Reliable Decisions in Design

Paz Arroyo, Lean Project
Andy Springer, Jones Lang LaSalle

David Long, Lean Project
Daniel Kim, Arup

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Reliable Design Decisions

- Introductions
- Philosophy & Lean Methods Background (10 minutes)
- Project Management Challenges (5 minutes)
- Team & Coaching Solutions (10 minutes)
- Conclusions (5 minutes)
- Discussion (10 minutes)
Philosophy & Lean Methods Background
Improving Design Decisions

**Providing Transparency**
- Create a clear and shared rationale for a decision
- Compare the ‘value’ vs. the cost of the alternatives

**Building Consensus**
- Optimize the whole not the pieces
- Avoid conflicts and unnecessary iterations

**Continuous Learning**
- Document decisions
- Help future iterations when adding information
- Save time, resources and result in a better overall decision
Coaching Decisions as Conversations

• A Decision is a common vision of the future shaped by conversations

• Moods:
  • Influence conversations
  • Moods are contagious

• Leaders skilled at conversations:
  • Allow for new opportunities
  • Improve productivity
  • Satisfied clients and stakeholders
Relevance of the Decision Making Method

Methods → Decisions → Actions → Outcomes

Suhr (1999)
Lean Principles

- Innovation during Decisions:
  - Target Value Design (TVD)
- Collaborative Decisions:
  - Set Based Design (SBD)
  - Choosing by Advantages (CBA)
  - A3 problem solving
- How to make Decisions Last?
  - Include relevant stakeholders
  - Consider decision timing
  - Be transparent
Lean Design Methods

1. TVD
   Design to target values within target cost

2. Decision – Making Process
   - SBD: Create and explore alternatives
   - CBA: Decisions based on differences
   - A3’s: Document the problem solving

3. Last Planner System
Set Based Design (SBD)

- Delay decisions until last responsible moment
- Keep options open
Choosing by Advantages (CBA)

1. Identify alternatives
2. Define factors
3. Define criteria for each factor
4. Describe the attributes of each alternative
5. Decide the advantages of each alternative
6. Decide the importance of each advantage
7. Evaluate cost data

Reconsideration Stage
A3 Reports

A3 Report Title and Description

Current State
- Problem Definition and Description
- Root Cause Analysis

Advantages Analysis
- Recommendation

Criteria Definition
- Solutions Analysis
- Proposals Description
- Cost Analysis

Results
- Action Plan

Future Steps

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Current State
- Problem Definition and Description
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Advantages Analysis
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Future Steps
Project Management Challenges
Project Background

• Large complex project in Silicon Valley
• Large, multi-disciplinary team in three different countries
• Minimal exposure to Lean principles
• Unique, iconic architecture
• Difficult jurisdiction in the SF Bay Area
• Highly engaged Owner
• Early onboarding of GC / Design Assist
• Aggressive schedule and budget targets
Early Design Process - No Decisions

• Complex problems with non-traditional solutions
• Initial “spray and pray” approach
  • Numerous system studies, no focus
• Lack of definitive decision strategy:
  • Reinventing the design process
  • Not anchored to project schedule
  • Competing design priorities
  • Poor documentation
Early Design Process - No Collaboration

- Repeated pulls plans of schedule:
  - Convoluted process
  - Too many “cooks”
  - Conflicting agendas
  - Lack of accountability
- SWAT teams
  - Minimal compromises
  - Unclear focus / priorities
- “CBA” process
  - Ambiguous scoring methodology
  - Lack of commitment to decisions
Broken Design Decision Process

- Initial design decisions resulted in:
  - Hasty decisions without all the facts
  - Misalignment between team members
  - No hierarchal structure
  - Overturned decisions
  - Design inefficiencies and rework
  - Competing points of view
  - Numerous decision trackers
  - **A process that didn’t work**
Overwhelming Data – System Selection

• The Mechanical Challenge:
  • Provide a mechanical design that creates optimal comfort of occupants
    • Open Office
    • Enclosed Meeting Spaces
    • Fixed / Flexible
  • No elimination of strategies
  • Revisiting previous decisions
  • Numerous peer reviews
Quick Case Study - Analysis Paralysis

- SWAT Team / CBA Approach to Mechanical Distribution
  - To Raise or Not to Raise?
- Lots of Time, Little Results
  - Resulted in $0 in savings
  - Total of 165 manhours to complete
  - Average manhour rate of $200
  - $33,000 in labor costs
  - ROI = 0%
Team & Coaching Solutions
Solution

- Implementation of Lean principles
- Client backed manager to implement Lean principles
- Manager consulted with Lean Project
- Implement A3 process with CBA “advantages” strategies
Initial “Break-in” Period

- A3 was mandated by the Owner
- “Living document”
- Reluctant buy-in without proven results
- Too many initial participants
- Confusion about A3 requirements
- Preconceived notions
- Competing opinions
- Time consuming meetings
Coaching

- Live coaching
- Team was doing and learning fast
- Limited training before decisions to project managers
Implementing A3’s

- Rules were established with A3’s:
  - A3 champions were established for each workstream
  - A3’s prioritized based on schedule
  - Minimize future tripping
  - Consistent process
  - Team efficiencies
Implementing Lean Principles

• Rules were established with A3’s:
  • A3 sections were developed:
    • 1. Baseline problem statement
    • 2. Criteria Description
    • 3. Alternatives
    • 4. Facts and attributes
    • 5. Cost
    • 6. Advantages analysis
    • 7. Recommendation
    • 8. Action
Empowerment of the Team

- Rules were established with A3’s:
  - Cancelled meetings when:
    - Key participants didn’t show
    - Lack of information
    - Team not prepared
  - Disruptive individuals were asked to “LEAD”
  - Owner was only engaged once the A3 decision was completed
# Types of A3 Design Decisions

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<td>Vapor Mitigation Strategies</td>
<td>24</td>
<td>UG Utilities and Settlement Displacement</td>
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A3 Case Study

- Macro A3 – Mechanical Zoning
  - A3-3: L2 Zoning Requirements for Open Office (Handout)

- A3-22: L1 Zoning for Conference Rooms
A3 Case Study

• A3-3: L2 Zoning Requirements for Open Office
  • Thermal Comfort Priority
  • Evolution of Dress in the Work Place
  • Overhead VAV v. UFAD

Section taken at 1.5 ft AFE

Walking shorts + short-sleeve shirt
PMV ~ -0.5

Trousers + short-sleeve shirt
PMV ~ 0.0

Jacket + trousers + long-sleeve shirt
PMV ~ +0.5

dT = 10°F

66°F
76°F

77°F

Operative Temperature

Humidity Ratio [g / kg dry air]
A3 Case Study

• A3-3: L2 Zoning Requirements for Open Office
  • Enclosed Studio v. Open Studio
  • # of Zones
A3 Case Study Stats

- A3-3: L2 Zoning Requirements for Open Office
  - Resulted in $1.7M in savings
  - Total of 86 manhours to complete
  - $19,933 savings per manhour
  - Average manhour rate of $200
  - $17,200 in labor costs
  - ROI = 9,867%
Benefits of Implementing Lean Design

• Satisfied client
• Paper trail to document decision
• Decisions started to “stick”
• Increased design efficiency
• Team developed trust and respect
  • “In the trenches together”
• Working together across contractual lines
Results of Implementing Lean

- Early A3’s averaged 5.3 meetings
- Meeting efficiencies increased by 37% or 3.3 meetings per decision
- Studied A3’s resulted in $9.7M or 10.93% in savings
- Average of $96,468 per A3 meeting
- Average of $12,596 per A3 manhour
- Average ROI of 6,198%
Large Project Savings
Efficiency: Higher Budget Reduction per Meeting
Conclusions
Conclusions

- Decisions can be managed as conversations in a network of commitments, affected by moods
- TVD: Allow money to move across boundaries
- SBD: Explore alternatives until last responsible moment
- CBA: Separate facts (information) from opinions
- A3: Support storytelling and the commitment to move forward with the decision
Conclusions

- Lean Design:
  - Saves money
  - Supports more reliable decisions
  - Promoted innovation
  - Better team work
- Team empowerment
- Coaching support was key
Discussion
Contact Us

Paz Arroyo
Lean Project
paz.arroyo@leanproject.com

David Long
Lean Project
david.long@leanproject.com

Andy Springer
Jones Lang LaSalle (JLL)
andy.springer@am.jll.com

Daniel Kim
Arup
daniel.kim@arup.com
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