crafting growth opportunities

Lean Construction 101 - Being agile post COVID

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April 24, 2020

Presented By:

KPDA
KENYA PROPERTY DEVELOPERS ASSOCIATION

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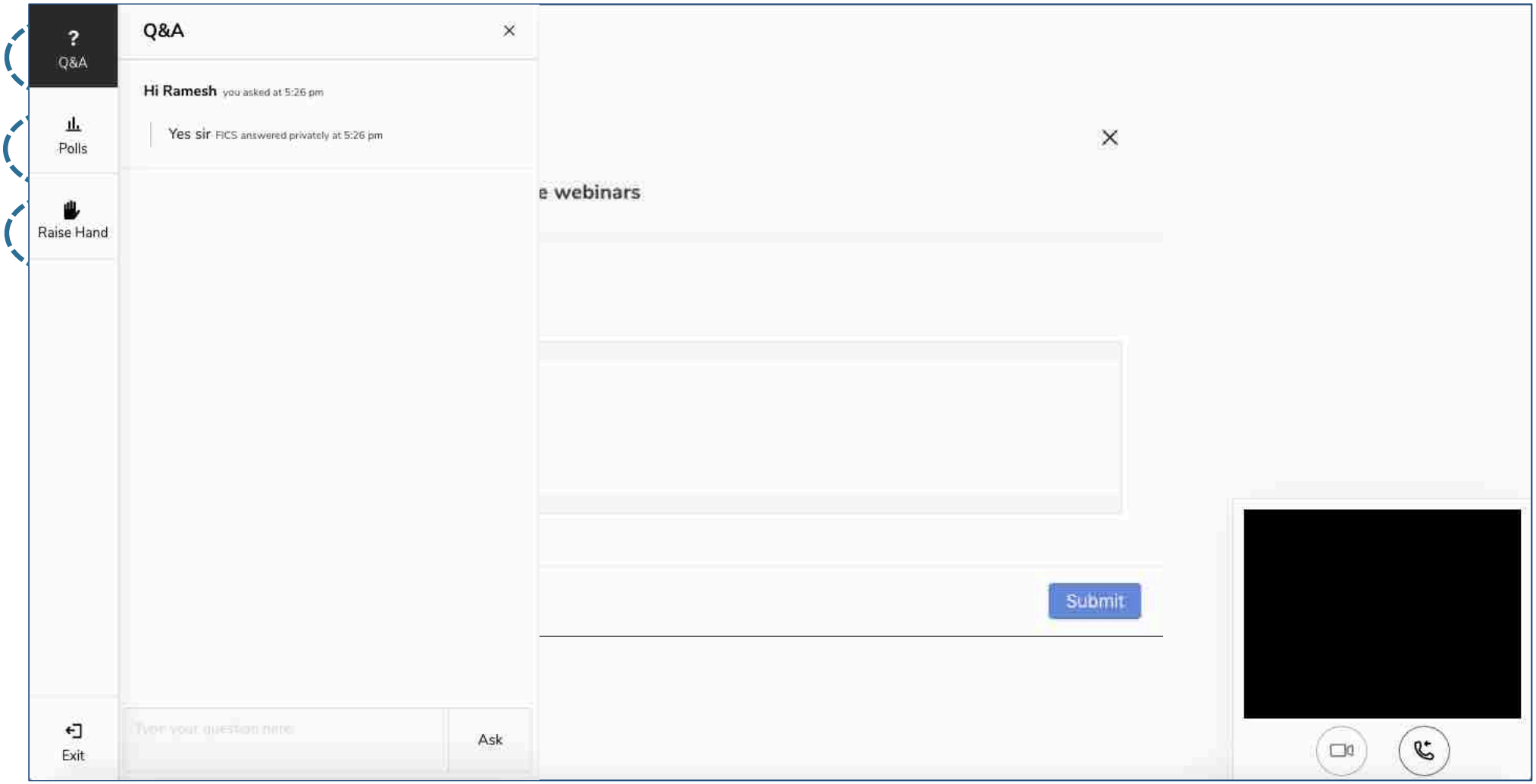
CRAFTING GROWTH OPPORTUNITIES

Webinar Controls



A story of a true champion!

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My biggest learning: Crisis creates opportunity

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- Subvert the paradigm – you are not alone!
- Believe in yourself – there is no option to mental resilience
- You need to have a PHD Degree to create opportunities;
  - Passion: to make a difference
  - Hunger: How badly you want to win?
  - Discipline: Being persistence is the key

Reality of construction sector

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80%+ projects are delayed

80%+ projects cause cost overrun

30%+ of work done is reworked

50% of site time is unproductive

10% of material is wasted

Effective Manpower utilization is **<50%**

Poor customer retention

Why construction sector is unique?

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- Every project is unique
- Physically challenging work environment and sometimes remote locations
- Expensive reworks/rejections
- Uneducated workforce
- High reliability on external factors

Common Challenges in construction sector (Poll)

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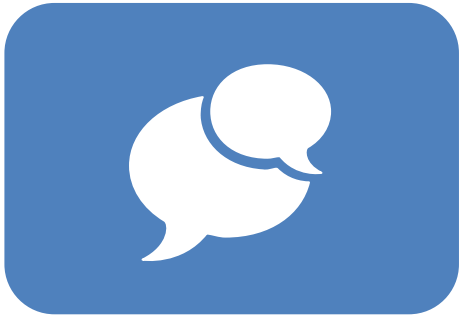
Improper Planning



Poor Communication

Design Delays/Reworks

Skilled Workforce unavailability

Material Wastages

Material Accountability issues

Vendor quality and delivery issues

Safety Issues

Answer to all of these is…..

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Lean Construction

(Inspired from Toyota Production System)

Objectives of Lean Construction

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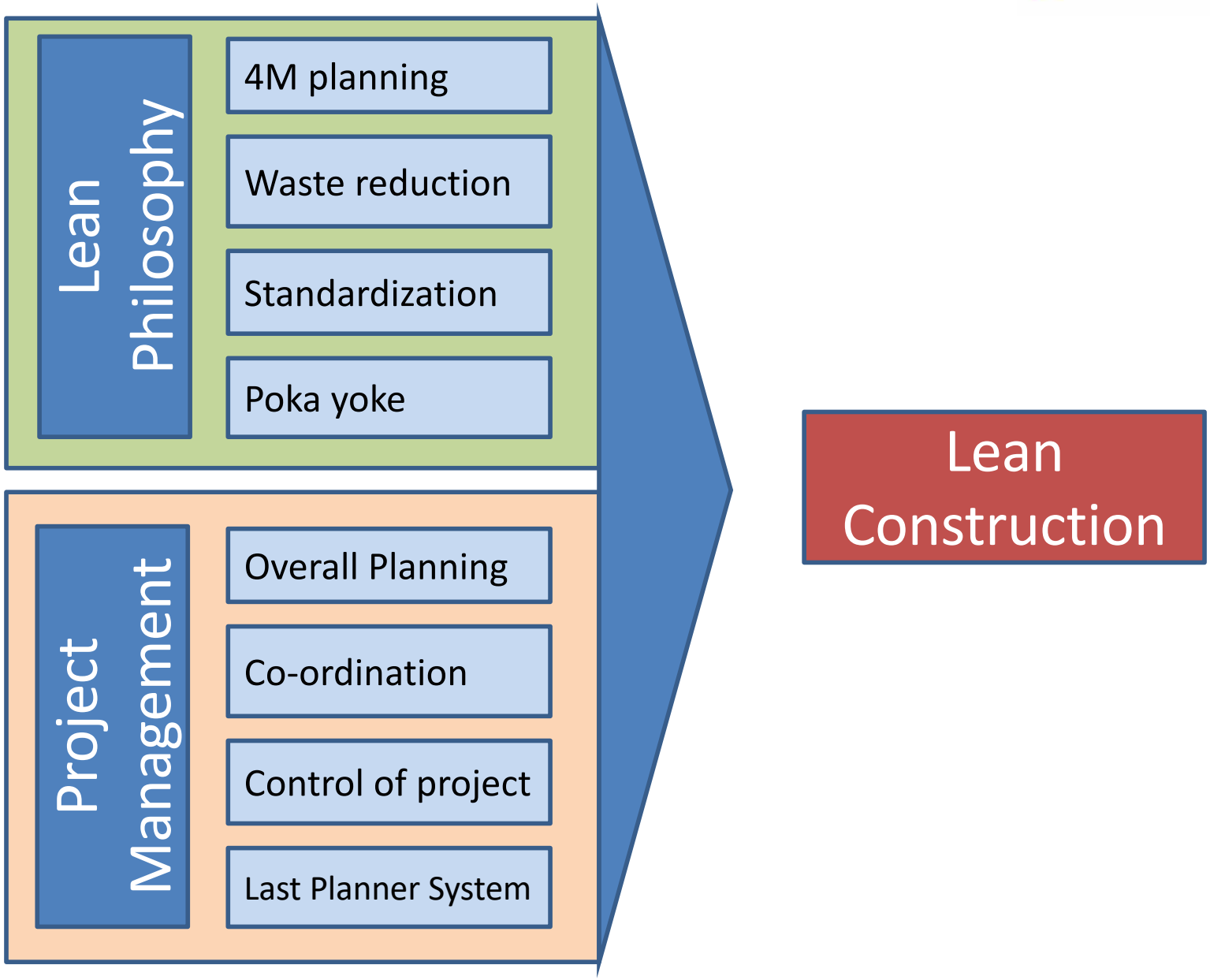
- Reduction in overall construction time
- Reduction in overall cost
- Increase work done per team per day
- Improve the quality of construction
- Enhance safe work environment
- Improve customer experience and ensure WOW!

What is Lean Construction



What is Lean?

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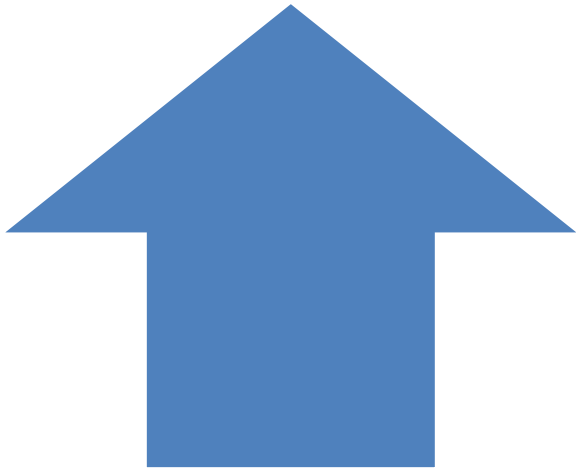
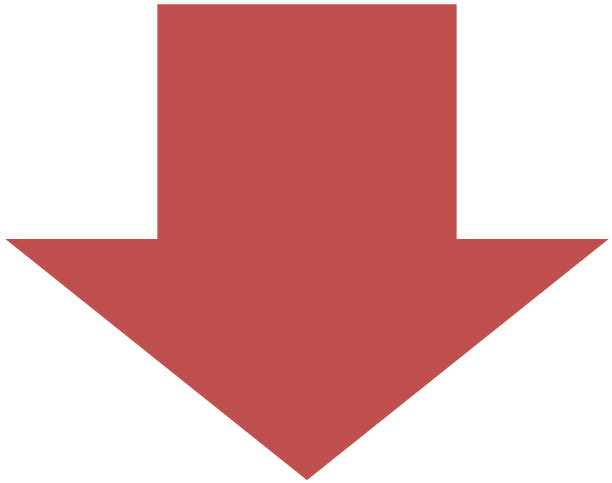


Focus on enhancing value



Eliminate or minimize waste

Value is something customer is willing to pay for; rest everything is waste

How Lean Works

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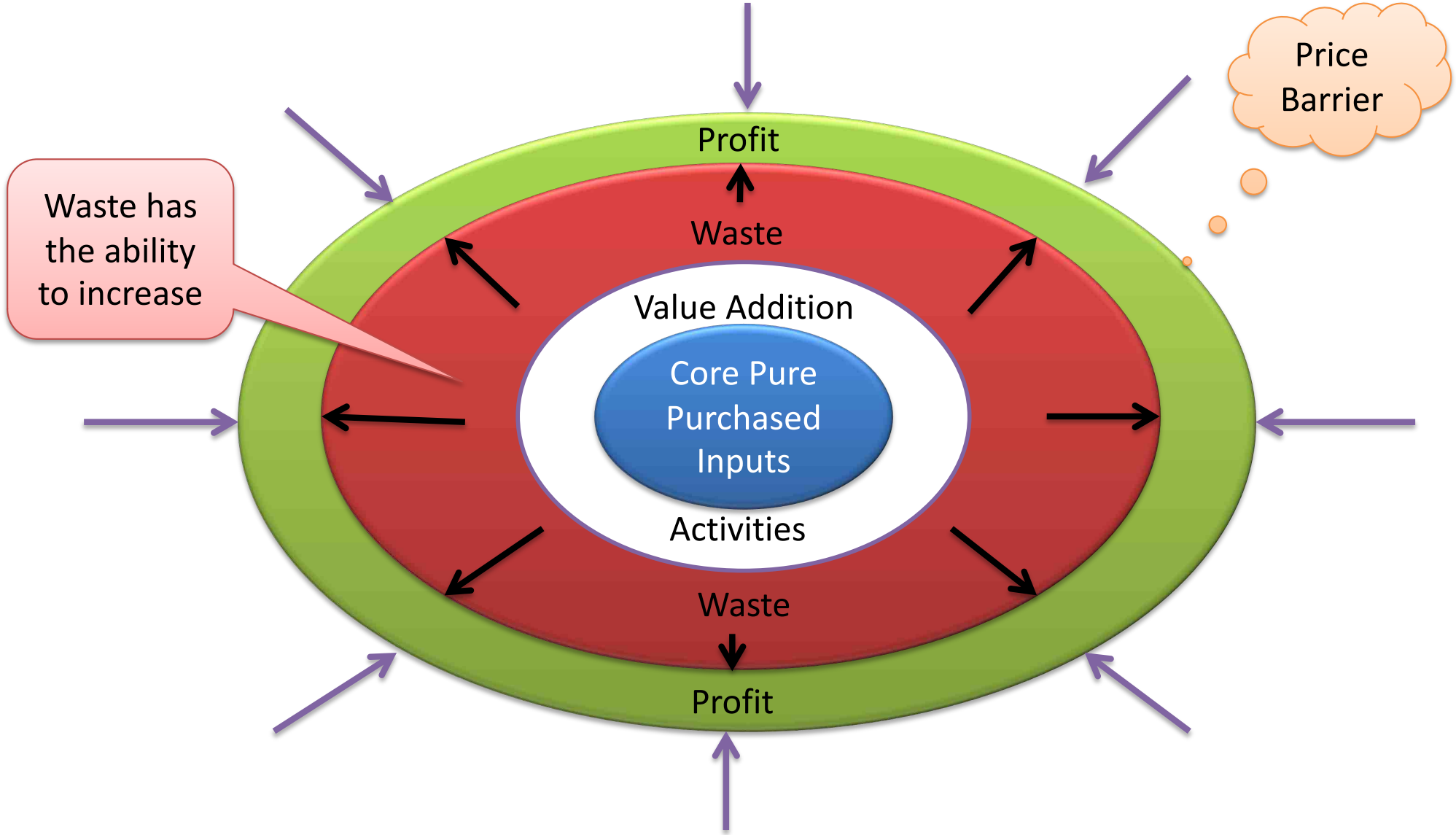

Before Lean Implementation

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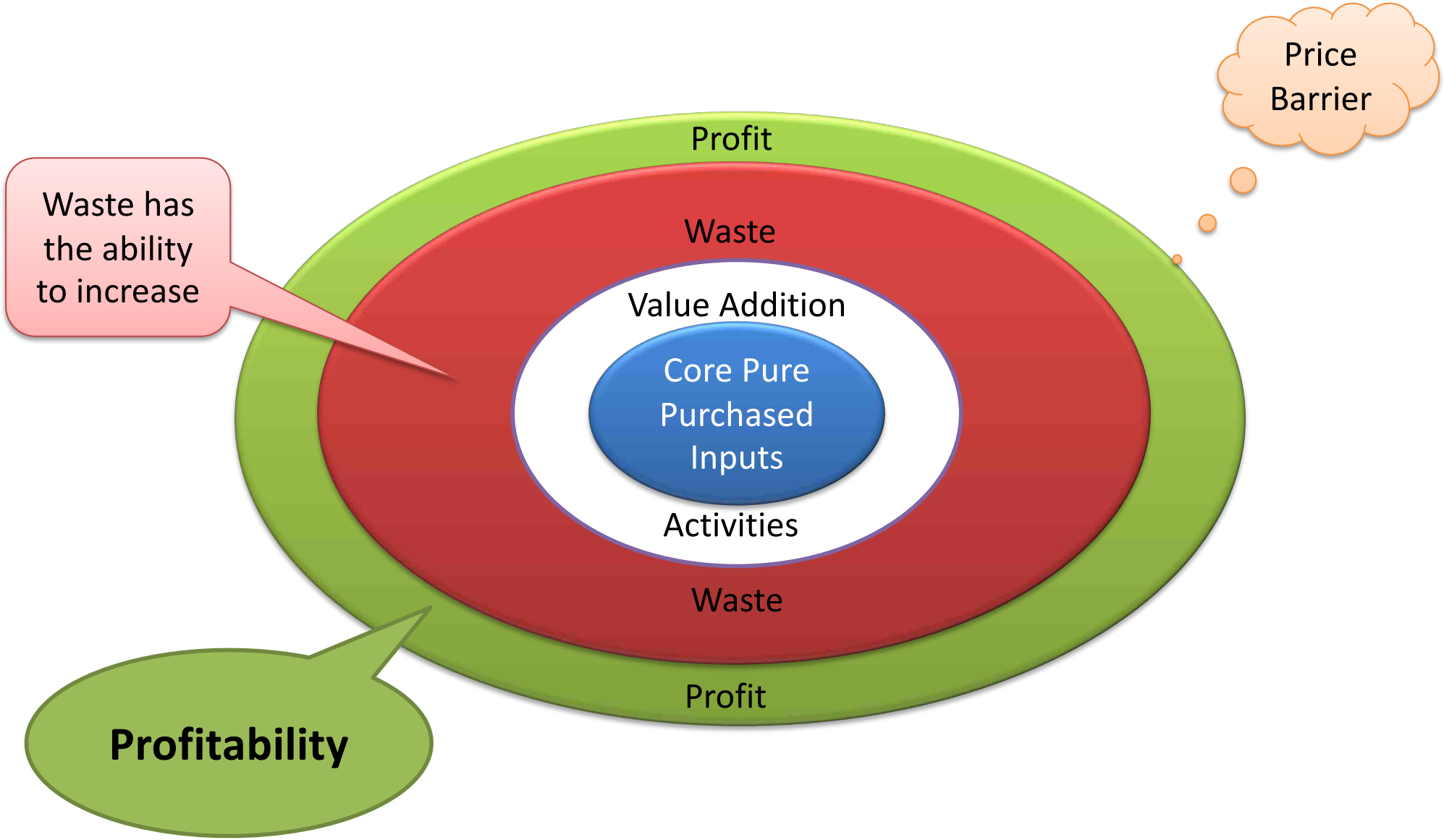

After Implementing Lean

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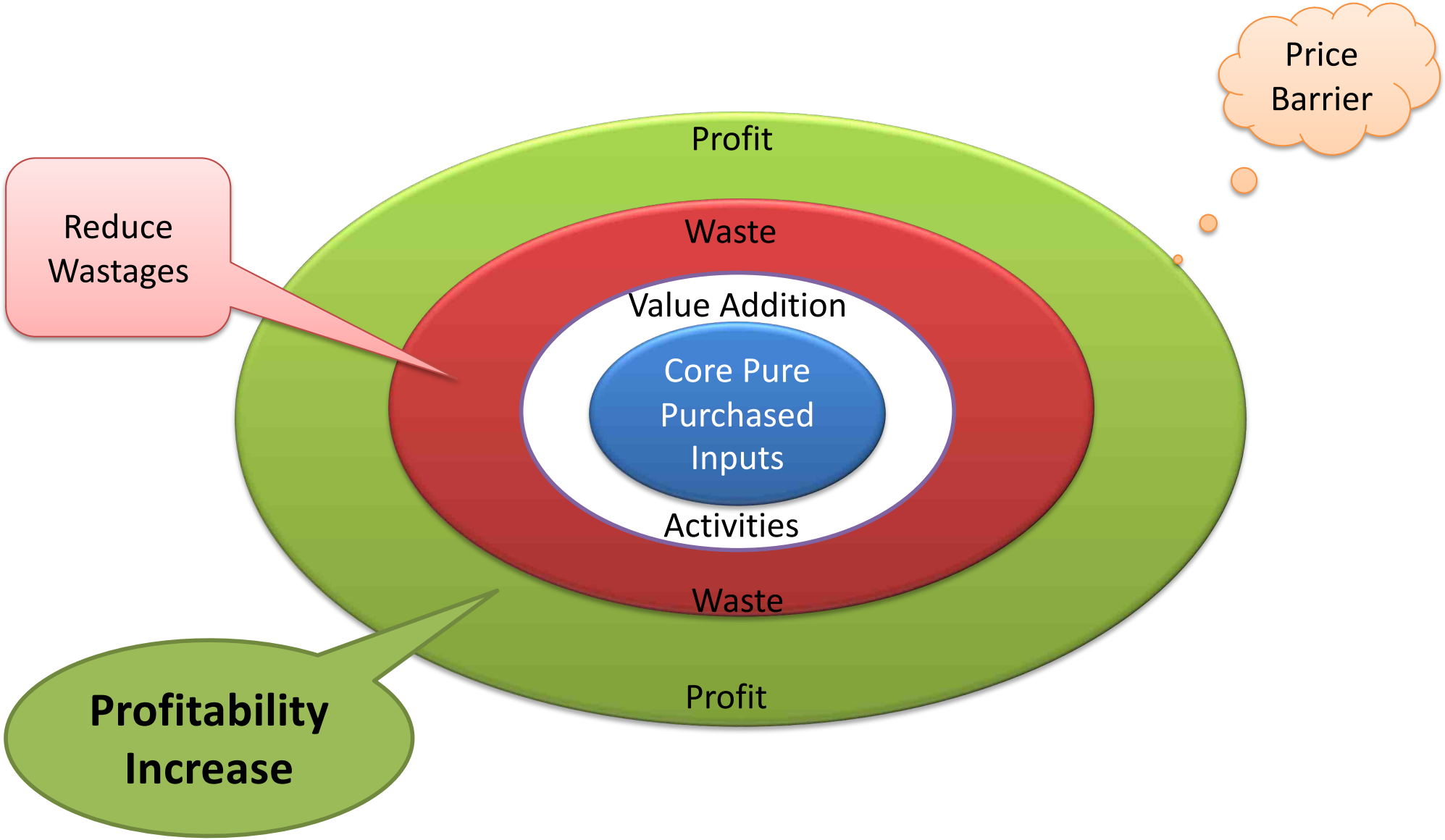

Lean Principles

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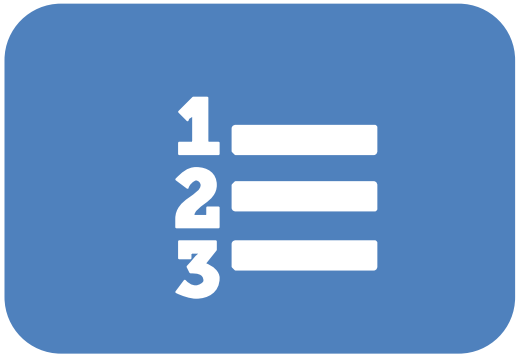
Respect for People

Removal of waste

Focus on Process and Flow

Optimization of whole (not localized)



Standardization

Continuous Improvement

Last Planner System (LPS)

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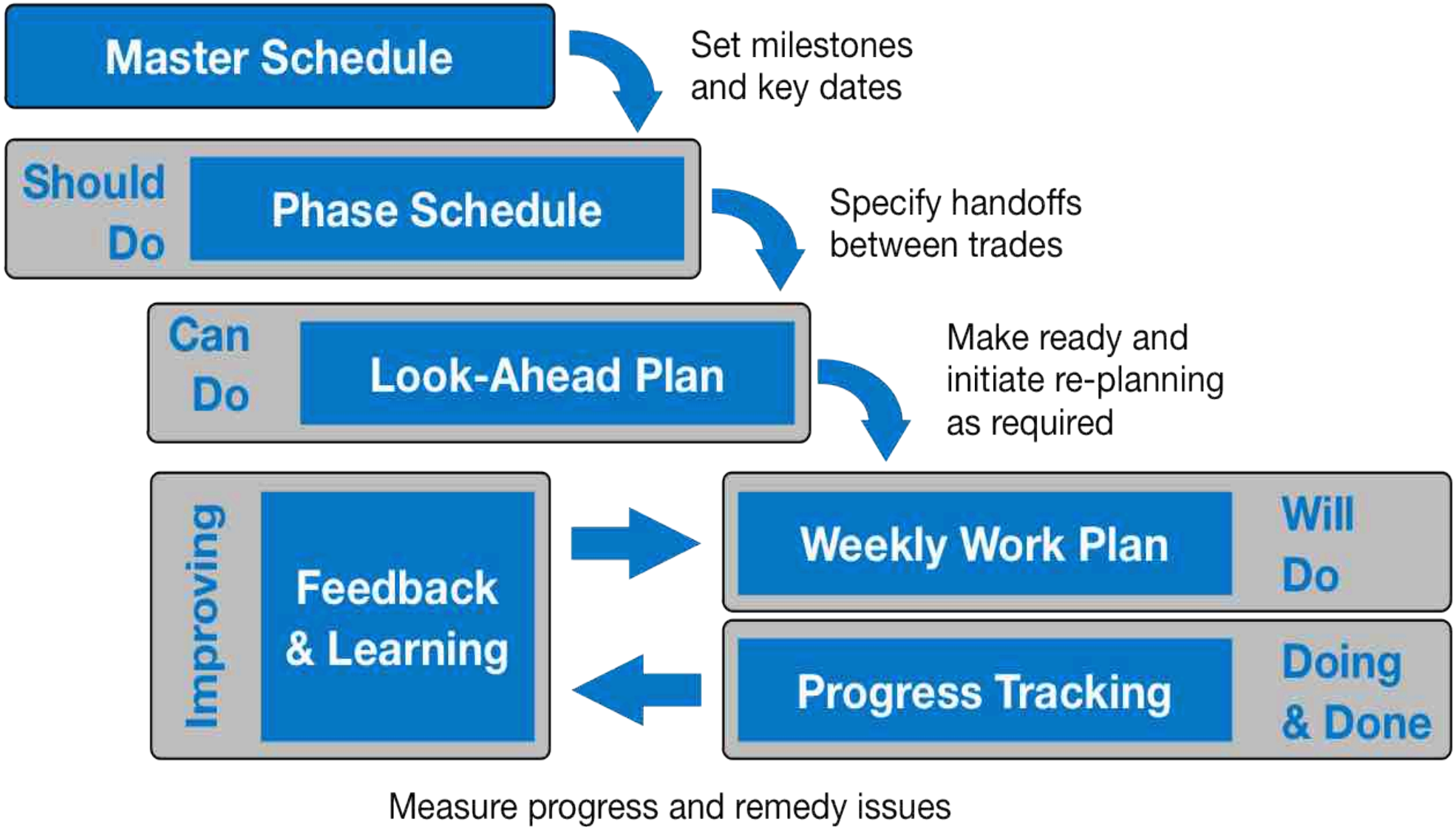

Coverage of Lean Construction

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House of lean in construction

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Improved Quality	Reduced Cost	On Time Delivery	Safety
Quality	**Cost**	**Delivery**	**Safety**
• Following Standard operating procedures and manual • Poka Yoke • RM quality check • Inspection test report (ITR) generation/resolution • Streamlining ITR process • Internal and consultant QC check points • Cost of quality • Frequent quantity surveying schedule	• Productivity gain by increased quantity and optimized man-hours • Time quantity report (TQR) • Delay codes monitoring • Inventory management • Yield improvement • Meeting budget target rates • Meeting budget man-hours • Supervisory league table monitoring • Pass cards implementation • Drawing backlog monitoring	• Planning effectiveness • Daily Plan attainment tracking and project management • On time in full (OTIF) tracking for all RM suppliers • Supplier panel management • Material cataloguing • Supplier follow – up table • Procurement log • Sub – contractor management • Meeting internal delivery deadline for clients	• Proactive approach • Reactive approach • Safety patrol audit • Near miss incidence capturing • Hidden accident analysis • Fire hazard prevention • Accident frequency ratio • Severity ratio • Near miss to accident ratio • Noise monitoring • Potable Water analysis

VALUE STREAM MAPPING

Tools Used in Lean Construction – An Overview

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Value Stream Mapping	Waste Elimination	Six S	Poka Yoke
Improves Lead time	Reduces wastages	Improves Safety,Reduces search time and release space	Reduces rejections and rework

Standardization	TWI	Last Planner System	DWM
Ensures Consistency	Improves speed with skills	Improves planning	Improves Communication

Lean In Construction Approach

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Plan

- Team Orientation
- Current State Mapping (L1 and L2 Level)
- Waste Identification and Elimination
- Improvement levers design
- Future State Mapping and LPS Design

DO

- Future State implementation

Check

- LPS Monitoring

Act

- DWM Implementation

Typical benefits of Lean Construction

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- Ontime performance improvement by 30% to 50%,
- Cost reduction by 10% to 15%
- Manpower productivity improvement by 30%
- Lead time reduction by 20%
- Rework reduction by 50%
- Customer retention improvement

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Case Study

Lean Construction

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Case Study

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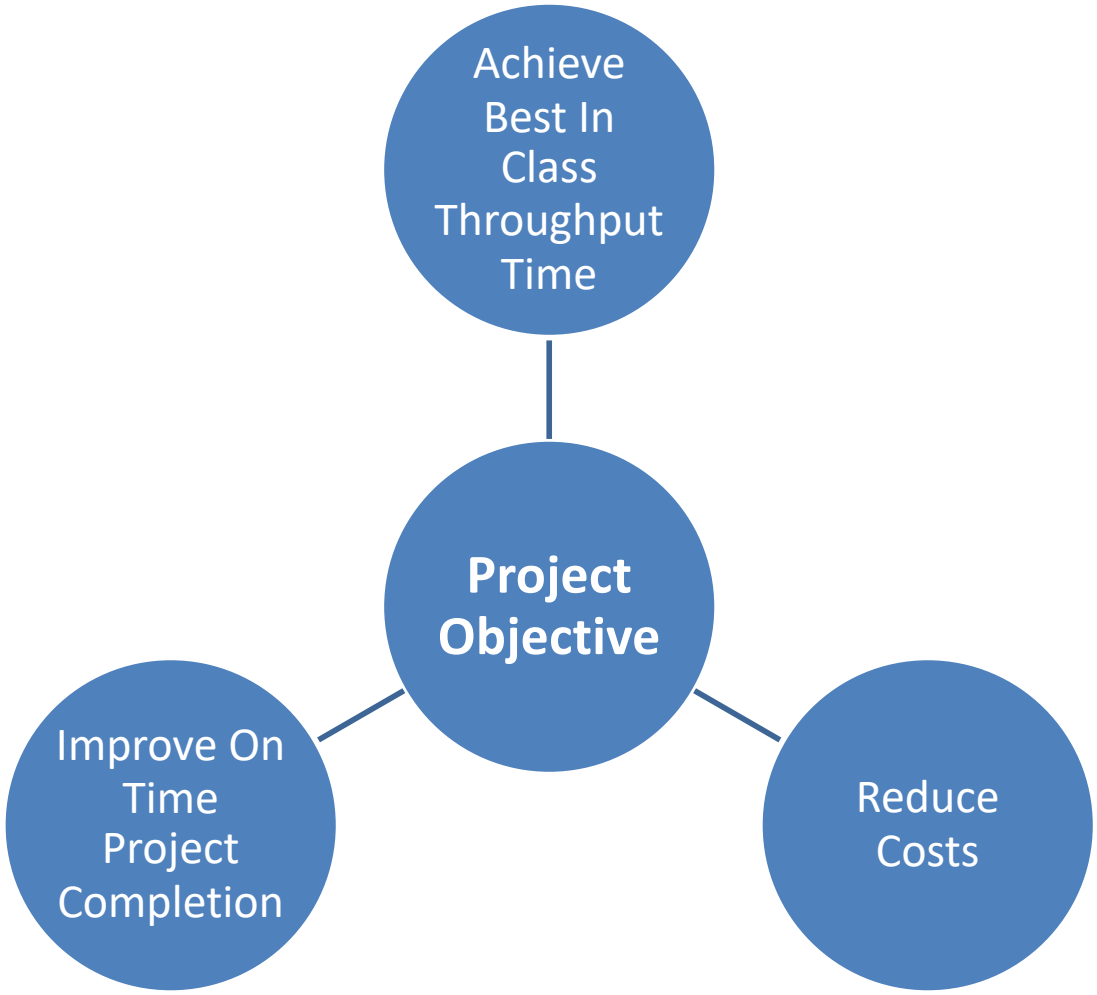
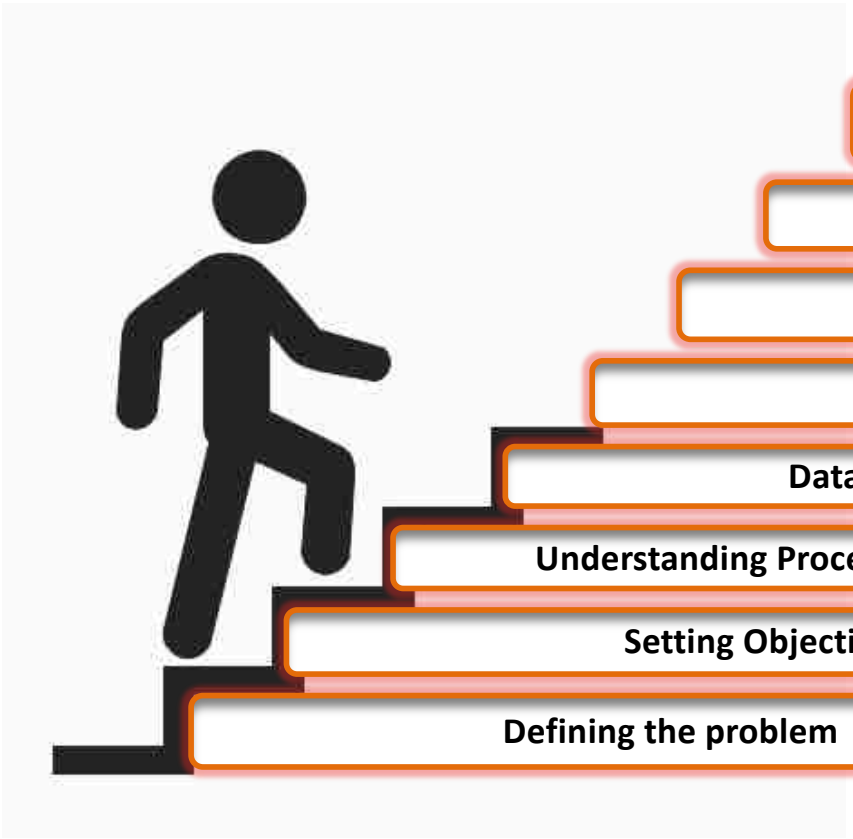
Client: One of the leading organizations in industrial & construction projects



Case Study: Steps Involved



- Future State Implementation
- Design of Last Planner System (LPS)
- Future State Design
- Solution Design
- Issues Identification
- Current State Mapping
- Data Grasping & Analysis
- Understanding Process Flow In Broad Level
- Setting Objectives
- Defining the problem

Defining The Problem

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- In last year out of 36 projects, only 24 were completed resulting into revenue loss
- Out of these completed projects, 2 were completed on-time resulting into an OTP of 5% as against target of 80%
- In addition to this additional expenses incurred due to overstay at site contributing reduction in margin
- Issues for project not completed on time due to delay in client inputs were 5 in numbers & due to internal delay were 19
- Overstay expenses for site establishment
- Overstay expenses of site contractor

Setting Objectives

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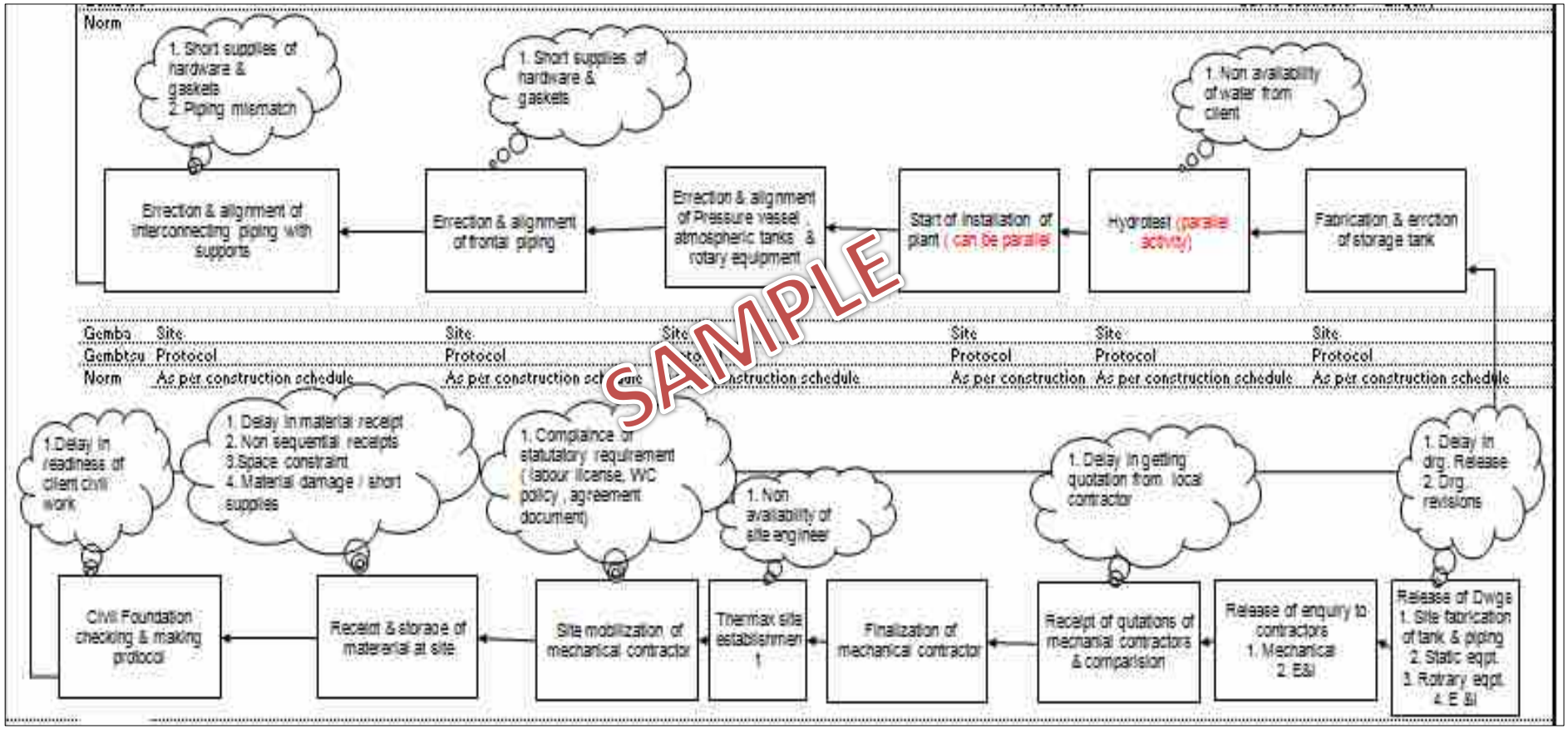
- To improve On time Performance from 5% to 80%
- Evolving root causes responsible for these delays
- Implementing counter action to eliminate above

	Current throughput time (in days)	Target throughput time (in days)
With civil	410	296
With commissioning	580	481

Process Flow Diagram



Data Collection And Analysis

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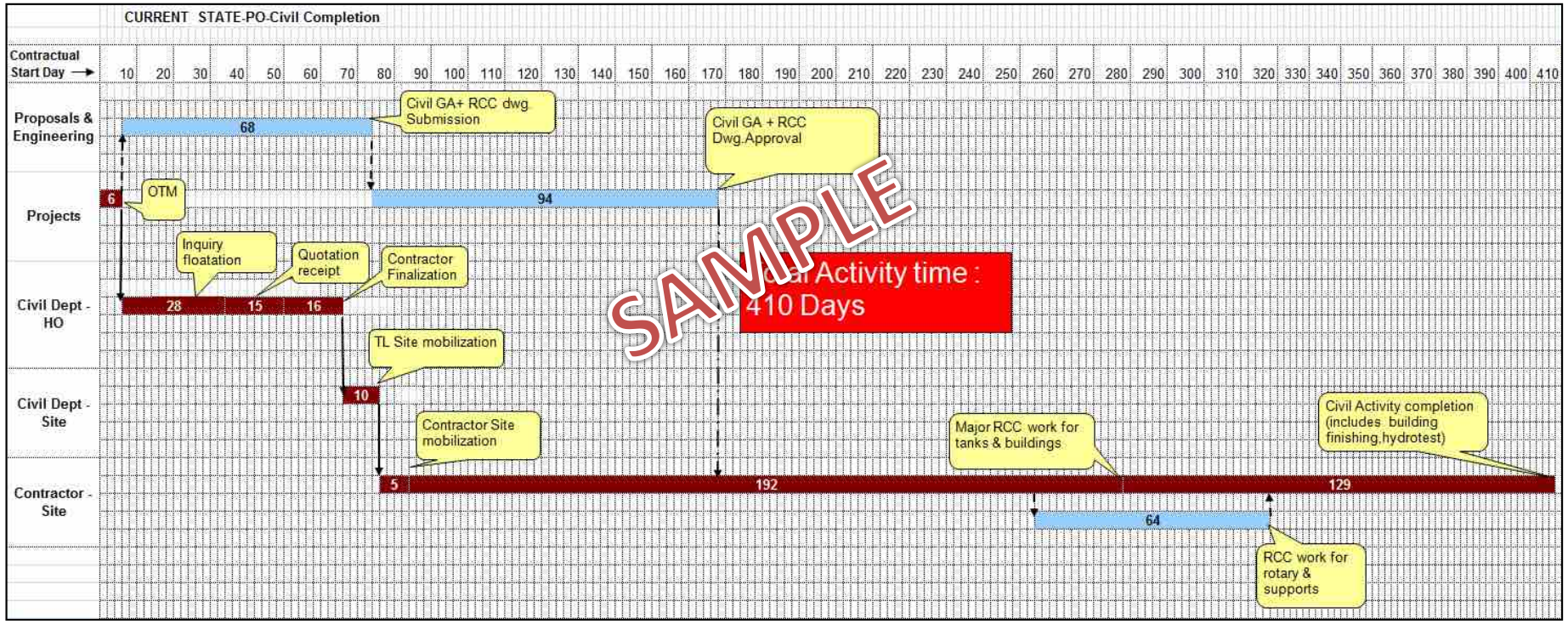
Contratual Start Date	Actual start date	Contratual Completion Date	OTM DATE	Civil GA submissio n	Civil GA Approval	RCC Dwg. Prepration	RCC dwg. Approval	Civil Enquiry floatation	Receipt of quotes	Contracto r finalizati on
24-Apr-15	14-Aug-15	22-Oct-15	5-May-15	8-May-15	19-Dec-15	23-May-15	21-Aug-15	22-May-15	29-May-15	11-Jun-15
13-Feb-15	9-Apr-15	12-Jun-15	6-Feb-15	12-Mar-15	30-May-15	30-Jun-15	31-Jul-15	17-Jan-15	26-Feb-15	16-Mar-15
12-Feb-15	28-Apr-15	18-Aug-15	16-Feb-15	3-Apr-15	19-Jun-15	15-Jul-15	30-Oct-15	6-Mar-15	19-Mar-15	9-Apr-15
9-Apr-15	19-Aug-15	22-Dec-15	17-Apr-15	11-May-15	24-Aug-15	20-May-15	28-Aug-15	11-Jun-15	20-Jun-15	19-Aug-15
20-Jul-14	7-Jan-15	17-Mar-15	22-Jul-14	18-Sep-14	10-Feb-15	22-Oct-14	18-Feb-15			
6-Jun-14	9-Oct-14	30-Jan-15	10-Jun-14	6-Mar-15	17-Mar					
26-Jan-15	15-May-15	24-Jun-15	3-Feb-15	20-Mar-15	29-May					
12-Feb-16	25-Aug-16	12-Sep-16	23-Feb-16	30-May-15						
28-Aug-15	7-Nov-15	14-May-16	31-Aug-15	18-Oct-15		23-Oct-15	8-Mar-16	19-Sep-15	25-Sep-15	13-Nov-15
27-Nov-15	5-May-16	31-Aug-16	4-Nov-15	23-Ja						

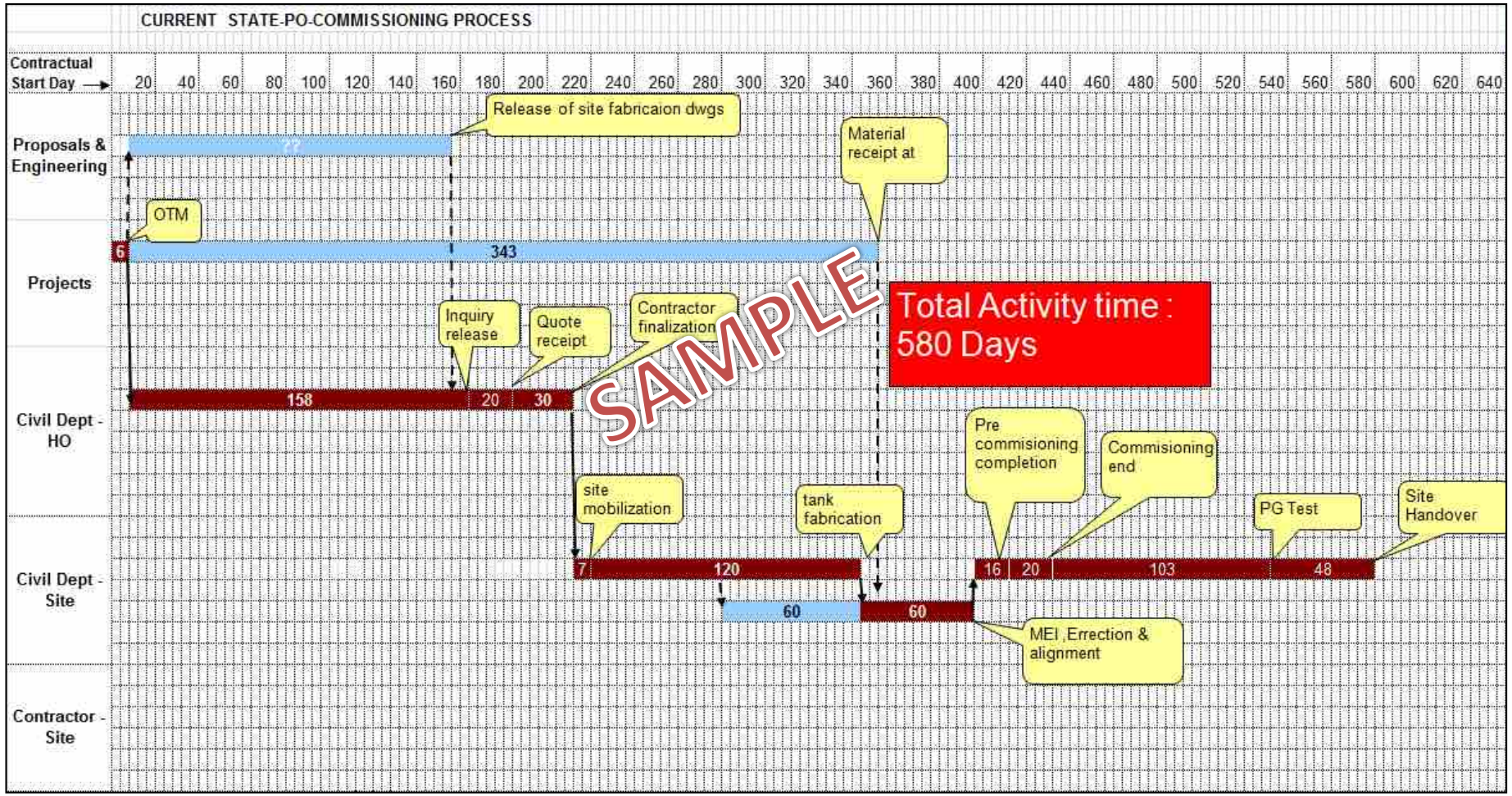
SAMPLE

Thermax Site mobilizat ion	Site mobilizai on by contracto r	Civil activity completio n	Release of dwgs	Rele of enq to mechanic al contracto r	quotes	Contracto r finalizati on	Site Mobilizat ion	Receipt of material at site (storage tank raw material)	Civil foundati on checking n making protocol	Start of Fabricati on & erection of storage tank	End of Fabricati on & erection of storage tank	Receipt of static , equipme nts
13-Jun-15	22-Jun-15	9-Apr-16	1-Oct-15	3-Sep-15	14-Sep-15	25-Sep-15	7-Oct-15	10-Sep-15	14-Oct-15	-	-	
9-Apr-15	9-Apr-15	15-Mar-16		25-May-15	10-Jun-15	22-Jun-15	25-Jun-15					
7-Apr-15	9-Apr-15	15-Apr-16		13-Jun-15	27-Feb-15	10-Aug-15	25-Aug-15					
19-Aug-15	19-Aug-15	15-Mar-16		2-Nov-15	10-Dec-15	31-Dec-15	10-Jan-16					
		25-Nov-15		28-Sep-14	16-Oct-14	28-Oct-14	30-Oct-14					
				11-Jul-14	25-Jul-14	22-Aug-14	25-Aug-14	31-Dec-14				
		31-Mar-16		14-Aug-15	29-Sep-15	17-Oct-15	22-Oct-15	15-Jun-15				
				18-Jul-16	29-Jul-16	5-Aug-16	10-Aug-16					
7-Nov-15	7-Nov-15	30-Sep-16		23-Apr-16	16-May-16	6-Jun-16	7-Jun-16					
				16-Aug-16	19-Aug-16	5-Aug-16	10-Sep-16	20-Apr-16				

Current State Mapping Of Civil



Current State Mapping Of Commissioning



Issues Identified & Counter Steps In Commissioning

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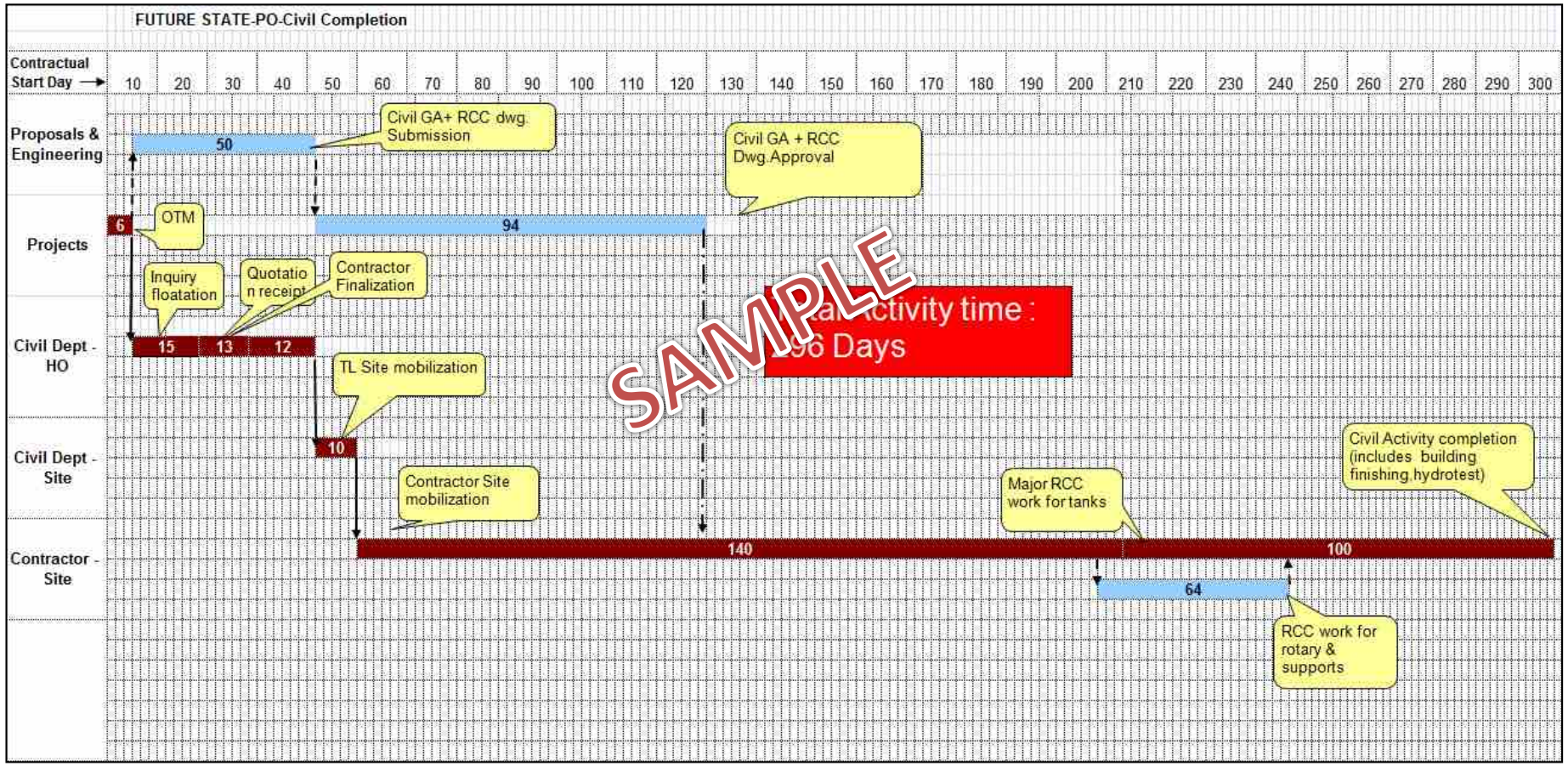
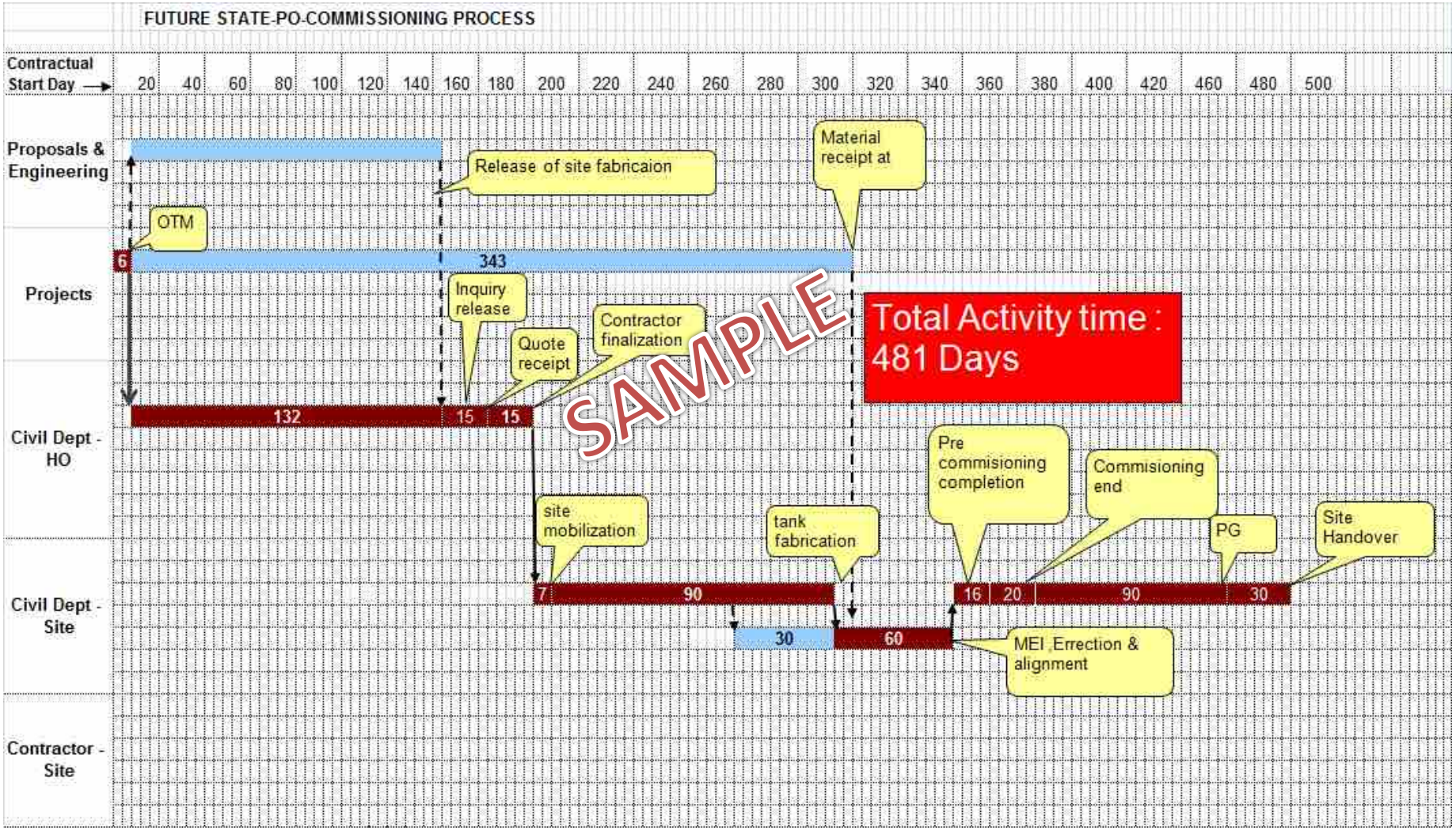
ISSUE ANALYSIS - COMMISSIONING												
Sr. No.	Activity	Actual Time	Ideal time	Gap	Issues (Why - 1)	Issues (Why - 2)	Issues (Why - 3)	Issues (Why - 4)	Issues (Why - 5)	Countermeasure	Future State	Saving potential
1	Contractual Start - OTM	6	6	0							6	0
2	OTM - Inquiry release - With civil	158	132	26	Delay in drawing release	Prority Clashes	Resource constraint	Engg. Flowlines sufficiency & competency check not yet done with respect to increased requirement		Check resourse sufficiency with respect to increased requirement	132	26
3	Inqury release - Quote receipt	20	15	5	Unavailability of contractors representative to send quote within 15 days	Same contractor represntative engaged with Thermax site execution					15	5
4	Quote receipt - contractor finlization	30	15	15	Contracot finalization discussion frequency (informal) is once a week					Descipline of contractor finalization within 15 days tobe maintained	15	15
5	Site mobilization - Tank Fabrication	120	90	30	Material short supplies	Majo[illegible] gets receiv[illegible]n time but Ornaments type of material like crown plate, grating , nozzle pipe , flanges & hand riling are not received in time	Less follow up on these items since billable items are already supplied	No methodology avaialble to check weather these maerial is received in time (i.e 45 days after site mobilization)		Start monitoring & giving propoer attention to these items	90	30
6	Commisiong - Trial run PG Test	103	90	13	Client input delay	Client not in a position to utilize produced water during PG test	Initially Our plant out put is required for clients boiler hydro test , pipe line flashing & testing . However plant is designed for total load requirement . Delay in completion of other packages (such as Boiler , condenser , cooling	Contract agreements are not honoured by clients & vice versa			90	13
7	PG Test - Site Handover	48	30	18	PG test checklist non complaince						30	18

SAMPLE

Future State Design Of Civil



Future State Design Of Commissioning



Comparison for Civil

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SR #	ACTIVITY	CURRENT STATUS	FUTURE STATE	% SAVING (in days)	% COST SAVING
1	OTM - Inquiry floatation	28	15	46.4	10%
2	Inquiry floatation - Quote receipt	15	13	13.3	
3	Quote receipt - contractor finalization	16	12	25.0	
4	Site Mobilization - Major RCC work for tank & building	192	140	27.1	
5	Major RCC work for tank & building - civil completion	129	100	22.5	

Comparison for Commissioning

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SR #	ACTIVITY	CURRENT STATUS	FUTURE STATE	% SAVING (in days)	% COST SAVING
1	OTM - Inquiry release	158	132	16.5	10%
2	OTM - Inquiry release - Without civil	141	132	6.4	
3	Inquiry release - Quote receipt	20	15	25.0	
4	Quote receipt - contractor finalization	30	15	50.0	
5	Site mobilization - Tank Fabrication	120	90	25.0	
6	Commission - Trial run PG Test	103	90	12.6	
7	PG Test - Site Handover	48	30	37.5	

Benefits

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SR #	ACTIVITY	BEFORE	AFTER	% SAVING
1	Civil	410	296	27%
2	Commissioning	580	481	17%
3	Cost Savings	overall		10%
4	On Time Performance	5%	80%	-

“

If you always DO what you’ve always DONE, You’ll always GET what you’ve always GOT!

- Yogi Berra

”

Our Coordinates

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