CITB Leadership & Management Development Project

© Copyright

LEAN THINKING LTD

1

Workshop Day:

- 10:00 – Introduction
- 10:05 – CITB Funding and Objectives
- 10:10 – How we Think and Learn.
- 10:30 – How to achieve the Objectives:
  - What is Value?
  - The One Thing that delivers against all the Objectives
- 11:00 – *Break*
- 11:15 – What is a System?
- 11:30 – Accounting for Time.
- 11:45 – Exercise: Batch V Flow
- 12:00 – *Lunch*
- 12:30 – Review: Batch v Flow – Why do we batch up work
- 13:00 – Exercise: Multi- Tasking
- 13:30 – Exercise: Task Distribution Curve
- 14:00 – *Break*
- 14:10 – What is Managing People?
- 14:20 – The Systematic approach:
  - At the outset
  - Weekly
  - Daily
- 14:50 – The next Steps
- 15:00 – Close

© Copyright

LEAN THINKING LTD

2

Workshop 2: Modules 3 & 4

- This is designed to be an interactive session
- I will present using the screen.
- I will also facilitate with your permission.
- There will be a few exercises.
- We are going to have lots of fun.

© Copyright

LEAN THINKING LTD

3

The CITB Fund:

- It was a competitive bid
- 33 successful bids (2 by GC)
- We were one of handful to win the maximum fund
- 4 Improvement Objective to Demonstrate
-

© Copyright

LEAN THINKING LTD

4

The Leadership Development Project:

- Workshops:
  - 2 per project
- On site Learning by Doing
- On site Learning by Teaching
- Audits & Feedback

© Copyright LEAN THINKING LTD

5

The Leadership Development Project's Aim:

To Enhance, Improve or Fine Tune Leadership Skills in order to demonstrate improvements against the set Objectives.

© Copyright LEAN THINKING LTD

6

The 4 Objectives:

1. Mental health, personal development, Relationships
2. Improving client value
3. Productivity improvement
4. Improving the profitability of all the supply chain (including Graham Construction's)

Plus, an additional GC Objective: To create a competitive edge. (2 seconds ahead)

© Copyright LEAN THINKING LTD

7

Achieving Improvement in Leadership:

- ❑By learning from each other, new or different ways of working and thinking day to day
- ❑Are we thinking as hard as we are working?

We act as the catalyst

© Copyright LEAN THINKING LTD

9

Learning:

- What did we learn in Workshop 1?
- What influences how we learn?
  - How we think
  - Mindsets
  - Time allocated to learning

© Copyright LEAN THINKING LTD

10

How we think:

2 + 2 =

A ball and bat cost £1.10
The bat cost a £1 more than the ball
How much does the ball cost?

17 x 24 =

© Copyright LEAN THINKING LTD

11

How we think:

2 + 2 =

A ball and bat cost £1.10
The bat cost a £1 more than the ball
How much does the ball cost?

17 x 24 =

© Copyright LEAN THINKING LTD

12

The Mind:

- Our body prefers not to put effort in and think (Which requires a lot of energy)
- The way we view things and act is mainly based on:
  - What is stored in the memory
  - Association (often loose) with stuff in the memory
  - Intuition and impulse (usually simplifying without understanding the facts).

We form opinions, beliefs or habits with out any thought given to the logic and causality.

© Copyright LEAN THINKING LTD

13

Hard Work & Hard Thinking:

- We need to redefine "hard work" to include "hard thinking."
- The person who outsmarts you is out working you. The person who finds shortcuts is out working you. The person with a better strategy is out working you.

  The person with a better system is out working you.
- Usually, the hardest work is thinking of a better way to do it."

© Copyright LEAN THINKING LTD

14

The Obstacles to Thinking & Learning:

- Confusing Experience with Knowledge
- Assuming a person is an expert based on their role or title.
- Management Approach – Theory X & Y
- Dismissing ideas from outside the industry
- Mindsets

© Copyright LEAN THINKING LTD

15

Mindset: Two Types

Fixed Mindset:

- Believes talent & Intelligence is fixed
- Praises ability and intelligence
- Is averse to failure and trying things
- Believes in being judged or judges themselves
- Sees effort as pointless and for people of low ability
- Considers their status is due to superior innate talent
- Only learns by chance
- Thinks can't do it – Sees things beyond their innate ability

© Copyright LEAN THINKING LTD

16

Mindset: Two Types

Growth Mindset:

- Believes talent & Intelligence can be developed
- Praises effort
- Always looks for challenges
- Is proactive in learning
- Excepts failure as just progress feedback
- Sees effort as path to Mastery
- Doesn't judge or feels is being judged
- Thinks - not yet

© Copyright LEAN THINKING LTD

17

Where do we start:

- 4 Demonstration Projects
- 5 Objectives for Improving Project Delivery/Management

© Copyright LEAN THINKING LTD

19

What is a project:

Where the:

- The work is unique
- There is Complexity
- High levels of Uncertainty
- A lot more work available to do than needs doing at a point in time

© Copyright LEAN THINKING LTD

20

What is Project Delivery?

It is basically planning, execution to plan, monitoring, learning and taking action in order to deliver an output (product or service).

Is Project Delivery: Art or Science?

© Copyright LEAN THINKING LTD

21

Project Delivery Performance:

- All projects in all industries have difficulty completing on time and budget. This is a project issue and not a construction problem.
- The same problem that exists in other environments is amplified in a project environment.

© Copyright LEAN THINKING LTD

22

What Causes Projects To Run Late?

- When projects run late it is because they run out of time.
- Time runs out due to project delivery being treated as an art rather than as science.

© Copyright LEAN THINKING LTD

23

Science of Project Delivery?

- Scientific management questions:
- The science, logic and value add behind each individual's activities.
- The assumptions made by individuals about themselves or others that the work is being done in the best possible way.

© Copyright LEAN THINKING LTD

24

The One Thing:

- Is there one thing that will help deliver improvement against the CITB objectives?
- Something uncommon that will give GC a competitive advantage?

© Copyright LEAN THINKING LTD

25

The 4 Objectives:

1. Mental health, personal development, Relationships
2. Improving client value
3. Productivity improvement
4. Improving the profitability of all the supply chain (including Graham Construction's)

Plus, an additional GC Objective: To create a competitive edge. (2 seconds ahead)

© Copyright LEAN THINKING LTD

26

Value:

What is "value"?

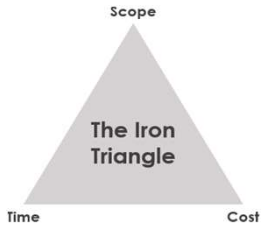
Where is it?

© Copyright LEAN THINKING LTD

27

Time, Cost & Quality Triangle:

Focusing on these must be without trade off.



© Copyright LEAN THINKING LTD

28

How to optimise Client Value

The ultimate value enhancement is improving time, cost & quality at the same time.

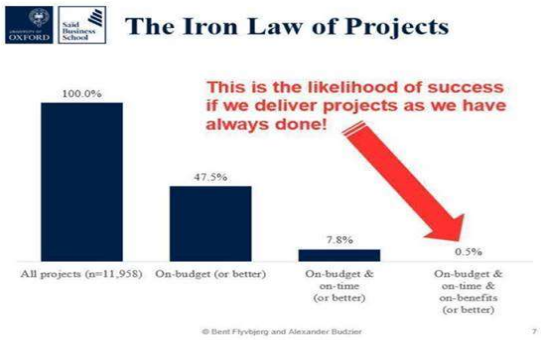
Or

"Delivering more with less by eliminating Waste"

© Copyright LEAN THINKING LTD

29

Global Project Performance



© Copyright LEAN THINKING LTD

30

The One Thing:

Where do we start or focus in order to deliver against all our objectives?:

- Time
- Cost
- Quality, Specification, Benefit

© Copyright LEAN THINKING LTD

32

The One Thing:

Quality:

Total Quality Management (TQM). The automotive route?
Less defects and less rework.

Cost:

Value engineering - gives limited scope for savings
The pain and gain incentives often focus on value engineering the product. This invariably leads to blaming and defensive reasoning when the project starts to run late.
Negotiating or Squeezing the supply chain
Bulk buying
Head count reduction:
Has negative impact on performance
Impacts well-being
Like a diet, the reduction always comes back.

What is the biggest cost on a project?

Time:

Delivering as fast as possible

The first two may not improve project duration or predictability of completion.

© Copyright LEAN THINKING LTD

33

The Current Improvement Approach:

Projects are incentivised to collaboratively reduce cost and share the benefits (Pain & Gain). This is

Primarily targeted:

What we build: The product (20%-30% of the cost)

Less targeted:

How we design and build: The process (70%-80% of the project cost)

© Copyright LEAN THINKING LTD

35

What is the Size of Improvement Opportunity?:

If:

- Time is the biggest cost:
  - What is the cost of a project days lost annually across all GC projects:
    - £72k per day, £7.2k per hour, £120 per minute

And:

- Completing the project as early as possible improves performance against all the 5 objectives

Then:

- How early can a project be delivered?
  - How much time can be saved?:
    - In large chunks – Treasure?
    - Small gains – Gold dust?

© Copyright LEAN THINKING LTD

36

Relationship with Time:

- What is your personal relationship with time?
- What is your organisation's relationship with time?
- Is time treated like a resource?
- How frugal is your team with this precious "commodity"?

© Copyright LEAN THINKING LTD

38

Relationship with Time:

Do we treat Time and account for it the same way as we do for Safety, Cost & Quality?

© Copyright LEAN THINKING LTD

39

The Current Systems:

What Systems are used on projects?:

- Safety System
- Cost System
- Quality System
- Time system?
  - Planning/Programming?

© Copyright LEAN THINKING LTD

40

The Systems' Characteristics:

Safety, Cost, Quality Systems:

Rigid / Strict parameters
Account and record for every loss – accident, penny, damage
- Consider near misses
- Individuals are all considered responsible for the system and its performance.
- It is Systemic/collective responsibility
- There is only one type of system
- Awareness of the system
- It is scientific
- Data analysed
- Monthly valuations
- Major events/failures are communicated to the top instantly
- Daily Risk Assessment
- Daily briefings and co-ordination
- Daily site checks
- Daily and weekly reviews for improvement
- Inductions
- Briefings / Tool box talks
- Value engineering

© Copyright LEAN THINKING LTD

41

A Project (not task) Time System:

- An operations system that scientifically accounts for Project time and delivers the project as early as possible.
- Accounting for time in the same comprehensive way as that for Safety.

© Copyright LEAN THINKING LTD

42

A Project Time System:

As early as possible does not mean rushing.

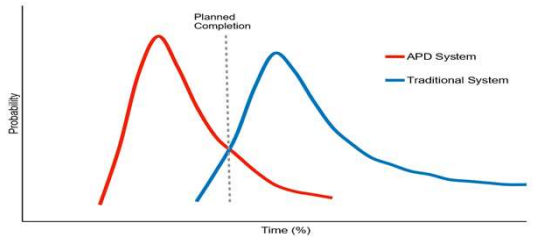
The system must ensures that most activities are carried out more slowly in order to simultaneously improves safety, quality and communication.

© Copyright LEAN THINKING LTD

43

A Project Time System:

- A system reverses the current trend of 80% late to 80% ahead of time



© Copyright LEAN THINKING LTD

44

Why a system?

Systems determine the outcome.

Most failures are system failures rather than people failures.

Quality of the people is often constrained by the system.

We don't rise to the level our of goals we fall to the level of our system.

© Copyright LEAN THINKING LTD

45

What is a System?:

A System is:
All the processes & sub-processes
The cultures:
Behaviours
Beliefs
The routines
All the habits

© Copyright LEAN THINKING LTD

46

The Type of System:

The best systems:
- Have standardised and codified steps and routines.
- Are intelligent (self-learning).
- Have clear goals.
- Encompass all the modern management. philosophies, principles & methodologies. (from across all industries)

© Copyright LEAN THINKING LTD

47

Additional Prerequisite System Characteristics

A system that:

- Everyone can focus on instead of the outcome.
- Focus on the system goals to drive and deliver the best outcome goal
- Allow standardisation and consistency of performance across all projects.
- Reduce the dependency and pressure on individuals.
- Stipulates that everything done by everyone is conscious and intentional and totally data driven.

Currently what gets done is driven by force of circumstance and subjective opinions. Reactive and habitual behaviour often leads to non-essential tasks being done at the expense of the high priority activities.

© Copyright LEAN THINKING LTD

48

What is an Intelligent System?:

- Optimisation of the system will be based on it being designed, adhered to and continuously improved by all the people (the collective wisdom) who are part of it.
- Every system requires constant weekly collective review and improvement with daily reflection.
- A proactive and forward looking system

A collective design and focus on a system is the most effective way to change the culture.

© Copyright LEAN THINKING LTD

49

The system for Project Time Accounting:

A system that accounts for project time: Scientifically, accurately, comprehensively and continuously

To what level should we account for the project time:

- In seconds
- minutes
- In hours
- In days
- In weeks

It would probably be best to start with half a project day accounting.

- Task Time V Project Time

A system with strict time and geographical steps with early warning feedback loop.

© Copyright LEAN THINKING LTD

50

The system for Project Time Accounting.

How much time can be saved?:

- In large chunks – Treasure?
  - Inventions (not innovation)
- Small gains – Gold dust / Marginal innovations?
  - Limiting, minimising:
    1. Time saving opportunities being missed
    2. Time being squandered – Time risk allowance
    3. Time being lost – Risk and uncertainty
    4. Assumptions not validated.

© Copyright LEAN THINKING LTD

51

The system for Project Time Accounting.

How can project time be saved?:

- In large chunks – Treasure? Very limited.
  - Inventions: Mainly products and new material
- Small gains – Gold dust/Marginal innovations? Unlimited
  1. Limiting, minimising:
     1. Time saving opportunities being missed
     2. Time being squandered – Time risk allowance
     3. Time being lost – Risk and uncertainty
     4. Erroneous assumptions not surfaced and validated

© Copyright LEAN THINKING LTD

52

The system for Project Time Accounting.

Gaining or losing Time:

Projects run late because they run out of time

Project time is lost due to thousands of potential "leakages".

Project time (the most precious resource) is wasted a little at a time.

These accumulate throughout the project to a much greater amount than many one off delays.

None of these small losses warrant the investment of time and effort to save, unless there is a holistic approach that is designed to pick up all these opportunities.

These tiny opportunities fall in different places, under the care of different individuals and organisations.

There is currently no one person who can positively impact all these opportunities.

The system must view these tiniest opportunities as gold dust which need to be gathered by a collective approach and not as one treasure trove to be discovered by professionals.

© Copyright LEAN THINKING LTD

53

The system for Project Time Accounting.

Gaining or losing Time:

- Opportunities for brining the end date forward are very limited often to a max of 2 days.
- The chances of the end date moving out by a large amount are real and frequent.
- There is no limit to how far the end date can go out.

© Copyright LEAN THINKING LTD

54

Project Time Improvement Opportunities:

Where and what are the Project Time Improvement opportunities?:

(The following exist on all projects, at all stages, at every level and all forms of contract)

1. One Piece Continuous Flow v Batch
2. The Constraint v Local Protection of the Completion Date
3. Prioritisation
4. Single v Multi Tasking
5. Being Date Driven
6. Process Variation – Uncertainty
7. Sequential Processing v Parallel processing/Off Site Manufacturing
8. Automation & Digitilisation
9. Standardisation
10. Quality – Rework
11. Individual's Motivation, Mindset

These also improve risk and predictability of completion.

©Copyright LEAN THINKING LTD

55

Accounting for Project Time:

1. One Piece Continuous Flow v Batch (40%-50%)

Let's do an exercise to demonstrate the benefits.

©Copyright LEAN THINKING LTD

56

Accounting for Project Time:

1. One Piece Continuous Flow v Batch **(40%-50%)**

Batching up Work:

All the work at every stage of the project including design is carried out in batches.

Batching up work doubles the processing time (ie 50% increase) and radically reduces quality leading to 90% more rework

Work is batched up often by default or sub-consciously due to:

- Common view that if everyone is 100% utilised/Productive leads to the best outcome. Optimising individual's productivity has a negative impact on the systems' productivity, output and quality.
- Building in just in case time risk allowance

©Copyright LEAN THINKING LTD

57

Accounting for Time:

1. One Piece Continuous Flow v Batch (40%-50%)

One Piece Continuous Flow:

This means working on one piece at a time continuously until it is complete. At no point in time the work in progress should sit waiting.

This principle may need adapting in projects to allow for different metrics in place of one at a time ie per meter or by volume.

Collectively involving the supply chain:

- Work will need to be broken down in to smaller elements.
- A Takt time has to be agreed and followed as the drum beat or processing speed
- The Flow needs to be reviewed weekly and checked daily

This technique is counter intuitive as it involves most people working at less than 100% utilisation/efficiency/productivity.

©Copyright LEAN THINKING LTD

58

Accounting for Time:

1. One Piece Continuous Flow v Batch (40%-50%)

The benefits of Continuous Flow:

It reduces the processing time by up to 50% as it reduces the standing time of the work in progress.

It reduces errors and defects by 90% as the problem gets picked up instantly due to the short feedback loop. The next step picks up the errors as the work moves.

©Copyright LEAN THINKING LTD

59

London Bridge – Batch v One Piece Flow

ID	Total Slack	Task Name	Resource Names	Remaining Duration	Start	Finish
1545	22 days	⊟LABS		132 days	08/03/2019	16/08/2019
1546	108 days	WORKS WITHIN RISERS		71 days	03/04/2019	16/07/2019
1572	22 days	Lab - LEVEL 00 - Traditional - Large Batch		132 days	08/03/2019	16/08/2019
1648	22 days	Lab - LEVEL 01		122 days	22/03/2019	16/08/2019
1723	22 days	LEVEL 01 CORRIDOR		31 days	12/07/2019	23/08/2019
1728	31 days	Lab - Fit-Out - Level 00 - One Piece Flow		83 days	25/03/2019	23/07/2019
2074	31 days	Lab - Fit-Out - Level 01		83 days	05/04/2019	05/08/2019
2420	0 days	Project Buffer		41 days	21/10/2019	16/12/2019

72

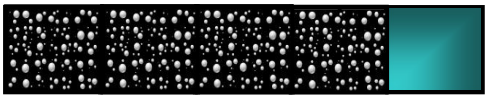
Creating Flow in Construction

Smallest Unit size

Early start for each activity

Start fast and finish slowly

Commission Reactor



73

Accounting for Project Time:

2. Identifying the Constraint of the system

Every system has a constraint / bottle neck

The constraint of the project determines the shortest time for completion.

The constraint can shift/move at any time and requires constant close monitoring.

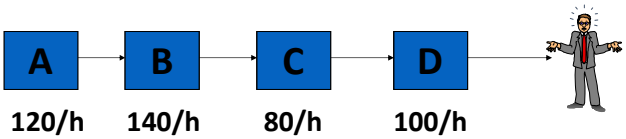
Improving any non-constraint step/activity leads to sub-optimisation and becomes invisible fast.

©Copyright

LEAN THINKING LTD

74

Constraint of the System:

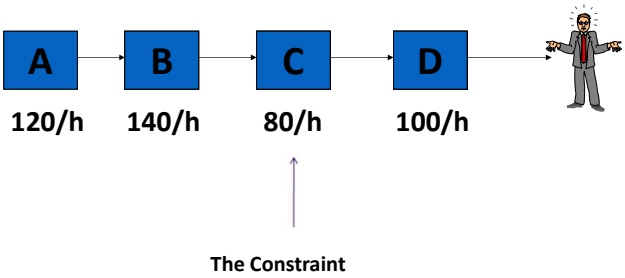


© Copyright

LEAN THINKING LTD

75

Constraint of the System



© Copyright

LEAN THINKING LTD

76

Accounting for Project Time:

2. Identifying the Constraint of the system

To establish the constraint as accurately and as scientifically requires:

At the outset:

- One program
- Collective validation of the logic robustness
- Surfacing and reviewing the assumptions
- Removing spurious tasks
- Removing all forms of task risk allowance

Weekly:

Systemic collaboration and collective wisdom – Daily and weekly

- Elapsed time used to monitor progress
- Only one system and program with:
  - Robust logic
  - precise resource levels

Daily:

- Collective walks
- Reflection period

Different element of the project will need full validation at different stages.

©Copyright

LEAN THINKING LTD

78

Accounting for Project Time:

2. Identifying the Constraint of the system

Validation of the constraint can be carried out at separate sessions and at different stages with the right people present:

- Design
- Procurement
- Demolition, Groundwork and Foundation (sub-structure)
- Frame, roof and envelop (Supper-structure)
- Internal Fitout:
  - Living spaces, Corridors
  - Toilets
  - Plantrooms
- Commissioning

©Copyright

LEAN THINKING LTD

79

The set up

Accelerating Project Delivery System

Project Constraint Validation Form

	Sign off when complet			
	Graham	P&G	MJL	L
ollective (all the supply chain) validation of the program and compliance with the ering criteria:				
• Master Program – Only one Master Program				
• Complete – All activities are built in (incl. procurement, design and scope allowances/risk pool)				
• Detailed – To an appropriate level where needed	✓	✓	✓	✓
• Fully logic linked	✓	✓	✓	✓
o Finish to start links with Lags and leads as appropriate				
o Water fall logic sequence (for ease of review)				
o Summary bar links: None				
• Robustness of all the logic				
• All assumptions surfaced and validated				
• Milestones – None	✓	✓	✓	✓
• Task description: Concise and clear				
• Task prefix – All tasks to have prefix relating to their heading/Summary bar				
• Structure: As few summary bars as possible				
• Date setting: Standard	✓	✓	✓	✓
• Robust: All the logic is 100% robust				
• Resourced: Fully				
• Contains none of the 5 types of arbitrary time risk allowances/delay protections:				
o Task padding	✓	✓	✓	✓
o Batching				
o Constraint dates	✓	✓	✓	✓
o Monday starts	✓	✓	✓	✓
o Bogus tasks				
• All time risk allowance to be aggregated in one transparent place. The project buffer	✓	✓	✓	✓
• Tasks allocated to each delivery manager				
• Baselined – When buffered	✓	✓	✓	✓
support compliance with these validation steps of the system:				
e completed by:				

80

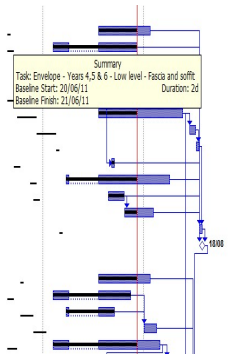
The set up

- *The Road Map (Programme):*
  - *Collective validation of:*
    - *Completeness – activities, links*
    - *Robustness – logic*
    - *Assumptions*
  - *Aggregation of all the traditional built in time protections such as:*
    - *Task paddings*
    - *Monday starts*
    - *Milestone deadlines*
    - *Batching of work*
    - *Spurious buffer tasks.*

81

Elapsed Time?

3	Envelope - Years 4,5 & 6 / Reception / Community	34 days
4	Envelope - Years 4,5 & 6 - Roof Flashings	12 days
5	Envelope - Years 4,5 & 6 - Low level - Fascia and soffit	15 days
6	Envelope - Years 4,5 & 6 - External Glazing	3 days
7	Envelope - Years 4,5 & 6 - Low level - External decorations (to screens)	15 days
8	Envelope - Years 4,5 & 6 - Low level - Single ply roofing	20 days
9	Envelope - Years 4,5 & 6 - Install hoppers / gutters	20 days
10	Envelope - Years 4,5 & 6 - RWPs & Metal Gutters	2 days
11	Envelope - Years 4,5 & 6 - Lightning protection - Final Connection	1 day
12	Envelope - Years 4,5 & 6 - Service penetrations	1 day
13	Envelope - Years 4,5 & 6 - Strike and clear perimeter scaffolding	17 days
14	Envelope - Years 4,5 & 6 - Complete external windows (seals)	3 days
15	Envelope - Years 4,5 & 6 - High level - External decorations to cladding	7 days
16	Envelope - Years 4,5 & 6 - Clean & Snag	1 day
17	Envelope - Years 4,5 & 6 - Complete	0 days
18	Envelope - Years 2 & 3 / Reception / Community	32 days
19	Envelope - Years 2 & 3 - Roof Flashings	12 days
20	Envelope - Years 2 & 3 - Low level - Fascia and soffit	13 days
21	Envelope - Years 2 & 3 - Low level - Glazing	6 days
22	Envelope - Years 2 & 3 - Low level - External decorations (screens)	4 days
23	Envelope - Years 2 & 3 - Low level - Single ply roofing	20 days



© Copyright

LEAN THINKING LTD

82

Accounting for Project Time:

2. Protecting the Constraint and the end date at: Project level v Task level

   Padding out individual tasks as a form of Time risk or certainty allowance.

   This often manifests itself in durations being rounded up to multiples of 5.

   Everyone pads out tasks as a way of protecting the end date but there is a more effective alternative.

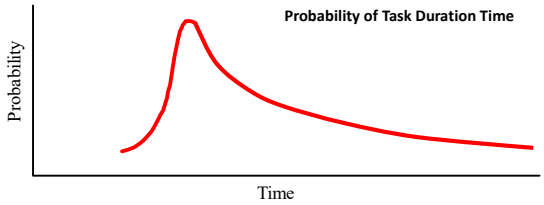
   This padding can cause confusion about the task time and what is realistic.

©Copyright

LEAN THINKING LTD

83

Which Time Are You Likely to promise?



Tasks on projects have skewed distribution curves. This mean when things go wrong, they go wrong greater than they can go right.

© Copyright

LEAN THINKING LTD

84

Duration Distributions

A "Realistic" Duration

17 18 19
17 18 19 20 21 22 23 24
16 17 18 19 20 21 22 23 24 25 26 27 28 30 32 34 37 41 45 49 53 57 61 66 72
Average = 30

A "Realistic" Duration

11 12 13 14 15 16
10 11 12 13 14 15 16 17
10 11 12 13 14 15 16 17 18 19 20 21 22 24 26 29 32 35 39 43 47 52
Average = 20

A "Realistic" Duration

8 9 10 11 12 13
7 8 9 10 11 12 13 14 15 16
7 8 9 10 11 12 13 14 15 16 17 18 19 21 23 25 28 31 34 37
Average = 15

A "Realistic" Duration

4 5 6 7 8 9 10
3 4 5 6 7 8 9 10 11 12
3 4 5 6 7 8 9 10 11 12 13 14 15 16 18 20 22 24 26
Average = 10

© Copyright

LEAN THINKING LTD

85

Duration Distributions

A "Realistic" Duration

5 6 7 8 9 10
4 5 6 7 8 9 10 11 12 13
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 23

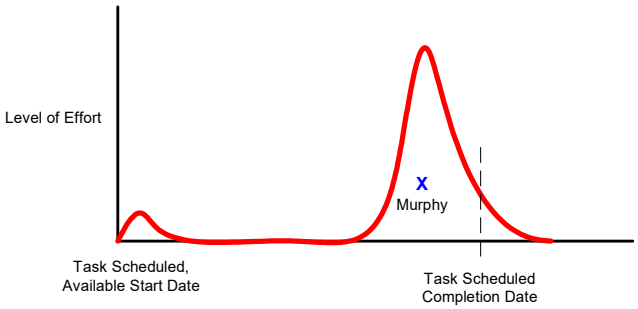
Average = 10

© Copyright

LEAN THINKING LTD

86

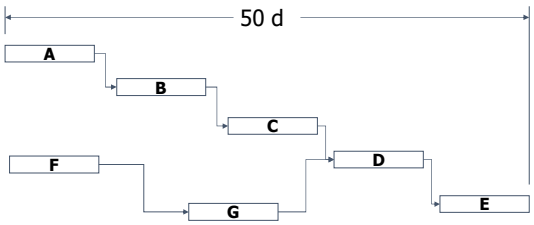
The Student Syndrome



© Copyright LEAN THINKING LTD

87

Current

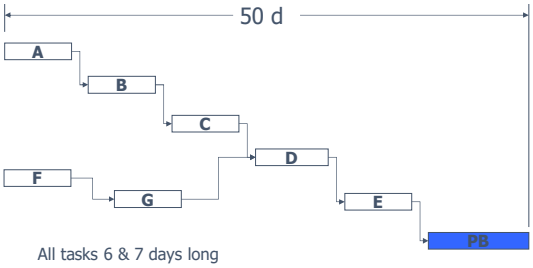


All tasks 10 days long

© Copyright LEAN THINKING LTD

89

Future

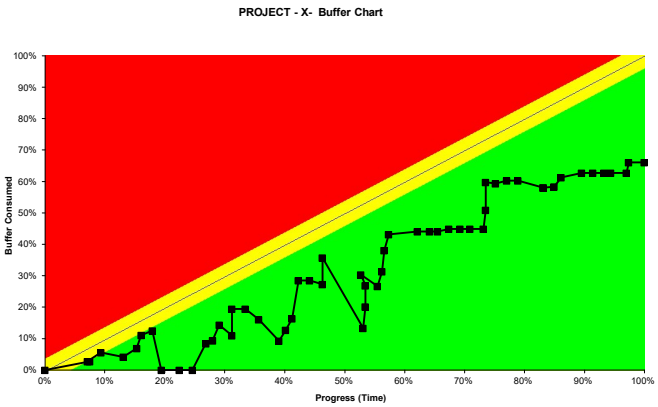


All tasks 6 & 7 days long

Is it better to finish each task early or late?

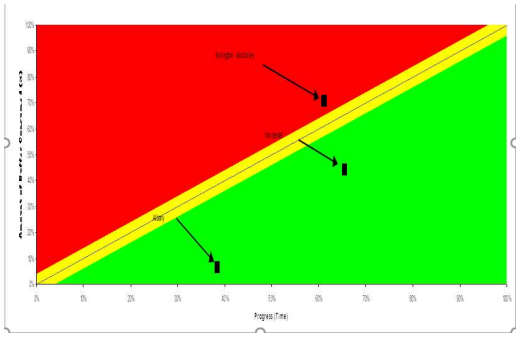
© Copyright LEAN THINKING LTD

90



© Copyright LEAN THINKING LTD

91



© Copyright LEAN THINKING LTD

92

Accounting for Project Time:

3. Prioritisation:

Lack of prioritisation is probably the biggest cause of projects running out of time and delay – No data available

A lack of scientific daily prioritisation and adherence to the priorities by all the trades is probably the biggest risk to projects running late.

It is the only risk to cost and time over run prevalent on every project at any time.

The risk or losses can be very small and very difficult to see and monitor. (the Brick Game)

It requires the whole system's collaboration and collective wisdom to prioritise accurately and establish the true constraint of the system.

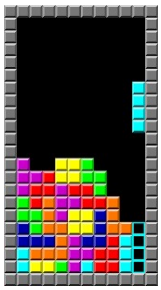
To scientifically establish the projects priorities requires updating progress using Elapsed Time

©Copyright LEAN THINKING LTD

93

Accounting for Project Time:

The Brick Game



©Copyright LEAN THINKING LTD

94

Accounting for Project Time:

3. Prioritisation:

Prioritisation would result in

Project Management being defined as:

Knowing the impact of every task on the end date.

Project Delivery becomes primarily a science with a little art. Many currently treat it as an art.

©Copyright LEAN THINKING LTD

95

Accounting for Time:

3. Prioritisation:

Prioritising all the managers and the trades work should prevent focus on optimising their own output at the expenses of the others or the project's.

High priority Red and Blues must be broken down in to daily outputs for accurate monitoring.

Two check sheets.

©Copyright LEAN THINKING LTD

96

Accounting for Project Time:

4. Single v Multi Tasking (20%-40%)

Individuals working on more than one thing at a time.

Are you starting too many things at a time and Why?

- Assumption that the sooner you start something the sooner it will finish
- Cash Flow:
  - Key Improvement driver of the automotive Industry
  - Killer of the construction industry

Business v Effectiveness

Are you measuring Elapsed Time?

©Copyright LEAN THINKING LTD

98

Accounting for Time:

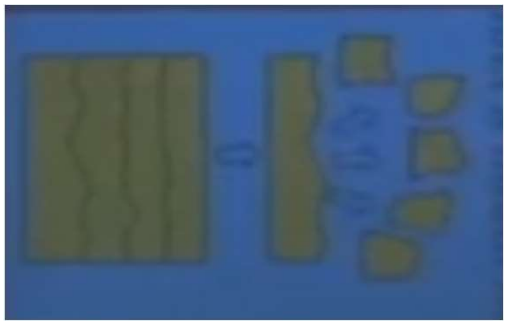
4. Single v Multi Tasking **(20%-40%)**

Let's do an exercise

©Copyright LEAN THINKING LTD

99

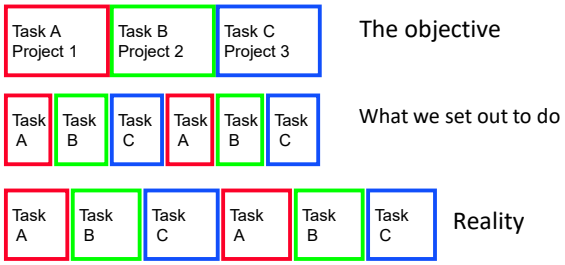
Page Tearing Game:



©Copyright LEAN THINKING LTD

100

The effect of multi-tasking



101

Accounting for Project Time:

5. Being Date Driven **(Possible 15 days a year)**

Milestones

Monday Starts

Half day Time risk allowance

Sub-contractor's completion date

Is it easier to push something back or to bring it forward?

©Copyright

LEAN THINKING LTD

102

Accounting for Project Time:

6. Process Variation - Uncertainty **(30%)**

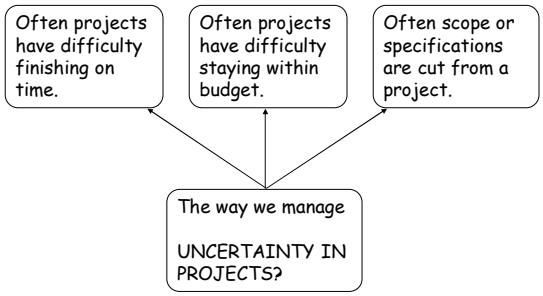
What are the types of uncertainty?
Only the Uncertainty or Risk that impact the end date matter.
Even what is considered as unknown unknown (the black swan) is often known by someone.
Are the client's changes the biggest cause of delay? By what %?
Is it uncertainty that leads to projects running late?
How often does the project completion date move weekly or daily?
Project end dates can go out indefinitely daily but have a 5% chance of coming forward by more than 1 or 2 days. This is due to projects having many merging paths of activities.
Any time lost on a project is not recoverable however most time losses are preventable.
To effectively deal with uncertainty requires the shortest feedback loop for monitoring and minimising (Sat Nav)

©Copyright

LEAN THINKING LTD

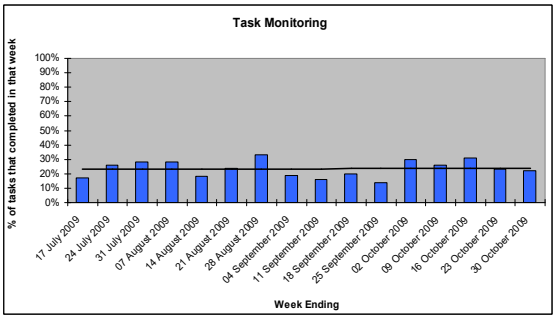
104

Is it to Do With the Way We (Mis)Manage Uncertainty



105

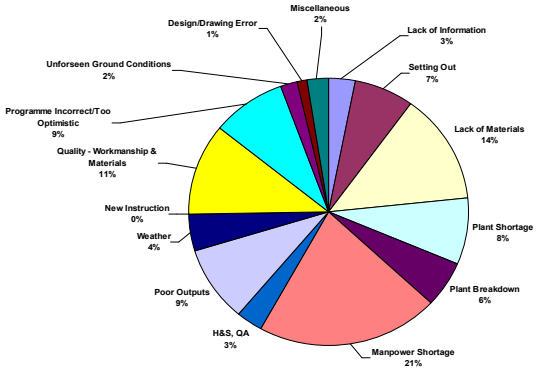
Activity measurement



© Copyright LEAN THINKING LTD

106

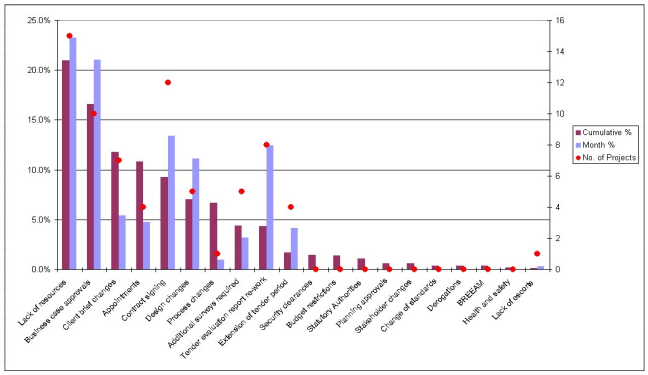
Uncertainty or Reasons for Delay



© Copyright LEAN THINKING LTD

107

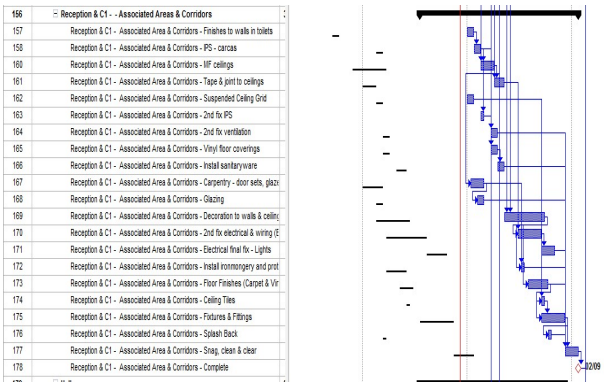
Reasons for Delay



© Copyright LEAN THINKING LTD

108

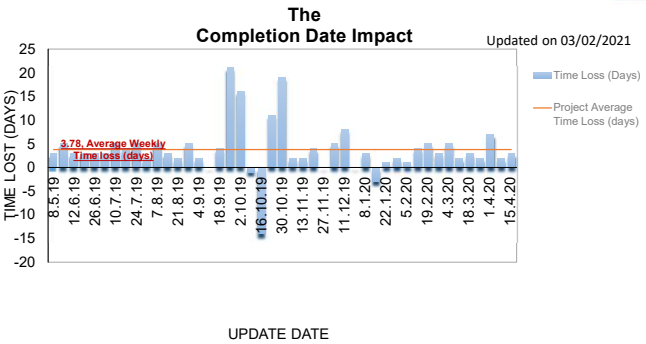
Chances of Tasks starting and finishing on time?



© Copyright LEAN THINKING LTD

110

Weekly Impact of Uncertainty:



© Copyright LEAN THINKING LTD

111

Accounting for Project Time:

7. Concurrent or Parallel Processing

Considered and practiced every day in other industries.

Need to be considered daily on projects

Offsite manufacturing or Flying Factory etc are forms of concurrent processing.

95% of the construction processes involves the use of or assembly of martial or components that are made off site. (5% is demolition or excavation)

The benefits can be zero or very limited to just a few days. (Cambridge Study)

Need a large percentage of the project probably over 60% to be built offsite concurrently.

©Copyright LEAN THINKING LTD

113

Accounting for Project Time:

7. Concurrent or Parallel Processing

Parallel processing including offsite can take time out if applied at the right time and place.

There is a baffling plethora of terminology describing the same thing in offsite.

If something can be built offsite 10 times faster it doesn't mean it will benefit the project.

©Copyright LEAN THINKING LTD

114

Accounting for Project Time:

7. Concurrent or Parallel Processing

Needs to be considered at the outset
After the constraint of the system has been established
All the right people
Facilitated by an expert in offsite
Using a comprehensive check list

Then needs to also be considered weekly on projects

©Copyright LEAN THINKING LTD

115

Accounting for Project Time:

8. Automation & Digitilisation

Automation:
- Automating value adding high priority activities can bring large benefits
- There is constant innovation in automation

Digitilisation:
- Currently in mots cases lead to sub-optimisation.
- AI – Questionable levels of benefits in Projects
  - Too much time and effort is being spent on establishing task times.
- Why do people use a Sat Nav when they have historic data from a million other travellers?

Collective Intelligence v Artificial Intelligence.

Sophisticated software are used like a spreadsheet.

©Copyright LEAN THINKING LTD

116

Accounting for Project Time:

9. Standardisation

The product (what we design and build):
- Most other industries are moving toward mass customisation
- Standardising:
  - The design reduces design time and cost
  - The product can save build time but not always

The system (How we design and build):
- Provides the biggest opportunity for time and cost saving
- Can have a positive impact on well being

Standardisation of the system leads to the formation of habits. This frees up the mind to be creative.

©Copyright LEAN THINKING LTD

118

Accounting for Project Time:

10. Quality – Rework (5%-20%)

Can be a big cost

Focus is often on improving recording and rectifying defects than preventing.
- Hand held devices

By far the best way to improve it is to reducing the batch sizes and shorten the feedback loop.

CITB: Get It Right initiative.

©Copyright LEAN THINKING LTD

119

Accounting for Project Time:

10. Individual's Motivation & Ability

Ability:
- Knowledge (often assumed to be greater than it is)
- Experience
- Physical ability

Motivation:
- Extrinsic motivation –
- Intrinsic motivation

©Copyright LEAN THINKING LTD

120

Motivating People

At any point in time on average only 30% of the operative are working and adding value.

What does Managing People mean?

How can we motivate people?

© Copyright LEAN THINKING LTD

121

Motivation at Work

What are the prerequisites for motivation at work?:

Having Autonomy of the:
- Task
- technique
- Time
- Team

Understanding the purpose:
- The bigger picture

Opportunity for mastery and achieving Flow through:
- Challenging
- Achievement
- Learning

© Copyright LEAN THINKING LTD

122

Motivation at Work

Most people are motivated, enthusiastic, energetic, open, honest, trustworthy and full of good ideas

except for the 8 hours they come to work

All because of the way they are managed.

Tom Peters

© Copyright LEAN THINKING LTD

131

The 4 Objectives:

- Mental health, personal development, Relationships
- Improving client value
- Productivity improvement
- Improving the profitability of all the supply chain (including Graham Construction's)
- **Additional GC Objective: To create a competitive edge. (2 seconds ahead)**

© Copyright LEAN THINKING LTD

133

The One Thing:

A system that accounts for project time and delivers the project as early as possible.

© Copyright LEAN THINKING LTD

134

The System:

A system that delivers projects as early as possible.

By

- Focusing on the time saving opportunities.
- Virtually no one we have met has been looking at these opportunities or aren't even aware of them.
  - Improvement will need to be marginal at a time and gradual. Getting the GC wheel to be rounder
- 2 seconds ahead and will be at the front of every queue.
- There are no treasures just gold dust.
- The system must deal with all these opportunities.

© Copyright LEAN THINKING LTD

136

The Best System:

The 14 Core Principles of an Effective Project Delivery System

To achieve the optimal project outcome and maximum client value requires all these 14 principles, being applied fully amalgamated daily.

1. **Systemic View**: Interdependencies, Holistic
2. **One System**: Science and Data driven.
3. **Accounting for Project Time**: Elapsed Time
4. **Constraint Management**: Protection, Prioritisation, Preparation
5. **Visibility & Transparancy**: (Go & See)
6. **Shortest Feedback Loop**: Daily time to completion (Sat Nav)
7. **One Piece Continuous Flow** Effectivenss ahead of efficinecy
8. **Collective Knoweledge**: Utilised at all levels
9. **Horizontal Accountability**: Collective focus on system not outcome
10. **Intrinsic Motivation**: At all Levels - Pull not Push
11. **Systematic Operation Routines**: (Standardised Hourley, Daily, Weekly) (CS)
12. **Digitilisation & Automation**: (BIM, AI)
13. **Parallel/Concurrent Processing**: Offsite
14. **Continuous system innovations & improvement**

There should be daily physical and auditable evidence of all of these being applied together focused on accounting for and optimising the project's time to completion.

Any of these applied in isolation can lead to a negative performance.

© Copyright LEAN THINKING LTD

137

The Effective System Principles:

1. Systemic View

Taking a holistic view

Appreciating the interdependencies

Understand culture, behaviours, beliefs

Understanding the impact either instantly or at some place and point in time in the future

The systemic impact of actions or comments by people in the system is at its greatest in a project environment.

A systemic view takes in to account all the processes, cultures, behaviours, habits and routines and doesn't treat anything in isolation.

©Copyright LEAN THINKING LTD

140

The Effective System Principles:

2. Science and Data Driven

No gut feel and no opinion about what the problem could be.
Gather the facts
Present the data
Using data and facts in general is more beneficial than intuition and gut feel.

Data v Collective Intelligence / knowledge

Data:
- % of tasks started: by project, by trade, by individual
- % of task completed: By project, by trade, by individual
- Buffer chart
- Weekly project time gains and losses
- Reasons for delay or causes of uncertainty

©Copyright LEAN THINKING LTD

141

The Effective System Principles:

5. Visibility and Transparency

Project performance measured and data shared
Notice boards displaying performance against the end date
Buffer Chart
Priorities posted for all to see. The weekly plan
Visible collaboration & collective wisdom daily and weekly

Check Sheets
One of the best ways of problem prevention
Reminders – Lower stress
Can be used as a record of the system being used

©Copyright LEAN THINKING LTD

142

The Effective System Principles:

5. Visibility and Transparency

- Visible data performance charts – Updated weekly:
  - Project Progress Charts – Including a buffer chart (Appendix 2 & 3)
  - Mangers' performance charts
  - Sub-contractors' and suppliers' performance charts (Appendix 4)
  - Project performance charts against the plan

©Copyright LEAN THINKING LTD

143

The Effective System Principles:

6. Short Feedback Loop – Daily Time to Completion (Sat Nav)

Daily Calculation of time to completion (Sat Nav – accurate and scientific using elapse time)

The shortest feedback loop for dealing with unfavourable events /uncertainty.

The shorter the feedback loop the less time lost and lower levels of defects and rework.

How short should the feedback loop be?

Maximum of half a day.

©Copyright LEAN THINKING LTD

144

The Effective System Principles:

6. Short Feedback Loop – Daily Time to Completion (Sat Nav)

https://www.bbc.co.uk/archive/sat-nav-cd-top-gear/zkj3hbk

©Copyright LEAN THINKING LTD

145

The Effective System Principles:

8. Collective Intelligence and Wisdom of all levels.

Tapping in to the collective wisdom and knowledge of all Daily and Weekly
- Morning Briefings
- Daily walks
- Weekly update and review

Minimise one to one agreements
Safety to speak and have your voice heard
Facilitating opportunities for all to be heard at all levels (at the minimum all on the constraint)
Listening?
Servant Leadership – Pull not Push
Creative tension
Independent facilitation
A catalyst
Science of influence

Utilisation of the collective wisdom is the most effective way to solve problems and also to predict and minimize future uncertainty.

©Copyright LEAN THINKING LTD

146

The Effective System Principles:

9. Horizontal Accountability and Self Management.

Distributed leadership
Deep democracy
Peer engagement and accountability to the system for the benefit of whole.
Understanding the interdependencies
Self-management and self-coordination
Collective accountability for project time

The prevailing management philosophy of 'control' suggest:
- Complex adaptive systems (CAS) like projects do not work well when you trying to manage them by central control

NO Naming and Shaming

Horizontal accountability reduces cost and radically improves communication as it will eliminate a step in the communication process.

©Copyright LEAN THINKING LTD

147

The Effective System Principles:

10. Pull rather than push.

Create an environment where trade contractors are full of desire to pull work forward and get on.

© Copyright LEAN THINKING LTD

148

The Effective System Principles:

11. Check Sheets for:

Establishing client expectations for:
- Aesthetics
- Benefits – Solutions
- Carbon Emission
- Social Value

Project delivery check sheets:
- Weekly plan
- 4-6 weeks preparation
- Morning Briefing
- Daily walks
- Problem prevention
- Weekly sessions

©Copyright LEAN THINKING LTD

149

The Effective System Principles:

14. Continuous System Innovations and Marginal Gains

The system should be an intelligent and self learning system that continuously improves in order to improve the outcome.

Businesses in other industries need to innovate to achieve a pipeline of work or orders. In construction businesses expect pipe line of work before they innovate.

©Copyright LEAN THINKING LTD

152

The Effective System Principles:

14. Continuous System Innovations and Marginal Gains

1. Failures and problems are the best source of learning.
   a. An environment needs to be created to allow open sharing of failures and problems.
   b. A structured failure and problem route cause analysis and learning system to be utilised to expand learning. The 'show me' process and robust benchmarks support this theory
   c. The following problem solving tools and techniques to be utilised as and when required:
      i. PDCA – Plan-Do-Check-Act
      ii. 5 Whys
      iii. SPC – Statistical Process Control
      iv. Pareto analysis
      v. Fishbone diagrams
      vi. Value Stream mapping

© Copyright LEAN THINKING LTD

153

The Effective System Principles:

The 14 principles would need to be applied:

- At the right time
- At the right place
- In a transparent way
- Applied interconnectedly

Requires deep understanding of the principles.

© Copyright LEAN THINKING LTD

154

The System?:

- **How should the system feel like?:**
  - A tangible calmness, less rushed and lower anxiety levels.
  - Better transparency
  - Greater level of involvement and belonging.
  - Substantially less verbal communication.
  - Less site management.
  - Fewer emails and meetings.
  - Less progress chasing and expediting.
  - A sense of collectiveness and shared responsibility.
  - Energy and creative tension amongst the supply chain.

© Copyright LEAN THINKING LTD

173

What will the System look like?:

1. On site:
   a. The system on display in ink:
      i. The detailed steps and timing of the routine for managing, monitoring, controlling & learning.
      ii. Scientifically and accurately prioritised work schedule.
      iii. Flags around the site physically marking high priority tasks

   a. Visible data performance charts – Updated weekly:
      i. Project Progress Charts – Including a buffer chart (Appendix 2 & 3)
      ii. Mangers' performance charts
      iii. Sub-contractors' and suppliers' performance charts (Appendix 4)
      iv. Project performance charts against the plan

© Copyright LEAN THINKING LTD

184

What will the System look like?:

a. The system in motion:

Daily:

1. Morning briefings – Standard format and stations
2. Ward rounds – twice a day – Including calculation of the end date – Akin to a Sat Nav.
3. Afternoon debriefing
4. Reflection Time
5. Total subordination to the weekly plan.

© Copyright LEAN THINKING LTD

185

What will the System look like?:

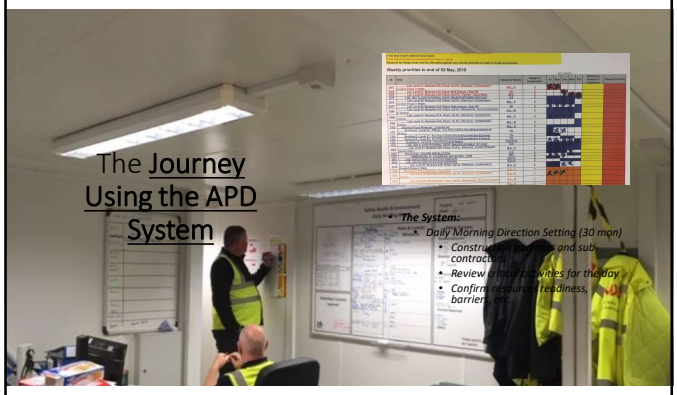
a. The system in motion:

Weekly:

1. Progress update using elapsed time
2. Feedback of performance by independent consultants
3. Collective validation and optimisation to completion.
4. Prioritisation.
5. Issue of flags.
6. 4-6 weeks look ahead.
7. Developing self-coordination.
8. Detailed program sections review – by sections teams.
9. System audits by consultants.
   •

© Copyright LEAN THINKING LTD

186



194

The System

- ***The System:***
  - ***Weekly session (3 – 4 hr)***
    - *Including:*
      - *Client (project management and technical resources)*
      - *Partners' supervisors*
      - *Key sub-contractors' black hats*
    - *Review impact on End-Date, Opportunities and challenges*
    - *6-week look ahead*
    - *New Weekly plan with prioritisation of tasks (Red/Blue/Orange/Grey)*
    - *Walk around to review critical tasks*
    - *Assessing opportunities for offsite*
    - *Use of BIM to assess better and short of sequence of work.*

195

The System

The System:

- *Daily walks*
  - *Supervisors*
  - *Assessing the system*
    - *One Piece Flow*
    - *Awareness of the priorities*
    - *Awareness of the remaining durations*

196

The 4 Project Related Objectives:

- Mental health, personal development, Relationships
- Improving client value
- Productivity improvement
- Improving the profitability of all the supply chain (including Graham Construction's)

- **Additional GC Objective: To create a competitive edge. (2 seconds ahead)**

© Copyright

LEAN THINKING LTD

198

Mental Health & Well being:

Enhancing the quality of well being:

- Work prioritisation
- Check sheets
- Standardised system – habits
- Intrinsic motivation
- Collective focus on the system rather than each other or the outcome
- Less multi tasking
- Less resources on site at any point in time.

- Focus on the system puts people in the here and now together an minimises stress and toxic behaviours.

©Copyright

LEAN THINKING LTD

199

Does it always work:

No. Why Not?:

Fear:

- Transparency
- Loss of Control

- https://www.youtube.com/watch?v=psAXMqxwol8&ab_channel=Speakers%27Spotlight

© Copyright

LEAN THINKING LTD

200

CITB Leadership & Management Development Fund

© Copyright

LEAN THINKING LTD

204