Texoma Medical Center
Denison, Texas

Cumberland Hall Hospital
Hopkinsville, Kentucky

UHS®

Lean Project

DELIVERY GUIDE

Temecula Valley Hospital
Temecula, California

Springwoods Behavioral Health
Fayetteville, Arkansas

Dear Healthcare Development Team Member,

On behalf of the entire UHS Project Delivery Team, welcome! You have been invited to this project for your unique talents, and you will be challenged to use them fully, as well as to develop them as we work together. *This project is very, very different from any other project you have worked on.* We expect that you will assist us in "breaking down the silos" and in reducing waste of traditional project delivery.

Trust: Talk straight. Demonstrate respect. Create Transparency. Right wrongs. Show loyalty. Deliver results. Get better. Confront reality. Clarify expectations. Practice accountability. Listen first. Keep commitments. Extend trust.

Learning: Ask a lot of questions before starting any task. What are the conditions of satisfaction? What are the expectations of my work? What is the target cost of the system I am working on and can I reduce that? What performance indicator is affected by this task? How might I add value to this project? What innovative concept could help improve the delivery of healthcare, or eliminate injuries during construction and operation? How can I reduce task duration? What can I do to ultimately improve the quality of care or the total cost of ownership? Listen to others for understanding and admit when you need help. If you know everything already, it will be hard to succeed as a part of this team.

Collaboration: Collaborate with people from other companies and disciplines. There are many intelligent people that you will have access to everyday. If you are a designer, then work hand-in-hand with a specialty builder. Communicate openly and frequently about how to best solve a problem or develop a system before we draw.

Innovation: Be as innovative and creative as possible. You are hereby given permission to think "outside of the box". Question the norm and challenge everyone on the team, regardless of position, company affiliation, or tenure.

Lean project delivery is about focusing on delivering value while reducing waste throughout the system. Working together to identify and reduce waste enhances everyone's value proposition. This goes beyond lower cost for the owner to include enhanced profits for partners, more timely delivery, better quality, and more satisfaction for all. We at UHS believe that all partners in the project should make a fair profit and that the team should develop on-going relationships that they enjoy.

As you will read further on, UHS's mission statement states, "to provide superior quality healthcare services…" We look to our healthcare facility development teams to incorporate this important thought throughout their work as they focus on delivering value to UHS and our extended customers.

We expect our development team to care about the operations of the facility long term; taking into consideration energy consumption, maintenance, the number of employees needed to service patients, the number of nurse steps and other such factors. Operationally, we look to our teams to Value Stream map and implement other lean approaches to improve the efficiency of our facilities while enhancing the quality of experience for the customer.

Taking this into consideration will make for rewarding relationships and positive outcomes for this project and for the people who will deliver and receive care in the future. Thank you for working with us to improve care delivery by enhancing the way a project is designed and built.

Sincerely,
UHS Project Development Team

UHS Mission Statement

To provide superior healthcare services that: Patients recommend to families and friends, physicians prefer for their patients, purchasers select for their clients, employees are proud of, and investors seek for long-term results. We will realize this vision through our commitment to the following principles:

Service Excellence
We will provide timely, professional, effective and efficient service to all of our customer groups.

Continuous Improvement in Measurable Ways
We will identify the key needs of our customers; assess how well we meet those needs, continuously improve our services, and measure our progress.

Employee Development
We understand that the professionalism and drive of our people are the most important factors in the quality of the service UHS provides. We will hire talented people, increase their skills through training and experience, and provide opportunities for personal and professional growth within the company.

Ethical and Fair Treatment of All
We are committed to forming relationships of fairness and trust with our patients, the physicians, purchasers of our services, and our employees. We will conduct our business according to the highest ethical standards.

Teamwork
We will work together to provide ever-improving customer service. This team approach to our work will supersede traditional departmental organization and create a true customer focus. People at all levels of the organization will participate in decision-making and process improvement.

Compassion
We will never lose sight of the fact that we provide care and comfort to people in need. The patients and families who rely upon us are fellow human beings, and they will receive respectful and dignified treatment from all of our people at all times.

Innovation in Service Delivery
We will invest in the development of new and better ways of delivering our services.

UHS Staff Expectations

UHS staff is committed to creating a "WOW" experience!

Treat Everyone as a Guest

I make a positive first impression and continue that positive impression through ongoing efforts.
I anticipate the needs and expectations of all customer groups.
I will display service recovery skills.
I am responsible for resolving customer dissatisfaction without assigning blame.

Associated Behaviors
Always say "Please" and "Thank You"
Greet guests with eye contact and a smile

Demonstrate Professionalism and Excellence in the Things I Do

I deliver excellence that goes beyond departmental and individual job responsibility.
I am proud to sign my name to what I do.
I demonstrate professionalism in how I look, what I do, and what I say.
I hold myself accountable – I am a positive role model.

Associated Behaviors
Always wear your name badge
Use language appropriate to the situation and the guest

Practice Teamwork

I participate in decision-making and process improvement, regardless of my level within the organization.
I communicate effectively within and beyond my assigned team.
I focus on the problem or issue, not the person.

Associated Behaviors
Always end an interaction with the guest by asking, "Is there anything else I can do for you?"
I hold myself accountable for getting the information I need to know to do my job

3
Why Lean?

The American healthcare construction industry is in crisis. The industry is struggling with skyrocketing costs, poor quality, skilled labor shortages and employee dissatisfaction— all symptoms of deeper problems inherent in the system itself.

More and more construction industry professionals are realizing the imperative of improving quality and safety and eliminating waste as strategies for responding to the challenges. Enter Lean Construction, the "how to" of managing change, and creating continuous improvement.

Lean Construction (adapted from the Toyota Production System) is not just another project delivery model: it's a way to transform your entire organization into a safe and high-quality, high-performing project delivery system.

Lean project delivery entails deep collaboration. It means collaborating with different parties and in different ways than used on more traditional projects.

"Collaboration dramatically improves team performance. Most teams collaborate with varying degrees of success, but by incorporating Collaborative Project Delivery teams can greatly enhance their effectiveness. Collaborative Project Delivery brings principles, structure and tools to enable collaboration to become an integrated system in which all team members are working together. It is a system that keeps teams mindful and purposeful about collaboration resulting in greater successes and more personal reward. Individuals can gain the skills necessary to work effectively in teams." **– InsideOut Consulting, Inc.**

Fundamentals of Lean:
- To understand *value* from the customer's perspective and to only take *actions* which deliver that value (thus eliminating waste).
- Waste is disrespectful
  - to humanity – squanders scarce resources
  - to individuals – adds work
  - to clients – adds cost/time/aggravation
- Become a leaning organization through relentless reflection and continuous improvement as a team. It entails continuously analyzing the work and the team's processes to improve them. Status quo is never acceptable.
- Lean is about inspiration and empowerment. People are empowered to affect decisions and the work itself which not only delivers better projects, but leads to heightened satisfaction for all.
- Lean is about developing *principles* that are right for your organization & diligently practicing them to achieve high performance. It is not about *imitating the tools* used by Toyota in a particular manufacturing process.
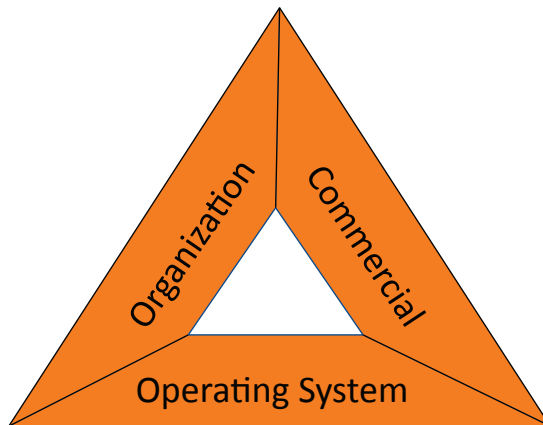
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The Lean Construction Institute
www.leanconstruction.org refers to
3 domains of a project as equal sides
to a triangle:

Commercial
The commercial terms supporting the project

Organization
How the delivery team organizes

Operating System
The system by which the team delivers

The **commercial** terms used by UHS teams are per Consensus Docs 300 for Integrated Project Delivery. This addressed in more detail in Section 5.1

Lean project teams **organize** in a flat, collaborative, cross-discipline, responsibility-based manner. This is addressed in more detail in Section 6.3.

Lean **operating system** consists of lean principles, behaviors and tools. This guide addresses all of these throughout but focuses on lean as a system in all of Section 6.

Important Note to Reader:

You are about to embark on a challenging yet fun journey. Shifting to lean delivery is referred to as a journey because it is exactly that! It entails learning step by step how to do things differently. It truly is a shift to new behaviors and thinking to form new habits. It entails change and change is never easy. But it can be fun and the outcome can be rewarding in many ways. The best advice is to relax into the new ways, open up to new ideas and processes, enter into it with an adventurous spirit and have fun. It is important not to become overwhelmed by the changes, especially with being presented with this guide. Back to the concept of the journey – one must learn one step at a time!

Learning Resources:
"Toyota Way", Jeffery Liker

Appendix 1   Why Lean? Presentation by Universal Health Services William Seed

4
Collaborative Communication

4.1 Trust, Trust, Trust!

Lean/Collaborative project delivery is dependent on building deep trust throughout the team. Trust does not just happen but must be consciously built and begins by understanding how it is connected with 3 assessments that others are making:

1.   Sincerity – ethical
2.   Competence – operational
3.   Reliability – need history

If teams start with an assumption that everyone on the team is sincere in their efforts for the greater project, and that they are part of the team because they are competent in their specialty, or they would not have been chosen to join the team, then the opportunity is to build trust through being reliable. Being reliable means making clear, complete commitments and managing those commitments well.

The following diagram from Steven M. R. Covey's "The Speed of Trust" indicates the importance of trust:

↓ **Trust** = ↓ **Speed**   ↑ **Cost**

↑ **Trust** = ↑ **Speed**   ↓ **Cost**
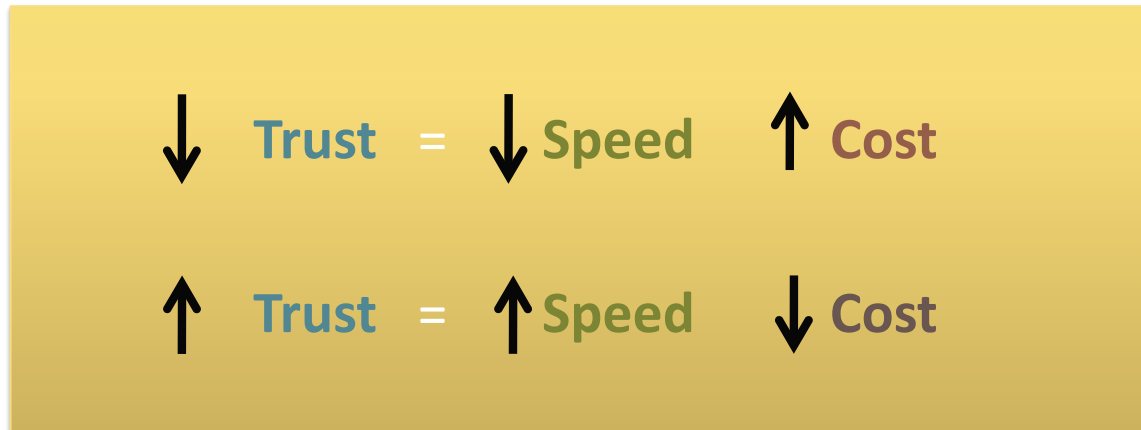
YouTube – Stephen Covey – Leading at the Speed of Trust
http://www.youtube.com/watch?v=igyxxYShXYo

4.2   Conditions of Satisfaction

All projects are a network of promises, commitments, or agreements. The promise to deliver the project is a big commitment that is delivered by people in network of commitments. A promise is not a complete promise unless it has clear, agreed-to "Conditions of Satisfaction" (CoS). Project teams must develop written CoS for their project in collaboration with the Owner and Key Stakeholders of the project. CoS are measurable statements that tell the project delivery team what tests a project must pass to be accepted as a success. They should be posted in the Big Room for all to share in understanding.

Conditions of Satisfaction are critical in the way projects are planned. See Section 6.2.1 Collaborative/Pull-planning.

Hand-in-hand with trust is a view that **contingency** represents a lack of trust. Every person and company that is involved in projects builds in contingency. Why? Because they are uncertain about what is going to happen during the project. Uncertainty is a form of lack of trust. Contingency is waste on a project, yet it is a major part of traditional delivery. It shows up in time, costs and space. Driving out uncertainty is critical to lean delivery. Identifying risks as a team and developing strategies to reduce or eliminate risk is the job of a lean team. But it takes being open with information – ALL information.

Learning Resources:

Appendix 2 Conditions of Satisfaction Examples for other UHS projects
GW Evolution of Conditions of Satisfaction

Appendix 3 Action Workflow Diagram

"The Speed of Trust", Steven M. R. Covey

"Crucial Conversations", Kerry Patterson

5
IPD Agreement
(Commerical Terms)

5.1   Consensus Docs 300

UHS implements Consensus Docs 300 as the base document to form the Agreement for Integrated Project Delivery. The agreement is signed jointly by a minimum of the Owner, Architect and Constructor. Other Trade Partners or Key Contributors may be invited to be partner signers of the Agreement. The Agreement requires the team to deliver the project using lean methodologies.

It is quite different than traditional contract agreements in that it is a *relational vs. a transactional* contract. It is based on building trust, being transparent and open and on the signing parties making decision regarding how they are going to act. It requires collaboration per the agreement:

> 3.2   COLLABORATIVE PROJECT DELIVERY The Parties agree that the Project objectives can be best achieved through a relational contract that promotes and facilitates strategic planning, design, construction and commissioning of the project, through the principles of collaboration and lean project delivery. This approach recognizes that each Party's success is tied directly to the success of all other members of the Collaborative Project *ConsensusDocs 300 (Standard Form) Page 5 of 47*
>
> Team and encourages and requires the Parties to organize and integrate their respective roles, responsibilities and expertise, to identify and align their respective expectations and objectives, to commit to open communications, transparent decision-making, proactive and non-adversarial interaction, problem-solving, the sharing of ideas, to continuously seek to improve the Project planning, design, and construction processes, and to share both the risks and rewards associated with achieving the Project objectives.

The traditional idea of "control" on a project by certain individuals is no longer appropriate. Management and decision-making is by a Management Group:

> 4.1 MANAGEMENT GROUP The delivery of the Project shall be managed by the Management Group, which shall serve as the decision-making body for the delivery of the Project and shall employ collaborative methods for achieving the highest quality and most efficient and economical delivery of the Project. The Management Group shall be comprised of an authorized representative of the Owner, the Designer and the Constructor. The original Management Group may invite other critical project participants to become members of the Management Group, for purposes of advancing the overall collaborative approach and the best interests of the Project. Any party added as an additional Management Group member shall be entitled to participate in all Management Group functions and shall have a right to vote on Management Group decisions that directly concern that party's work and area of expertise. The Management Group may also vote to remove non-original Management Group members from the Management Group.

It is recommended that new teams perform a Study Action Team™ to lean about the agreement with a shared understanding. See Appendix 20, Another Approach to Project Delivery: Creating a Shared Mind.

5.2   Choosing Your Partners /Management Group

As stated above, the Integrated Project Delivery (IPD) Agreement is a relational contract. It describes HOW the team members will act, make decisions and manage the project as a collective entity. Therefore choosing partners who will operate in this way is imperative to the success of the team and project. From Consensus Docs 300:

> 3.4 COLLABORATIVE RELATIONSHIP The Parties each accept the relationship of mutual trust, good faith and fair dealing established by this Agreement and covenants with each other to cooperate and exercise their skill and judgment in furthering the interests of the Project. The Designer and Constructor each represents that it possesses the requisite skill, expertise, and, as applicable, licensing to perform the required services. The Owner, Constructor, Designer and all members of the CPD Team agree to adhere to principles of collaboration based on mutual trust, confidence, good faith and fair dealing. Within the scope of their respective expertise, the Parties shall together actively and continually pursue collaboration in the best interests of the Project. The Parties shall endeavor to promote harmony and collaboration among all Project participants.

Notice the reference to the parties acceptance of a relationship of mutual trust, good faith and fair dealing. This is the basis for choosing partners for the project. The team must be comprised of members who trust each other, are willing and interested in operating by lean approaches, who will contribute to the team through innovating and problem-solving as a whole, and who will focus on optimizing for the good of the project as a whole. This is very different than choosing partners based on a fee structure.

UHS has developed a preliminary questionnaire that can be used during the interview process. It is attached in Appendix 5. It is expected that teams will add to the list for themselves and other teams in order to continually improve the interview process.

IPD projects are managed by the signors of the agreement who form a **Management Group.** It is important that teams learn to make decisions by consensus, hence the name Consensus Docs. Per the Agreement, a Management Group is the management body or the delivery of the project. It is often also referred to as the Core Group.

> 4.1 MANAGEMENT GROUP The delivery of the Project shall be managed by the Management Group, which shall serve as the decision-making body for the delivery of the Project and shall employ collaborative methods for achieving the highest quality and most efficient and economical delivery of the Project. The Management Group shall be comprised of an authorized representative of the Owner, the Designer and the Constructor. The original Management Group may invite other critical project participants to become members of the Management Group, for purposes of advancing the overall collaborative approach and the best interests of the Project. Any party added as an additional Management Group member shall be entitled to participate in all Management Group functions and shall have a right to vote on Management Group decisions that directly concern that party's work and area of expertise. The Management Group may also vote to remove non-original Management Group members from the Management Group.

5
IPD Agreement
(Commerical Terms)

Frequently Asked Questions about a "Management/Core Group"

These answers are based on and supported by the Integrated Agreement for Project Delivery between Owner, Architect, CM/GC and MEP/FP Engineer (IAPD) prepared for a project team working on a hospital project.

What is a Core Group?

The Core Group includes representatives from the Owner, Architect, CM/GC and MEP/FP Engineer. They provide "governance" for the project – in other words – resolution of cost and schedule questions, resolving personnel conflicts, making sure the goal of collaboration is met and generally setting the strategic direction of the project. The representatives must be close enough to the project to understand the needs of the various parties and senior enough in their own organization to be able to commit resources as required. The Core Groupfunctions in a very open, frank, collaborative way – this requires a certain "chemistry" within the group for it to function effectively. It also implies that there is no "hierarchy" within the group – all are equal in stature and value and all opinions are considered.

Why do we need a Core Group?

The IAPD establishes a fundamentally different way of operating. **The parties agree to establish a relationship to jointly deliver the project.** The Owner does not buy a design from the Architect and a constructed plant from the CM/GC with all the details, specifications and conflicts inherent in that transaction. The goals of this relationship are: collaborating throughout design and construction with all members of the Integrated Project Delivery (IPD) Team: planning and managing the Project as a network of commitments; optimizing the Project as a whole, rather than any particular piece; and tightly coupling learning with action (promoting continuous improvement throughout the life of the Project). The Core Group provides the leadership and "governance" to see that these goals are met.

What does the Core Group "do"?

The Core Group provides "governance" of the project. This being said, there are some specific responsibilities that they must fulfill:

• They must insure that the IPD Team implements and uses a Production Control System (such as Last Planner System®·) The Core Group will encourage all IPD Team members to make "reliable promises," realistic requests, understand constraints and work to improve the planning system.

• They will closely monitor the team's schedule and cost performance. Both of these are critical to all team members, especially when incentive programs have been put in place. The Core Group's responsibility includes review of a preliminary cost model, the SD Cost model, the project estimate and approval of overruns. • The Core Group shall oversee development of design documents, including milestone schedules and the use of CADD techniques. • The Core Group selects the remainder of the project team. They do this in conjunction with the CM/GC and use various methods ranging from "team, qualifications and fee" proposals to lump sum bids. The Core Group may choose to eliminate or add additional contractors as the project proceeds.

How often does a Core Group meet?

The Core Group typically meets bi-weekly. Some Core Groups have found that at certain times during a project weekly meetings are more appropriate. It is suggested that on a quarterly basis, senior staff or management from the parties attend the Core Group meeting to better understand the progress of the project.

How does a Core Group make decisions?

The Core Group will try to make all decisions by consensus.

Can a Core Group change over time?

Yes, new members can be added or removed by the original Core Group. This would typically happen as the project progresses and an organization's role was begun or completed.

If there is an impasse in the Core Group, how is the issue solved?

In the event of an impasse, the Owner may give directions that it believes are in the best interest of the project.

Can an Owner overrule the Core Group?

There is a detailed "Dispute Resolution" procedure described in Section 41 of the IAPD that provides a means to resolve contentious issues that is similar to that included in more standard contracts. Section 41 also stipulates that subcontractors who are not a party to the IAPD must agree with the resolution procedure.

What is the relationship between the Core Group and Lean Contractors?

Lean Contractors are those brought on to the project as Trade Contractors and later awarded a subcontract for design and/or construction services. These contractors will participate in incentive programs and agree to fully support the goals of an integrated project delivery program. The Lean Contractor staff participates in weekly IPD Team meetings, utilizes the production control system and are considered an integral part of the integrated project delivery model. The Core Group will, on a regular basis, invite the senior leadership of these contractors to participate with them in reviews of the project progress. These reviews will include assessments of the contractor staff performance, the current schedule status and most importantly the financial status of the project as it reflects on the availability of incentive funds to be awarded at project completion.

5.3 Executing the Agreement

Executing the IPD Agreement takes time. It is a VERY different form of agreement and companies should take appropriate time to understand the agreement. It is highly recommended that the signors all read the agreement in sections and come together (phone is fine) to discuss in segments to gain an mutual, shared understanding of what is being signed. It is ideal to have these conversations coached by a facilitator that understands the agreement.

Teams usually work together through a Validation Period (See Section 6.2.3 Target Cost) to determine a Target Cost in which they have confidence that they can deliver. Alignment to a Target Cost is imperative to signing the IPD Agreement. UHS project teams are funded to deliver work through Validation under letters of agreement. Fees for service are determined and tracked openly during this phase. Teams must sign the IPD Agreement prior to submitting for Permitting of the project, unless otherwise agreed to with UHS Management. Initially a pull-plan should be developed to take the team through Validation.

Learning Resources:

Appendix 3 Copy of Consensus Docs 300

Appendix 4 Integrated Project Delivery; An Example of Relational Contracting, Owen Matthews & Gregory A. Howell

Appendix 5 Interview Questions – Wellington
             Sample RFP for Contractors

Operating System
The following mind map diagram is a way to think about lean as an operating system. The principles and tools of lean delivery intertwine to create a system. No one principle or tool can stand on its own. For purposes of this guide, they are given a structure to help the beginning learner ground their thinking and gain a mental picture of the system. In addition, the diagram and this guide focus on the tools and principles that a beginner should start to learn and continue to relentlessly develop. As one shifts in their understanding of lean delivery and their thinking and behaviors will also shift. Then they are ready to start to take lean delivery to higher level.
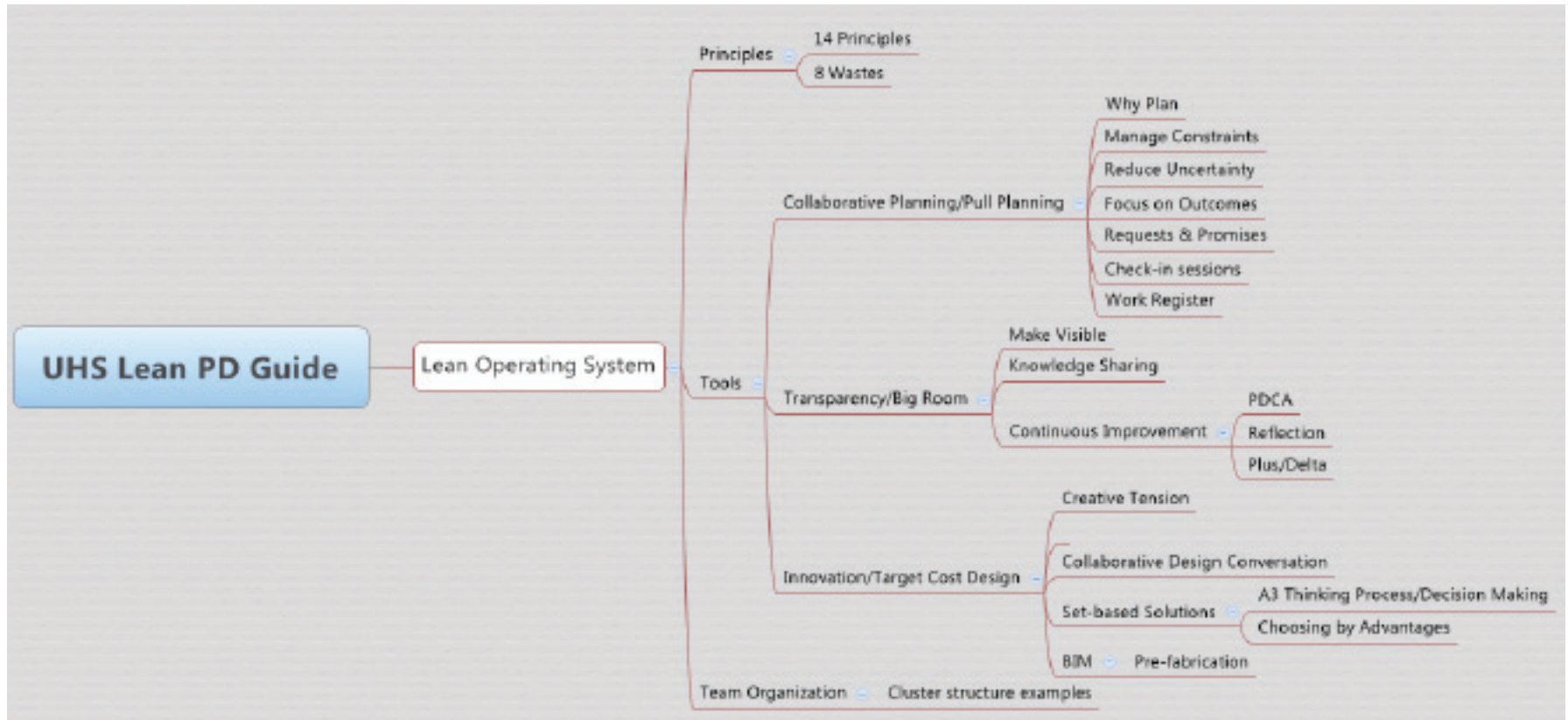
6.1   Principles

6.1.1   FOURTEEN PRINCIPLES

The following diagram indicates how the principles build upon each other and are needed to complete the full pyramid. Most companies stay focused at the process or tool level on the pyramid below during transformation, thus not realizing long-term success with lean initiatives.

The "4 P Model"
From *"The Toyota Way"*

14 Principles as identified in "The Toyota Way" by Jeffery Liker

Philosophy: Long Term Thinking
Principle1: Base management decisions on a long-term philosophy,
           even at the expense of short-term financial goals

Process: Eliminate Waste
Principle 2: Create continuous process flow to bring problems to the surface
Principle 3: Use 'pull' systems to avoid over production
Principle 4: Level out the workload (Work like tortoise, not the hare)
Principle 5: Build culture of stopping to fix problems, get right quality first time
Principle 6: Standardize tasks as foundation for continuous improvement & empowerment
Principle 7: Use visual control so problems are not hidden
Principle 8: Use reliable, tested technology that serves your people & processes

People & Partners: Respect, Grow, Challenge
Principle 9: Grow leaders who understand work, live philosophy & teach others
Principle 10: Develop exceptional people & teams who follow your philosophy
Principle 11: Respect your extended network of partners by challenging them & helping improve

Problem Solving: Continuous Improvement & Learning
Principle 12: Go & see to thoroughly understand the situation
Principle 13: Make decisions slowly by consensus, considering all options, implement rapidly
Principle 14: Become a learning organization through relentless reflection & continuous improvement
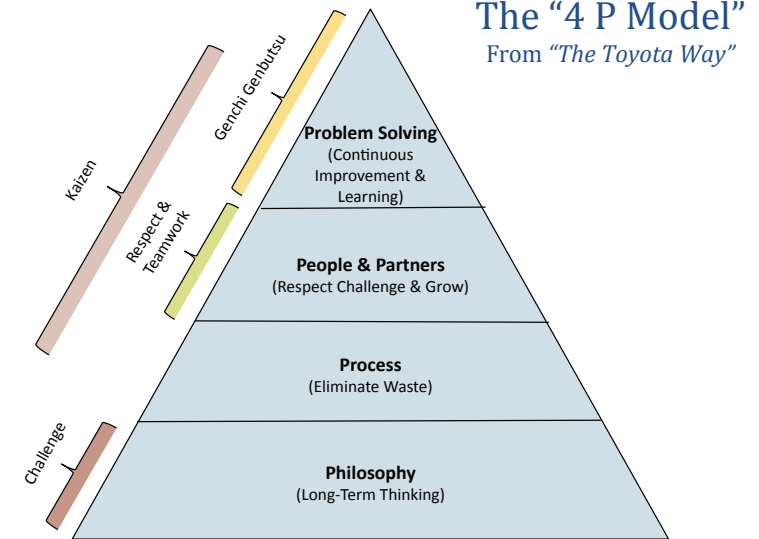
6
Lean Operating System

6.1 Principles (cont.)

6.1.2 EIGHT WASTES

There are 8 categories of waste identified in "The Toyota Way", by Jeffery Liker. Most waste in the design and construction industry fall into the same categories. See if you can think of examples of waste in each!

- Overproduction
- Waiting
- Unnecessary transport or conveyance
- Over or incorrect processing

- Excess inventory
- Unnecessary movement
- Defects
- Unused employee creativity

Learning Resources: "The Toyota Way", Jeffery Liker

6.2 Tools

Many tools exist for teams to deliver on a lean basis. The tools presented herein are just a few and are included in an introductory manner. Much more depth of understanding is needed in order to successfully implement the tools. As you learn about the tools, keep in mind that they are based on the principles, without that understanding the tools become meaningless. Also keep in mind that the tools and principles work together as a system. They are intertwined liked gears, all turning and affecting each other.

6.2.1 COLLABORATIVE/PULL PLANNING

"Collaborative Planning is the foundation by which the team collectively organizes the actions required to meet their goals. It is an approach which profoundly improves the team's ability to plan, and then deliver, effectively. The focus is on expected outcomes and doing the right work at the right time. Planning and execution are connected through conversations resulting in well-coordinated action and an understanding of the interdependency of the work." **– InsideOut Consulting, Inc.**

Collaborative Planning results in: (InsideOut Consulting, Inc.)

- team-wide understanding of value for client
- realistic and achievable plan
- alignment by all performers
- increase in reliability
- diminish or eliminate re-work/unnecessary work
- rapid response to unpredictable circumstances

- capacity being managed
- more simultaneous work
- less problems during execution
- less stress, frustration and overwhelm
- people enjoy their work

6.2.1 COLLABORATIVE/PULL PLANNING (CONT.)

Pull-planning is method of planning that is based in conversation about requests and promises. Work is planned at the "request" of a downstream "customer". The "performer" of the work makes a promise with agreed to "Conditions of Satisfaction". In essence, the work in planned from the "expected outcome or defined milestone" backwards, and becomes more detailed as it is closer to the date of the planning conversation.
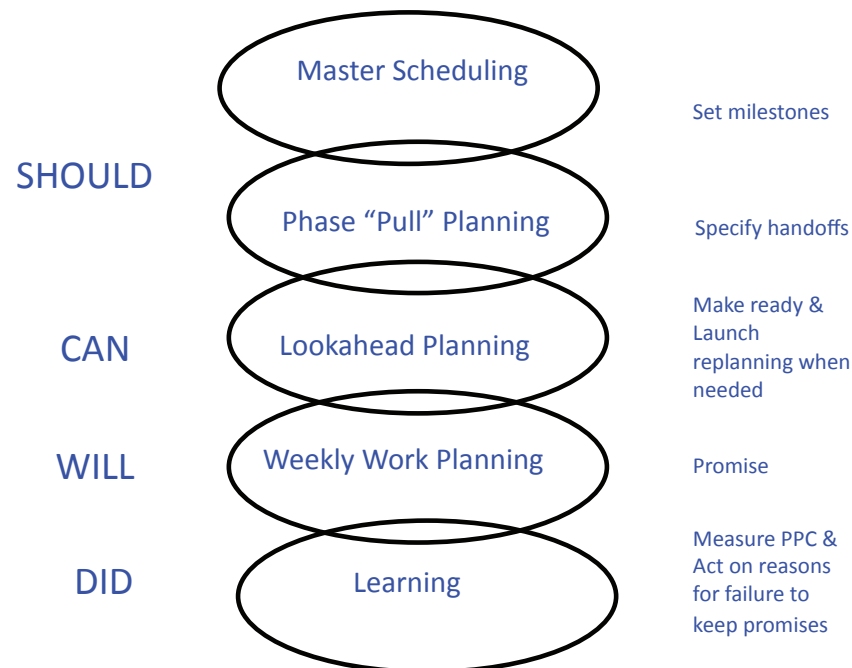
"Plans are nothing; Planning is everything." – Dwight D. Eisenhower

"Planning is the act of conversation that leads to well-coordinated action." – InsideOut Consulting, Inc.

Planning is linked through conversations; what we SHOULD be able to do, what we CAN do, what we WILL do and what we DID.

The Last Planner System of Production Control

Courtesy of Lean Construction Institute

	Master Scheduling	Set milestones
SHOULD	Phase "Pull" Planning	Specify handoffs
CAN	Lookahead Planning	Make ready & Launch replanning when needed
WILL	Weekly Work Planning	Promise
DID	Learning	Measure PPC & Act on reasons for failure to keep promises

6.2.1 COLLABORATIVE/PULL PLANNING (CONT.)

Key aspects of pull-planning are:

• Manage **constraints** and **variances** of the project as a team

• Reduce the **uncertainty** so that the team is better prepared to respond to the unexpected

• Focus on clearly **defined outcomes.**
  Note: 50% Design Development is not a clearly defined outcome.

• Planning is done in a **pull manner.**

• Planning and execution are **connected through conversation** using requests
  and promises with clear Conditions of Satisfaction for each agreement.

• Work is made to **flow** by breaking the work down into smaller increments

• The people **performing** the work are the ones who **plan** the work

• Holding regular, short, energetic **Check-in Sessions** is an important part to keep the
  team coordinated and to manage the constraints.

• During the design phase at Check-in Session each person answers **4 questions:**
1. What commitments did you complete since the last session?
2. What commitments will you complete before the next session?
3. What concerns or constraints do you have regarding your work?
4. Are you on track to meet the overall work plan?

• During the construction phase the process shifts to using a 6-week look ahead
  plan for tracking the commitments and constraints

• We track the productivity of the team using **Percent Plan Complete** or PPC. In the industry
  on average 55% of what is said will be accomplished by a given time actually is. This is a
  low percentage and indicative of the problems in the industry. Lean teams strive to reach
  at least 85% on a regular basis.

• Work is planned using sticky (GM Post-it) notes on a wall (see photos below). The work is
  then captured in a **work register** or other format. Often this is an excel spreadsheet that
  all can easily use.

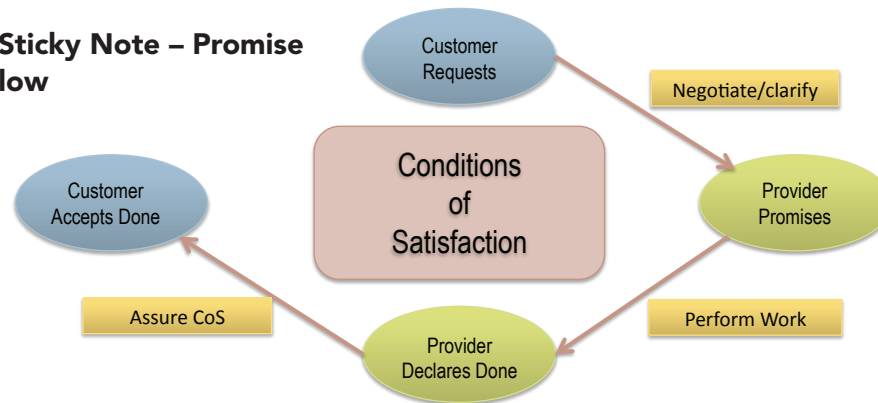• There is a **continuous learning** cycle built-in (Plan-Do-Check Act/Adjust)

6.2.1 COLLABORATIVE/PULL PLANNING (CONT.)

Your Name	Delivery
Company	Date

Your Promise
What you will deliver
Make a reliable promise

_____

Your Request
What you need from others
Make a reliable request

- Promise must have clear CoS
- Next step after making a promise is to manage and keep it

_____

- A request must have clear CoS
- Be sure to negotiate to a promise you can keep

Elements of a Sticky Note – Promise Action Work Flow

Customer Requests → Negotiate/clarify → Provider Promises

Conditions of Satisfaction

Provider Promises → Perform Work → Provider Declares Done

Provider Declares Done → Assure CoS → Customer Accepts Done

Learning Resources:

Appendix 6 Last Planner System of Production Control

Appendix 7 Intro to Pull Planning GWUH On-boarding Manual Presentation

"Product Development for the Lean Enterprise", Michael Kennedy

"Joe's Garage", William Miller

6.2.2 TRANSPARENCY / BIG ROOM

"Making work 'transparent' or accessible and visible to all team members at all times is key to collaboration. The open sharing of work that is still in progress enables others to contribute knowledge that may shape the outcome of the work (refer to Innovation above). Transparency improves predictability by allowing the whole project team, especially the team leaders, to know that quality work is being delivered with a better understanding of its status. Collaborative Delivery tools and methods bring transparency to the work." – **InsideOut Consulting, Inc**

Transparency results in: (InsideOut Consulting, Inc.)

• understanding of status of work
• rapid identification of misalignments
• responsiveness to others' difficulties
• clarity of work product across disciplines

• anticipating and delivering on the needs of other team members
• more coordinated work
• team confidence

An important aspect of lean project delivery is the concept of the **"Big Room."** The Big Room is a term to describe a space where all stakeholders in the IPD team can come together and work. As opposed to individuals working in silos in their own offices, this allows for open communication and dialogue, resulting in more efficient and real-time work product, as well as less rework and revision. Teams should plan consistent Big Room days for working together. If teams cannot be physically together, they must look to technological means to implement the concept of working in this manner.

Examples of activities in the Big Room include:
• Collaborative design conversations – set an agenda for the subject of the conversations to ensure the right people are included
• Pull-planning
• Presentations
• Learning opportunities
• Structured Reflections – the team collectively reflects on how they are operating for the purpose of continuously improving their process of working together
• Plus/Delta for rapid improvement
• Collective team sessions and smaller break-out sessions
• Mutually developing working agendas for big room days

Teams should strive to have the space set up in a manner to support their work and be flexible. This may include:

• Smart Boards
• Wireless internet connectivity
• Lots of wall space for posting work, financials, Conditions of Satisfaction
• Dedicated space for the Pull-plan with space around for gathering to plan
    o Supplies for Pull-planning
• Break out rooms for smaller meetings
• Conference calling set up
    o Post the call numbers and pass codes on agendas and in the rooms
• GoToMeeting or other video conferencing set up
    o Post the call numbers and pass codes on agendas and in the rooms
• Provide flip chart pads and/or marker boards
• Restrooms and kitchenette area for coffee/water/snacks

6.2.2 TRANSPARENCY / BIG ROOM (CONT.)

Teams should post information on the walls to serve as reminders and guides to the team. This should include things like:

• Conditions of Satisfaction for the project (Appendix 2)
• Rules for Engagement in the Big Room (Appendix 8)
• Pull-plan with Plan Percent Complete (PPC)
• Project data/plans, etc.
• Financial tracking data – keep up to date
• A3's

Lean principle 14; Become a learning organization through relentless reflection and continuous improvement.

Lean thinking and behaving integrates a continuous improvement cycle. This cycle is one of Plan-Do-Check-Act/Adjust known as PDCA.

The following is an adaptation of PDCA to a project called the Four P's and is critical to the successful development of a project. An Owner's challenge is to predict the cost, make a business case, and decide to proceed, then deliver and operate. Most projects predict a cost, decide to proceed then pay whatever it takes to build and operate. UHS looks to **predict** the cost, **plan** to the prediction, **perform** to the plan while perfecting along the way and **perfecting** from one project to the next. This approach applies to each participant of the project from design parties through the trades. It is applicable to every scope within the project, each day of work and every meeting.
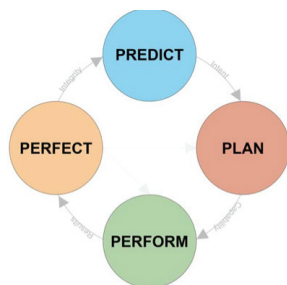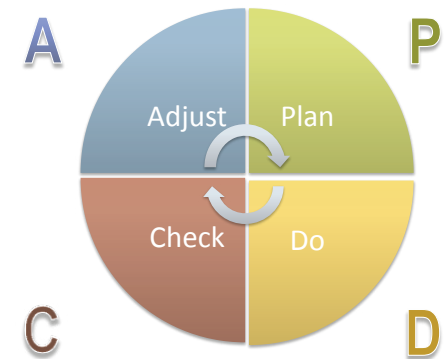
The fundamentals of the projects are based on the Four P's:
Predict: UHS is an investor-owned system. Therefore, our client must accurately predict the cost of a project prior to its start and maintain or reduce that cost as the project moves to completion.

Plan: Planning is extensive and constant. The effort should involve a significant amount of innovation.

Perform: Everyone is expected to deliver on promises.

Perfect: Lean is a method of continuous improvement.

Learning Resources:
Appendix 8 Big Room Rules of Engagement
Appendix 9 Email Etiquette
Appendix 10 Examples of Project Big Room Agendas
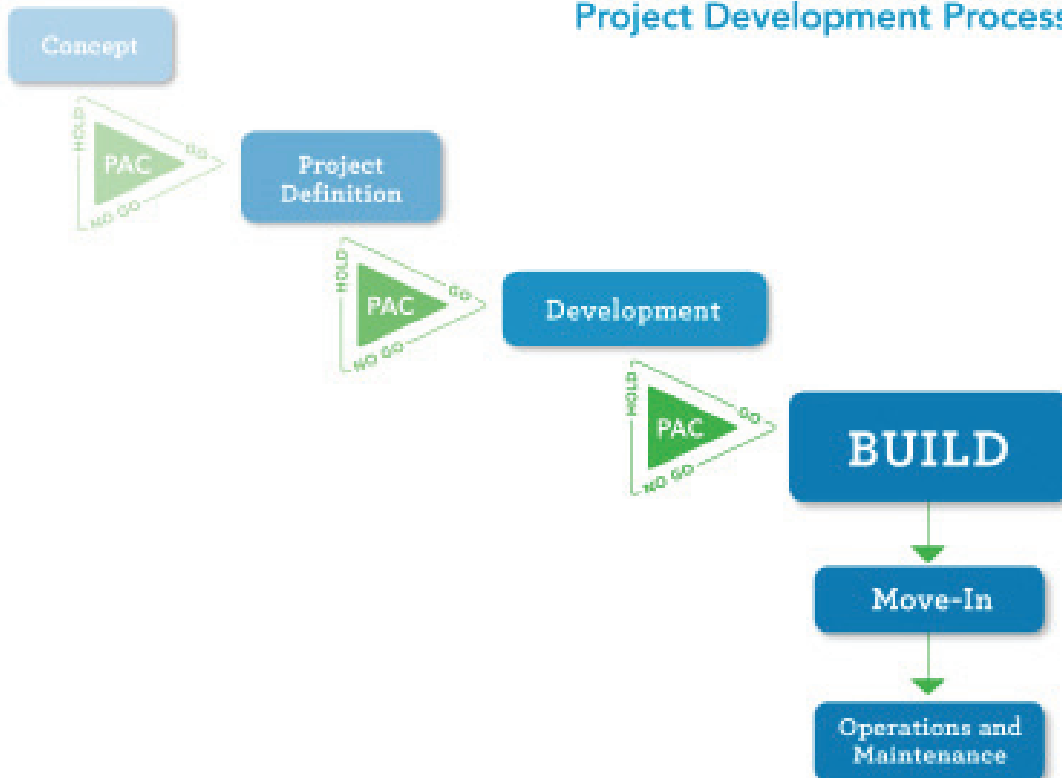*"Toyota Culture"*, Jeffery Liker

6.2.3 INNOVATION / TARGET COST DELIVERY

Target Cost Delivery is a cornerstone of lean project delivery. It is comprised of Target Value Design (TVD) and Target Value Production (TVP). The Agreement requires that the team align around a Target Cost for delivering the project early in the project, during the business case development and then validate the Target Cost through a validation period. The graphic below indicates how Target Cost Delivery is addressed throughout the phases of a project.

Project Development Process

Concept

HOLD / go / PAC / NO GO

Project Definition

HOLD / go / PAC / NO GO

Development

HOLD / go / PAC / NO GO

BUILD

Move-In

Operations and Maintenance

Target Delivery is upside down and backwards to traditional project delivery costing. Therefore it is also a hard concept for teams to grasp. It is a very different model from design, estimate in review, cost and value engineer – a traditional process full of waste. Keeping in mind that lean is about identifying value and taking only actions to deliver value, clients do not value the process of rework and loss of quality that comes from "value engineering."

Target Cost Delivery is a project approach that drives design and production (construction) to deliver to defined **Conditions of Satisfaction** (value) within **project constraints** including cost and time. It generates a "creative tension" between driving up quality YET driving cost down.

Drive Value

YET

Drive Cost
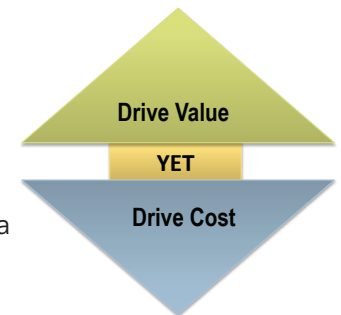
Teams develop the Target Cost through consensus with each other and the owner. Often teams start with benchmarking similar projects in a similar market on a square foot basis, then deciding on a lower target. Delivering to Target Cost results in savings not only for the client but the entire team.

6.2.3 innovation / target cost delivery (cont.)

An approach for designing to the Target Cost is outlined in Appendix 11. It involves keeping a "creative tension" throughout decision making. This is often referred to as "no-compromise goals." For a better understanding of this, refer to Chapter 5 of the "Toyota Way" by Jeffery Liker. Traditionally we describe a 3-legged stool, the legs being quality, price and time. It is said that a project can deliver on 2 but not all 3. Target Cost Delivery proves this to be wrong. Clients can have all 3 and project teams must strive to deliver on all three aspects. Driving out waste in the system and continuously improving on their delivery process are critical ways in which teams reach target cost.

Innovation is equally important for delivering to target cost. Without changing the way they design and produce projects, teams will struggle to meet target cost and likely fall back on traditional actions and behaviors that don't work. Innovation in this context means doing things that are not traditionally or usually done on projects.

Eliminating Contingency is a prime goal of a lean project team. Contingency is waste. When viewed this way, it becomes imperative that project teams actively reduce uncertainty and raise the level of reliability for the project. **Open book management** is required to drive to a target cost. Teams must identify true project direct costs, which means no contingency included. Risk must be managed by identifying possible risks with associated probable costs. Then actively working to address the risk to reduce or manage it as a team. Contingency as related to trust is addressed in Section 4.2.

Project costs are comprised of direct costs, profit/overhead and contingency. When contingency is hidden throughout it represents a huge portion of project costs. Identifying contingency and pooling it together to manage risks becomes the additional shared profit pool for IPD teams to share. Understanding that eliminating the need for hidden contingency results in $$$ for the company via the shared profit pool metrics.

Following are some means or achieving Target Cost Delivery.

Collaborative Conversation before drawing is a form of innovation during the design process. In the lean context this means including ALL relative stakeholders and perhaps others as provocateurs in designing an aspect of the project IN CONVERSATION prior to drawing. Stakeholders must include constructors and cost estimators to influence the decisions early on. All stakeholders arrive at mutual consensus during the conversations and know what their work consists of upon conclusion. This means that engineers do not have to wait (waste) for the architects to draw everything before they can do some work. Here are pictures of teams in collaborative conversation.

Collaborative Conversation: Architect PM, Mechanical Trade Partner, Electrical Trade Partner, Space Planner, Drywall/Stud Trade Partner, Contractor PM, Interior Designer, Medical Planner

6.2.3 INNOVATION / TARGET COST DELIVERY (CONT.)

Set-based Solutions is a critical aspect of lean design. Traditionally teams make decisions from narrow perspectives of their specialty or discipline – "knowing" what is best. Those decisions become integrated into the design early on and often need to be revisited due to other project constraints resulting in rework, OR the right thing is not actually built. Set-based solutions involve looking at multiple options early on from a broader, collaborative perspective. Options are thoroughly considered from all stakeholders and from the perspective of the whole project. The team narrows the options, choosing the best one for the project at a time that is right. This "right time" is referred to as the "last responsible moment". When decisions are made too soon, they may not be the best decision and a may be influenced by information that emerges at a later time. Last Responsible Moment decisions should be identified on the pull-plan.

A3 Thinking/Decision Making Process is used to analyze, document and lead to alignment on decisions for the sets. A3 refers to an 11x17 piece of paper used for documenting the process. However, the A3 Process is way more. It is a process that tells a clear story and is about the underlying thinking. It is a documented representation of the thinking process behind a decision. It must include all stakeholders at a minimum in order for the process to render a collaborative, decision made by consensus. Appendix 12 is a presentation that describes the A3Thinking Process.

Choosing by Advantages (CBA) is a powerful tool for sound decision making that supports the A3 decision making process. The A3 process includes an analysis step; conducting a CBA is a way to arrive at a sound decision. From *www.decisioninnovations.com*

> Decisions must be based on the **Importance of Advantages!**
>
> Compared with the methods in common use today — including such methods as Choosing By Advantages and Disadvantages, the pros and cons methods, the so-called Rational Methods, and others — the CBA methods are simpler and faster, and they produce better decisions. Those who learn and apply the CBA definitions, principles, models, and methods are able to significantly improve the quality of their lives and the lives of others by improving the quality of their decisions. Because CBA helps good decision makers become excellent and excellent decision makers even better, more and more individuals, families, and organizations are learning and using the CBA methods. For example, CBA is being used in several government agencies, including the U.S. Forest Service, the National Park Service, and others. As another example, it was successfully used by an interdisciplinary decision-making team — with representatives from the Sierra Club, the Audubon Society, land developers, government agencies, and others — to select a highway location for the 2002 Winter Olympics.
>
> What is very exciting is that CBA strengthens interpersonal relationships in families, as well as in business organizations and government agencies. CBA is a major breakthrough in the art of decision-making.

See Appendix 13 for examples of CBA decisions.

6.2.3 INNOVATION / TARGET COST DELIVERY (CONT.)

Building Information Modeling (BIM) is a tool that supports lean delivery. It allows teams to fully understand the implications of the design early on by detecting clashes and to sequence work. It provides the opportunity for "drawing once" to become a reality. Re-drawing work in the form of shop or fabrication/detailing drawings is considered waste. When trade partners are included in the design process, they can be the producers of the models/drawings that are not only used for Construction Documents and Permitting, but for the final fabrication and production. Furthermore, the use of BIM allows for pre-fabrication or pre-assembly of portions of work. Producing sections of work off-site enhances the team's ability to deliver better quality and in reducing the schedule. A project teams using exterior panel systems assembled and hung from the inside of the building cut a production schedule from 11 months to 4 weeks for close in of the building. BIM affords the opportunity to dramatically change a production process from the traditional stick by stick sequence that extends of long periods of time.

Learning Resources

Appendix 11   Target Value Design, Lean Project Consulting

"Managing to Learn" – John Shook

Appendix 12   A3 Thinking Process, InsideOut Consulting

Appendix 13   Examples of CBA Decisions

Appendix 14   Target Cost Delivery Presentation, InsideOut Consulting

"The Toyota Way" – Chapter 5, Jeffery Liker

www.ewenger.com/theory, Community of Practice Informational Website

6
Lean Operating System

6.3   Team Organization

(Organization)
During design, lean projects teams organize in a manner conducive to cross-discipline collaboration.
The organization is in "clusters" sometimes also referred to as "components". The clusters are developed
to address or design a particular aspect of the facility. The clusters are comprised of team members who are
appropriate to the system or aspect design and must include estimating and constructors as part of the group.
The clusters are responsible for planning their work and for delivering it to the target cost associated with their
portion of the work. This is why real-time-estimating is important in the clusters. The clusters will change with
the project as it develops. See Appendix 14 for a PowerPoint presentation of a particular project's clusters.

Learning Resources:

Appendix 15   Cluster Group PowerPoint (Temecula)

Recall the 4P's Pyramid from section 6.1 and the top segment of the pyramid:

Problem Solving: Continuous Improvement & Learning

Continuous Learning IS what lean is about. It is a major differentiator for lean delivery. Teams must incorporate proactive, planned ways to advance lean and to continuously learn to better their delivery. Teams often feel too busy to take time out for learning and this is a mistake.

Developing a Community of Practice (CoP) is an approach for teams to ensure that they continuous advance their lean learning. See Appendix 16 for an A3 for Advancing the Skills of LeanTeams. This A3 describes how a CoP can be instrumental to a team's development.

Learning Resources:

Appendix 16   A3 Advancing Skills of Lean Facilitators
Appendix 17   COAA Project Leadership Awards Nomination for GW
Appendix 18   GWB Story
Appendix 19   Links to Informational Videos
Appendix 20   Another Approach to Project Delivery: Creating a Shared Mind
Appendix 21   Project Delivery is Broken: If's it Broke, Fix it
Appendix 22   Learning Guide for a High Performing Team

Timeline

Project Definition

Validation

Design Documentation

Construction

Apply for Permitting

Sign IPD Agreement

Funding Approval

Request Funding for Project

Validate Target Cost

Determine Project Target Cost Estimate

Assemble Team Including Major Trade Partners and Engineers

Determine Project Budget

Learning Resources: