IGLC Report 2 – The Academic Program

The academic program started on Wednesday the 18th of July and ran through noon on Friday the 20th. The annual business meeting was held on Friday afternoon and a day and half "Graduate School" followed on Saturday and Sunday morning. More on that in the next edition.

The IGLC meeting itself was broken into 10 sessions each an hour and half for the presentation and discussion of between 10 and 12 papers. The required A3 report for each paper was a great help. A session chair was assigned in advance with the responsibility and unquestioned authority to manage the session as they saw fit. Three basic approaches emerged; 1. Speed Dating where each author visited a table of 10 people +/- to make their case and then larger discussion of all papers. followed by discussion, Small groups, 3 or 4 short presentations followed by discussion, and longer presentations for a few paper selected by the authors in the panel followed by discussions. Many session leaders required presenters limit themselves to 4 PowerPoint slides. 1. What question did I have? 2 & 3. What did I learn? 4. What question do I have now? Alan Mossman pushed the short presentation envelope to a 1 slide in a minute or two extreme followed by discussions of papers in groups of 3 or 4. It was all pretty wild and worked better than I expected. Looking back or maybe forward, The IGLC meeting next year will be in Fortaleza Brazil. There are many reasons to make that trip. High on my list is to visit Pedro Pereira, more on him later.

So here are the papers I particularly thought useful and/or important with links to the site. You can find all the papers at http://www.iglc20.sdsu.edu/papers/ where you may need to use the password "lean" to enter. Unfortunately, the papers are listed by number with no author or title. So I will provide the links to the papers I selected this list. You can also find the papers listed on the IGLC permanent site - http://iglc.net/?page_id=277. On this site, papers are grouped by topic and then author but without the paper number from the conference. You can see a program for the sessions that has both the number and title of the papers. If you find one you want to read, to the first link in this paragraph. Good luck finding your way through. One note – I use the tradition of providing the email address of the senior author on each paper. The link to the paper is at the bottom of my comments on each paper.

6: On The Categorization Of Production; The Organization – Product Matrix, Trond Bølviken, trond.bolviken@veidekke.no

The paper makes an interesting connection between types of production and the appropriate approach to safety. I am a fan of 2X2 matrices. In this case, the authors suggest a quadrant where Lean Construction resides. Implications of this "zone" are explored in other papers - #47 , 121, 126, 187, 193, 194 & 202 – from different perspectives.

http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/2_P_006.pdf

11: Should Project Budgets Be Based On Worth Or Cost? Glenn Ballard ballard@ce.berkeley.edu

This paper proposes a radical way to set the budget for a facility. Setting Allowable Cost at what the owner is willing and able to spend to achieve project goals. Target cost establishes the area for Gain Sharing. Overrunning the Allowable Costs puts all parties in Pain Sharing. http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/77%20P%20011.pdf

23 Arranging Precast Production Schedules Using Demand Variability, Chien-Ho Ko, ko@mail.npust.edu.tw

Here the author tries to solve the problem of demand variability for precast suppliers by estimating Lead Time and considering past performance of customers. http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/86%20P%20023.pdf

31 Use Of Five Whys In Preventing Construction Incident Recurrence, Antti Leino and Sacha Helfenstein, antti.leino@skanska.fi

This paper reports a contractors experience using 5 Why's to investigate accidents. The results are provocative and the paper shows a remarkable shift in understanding. I expect we will see some great improvements from their work. http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/114%20P%20031.pdf

40 How Integrated Governance Contributes To Value Generation – Insights From An IPD Case Study, Patricia Tillmann, Glenn Ballard, Patricia Tzortzopolous and Carlos Formoso. patriciatillmann@gmail.com

Solid paper on IPD connecting theory to observed practice:" The hypothesis tested in the work was: "Integrated governance improves value generation because it enables the co-creation of value by creating a shared understanding of expectations and assumptions between those involved in strategic and operational decisions (customer x supplier relationship)" http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/29%20P%20040.pdf

42 A Case Study On Benefits Realisation And Its Contributions For Achieving Project

Outcomes. Patricia Tillmann, Patricia Tzortzopolous, Stelios Sapountzis, Carlos Formoso and Mike Kagioglou. patriciatillmann@gmail.com

A group of strong international academics have produced a super paper about a project in the UK using a Benefits Realization Approach, BeReal , a 5-step process. As in paper 40, there is a clear statement of the hypothesis to be tested: "the benefits realisation approach improves value generation by creating greater awareness of how project outputs will contribute to the achievement of expected outcomes and by pulling the decision making process based on the established benefit criteria". This is an important paper with significant implications for understanding and delivering value. http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/21%20P%20042.pdf

47 Making-Ready And Making-Do: Information, Uncertainty And Perceptions Of Readiness. Ergo Pikas, Rafael Sacks and Vitaliy Priven. epikas@tx.technion.ac.il

Here is a key paragraph from the abstract: "At each step planners make decisions based on their perception of the state of readiness, or maturity, of the work, but there is always, by definition, some residual uncertainty. Therefore, fine-grained planning decisions are often required even after commitments are made in weekly work planning using the Last Planner® System. These decisions can result in abandoning (or stopping) the planned work or improvisation or 'making-do'." The paper explores this reality and offers a well conceived decision making process based on project data. http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/44%20P%20047.pdf

76 Cost Comparison Of Collaborative And Ipd-Like Project Delivery Methods Versus Competitive Non-Collaborative Project Delivery Methods. Aditi Kulkarn, Zofia K. Rybkowski and James Smith. aditi_kulkarni@tamu.edu

The paper compares project performance between CM-at-Risk (CMR) and Competitive Sealed Proposal (CSP). The research finds performance is higher on CMR than CSP. The authors say, "This study is expected to help boost confidence in the benefits of collaborative project delivery methods. It is also likely that the results will encourage acceptance of IPD for public projects. http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/79%20P%20076.pdf

78 Literature Review On Trust And Current Construction Industry Trends. James P. Smith and Zofia Rybkowski. james.smith@tamu.edu

The authors have assembled a significant collection of publications on trust. I would add one

more: Building Trust by Solomon and Flores. http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/32%20P%20078.pdf

102 Meta-Organization: The Future For The Lean Organization. Paulo de Tarso Soubhie Napolitano and Fernando Cerveró-Romero. pnapolitano@herrero.com

I have been thinking about how the arrival of the Critical Path Method about 50 years ago changed the shape of the industry. We can see that General Contractors do far less of their own work but surely its impact on the structure of the industry goes beyond that. This is a job for historians. The authors here look forward and suggest how the industry might change with the advent of Lean Construction. http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/24%20P%20102.pdf

121 Revisiting The Concept Of Flexibility. Antonio N. de Miranda Filho, Luiz F. M. Heineck and Jorge Moreira da Costa. anmirandaf@yahoo.com.br

This paper had me after the first lines of the abstract: “Research studies indicate the existence of three generic ways for dealing with variation: control, flexibility and buffering. These are the ways of assuring organizational robustness to support the proactive and reactive management of events that occur during the project life cycle. Traditionally, project management practices have strongly relied on the combined use of control and buffers. However, the growing recognition of problems associated with organizational complexity has been changing paradigms and pushing structural changes towards the development of flexible competences.” The paper is worth study even if the authors missed my personal motto: “Indecision is the key to flexibility. Dare I close with ;) ? http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/118%20P%20121.pdf

122 Deciding A Sustainable Alternative By ‘Choosing By Advantages’ In The AEC Industry. Paz Arroyo, Iris D. Tommelein, and Glenn Ballard. parroyo@berkeley.edu

My experience with introducing Choosing By Advantages is that the uninformed struggle with great force to maintain their position. This paper digs underneath issues to make the case for CBA. From the abstract: “We compare and contrast value-based methods versus Choosing By Advantages (CBA). In addition, we explore what characteristics would make a method be aligned with lean thinking. We have found that methods that rank factors or values, such as value-based methods, require a high level abstraction, inducing unanchored conflicting questions. In contrast, CBA methods base judgments on anchoring questions, which are based on valuing the importance of between alternatives. CBA produces fewer conflicting questions

and allows stakeholders to discuss what they value in a richer context. We discuss why we think that CBA methods are superior to other methods for making sustainability decisions. In addition, we discuss why CBA is in line with lean thinking." http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/5%20P%20122.pdf

126 Causes Of Time Buffers In Construction Project Task Durations. Marion M. Russell, Greg Howell, Simon M. Hsiang, and Min Liu. mliu2@ncsu.edu

This paper grew from a conversation with Professor Liu from North Carolina State. We thinking through the different ways people cope with uncertainty in projects. Adding padding, buffers, is one way to absorb uncertainty. So Prof. Liu and her graduate students began their research by asking people how they respond to uncertainty and establish buffers. Part of their conclusions: "First, the overall top most frequent and severe causes of time buffer were identified. The top twelve most frequent causes of time buffer were: project complexity, complexity of the trade task, quality of documents, size of the project, required coordination with other trades, contract period, design constructability, tendency of scope changes, material transfer distance, material transfer method, work area access, weather/climate."

The second general conclusion is: "The second objective involved comparing the differences in opinion and perception between different survey groups. Overall, the frequency and severity increases as you move from project manager to the superintendent to the foremen. Acknowledging and understanding this difference in perceptions is important for construction managers as they plan and carry out their projects. The survey analysis also highlighted larger frequency and severity of time buffer perceived by trades with more complex tasks and greater interdependency such as mechanical, electrical, and plumbing. Experience was also shown to impact how much time buffer is included in construction task durations. Limited experience (5 years or less) resulted in adding a larger amount of time buffer.
http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/88%20P%20126.pdf

127 Pull Planning As A Mechanism To Deliver Constructible Design. Saurabh Tiwari and Partha Sarathy. saurabht@dpr.com

These two practitioners brought Pull Planning to a significant project. The abstract reflects a common reality. "This process was a new way of planning for the team members. A process that was initially perceived as "stating the obvious" soon turned out to be a process that helped discover misinterpretations of scopes of work between the team members. It became a tool to define who is supposed to do what, and when, and a tool to track commitments, and to ensure all prerequisites are identified. The plan-do-check-act cycle of pull planning demanded continuous involvement of team members which was resource intensive. The team was

gradually able to attain a balance between the necessary level of detail in the pull plan and the collaboration time required." This is a careful paper that develops the situation and clearly describes the steps taken. http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/14%20P%20127.pdf

130 Use Of Design Drivers, Process Mapping, & DSM To Improve Integration Within An Introductory BIM Course. Lei Xu and Cynthia C.Y. Tsao, xulei25@gmail.com

There has been a lot written about BIM and how it facilitates the design process and helps project teams think through the structure of work in the field during design. This paper looks inside the design process. "However, if a project requires (1) tight coupling between systems and components because doing so generates value for the project and (2) interdependent engineering disciplines to work in parallel due to schedule requirements, the team may face difficulties when they re-integrate any work completed independently back into the main model. To address this problem, we propose combining the use of design drivers, process mapping, and Design Structure Matrices (DSM) to improve a project's ability to de-couple building components, enable concurrency in component development, and achieve seamless BIM integration within a parametric BIM environment. Specifically, these tools combined may help projects reveal and then reduce the number of design interdependencies between building components."

The authors explain how they developed this capability with students and the practical benefits. http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/17%20P%20130.pdf

136 Driving Continuous Improvement By Developing And Leveraging Lean Key Performance Indicators. Fernando España, Cynthia C.Y. Tsao, and Mark Hauser. fespana@cornercubeinc.com

I am normally not a big fan of Key Performance Indicators but I think this group is on to something important. From the abstract: "However, unlike formal lean programs in the manufacturing sector, the Architecture-Engineering Construction (AEC) industry often uses the Last Planner System ® (LPS) and forms ad hoc project teams to manage their lean programs. To advance to the next stage of improving project performance, we propose that the AEC industry begin adopting an available set of lean metrics and analytics that are more effective in evaluating system performance. These metrics and analytics can help project teams aggregate and filter project and enterprise information. They can then determine lean key performance indicators that reveal new opportunities for continuous improvement of the production system." And they make their case by giving management a balanced way to understand what is and isn't happening. http://www.iglc20.sdsu.edu/papers/wp-

content/uploads/2012/07/96%20P%20136.pdf

139 Subsidy Allocation Mechanism For Successful Implementation Of Green Contracting Strategies. Deepak K. Sharma and Qingbin Cui. dsharma@umd.edu

I have joked that world piece would not be achieved if it took two projects that lost money to find a way to it. This paper offers a way to improve sustainability on projects. A great idea with some real difficulties to overcome the here and now focus of politics.
http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/9%20P%20139.pdf

159 Production Control Game For Teaching Of Location-Based Management System's Controlling Methods. Olli Seppänen. olli.seppanen@vicosoftware.com

Simulations are powerful research and teaching tools. An interesting new simulation explores the application of Location-Based Management. From the abstract, “Game results show that total duration and total cost have a large variance depending on the control actions taken during the project. Purely theoretical LBMS outperformed all players in all groups. Purely theoretical CPM focusing on the critical path finished last or second to last both in terms of durations and total cost. All the players felt that they understood the impact of their decisions better after finishing the game and comparing the results with others in the same group.
http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/61%20P%20159.pdf

160 Öppen - Lean Thinking, Prefabrication, Assembly And Open Building Thinking - All Applied To Commercial Buildings. John Rich. john.rich@oppen.co.uk

Open Buildings offer a way for organizations to cope with uncertainty by designing buildings with built in flexibility. This movement always reminds me of Stewart Brand’s book, “How Buildings Learn”. So Googled that to find a link and discovered he made a 3 hour documentary on this for BBC. http://kottke.org/08/08/how-buildings-learn-tv-series

Back to Öppen: From the paper, Öppen is a building system that combines lean thinking, open building theory and prefabrication. From the success of this first project, it was understood that the goals could be achieved through the elimination of waste. I like this line of thinking because it extends the boundaries of optimization. Think of paper 139 reviewed above suggesting subsidies be added to increase sustainability in ways not yet valued in the market. Having said that, Mr. Rich reports here that the building came in 40% under the budget on first design. The paper argues that that open building design practices can indeed reduce first cost and deliver a superior building for first use. I am still uneasy that such flexibility is free.

http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/84%20P%20160.pdf

173 Leading Indicators For Safety. Kevin Ng, Alan Laurlund, Gregory Howell, George Lancos. kng@xlconstruction.com

I first heard Kevin's presentation at the AGC meeting in Puerto Rico where the AGC rolled out their initial Lean Construction course. It was an impressive bit of clear thinking on a project where the Owner's rep had long interest in Lean both "classic" and construction. I urged him to write the paper and served as the guy who got the formatting close. I know some of the people who worked on the project and they support his claims too.

The 5-S practices clearly helped the site. And I was more impressed with how they thought through the data to realize that the contractor with the worst performance in terms of total fall failures of people working without fall arresting protection was not the most dangerous contractor. Another contractor had fewer cases where people were seen without proper equipment and very few workers on site. This observation brought the major danger into sharp focus. The contractor has carried this practice forward. " The rate of total leading indicators observed (per 200 man hours worked) during the first four months of the project was 1.29. This rate decreased to 0.22 during the second third of the project, and the overall project rate remained at 0.22 during the final four months of the project schedule. The paper closes with practical advice for implementation. http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/110%20P%20173.pdf

187 Uncertainty And Contingency: Implications For Managing Projects. Yours Truly. Ghowell@leanconstruction.org

OK, this was my paper. It gathered a lot of interest when presented. And Jim Carroll (of MK way back then) caught some typos and confusing mixing of uncertainty and certainty. Having said that, there were a number of papers working on buffers, contingencies, risk and so on. I will also post this link in a coming LCI update but you heard it here first: http://vimeo.com/45947817

193 Construction Crew Design Guidelines: A Lean Approach. Naveen Nerwal, Abdelhamid, T.S. nerwalna@msu.edu

This is surely the first article in the Lean Construction library to use the term "choreographically". And the authors have written a paper that brings structure to the conversation about crews and their makeup. There are ways in which Lean Construction can be understood as both bringing a very standardized work processes to the site and expecting crews to have the mental,

organizational and decision making skills to cope with uncertainty. see papers 47 , 121, 126, 187, 194, 202 – from different perspectives. This paper will be a key source for others as we work through the issues raised. http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/100%20P%20193.pdf

194 The Oops Game: How Much Planning Is Enough? Gregory Howell & Min Liu. ghowell@leanconstruction.org
This paper reports a simple simulation used to explore how we make decisions in the face of uncertainty. The same theme was explored by Rafael Sacks in paper 44. Prof. Liu and I are working on a larger paper perhaps for an education journal and perhaps a larger one exploring the question from a brain science perspective and an organizational perspective. Think of the padding practices reported in Paper 126. More experienced people add apply less contingencies, perhaps because they have learned how to make-do….http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/60 P 194.pdf

202 Exploring Crew Behavior Under Unexpected Events. Ankur Paresh Desai and Tariq Sami Abdelhamid. desaian5@msu.edu

In this paper, we see again the tension between developing a crew with skills to solve unexpected problems with reliance on higher authority and a crew with the great task skills necessary for highly productive work. Building skills to cope with uncertainty now seems to be another form of contingency available to cope with the unexpected. And where is such a skill developed? Early last century and even now, the military trains in teams for both building and battle. And this reminds me of issues discussed in papers 102 about organizations and in 139 about investment. http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/54%20P%20202.pdf

204 Adapting Lean Construction Technique In Nigerian Construction Industry. Ismail Adam, Gregory Howell. adam@live.com

A lot of people have taken a lot of risks to bring Lean Construction forward in the world. I met Ismail on the internet a few years back. I became his distant advisor when he set about using LPS on housing in the far northern part of Nigeria. http://www.iglc20.sdsu.edu/papers/wp-content/uploads/2012/07/74%20P%20204.pdf. Here is his most recent note to me.

Sir,

I am very greatful for all your efforts, I am in a certain situation

of constraint of attacks by militants of BOKO HARAM in my town. our security situation is very bad, that's why I am cut off with you. You can please go ahead and present the paper. I have started work on some project under our transformation agenda programme through Millenium Development Goals, I will liese with you. And the mission is transforming the construction industry. I have made a small presentation introducing Lean Construction as a tool of transforming Nigerian Construction Industry, with the little presentation, the importance of lean construction in transporming the industry was acknowledge and accepted. I will contact you as I progress. Sir I have alot of constraints here in Nigeria. thus; 1. our internet is very bad, some times I use to stay for 2 weeks with out network and is very expensive and difficult. thats why i feel demorilised most of the time. please Sir bear with me. My interest in Lean Construction is forever, because I have realised that is the only concept that will solve the problems in the construction industry. thank you once again.

SAMAILA ADAMU