan of action, similar or different to responses typically followed in the US. In this case, students identified issues were both relational and technical.



ACTUAL RESOLUTION: Actual resolution was extremely low tech, making boxes and filling with sand to load the structure and inspecting visually over a week, project moved forward and a new local clerk of the works was hired.

STORY #3: BUILDING AN ICON

PLOT: Architect 4 owns an architectural firm internationally known for iconic large-scale buildings. Stories covered the full range of issues similar to 3 above, except with an emphasis on strategies used with high profile clients. Each class covered different projects, revealing firm design, business, risk management, relationship management, team structure and marketing strategies. Students were asked to make mock presentations addressing design, business and/or marketing issues, evaluate risks and recommend strategies that address critical issues in niche markets abroad.

CLIFF-HANGER: You have been approached by a potential client to submit design proposals for a building in southern Malaysia. The client wants an "icon...with marketing impact and global interest" and expresses a desire for a twin tower. You believe that any type of tower may not be the best solution for this site and culture. Using the given renderings, how do you show the pros and cons of these designs and advocate for your point of view?

STUDENT PROPOSAL: Students looked at other icons that were defined by place. Argument was made that for this particular site a tower would not be appropriate, however, the building could still be iconic. Tower was presented but a low rise building demonstrated to be a "horizontal tower." Population and economic comparisons between Malaysia and other Asian cities were made, local materials and culture identified.

ACTUAL RESOLUTION: Actual presentation followed much of the same path as student proposal, senior executive loved the idea of an icon that was not a tower.

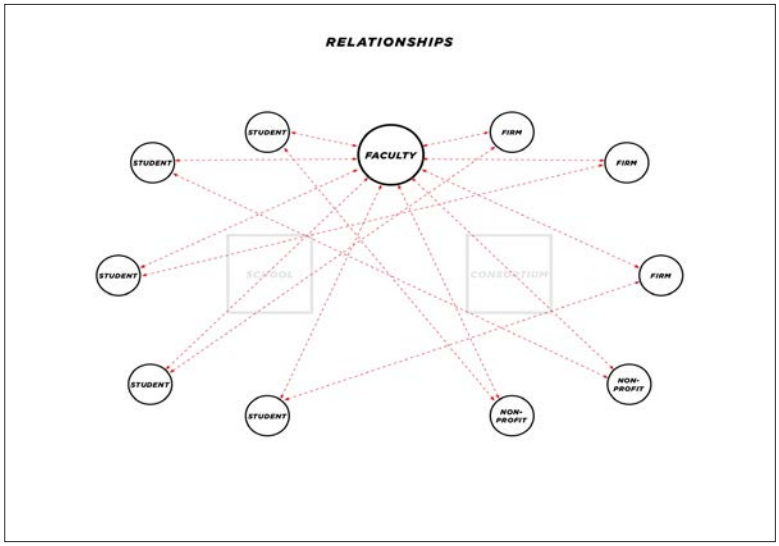
EXHIBIT 10

TITLE: M.S. IN ARCHITECTURE – RESEARCH PRACTICES & CONSORTIUM FOR RESEARCH PRACTICES

DATE: MAY, 2013

ROLE: HEAD OF SCHOOL OF ARCHITECTURE

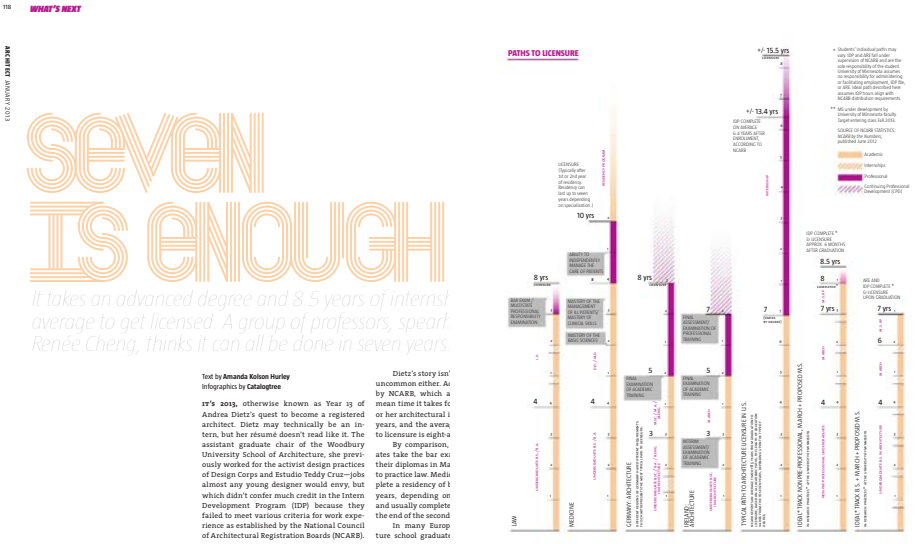
COLLABORATORS: FACULTY, RESEARCH ASSISTANTS



INTRODUCTION

The relation between the architectural profession and academia has the potential to be a rich and interactive exchange leading to meaningful advancement of the discipline. This consortium creates a robust knowledge loop in which the professionals identify problems in the course of practice and academic researchers communicate useful results back to practitioners. Research priorities developed by professionals ensure their value to clients, while complementary research priorities collectively developed with academic researchers address broad societal needs, advance building technology and reduce waste at many scales in the building industry. In the midst of this dynamic mix of professional experts and academic researchers, students thrive, guided by both mentors and professors in individual research projects that connect to multi-year research goals. Since the students' roles in these research efforts is counted in their IDP, meaningful work systematically leads to licensure, potentially upon graduation of the advanced post-professional degree, the Masters of Science in Architecture, concentration in Research Practices (MS-RP).

The proposed MS-RP incorporates a new experience that we at Minnesota are calling a "research practice internship". The student is working within a larger consortium of firms and the University that establishes multi-year goals and links faculty advisors with professional mentors to the students. This establishes meaningful internships for students that combine funded research as student assistants supervised by faculty with office-based internships paid by the firms – qualifying for the all important "Experience Setting A or O" as defined in IDP. By integrating the two experiences for the student, academic research is applied on actual projects and information is gathered in a way that allows for consistent methods and metrics.



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ARCHITECT JANUARY 2013

SEVEN IS ENOUGH

It takes an advanced degree and 8.5 years of internsh average to get licensed. A group of professors, spearh Renée Cheng, thinks it can all be done in seven years.

Text by **Amanda Kolson Hurley**
Infographics by **Catalogtree**

IT'S 2013, otherwise known as Year 13 of Andrea Dietz's quest to become a registered architect. Dietz may technically be an intern, but her résumé doesn't read like it. The assistant graduate chair of the Woodbury University School of Architecture, she previously worked for the activist design practices of Design Corps and Estudio Teddy Cruz—jobs almost any young designer would envy, but which didn't confer much credit in the Intern Development Program (IDP) because they failed to meet various criteria for work experience as established by the National Council of Architectural Registration Boards (NCARB).

Dietz's story isn' uncommon either. A by NCARB, which a mean time it takes fo or her architectural i years, and the avera to licensure is eight-a

By comparison, ates take the bar ex their diplomas in Ma to practice law. Medi plete a residency of t years, depending on and usually complete the end of the second

In many Europ ture school graduate

PATHS TO LICENSURE

The School of Architecture formed the Research Practices Consortium to advance the level of research in architecture. By creating a model of "Research Practices", the School nudges the profession towards true culture change, one that expects students can be licensed upon graduation, regardless of their final career choices. This change extends to architectural firms and the building industry, transforming its culture to share knowledge in the effort to collaboratively tackle the serious "wicked problems" affecting the built environment.

CONSORTIUM-WIDE GOALS

advance building industry by reducing waste, improving outcomes and demonstrating value of design fully integrate education, practice and research support better prepared leaders for the profession build a knowledge base as a professional resource to broaden and deepen expertise

CONSORTIUM MEMBERS

expand capacity for research that is practice-based and use-inspired collaborate in developing case studies documenting best practices and new models
sharpen regional competitiveness

STUDENTS / INTERNS

focus within a structured path to internship, examination and licensure
assume role in the profession as conduits for knowledge exchange
develop leadership skills for future-oriented practice-based research

FACULTY / SCHOOL / COLLEGE / UNIVERSITY

advance value of academic architecture in the discipline
establish leading model of education/practice/research integration
develop collaborative interdisciplinary education / practice / research in the University