

Responses to Qatar Workshop Questions

Prepared by Dick Bayer, Feb 1 through March 15

No.	Question	Responder(s)	Answers
1	can we do IPD Team during the current projects & make a change to the contract or it should start with project initiation?	Luai, Ahmed	
2	how effective IPD in Qatar at the time of blockade. what are the lessons that can be made during the time of blockade in terms of IPD implementation?	Luai, Ahmed	
3	where are we standing from getting fully applying first project in Qatar?	Luai, Ahmed	
5	1. isn't current paradigm is because of form of contract, should industry use partnering, alliance of relationship form of contract then things will be different 2. is IPD and IPT (i.e., integrated Project teams) are same 3. mega or giga projects are using collocated IPT and still construction projects suffer same fate unless form of contract is based on relational contracting	Glenn	1. With respect, I think you have the direction of causality reversed. Paradigms cause forms of contract. Changing forms of contract without changing paradigms will fail. Fortunately for the industry, some individuals are less bound by paradigms than others, and are willing to try something new. Their success results in broader adoption because the benefits have already been demonstrated and concerns about risk addressed. Some client and contractor organizations will only adopt lean when compelled; by client demands or by market pressure from competitors.] 2. They are not the same. IPT refers to selecting people for project management roles from different companies involved in the project. Typically, IPT happens on larger projects where there are multiple design and construction firms involved.] 3. I'm not surprised to hear that. Thanks for sharing.
4	In Qatar BIM Stops at design stage. Wish Contractors adopt it in construction (i.e., shop drawings)	Luai, Ahmed	
6	We use LC for new project what about using LC as an evaluative model like what LEED does. Dr Salim Ferwati, Qatar University.	Glenn	Highways England uses such a model. See https://www.gov.uk/guidance/highways-england-lean-maturity-assessment-helma
7	up to what extent do you believe that IPD is interrelated to the Advanced work Packing and Workface Planning?	Glenn	AWP and Workface Planning violate fundamental principles of project production management, the most damaging of which is failing to assure reliable handoffs between trades. Instead, they focus on increasing labor utilization of individual trades. You can find critiques on the website of the Project Production Institute (https://projectproduction.org/)
8	Form of contracts PWA using.... FIDIC Red book or D&B etc. (conventional) forms are allowing to add articles pain and gain approach and collaborative/partnering arrangement	Luai	
9	The projects in America are different, suppliers are major there. Here, especially in Middle East, the main contractor is more important than trades; so, my question is how rewards will be given for engineers in the field to let them apply Lean during construction.	Luai	
10	is IPD can be consider as a new type of Procurement Route? Exactly, it's not only new. It's revolutionary to achieve the value we seek to clients and align the interests of all project participants towards a common goal.	Luai	
11	Does the meaning of term "Lean" in "Lean Concrete" applies in IPD? You know low ratio of cement to water as well as to aggregates will LEAN the CONCRETE, please explain, do we undermine quality of works in applying Lean Method of Construction? Though lean concrete is not structural, but leans the conditions to further works, please explain	Luai	
12	To Abdulla - How Lean Construction is being integrated throughout all Authorities and Stakeholders across Qatar to ensure that all aligned to achieve the most out of this	Abudulla	

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	initiative? We have approached all key stakeholders seeking collaboration. LCI-Qatar signed MOUs with QU and PWA. Please wait for the good news about LCI-Qatar collaboration with MME. SC, Kahramaa, QF, Barwa, MOT, and many others to follow.		
13	in collaborative/relational contract litigation has not been reported ...does Ashghal (PWA) facing litigation	Ahmed, Will	
14	Dear Mr. Ahmed, Good day, as you know D & B of various major projects unlike other type of projects are always exposed to time & cost overrun, what is the course of action needed to avoid this from start to completion?	Ahmed	
15	Shukran Engineer Ahmed. I have a question - Is ASHGHAL (PWA) also considering Public Private Partnership (PPP) initiatives?	Ahmed	
16	Engineer Ahmad Al Ansari - Ashghal designated a project for the new integrated design and construction framework? When do you expect one to happen?	Ahmed	
17	How is Ashghal, supervision consultant and Contractors dealing with short supply of lean staff since Lean is fairly new in Qatar?	Ahmed	
18	What is the first step to undergo if i want to be a lean engineer	Tariq	<p>I will assume that you have a background in an engineering field already and would like to further specialize in Lean Construction. I propose the following:</p> <ul style="list-style-type: none"> • Embark on a learning journey that is thoughtfully grounded in solid content from reputable and credible academics and practitioners. • The Associated General Contractors of America Lean Construction Education Program is a good start. Another is the series of courses offered by the Lean Construction Institute. • If you have the time and resources, consider a master's degree where you concentrate on Lean subjects. <p>Regardless of the learning journey you undertake, Lean is learned by doing. You need to practice by applying to actual problems. If your company provides you with this opportunity that will be great.</p> <ul style="list-style-type: none"> • You need access to a mentor to work with you to clarify doubts, give guidance and share insights. You can find this by networking on LinkedIn or maybe through your local Lean Construction Community of Practice or Institute. • You also need access to a support network of peers. Again, on-line or physical communities.
19	Dr Tariq, I saw it is all still paper based implementation, do you plan to change to a software for LPD such as Lean PlanDo or other software?	Tariq	The implementation I showed was our first. The software options were limited back then but were available. Now there is more. We preferred to learn the process using the paper-based approach to get the process down first. In addition, the physical connection to the boards was also key because the team members trusted that their plans would not be moved around by anyone except them. Something also about the tactile feeling with the post-it-notes was allowing the crucial conversations we look for in LPS to happen.
20	Dr. Tariq Abdelhamid, what is the facility doing now?	Tariq	The facility managers rave about how the renovated areas are performing compared to other buildings. They say that they don't have to wait for months to replace light bulbs that have to be imported from Italy – this is in reference to light fixtures installed in other dining halls that are problematic to maintain because of imported parts. They also mention how tight nooks and crannies don't exist, which does not cause issues for floor cleaning and carpet vacuuming operations. All of this because they were consulted. The chefs, cooks and the back of the kitchen staff love it because they have windows through which they see the sun and the outside in general. The bulding received LEED Gold.
21	Thank you all for the presentations. The presentations are for relatively small size projects, however, in Qatar, we have much larger sizes projects, in particular Ashghal Projects.	Tariq	The logic behind this question is that we can only generate value on a small project because the Lean Project Delivery approach is not scalable. Experience has shown that the approach is in fact scalable. Projects in the range of \$5 Million to \$1.5 Billion have been completed with approaches similar to what was presented. There is no doubt that the process management across the phases change and thought needs to go into adapting the methods. We successfully implemented projects in Qatar in Lusail – Check with Dr. Luai El-Sabek for details.
22	Dr Tariq - you presented an impressive project in which you applied many lean construction concepts and tools all at the same time and you did that fairly early on in the history of lean construction. Can you share with us	Tariq	The credit belongs to an incredible team of dedicated colleagues who were ready to embark on something new. We definitely faced challenges. The concept that construction is an input to design – not an output from it – was a major challenge. The specialty contractors, Mechanical for example, were involved in the late stage of schematic design. We didn't hire them to be a design-assist function. We wanted them to influence the design. In this case the mechanical contractor waited until a design was ready and wanted to estimate the GMP for the system. To overcome

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	(expected) difficulties you must have faced in getting buy-in, and how you resolved them?		this, we explained that we would like them to give input on the design parameters that would influence the cost of the systems such that we can meet the target cost. The mechanical contractor was not convinced initially. It took time to change from the traditional role. In a project delivered in this manner, risk is shouldered by the party that can best take it. So, as the owner, we took on many project risks (escalation; parking; hidden conditions, etc). We expected that these risks would be removed from the unit costs used in the estimating process. This was a difficult process. Again, through dialogue and showing that we are really picking up these items the discussion became easier. We were worried about behaviors slipping back to the traditional ways. We used a performance-based scoring system that rated the adherence of the team to the 5-Big Ideas that Sutter Health created. We also connected the return of the risk pool (profits) to the scores against this system. This worked well to ensure compliance but also generated discussions when there was a month when we had issues.
23	What is the difference in cost estimating between traditional project delivery and lean project delivery methods that presents more sensitive budgets?	Dick	Traditional cost estimating (especially Chartered Quantity Surveyors) have developed processes for doing "take offs" (calculating square feet/square meters) from developed plans. The stages of estimating are based on the granularity of the plans. In Canada, an indicative estimate (Class "D") is the least granular but still relies on "a comprehensive list of project requirements (i.e. scope) and assumptions; the Class D estimate is evolved throughout the phases of the project identification stage, finally being incorporated into the cash flows in the Analysis Phase." https://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/bi-rp/conn-know/couts-cost/definition-eng.html . In th lean process, especially in Target Value Design, we don't have a plans from which we can "take off" square ft/mtrs and we do not yet have a "comprehensive list of project requirements," so we need another process. That's why we use a combination of benchmarking, conceptual estimating, parametric cost modelling and model based estimation.
24	From Owner point of view, what are the lessons learned from Business College Pavilion Project?	Amr	Here is the answer of the question about lessons learned at MSU IPD projects: (a) Leadership Engagement is a Key, (b) Need to Build Culture within Public Agency, (c) Identify Key Opportunity, (d) Set Measurable Targets, (e) Create a System that is a Customer centered, (f) Empower staff with trust and compassion, (g) Take it with phases, and (h) Skills come with Practice: Educate, Train and Coach
25	What technological advancements like BIM implementations in construction industry, can contribute to Projects, in terms of decreasing waste, enabling smooth workflows and increased value to Clients, which are embracing Lean Project Delivery. For Mr. Amr Please. Thank you.	Amr	
26	Is Lean theory causing cost for acceleration for main Contractors, in other words who relatively more benefit from IPD, Client, Engineer, Main Contractor or equally all?	Glenn	The study that would answer your question definitively has not yet been done, at least not to my knowledge. From what I've been told and from the studies that have been done, it looks like all parties have equally benefited.
27	how automation and AI, ML etc. in construction sector compliment lean implementation	Glenn	4. It is simply good business to use the sharpest tools available for performing project tasks. Although lean is a philosophy based on principles and grounded presuppositions, at the level of methods for managing people and processes, lean is the sharpest tool.
28	It is a matter of trust running from convincing the client with the IPD approach to the suspicious trust between selected Consultants and Contractors. This led us to the search for proper governance system implemented based on minimum trust. That said, where do you see the blockchain application on this type of projects?	Will, Mark	
29	I think its a bout rewards more than culture, also size of projects size ??	Glenn	In my experience, with few exceptions, the individuals on IPD projects want to collaborate rather than fight one another. However, they are compelled to do whatever they can to increase their individual company's profits, unless given permission to collaborate. Tying a contractor's profits to project performance provides the leaders of contracted companies an incentive to give their employees permission to work together toward project objectives—the best way for each company to make the most profit from the project.
30	How do you see the possibilities of convincing the ultimate stakeholders in Qatar to adapt IPD contract in a region that has a lot of conservation about involving any of the competition in an early stage? This will need special regulations to make it possible, do you agree?	Dick	I'm not certain about the laws in Qatar and what might have to happen in order to allow IPD in its fullest form. However, the convincing part of the question is what interests me. I would ask the Owner group in Qatar (including the public owners) does the system you operate under currently give you the value you are looking for? Do you believe that is substantial waste in the system? Has being reactive served you well? What if you could have your
31	Early contractor's involvement good idea 100% How about the other authorities / government entities involvement into the tender / design process?	Dick	This is something that I have always believed is a good idea. In California, a project could hire an inspector of record and that person was dedicated to your project. That worked out well on many projects. At the California Prison Healthcare Receivership program, the State Fire

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			Marshall and other public officials joined the project. It certainly helped advance the ball in design (designing to pass inspections is a part of target value design), even more than just in tender.
32	According to lean and IPD, the low-bid selection is less preferable, and replaced it with production indicators. My question When there is no partnership history, which of them we use and how can we utilize them to select partners?	Glenn, Dick	Glenn: Get and check references carefully. And, since you're hiring individuals, not just a company, interview the proposed individuals about their willingness to adopt lean principles. Dick: I agree with Glenn and would emphasize that the interview is the most important part. Subsidiary to the interview are the explanations of the proponents understanding of lean principles and their experience with them in previous projects. But the actual individuals who will be on the job, so long as they are supported by their organizations, are the juice in the machine. Work hard to get that right!
33	Is the application of lean construction or IPD method relates to scale and type of project? It seems more suiting in building industries rather than infrastructure projects, kindly clarify.	Glenn, Dick	Glenn: Early applications of IPD were mostly on building projects, but I don't see any reason why it shouldn't apply to any scale and type of project. Dick: As pointed out below, the FTA has used Alliancing for rail and highway projects. Delivery of infrastructure in Australia is often through Alliancing. I was honoured to work on the Third Crossing, a new Bridge project in Kingston, Ontario, Canada. Caltrans uses a design process called sequential design that has a number of lean attributes--because they are designing the next part of the road as they are building this part, they focus on "just in time" design, accomodating the conditions they currently find.
34	Why despite all the technological advances we are not as good as we were in the past. Why in 1930 they built the empire state in one year, and we take it as granted that every project will be delayed. What they made right, and what we are doing wrong?	Glenn, Dick	Dick: I've been on several projects where members of the team have been replaced. Usually there are deep discussions about the goals and alignment of the team and yet there are those that are not constituted to participate in the team relationship. I c
35	Any examples of IPD applied for horizontal type projects; transit/rail, highways, pipeline, etc.	Glenn, Dick	The Finnish Transport Agency has completed a number of rail and highway projects using a form of IPD called Project Alliancing. For details, see leaninpublicsector.org
36	Highly useful and enlightening one. The parameters of lean construction elaborated are qualitative ones. could you pl share quantitative parameters to measure lean practices.	Glenn, Dick	Glenn: The performance measurements for lean are mostly the traditional ones: fewer injuries and occupational illnesses, higher customer satisfaction with delivered quality and functionality, projects completed on or under schedule, projects completed on or under budget. The Lean Construction Institute (www.leanconstruction.org) is one source for information on project performance. The International Group for Lean Construction (www.iglc.net) has published papers on lean since 1993, all of which can be downloaded for free, and many of which report performance metrics. Dick: In addition to what Glenn has said, we look at the reduction in typical project processing: reduced RFIs from a similar project, reduced change orders, development of specs in design so we don't need an "as good as" book of specifications that runs to several volumes.
37	Have you ever replaced site manager if he is not complying with the collaborative spirit?	Glenn, Dick	Dick: I've been on several projects where members of the team have been replaced. Usually there are deep discussions about the goals and alignment of the team and yet there are those that are not constituted to participate in the team relationship. I can't remember having to remove a "site manager."
38	Until IPD becomes the common delivery method, how is it best to address the challenge for having the stakeholders/partners to jump between two different culture/mindsets: IPD vs. conventional project delivery?	Glenn, Angelo	
39	Is there a standard contracting format acceptable to the World Bank, which would be easy for the Public Sector clients bound by Vigilance Rules to accept?	Geza	
40	Are there some references for larger size projects?	Geza, Will	Will Lichtig can provide references for Sutter Health's \$1.5B 'Cathedral Hill' Hospital Project in San Francisco.
41	2- How the IPD will protect the interest of the EPC Contractor and the Client on multi-billion USD Projects?	Glenn	On IPD projects, the client bears the risk of paying overruns of project budgets. Key players, which include the EPC Contractor and other design and construction companies, bear the risk of receiving no profit from the project. Doing what's needed to reduce the risk of losing profits also reduces the risk of project overruns.
42	Are there currently any standards for practicing IPD? How developed is the practice of IPD globally apart from Canada and Qatar?	Glenn	Collaborative contracting (IPD) is in broad use in various places on the globe, including Australia, Finland, Germany (now doing their first projects), and the United States. Lean in the Public Sector, an organization pushing the Lean philosophy worldwide, is one source of information (leaninpublicsector.org). The Lean Construction Institute in the United States is another source (www.leanconstruction.org)
43	In road construction what percentage (range) of idle time should be considered for Plant and Machinery for unit costing.	Glenn	I have no idea.
44	who selects the participants and how? any flowchart?	Glenn	Increasingly, competitors for IPD contracts come as a team. Some form of Best Value Procurement is used to decide whom to award the contract. That involves evaluating non-cost parameters such as relevant experience, financial stability, and openness to collaboration. The number of points given is used to reduce the number, then the key players on the remaining contestants are interviewed with an eye to these individuals'

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			capabilities and openness to learning and collaboration. The competing companies that clear this hurdle are invited to submit cost estimates. Supposing that there are 100 points in all to be awarded, usually 70 go to non-financial and 30 to cost. As a result, the winner may not be the one with the lowest cost. In any case, the owner is more likely to get a team that is capable of delivering the project successfully.
45	Dr Glen, nice to hear you live again, guru of LC. Is there a correlation on your proper triangle Also LC been over 2 decades and what its success rate of acceptance in industry	Glenn	That's really difficult to say. As far as I know, no such studies have been done globally. One indicator may be the number of countries with Lean Construction Institutes or equivalents. To my knowledge, that now includes LC-Australasia: Christina Levinson, christina@iconnectconsulting.com.au LCI-Canada: Eric Lee, elee@cca-acc.com LCI-Denmark: Rolf Simonsen, rs@vaerdibyg.dk LCI-Finland: Lauri Merikallio, lauri.merikallio@vison.fi LCI-Germany: Shervin Hagsheno, shervin.hagsheno@kit.edu LCI-Mexico: Andrés Bustos, abustos@lcimexico.org LCI-Norway: Lena Bygballe, lena.bygballe@bi.no LCI-Peru: J. Guzman, JGuzman@LCIPERU.org LCI-Qatar: Luai Sabek, LSabek@Lusail.com LCI-UK: Derek Drysdale, derek.drysdale@leanconstruction.org.uk LCI-USA: Dan Heinemeier, danh@leanconstruction.org Brasil: Dayana Costa, dayanabcosta@ufba.br Chile: Luis Alarcon, lalarcon@ing.puc.cl Colombia: Sandra Cano, sandra.cano@correounivalle.edu.co France: Patrick Dupin, patrick.g.dupin@gmail.com India: N. Raghavan, nraghavan@iitm.ac.in [Institute for Lean Construction Excellence] Israel: Rafael Sacks, cvsacks@technion.ac.il New Zealand: Vicente Gonzalez, v.gonzalez@auckland.ac.nz Spain: Victor Roig, vroigs@bimetriclab.com [Lean Construction Barcelona]
46	Why are principles important in Lean? Aren't methods and tools all that's needed?	Glenn	Here are a few of the principles of the Last Planner System, one of the primary Lean Construction methods: Produce plans collaboratively with those who are to do the work being planned. Don't start tasks that you should not or cannot complete. Commit to perform only those tasks that are properly defined, sound, sequenced and sized. Make and secure reliable promises, and speak up immediately should you lose confidence that you can keep your promises (as opposed to waiting as long as possible and hoping someone else speaks up first). Learn from breakdowns (unintended consequences of actions taken, both positive and negative). These are very different from non-lean principles, which separate doers from planners, push for completion of scheduled tasks regardless of readiness, give orders not requests for commitments, and see learning as something restricted to classrooms. And in addition to principles, consider these Last Planner System presuppositions: All plans are forecasts, and all forecasts are wrong. Forecast error varies with forecast length and level of detail. An essential prerequisite for reliable promising is that those to whom a request is made can say "no" to that request by appeal to task appropriateness (sequence), or readiness to be performed (task definition, soundness, or size relative to capacity of performers). Perfect planning may not be possible, but it is possible to never make the same mistake twice. The first says that CPM's dream of finding a pathway to project objectives that never changes is exactly that, a dream. The second is framed within the conceptualization of a project as a network of commitments. The third is the basis for investing in learning. Methods are just tools. We invent better methods all the time, but those methods are lean that are fit for the purpose of delivering value and eliminating waste and are to be used consistently with lean principles and presuppositions.
47	Dr Ballard - Re Malling Precast, did you take action to speed up curing? If yes, how? If not, why didn't you consider?	Glenn	After the successful implementation of production cells at Malling, Laing-O'Rourke, the parent company, went on to relocate and restructure their concrete products production using computer-controlled machines, including kilns for reducing the time for hitting strength targets.

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48	is it possible to repeat the article / give link where the improvement in shear wall mould production took place?	Glenn	Ballard, G., Harper, N. and Zabelle, T., 2003. Learning to see workflow: an application of lean concepts to precast concrete fabrication. <i>Engineering, Construction and Architectural Management</i> .
49	pain/gain isn't incentivization?	Will, Dick	Dick: Incentives are tricky things. Daniel Pink, the author of <i>Drive</i> , believes "carrots and sticks" (pains/gains) "as motivators, have seven deadly flaws: "He argues that carrots and sticks, as motivators, have seven deadly flaws: They can extinguish intrinsic motivation, as people offered money to carry out certain activities stop doing them - or stop doing them properly - unless they are adequately paid. They can diminish performance, . . . They can crush creativity, . . . They can crowd out good behaviour, . . . They can encourage cheating, shortcuts and unethical behaviour, as we have seen on Wall Street. . . They can become addictive. [and] They can foster short-term thinking." Pink quoted in https://www.theglobeandmail.com/report-on-business/carrots-and-sticks-have-deadly-flaws/article4302750/ . Think about a situation where we say to Bob, "eliminate \$1M in expenses by the end of the year, and we'll pay you a \$100,000 bonus. Bob works really hard, does Kaizen events, leans up the operations, saves \$100,000 by November. In December he fires 7 people so he can secure his bonus. Is that what we wanted? The IPD idea is not really pain share/gain share. It is more about aligning the contracts of all partners on the project to focus on securing our objectives and fulfilling our responsibilities. This is why the validation process is so difficult because people want to get their commitment right.
50	Are these private or government projects where you have used ipd contract	Will, Dick	Dick: I've been party to private IPD contracts (TD Bank in Toronto for instance) and public projects (all of the other projects I've done in Canada).
51	the collaborative environment that IPD demands can be easily contaminated by uncommitted individuals especially in large-scale projects. What kind of protective measures can be contractually introduced to maintain the IPD environment in large scale projects?	Will, Geza	Geza: Contractually, the key to maintaining the integrity of the IPD environment is a governance structure appropriate to the size and complexity of the project, coupled with provisions authorizing the termination of non-performing team members. <ul style="list-style-type: none"> • The essential governance principles are (a) ensuring that all of the right team members are part of the governance structure (Senior Management Team [SMT], and especially, the Project Management Team [PMT], which has the day-to-day operational responsibility for the project); (b) providing for a proportionate voting representation by these members; and (c) ensuring that the governance is workable in practice. • The CCDC 30 standard form contract used in Canada stipulates that each and every member of the IPD Team is represented on the SMT and the PMT, and that all decisions are made unanimously (except a decision to terminate a team member, which decision must obviously exclude that member from participation). Experience has shown that this governance model may not be appropriate in all cases, particularly where the number of parties is large. Operating with a governance which includes 15, 20 or more members is unwieldy and inefficient, and as a practical matter, is also unnecessary as long as non-participating members trust those in governance to exercise sound decision-making which recognizes the interests of everyone. Instead of this, we have limited the SMT and PMT to a smaller group, including always the owner, the contractor and the designer, and usually the key trade contractors. We have also replaced the unanimous decision rule with one requiring only 80% approval. • Another variation is to keep the SMT and PMT open to all IPD Team members, but establish a Core Group from among these parties, and empower that Core Group to make the granular operational decisions, with the PMT reserved for higher level issues and the SMT retaining broad project oversight. • Under the CCDC 30 form, the SMT is authorized to terminate any member of the Design/Construction Team which is failing to collaborate for the benefit of the project, neglects to properly perform the work or the design services, or otherwise fails to comply with the requirements of the contract to a substantial degree. Termination must be done on notice to the affected party, and there is a cure period prescribed. The SMT's decision must be unanimous, other than the party being terminated. • Interestingly, the CCDC 30 form does not prescribe any mechanism for terminating the participation of any particular individual, only termination of the party. The presumption within CCDC 30 is that the problem of a disruptive individual is one to be solved by the PMT as part of its overall project supervisory authority.
52	For public governmental projects, what is the criteria used to choose the contractors & consultants to execute the projects ??	Will, Geza	Geza: The key considerations for an owner, either in the public or private sector, when procuring IPD teams are (a) an understanding of the IPD process as demonstrated by the team; (b) the prior experience of the team and its record of successfully completing collaborative contracts; and (c) the chemistry between the proposed team and the owner's project group. <ul style="list-style-type: none"> • It will be readily apparent that procurement in an IPD project is a very different process than procurement in traditional delivery, where price is a key determinant. The focus in IPD is the team itself, and the procurement process typically involves a review of written submissions by prospective teams outlining their experience, etc., followed by an extended interview process among prospective teams and the owner's project group.
53	How contractors/partners compete in IPD.	Will, Geza	Geza: The compete on the basis of their demonstrated understanding of the principles of IPD and Lean construction, and their track record of successfully working as a team on successful IPD projects.
54	Agree. Thanks for that response. what type of Form of Contract can be use for IPD contract?	Will, Geza	Geza: There are various forms available throughout the world. In Canada, the standard form is the CCDC 30-2018 form, which is likely generic enough to be considered for use elsewhere.
55	Thanks for all,	Will, Geza	

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	Can anyone share an IPD contract template? so we to make a comparison with the traditional contracts		
56	IPD concept requires early choice of Contractors involved and associated to the project; how to maintain fair competition between competitors? Can you elaborate about the process and contract awarding?	Will	
57	what method or tools PWA has been using in partnering or collaboration within team	Will	
58	at which stage of lean process, does "contractor selection" takes place? how is the contractor selected? competitive bidding? frame agreement? And how does contribution of lean process measured depending on procurement type?	Will	
59	1-Does the IPD applies on multi-billions USD LS projects where the Agreement is set on stone and any deviation is a breach of contract?	Will	
60	Is IPD another term or customization of relational contract	Will	
61	How does IPD differ from an Alliance delivery model?	Will	
62	What has been your biggest challenge through the validation process?	Dick, Angelo	Dick: The greatest challenge is focusing too much on the estimate as the "font of all knowledge." The estimate requires drawings and that moves us to draw faster than we should. We need to use a combination of techniques (benchmarking, conceptual estimating, parametric cost modelling and model-based estimation) to validate at what this project should cost using competent traditional resources.
63	is the lean on site work is different other than on paperwork ...? real experience question???	Dick, Angelo	Dick: The goal of the IPD process and the lean operating system is maximizing the amount of money spent on the project and minimize the amount spent on process. That answers your paperwork question. But the lean operating system and its focus on flow efficiency rather than resource efficiency is also very important and distinguishes how, where, when and why work is done on the project. Most trades who have participated on a successful IPD/lean project will tell you that they never want to go back to traditional delivery. A really good book on this subject is <i>This Is Lean, Resolving the Efficiency Paradox</i> , by Niklas Modig and Pär Åhlström. https://www.amazon.ca/This-Lean-Resolving-Efficiency-Paradox/dp/919803930X/ref=sr_1_1?dchild=1&keywords=this+is+lean&qid=1615578288&sr=8-1
64	Mark and Dick, I saw once again it is all still paper based implementation, do you plan to change to a software for LPD such as Lean PlanDo or other software in the future?	Dick, Mark	Dick: I am open to software solutions, especially in remote implementations. We developed a remote excel process for Last Planner® last March (2020) when we began lockdown. Since then, I've used Mural for live sessions and have seen Miro being used. The problem with all remote and software solutions is that you lose the political act (using "politics" [Πολιτικά] in the Greek sense of the word--the "philosophy of human affairs") of someone writing a commitment in their own hand, walking to the board and placing it in public, in front of the people who will rely on that commitment. It's a powerful act that is not mirrored by software.
65	Question to Mr. Byer: How are contract breaches tackled in an IDP contract setup?	Dick	Almost all contract breaches in an IPD contract are failures to act as a responsible team member. Because all IPD models developed so far have a waiver of liability amongst the signing members, traditional "claims" cannot be made against an irresponsible team member (there are limited exceptions for fraud and criminal behaviour). The remedy for an irresponsible member is removal. That said, there are often disagreements in how best to proceed with a certain scope of work. In those cases, all IPD contracts of which I'm aware provide a dispute resolution process that most often includes mediation and perhaps arbitration to finally determine the controversy. Although I've never participated in that process, I would imagine it is most likely where an Owner vetoes a certain less expensive alternative, and the parties can't agree and how the Owner will compensate the team for the consequences of the veto.
66	How do you see processes, methods and technologies related to Lean Construction, Integrated Project Delivery and Building Information Modelling being applied together into construction projects? How can all these be leveraged for the benefit of all the parties involved in a construction project: owners, contractors, consultants, operators? What are the main drivers for adopting LC, IPD and BIM collaboratively?	Dick	Quite a mouthful there. Construction Projects in General: We usually use a Venn diagram to describe the overlapping interests of all the parties you've mentioned in forming our teams on IPD projects. Lean construction ideas can have universal application to design and means and methods but without an IPD contract (or to some extent an Alliancing model), you normally don't have the contractual alignment and leverage necessary to take advantage of all the various principles of lean. That said, we have seen trade partners (even lump sum trades) decide they will use lean processes to enhance value and eliminate waste in their production and delivery. There are a number of General Contractors (Boldt, DPR, Turner, e.g.) who try to leverage lean thinking on every job regardless of contract model. There are lean designers like Boulder Associates or Devenney e.g., that use lean principles in both programming and design regardless of contract model. BIM: We see some form of modelling on almost every project. In one famous exchange to which I was witness, Phil Bernstein of Autodesk said, "you can't do lean without BIM." Chuck Greco of Linbeck, then chair of the LCI Board and later President of the AGC, replied, "I disagree Phil. You can use lean with a brain and a pencil." That said and with all due respect to Chairman Greco, BIM does help with visualization, organization and streamlined design processes.

No.	Question	Responder(s)	Answers
			<p>Main Drivers: The main drivers for lean construction and these collaborative, cooperative, relational processes are best summarized by Daniel Pink when he said of incentives in <i>Drive: Autonomy, Mastery, Purpose</i>. Lean construction unlocks intrinsic motivation, it allows people to "play at their best." If you allow others a measure of autonomy (the ability to direct their own actions), develop mastery (the ability to do something really well, what Malcolm Gladwell suggests might take 10,000 hours to become a world-class master) and allow that good work to be their purpose (or a significant purpose), people will take to lean. Taichi Ohno, the author of the Toyota Production System said the 2 keys to lean were just in time delivery and the relationship between people and machines. LCI, among others claims that the twin goals of lean are respect for people and continuous improvement. The people connection is obvious; people drive lean.</p>
67	collaboration is always there, and this term is diplomatic word, relationship or relational is term to be use or has been coined by industry in the past	Dick	Collaboration is a very specific skill, used by skilled people together to solve problems. IPD is not necessarily a collaborative delivery model, it is in fact a relational delivery model as suggested by Ian Macneil in the 1970s. Overuse collaboration (gather 300 people in a big room and expect them to collaborate) and you'll be disappointed. Concentrate on the relationships IPD allows and you'll be better served.
68	what are the prerequisites or tenets of collaborative approach and you to develop teamwork ...?	Dick	Because construction projects are installed by teams, buildings are built by teams, roads are paved by teams, we need to have a team. It is best to have a "better" team than a "worse" team. What does that mean? The team has to understand mission. The team has to understand the language used by other team members. The team has to recognize and endorse the finish line. The team has to have an artifact of their team, symbols they share that mean they are part of a team. What have we just described here? We have described a "culture." That's why we concentrate on developing a team culture that is different from the cultures of the organization from which each team member is plucked.
69	How Can we Implement IPD during Tender Stage; while i mean contractor point of View for Projects under Client Design?	Dick	The Tender Stage means many different things. It typically means that a project has been sufficiently developed to go the market (tendered to the market) for responsive offers. This can happen before design--tenders to designers. It can happen during design--tenders to consultants. It can happen after design--tenders to the GC community. An IPD "tender" is most effective if you go to the market seeking an IPD team, either all together or in pieces and parts. Most IPD programs have "tenders" for lump sum contracts where the team has decided it will get a better value from competitive pricing often because the product or service sought is very fungible. That tender should be developed and scrubbed by the IPD team to ensure it is clear and its conditions of satisfaction ("how will the promisor know when the promisee will accept the result because the conditions of satisfying the promise have been made explicit") are obvious.
70	In complex organizations with many stakeholders, how would you Lean training?	Dick	<p>This is a great question. The first project I worked on with the ReAlignment Group and my partner Dan Fauchier was a complete realignment of a large water agency in Southern California (where water is more valuable than gold). The first thing we had to do was understanding their Mission. Next, did the organization understand the Mission? Finally, were there systems and culture organized in a coherent way that produced the mission? This is where the rubber left the road. The organization spent a lot of time trying to maximize the efficiency of their resources, department by department that they lost sight of the mission which was to deliver high quality water at the lowest cost to the public. It is not surprising that systems lead to results counter to the mission of an organization. Most organizations do not concentrate on developing systems that are resilient to unintended consequences. Competitive bidding is a good example. It seems perfectly reasonable to imagine that if we issue something of the market, all responses will be the same except for price. If we chose the lowest price, we will get the best value. But anyone who has spent more than a nano-second in the competitive bidding process, especially for complicated buildings or facilities know that the responses differ greatly in terms of the competence of the organizations to complete the project, the difference between intended scope and the scope the respondents have seen and the hope that below market bids can be made profitable through change orders, to mention a few. This means that money cannot be the sole determinant of whether we will receive value from any of the responses. Yet for more than 70 years, we have mandated that it is the sole determinant.</p> <p>This long introduction underscores how important it is to design "lean training" to fit the organization and its mission. So often we try to teach people how to use lean tools for systems that cannot possibly accommodate them. Consequently, start slowly. Understand the mission--understand the value proposition. Then understand the system or systems that deliver that value proposition. Ensure that those systems can accommodate lean principles and lean systems. Are they transparent so we can establish Kanban boards for management of task? Are they open to removing waste from processes? Can the organization survive Kaizen events? Answer these questions and you can begin to design a program for a complex organization that will lead to a resilient system that focuses on delivering the value proposition of the organization.</p>
71	to Dick, when he explored managing risk through change from focus on activities to focus on workflow, please give example	Dick	Risk is what we don't know. Risk happens at every level of a project and, it must be remembered, at every level of a process. There is always a risk that a process won't respond to the question (to the value proposition that process was designed to achieve). These two risks are not mitigated by concentrating on resource efficiency. Resource efficiency is the efficiency of each step in the process to accomplish its process without consideration of the whole. Flow efficiency is the process of a designing how value is created as something flows through the system. Take a P-6 schedule for example. This is a classic maximization of resource efficiency. Each task is invented, then is hooked to another activity upon which it is supposedly dependent, followed by activities dependent on that task. When tasks are discovered, at the end of the month, not to have been done. The automated "logic" (which seems extraordinarily illogical to me) moves everything forward. We are left trying to recover from the effects of this "efficiency." The Last Planner™ System focuses on the activities on a daily basis. The risk of not understanding why an activity was not done, which is rampant in a P-6 schedule, is mitigated by knowing when failure happens and dealing with it immediately.

No.	Question	Responder(s)	Answers
72	Do you have any case study or example of an infrastructure project in IPD?	Dick	Yes, the Third Crossing Bridge in Kingston, Ontario, Canada. See the proceedings of the International Group for Lean Construction for papers and presentations about other infrastructure projects, notably in Finland and Australia done using a relational contract vehicle. See for instance, Lee, Tommelein and Ballard, <i>Lean Design Management in an Infrastructure design-Building Project: A Case Study</i> , IGLC-18, 2010, https://www.iglc.net/Papers/Details/691 and Hanna, A. S., Wodalski, M. & Whited, G. 2010, 'Applying Lean Techniques in Delivery of Transportation Infrastructure Projects' In: Walsh, K. & Alves, T., 18th Annual Conference of the International Group for Lean Construction. Haifa, Israel, 14-16 Jul 2010. pp 609-619.
73	i need to repeat the question: is IPD a new procurement type/route?	Dick	IPD is a contractual model for the delivery of design and construction projects in an integrated fabric. As James Peace points out, "The primary goal of this contract model is to remove barriers to collaboration and innovation while aligning incentives for the project team." https://leanipd.com/blog/what-is-integrated-project-delivery-the-contract/
74	What is the role of "Change Management" in supporting IPD practice, especially to the supply chain of construction projects?	Dick	At the Centre Block Program in Ottawa (renovation of Canada's main Parliament Building), we used the ADKAR process when addressing change management. ADKAR stands for Awareness (you're aware that a change is coming or is necessary), Desire (you have learned enough to think this change would be beneficial to the organization), Knowledge (you understand what it takes to make the change you desire), Ability (you build your capacity to employ the skills and necessary behaviours) and Reinforcement (making the change stick). It is a good way of seeing the steps of change. This is also the undergirdment for the changed paradigm process discussed by James Kuhn in the <i>Structure of Scientific Revolutions</i> (Univ of Chicago Press, 1962). You'll notice that the key to both of these systems is that your current system is broken or stressed to the point where it is not functioning. I've noticed in Canada that while Owners believe the system is broken (they are Aware change is necessary and they Desire that change), the rest of the supply chain is not necessarily convinced. The way to change the market and the supply chain is to ask for something different from what the supply chain currently offers.
75	For Dick - I'd love to see your graphs on prevailing views of trust2.	Dick	
76	How would lean be implemented in a program management setting? In CM its easily applicable, however I am seeing a difficulty to implement it on the program or sub program level.	Dick	Great questions. Large Programs are perfect for a lean management or operating system because they are often complicated and complex at the same time. For starters, complicated means a series of activities that are hard to understand, were difficult to develop but nonetheless lead to a single conclusion. Complex means a variety of collisions from different parts of the system that often lead to "black swan" events--totally unexpected outcomes. That means they are not susceptible to off the shelf applications, contracts or processes. Designing a system to accommodate the value proposition is at the heart of the lean operating system.
77	Is there a big difference between the three countries Germany, Austria and Switzerland?	Dick	This is a question I'll leave for Fabien Font and Dr. Claus Nesensohn.
78	Could IPD be considered or compared with sustainability process concepts, or sustainability itself still far off lean thinking principles.	Dick	I think sustainability is at heart a lean focused process. Wikipedia notes that "Sustainability can also be defined as a soci-ecological process characterized by the pursuit of a common idea. An idea is by definition unattainable in a given time and space. However, by dynamically and persistently approaching it, the process results in a sustainable system." Womack and Jones, in defining lean principles claimed the fifth principle as "strive for perfection." Womack, J.P., Jones, D.T., 1996, <i>Lean Thinking - Banish Waste and Create Wealth in your Corporation</i> , New York: Free Press Nature, at heart, is a lean system. Evolution is the process by which species get leaned up and where the things they need are developed genetically while the things they don't go by the wayside. Remember Darwin's finches on the Galapagos Islands. Different species developed different beaks to handle different types of food. The United Nations Economic Commission for Europe, Committee on Education for Sustainable Development, identified "sustainable thinking" as a desired change to the then current thought of "economic development." That committee cited the United Nations' Environment Programme's definition of a green economy: "a green economy can be thought of as one whose growth in income and employment is driven by public and private investments that lead to enhanced resource efficiency, reduced carbon emission, waste and pollution, and prevention of biodiversity loss and ecosystems degradation". https://unece.org/fileadmin/DAM/env/esd/01_Typo3site/PanelDiscussionCAREC.pdf . This sounds very much like a "lean" manifesto: focus on value (growth in income and employment) by ruthlessly eliminating waste (carbon, waste, pollution, prevention of biodiversity and ecosystems degradation). Hence my belief that sustainability strives to be lean.
79	Has IPD take into account O&M (end user) as a stakeholder? or only is focusing on tender, construction and finally handover?	Angelo	In our case with the Humber Cultural Hub, we have established IPD teams for design development that includes the end users. In addition, prior to launching the IPD process, we completed a functional program for the services in the new facility to ensure the end user requirement were captured in the design.
80	Question to presenters that were involved in IPD: how are the contractors and designers selected, and how was it made fair?	Angelo	Humber completed several RFPs to assemble the IPD team. The first RFP was specific to design consultant team (this also included engineering teams). This was followed by RFP for the IPD consultant. The entire group (owner, design team and IPD consultant) completed the RFP for the general contractor. Following selection of the general contractor, there were separate RFPs for the major subcontractors. This was led by the general contractor with input from the entire team. The term used in IPD contracts for the team members is PARTNER.

No.	Question	Responder(s)	Answers
81	Humber can offer online study and certification.	Angelo	Yes, we offer online learning and certifications.
82	What were the concerns presented by the Humber College Executives when you proposed IPD for the new project?	Angelo	The biggest concern is that there is no final contract price for the project. We have a target budget for the project, but the final cost is determined through the construction process. This was new as there is no traditional competition for the final cost, but IPD pushes efficiency throughout the design and construction, so in reality you end up with a lower cost than traditional methods of construction due to this efficiency and LEAN implementation.
83	Angelo - if those large contractors are profitable and happy, why sell them on IPD or lean? Curious re your take on this interesting situation.	Angelo	The IPD growth is coming from the owners who want a better and more efficient construction process. As owners, we feel there is a better way, and we are pushing the industry in this direction. The contractors are seeing this in the construction environment and are responding to the market. If contractors don't respond, they will lose future business.
84	Who initiates to form an IPD Contractor?	Angelo	In our case, the owner started with the push for the IPD contract. We are fortunate in Canada that a new nation-wide construction contract (CCDC 30) has been developed. All partners have agreed to sign the contract. We the owner, have made some changes to the standard contract through inclusion of Supplemental Conditions.
85	What is your biggest concern or frustration with the more traditional design delivery processes?	Angelo	Our biggest concern is that once the contract is awarded to the general contractor, there is a process that is completed by the contractor to eliminate costs from the project in order to maximize contractor profit. We the owner are not aware of where these cuts have taken place. Once we see something that does not fit in what we want, the contractor presents change order costs to address what we wanted in the first place. Unfortunately, owner specification documents are never complete enough to address all the items and therefore the owner needs to carry a significant contingency to cover these change orders. This does not exist in IPD projects.
86	A lot were discussed about having the right team members. What are the attributes of ideal candidate?	Angelo	The owner team needs to know design and construction processes. They need to have a good understanding of the IPD construction process. Similarly, the partners should have past experience in IPD and understand how the process works from design development, target value design, validation, pull planning. Also need to know how the Big Room will work. The owner does not lead this IPD process. This comes from members of the partner team. In our case, we have the IPD consultant and the contractor project manager leading the IPD processes.
87	likewise, trust is important, shouldn't expect all from client only. the Contractors should build trust to clients...	Mark	This is a true statement. Trust has to be developed by all parties not just the Client. For an IPD project to be successful a collaborative environment must be developed that encourages the right team behaviors.
88	What will be the tool to convince the contractors in Qatar or in the area to participate in IPD projects and put their profit at risk while their normal profit for fixed lump sum project is above 10%?	Mark	The value proposition to contractors is that a collaborative environment will provide more opportunities to preserve and enhance profit margins. Traditional project delivery methods push risk down to the contractors and trade partners which forces the construction team to fight to preserve profit margins in an adversarial environment and through self serving risk management decisions. This self-centered approach increases costs and can erode profit margins. Integrated project delivery provides an environment of risk sharing and collaboration which eliminates the layer of costs spent to protect one's own self interests.
89	Question for Mark - When you mention 'open book' and 'accounting transparency' i assume you are referring to the project only and if so, could each parties contribution be pooled and managed as one entity rather than separate interests. I suppose I am suggesting a JV arrangement?	Mark	I feel it is important to separate the fees at risk pool from the actual costs and overhead incurred by each team member. Even in a JV agreement each company continues to retain and pay its own staff and overhead costs and it would be cumbersome to try to consolidate these costs into one cost center. The most important concept is that costs are actual and presented in a transparent manner.
90	Mark - Is IPD only for large complex projects?	Mark	IPD is not just for large complex projects. In many ways it's use on smaller projects will give teams the opportunity to develop the right collaborative environment and coach the right behaviors behaviours.
91	Does the meaning of term "Lean" in "Lean Concrete" applies in IPD? You know low ratio of cement to water as well as to aggregates will LEAN the CONCRETE, please explain, do we undermine quality of works in applying Lean Method of Construction?	Mark	The lean in "Lean Concrete" does not apply to IPD. "Lean Concrete" is a low cement concrete mix used for backfill and mud mat applications.
92	greetings, removing RFI's can damage the legal relationship	Geza	
93	pain/gain approach in your contracts based on open book among supply chain...	Geza	
94	principles or variables shared are following partnering or relational contract or it is conventional approach?	Geza	
95	What organization led the development of the public standard IPD process? How long did that process take? If anyone involved in that process in Canada is a part of this conference, what would they recommend to other public organizations that seek to do the same?	Geza	The Canadian standard form contract, CCDC 30, was created by a task force sponsored by the Canadian Construction Documents Committee (CCDC). CCDC is a group of approximately 18 members comprised of representatives from the owner community (public and private), contractors, design professionals (architecture and engineering), and specification writers. The group is managed by a Secretary, with two others engaged to provide document drafting assistance, and a legal representative who acts in an ex officio capacity. <ul style="list-style-type: none"> • CCDC has been in existence since about 1974 and operates on the principle of consensus: no document becomes an official CCDC form unless and until all members of the Committee agree. The result of this is that its contracts tend to be balanced, reflecting principles of risk allocation

No.	Question	Responder(s)	Answers
			<p>that are broadly accepted. CCDC contracts are by far the most widely used standard forms in Canada.</p> <ul style="list-style-type: none"> • In early 2014, CCDC decided to establish a Task Force to create a new standard form IPD contract for use throughout Canada. The Task Force numbered approximately 11 or 12 people, most of whom were drawn from within CCDC, and was chaired by Geza Banfai. Assistance was obtained along the way from experienced IPD practitioners, as well as representatives of the insurance industry. The Task Force met sporadically at first, but the frequency of meetings increased to every 4 to 6 weeks during the last year or so of the effort. A draft contract was finally concluded in 2017 and published in 2018. • That long gestation period for the contract was primarily because IPD was a model new to us and required a period of education and “reprogramming” from the principles governing traditional project delivery with which we were all well familiar. We would expect that the introduction of a standard form contract in another jurisdiction today would not take this long. • Whether other organizations elsewhere should adopt this approach is an open question. Before CCDC 30, there was no Canadian form of contract, and the form most prevalently used emanated from the U.S. It was felt that a home-grown form of contract created by CCDC was necessary and appropriate to meet the needs of the Canadian industry. Whether the same is true in other jurisdictions depends upon local cultural and historical factors. • Whether or not the creation of a contract form specific to a jurisdiction is considered appropriate, there is no question that a program of education as to the principles and use of whatever form is adopted is necessary.
96	What has been the response among the legal profession in Canada to IPD?	Geza	<p>It’s difficult to generalize, although the question requires it.</p> <ul style="list-style-type: none"> • To date, I would characterize the response of the legal profession to Canada as one of “skeptical curiosity”. Skeptical, because lawyers, as a broad generalization, are people who, by their predisposition, training, or both, tend to hold a pessimistic assessment about human nature and the capacities of people to work together harmoniously. They are focused on “the 16 reasons why something will fail” rather than “the 1 reason why it must succeed”. In this, they do a service to their clients, who in traditional project delivery, retain them precisely for this analysis, and integrate that into their own decision-making when dealing with contractual counterparties. • The challenge of IPD, of course, is that it is a model which adopts a radically different approach to risk than do traditional methods of delivery. In IPD, risk is not “bought and sold” contractually, as it is in traditional delivery. It is shared and collectively managed. The legal profession is accustomed to the transactional buying and selling of risk, but a model which involves a collective management and sharing of risk – including a waiver of the rights to make claims, which is otherwise a bedrock principle upon which traditional delivery is founded – is foreign to them. • Owners retaining lawyers to advise on IPD delivery should keep this problem in mind. Unless they retain a lawyer, who understands IPD and accepts it, they can expect resistance from their own legal advisor, who will likely want to approach an IPD contract in the same manner as he/she approaches any other, as an exercise in risk transfer. This will inevitably be counterproductive, costing the client wasted time and money, as the client educates its own lawyer.
97	Question for Geza - You mentioned the principles of IPD being Collaboration, Teamwork and Positivity. These principles can be applied to any project and often are certainly for major programmes in the UK using NEC contracts. Trust is also mentioned but as a lawyer surely you must agree that trust also comes along with the use of robust contract and agreements between parties?	Geza	<p>This is an interesting question which, among other things, gets at the core of this thing we call “trust”. I thank the questioner for this; the question prompts a much deeper analysis than time presently permits - and probably an article or two which would be most interesting to craft!</p> <ul style="list-style-type: none"> • I maintain that IPD actually recognizes the fundamental importance of, and necessity for, trust in a way in which traditional delivery never does. The contract terms which underlie traditional delivery are there precisely because the parties have embarked upon their relationship already conceding that they do not trust one another and that they can never do so, and that in recognition of that, they are left with a contractual regime which relies upon “robust terms” to ensure that each meets its contractual promises to the other. Trust is considered unachievable and is therefore ignored as a driver of cooperative behaviour. Instead, it is replaced by threat – those “robust terms” again. • We all know how that has turned out. Studies of construction project delivery around the world uniformly reveal the same dismal tale of failed expectations, waste, and conflict. The absence of trust becomes a prophecy which fulfills itself, over and over again. • IPD, on the other hand, places trust front and center as a core principle governing the relationship of the parties. It is not, however, naïve about this. The model recognizes that trust is never implicit, that it must be earned, and that it is hard won and easily lost. And so, among other things, we have as a central tenet of IPD delivery the exchange of “reliable promises” – small scale commitments made during the project which, besides being a core aspect of pull planning, also establish and maintain an atmosphere of trust among the project participants. This is just one example. • Rather than assuming that trust is impossible, IPD proactively nurtures it. Its approach to trust is completely opposite to how trust is viewed in traditional delivery. • As I write, I’m reminded of a book by Francis Fukuyama that was published about 25 years ago on the subject of trust. Among other things, he compares northern Italy, a region that has been economically prosperous for centuries, with southern Italy, which has been mired in internecine conflict and has never enjoyed the same level of prosperity. The difference: northern Italy enjoys a much higher level of integrated, trusting relationships among people than does the south, which remains locked in familial arrangements in which trust is reserved for members of the same clan but for no one else.

No.	Question	Responder(s)	Answers
98	How you compare IPD contract with ppp contract	Geza	<p>They are polar opposites.</p> <ul style="list-style-type: none"> • A PPP contract is all about massive risk transfer down to the contractor/designer team, with no “stranded risk” left with the shell entity contracting with the public authority (known as “Project Co”), and minimal risk left with the owner authority at the top. The word “partnership” in “public-private partnership” is an oxymoron. • That risk transfer in PPP is effectively a risk sale. In exchange for price and schedule certainty, the owner pays a higher price. But the problems inherent to traditional delivery remain, pushed down to the contractor and designer teams and those below them in the contractual chain. The frequency of disputes and claims is not appreciably better in PPP than it is in other traditional delivery.
99	Why are there not more IPD projects in Germany?	Claus	The Germans have tried and believed too long in the traditional project delivery and there was only a small group of people that has continued their learning around Lean and IPD. So, someone could argue the majority was waiting until IPD is precisely defined and installed in Germany.
100	Any study done related to use of recycled material in road construction as compared to that using conventional materials for maintenance cost for return on investment.	Fabien	
101	For Fabien: In sharing the buffer, at what point is the contractor engaged? Does the contract have a say in the overall schedule?	Fabien	not necessary, you could involve them in some workshop to schedule with them
102	Thank you all for the presentations. Thanks for Mr. Font for explaining the case in France. My question is: I saw that France is making some progress in implementing LC; the focus now as the presentation showed on Supply chain management (in 2020). In your opinion Mr. Font, what is necessary now to make some progress in this area (i.e., supply chain); what studies and case studies are needed?	Fabien	<p>Hi, the target of the supply chain is very simple: the good material at the good place at the just moment.</p> <p>In this case You have to open issue like:</p> <ul style="list-style-type: none"> • Time location planning • pull the delivery on site with the scheduling • Identify the material (create BOM per task) • share logistic between several project trough CCC for example... etc. <p>And at the end you will find that the real topic is the capacity to standardize design and material.</p>