



اجرا و مدیریت پروژه به روش اصول ناب (Lean Project Management)

فصل اول: مفاهیم، اصول و ابزارهای روش ناب (Lean)
بخش نهم: مفهوم همکاری و رقابت

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کامبیز کردانی

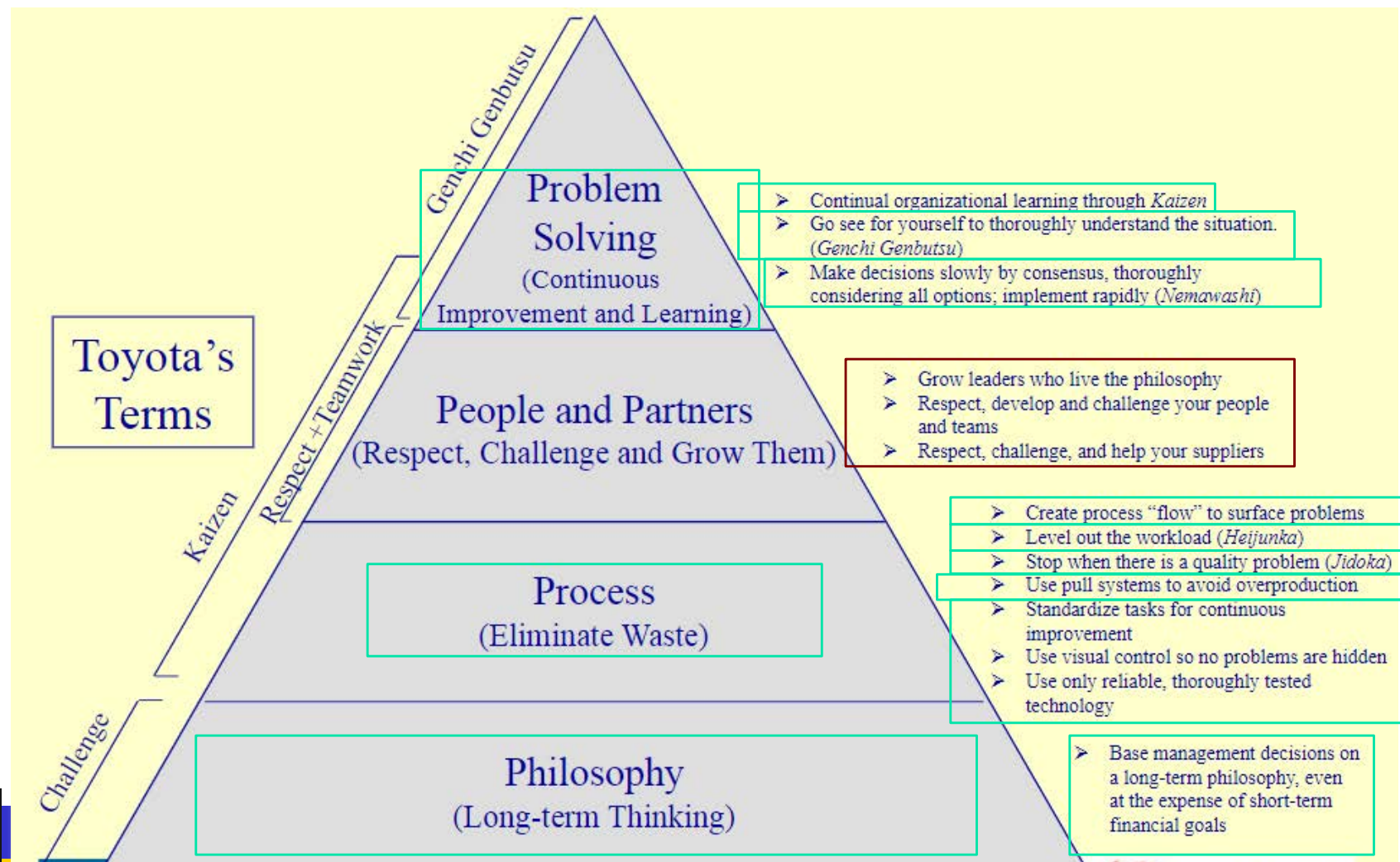
(M.Sc., PMP)

What we will learn?

❑ Competition and collaboration in organization

- ❖ Concepts
- ❖ Competition
- ❖ Collaboration
- ❖ Management-Related issues
- ❖ Integrated project delivery (IPD)
 - ✓ CMAA
 - ✓ AIA
 - ✓ ARCADIS
 - ✓ IFOA

Lean – Principles (4P Model of the Toyota way)



Principle 9

❑ Term: Develop exceptional leadership

- ❖ Find leaders
- ❖ Grows leaders
- ❖ Who? Places the highest value on team members

❑ Tool: Leadership and soft-skills



Principle 10

❑ Term: Develop exceptional people

- ❖ Creates exceptional people
- ❖ Trains exceptional individuals
- ❖ Promotes effective team work

❑ Tool: Soft-skills

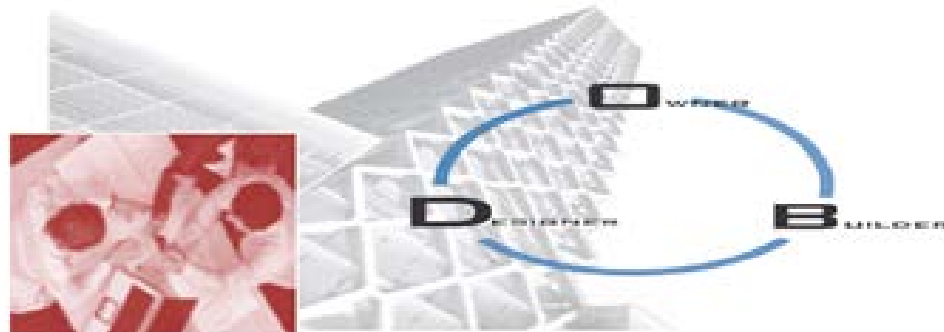


Principle 11

❑ Term: Develop collaborative relationships and build trust and respect

- ❖ Benefits internal and external network
- ❖ Looks for maintaining capability

❑ Tool: Integrated Project Delivery



Competition and Collaboration in Organizations

(Concepts)

Key concepts

□ Boundary:

- ❖ **Distinction** such in **domain specialties**,
marked by **sociocultural differences** and
giving **rise** to **discontinuities** in **interaction** and **action**

□ Resources:

- ❖ **Available assets** to an organization. The **basic types** are:
 1. Human (actors)
 2. Monetary (money to pay for goods and services)
 3. Materials (elements for production)
 4. Equipment (machines)
 5. Supporting capital for cyber and physical infrastructure

Key concepts

❑ Collaboration:

- ❖ Various relationships between individuals and special groups striving for a common goal.

- ▶ *Positive Collaboration – action connected with cooperative attitude and expectation of mutuality*
- ▶ *Competition (rivalry)*
- ▶ *Negative Collaboration (battle)- it takes different forms of competition*

❑ Collaboration features

- ▶ Voluntary or imposed
- ▶ Interactions have one-off or lasting character

Competition and Collaboration in Organizations

(Competition)



What does wining mean?

- ☐ Individual vs. individual (within a company)
- ☐ Group vs. group (between companies on the same team)
- ☐ Short-term vs. long-term relationship



What does wining mean?

- You need to understand the competing forces* :
 - Bargaining power (buyers and suppliers)
 - Nature and intensity among competitors
 - The threats (new entrants, threat of substitutes)

What are your measures of success?

*(M. Porter 2014)



What is the role of reliability and trust?

- ☐ What can you do to make sure that agreements are implemented and commitments are kept?
- ☐ How does trust (or distrust) impact negotiations?
- ☐ How can one built (or rebuilt) trust?
- ☐ Can you negotiate in the absence of trust?



Exercise

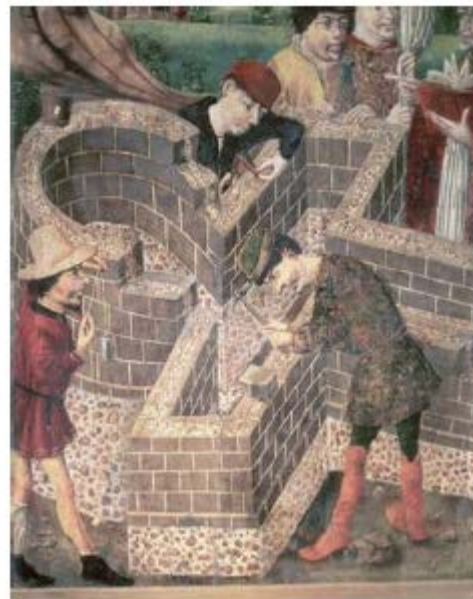
EXERCISE:
WIN AS MUCH
AS YOU CAN!



Competition and Collaboration in Organizations (Collaboration)



Being a team member is
all about your
perspective, your
attitude, and your
behavior



What is a team and teamwork?

- ❑ “Most teams aren’t teams at all but merely collections of individual relationships with the boss (or client)...Each individual vying with the others for power, prestige and position.”

Douglas McGregor

- ❑ “Teamwork represents a set of values that encourage behaviors such as listening and constructively responding to points of view expressed by others, giving others the benefit of the doubt, providing support to those who need it, and recognizing the interests and achievements of others.”

Katzenbach and Smith

- ❑ “Team Player: One who unites others toward a shared destiny through sharing information and ideas, empowering others, and developing trust.”

Dennis Kinlaw

Collaboration

☐ Involves **working together** (individuals and social groups)

to achieve a **common goal**

❖ Positive

☐ It is a **characteristic feature** of **every organized activity**

☐ A **creative endeavor** that involves

1. Sharing knowledge,
2. Learning together, and
3. Building consensus.

☐ Teams that **work collaboratively** can **obtain greater reward**

Levels of collaboration in construction

- 1. Collaboration Level 1 –**
Typical; collaboration not contractually required
- 2. Collaboration Level 2 –**
Enhanced; some contractual collaboration requirements
- 3. Collaboration Level 3 –**
Required; collaboration required by a multi-party contract



Collaboration Level 1

- **Collaboration Level 1 – Typical**; collaboration not contractually required
- Common Procurement Methods:
 - Design: Qualifications-Based Selection (QBS)
 - Construction: QBS or Best Value
 - Best Value = Tradeoff between price and performance that provides the greatest overall benefit under the specified selection criteria.

Collaboration Level 2

- **Collaboration Level 2 – Enhanced**; some contractual collaboration requirements (early participation of stakeholders, use of BIM and sharing of models, etc.)
- Common Procurement Methods:
 - ▶ Design: Qualifications-Based Selection (QBS)
 - ▶ Construction: QBS or Best Value

Collaboration Level 3

- **Collaboration Level 3 – Required**; collaboration required by a multi-party contract (true Integrated Project Delivery (IPD))
- Common Procurement Methods:
 - ▶ Design: Qualifications-Based Selection (QBS)
 - ▶ Construction: QBS or Best Value

Collaboration behavioral principles

- ☐ Mutual respect and trust
- ☐ Willingness to collaborate
- ☐ Open communication



Competition and Collaboration in Organizations

(Management-Related Issues)

Introduction

❑ **Although technology** is being gradually incorporated in construction processes, industry is still **driven largely by the human factor**.

all levels of the supply chain are people-dependent: designers, contractors, subcontractors, and suppliers

all interact to take a construction project from the owner's project requirements (OPR) to the finished product.

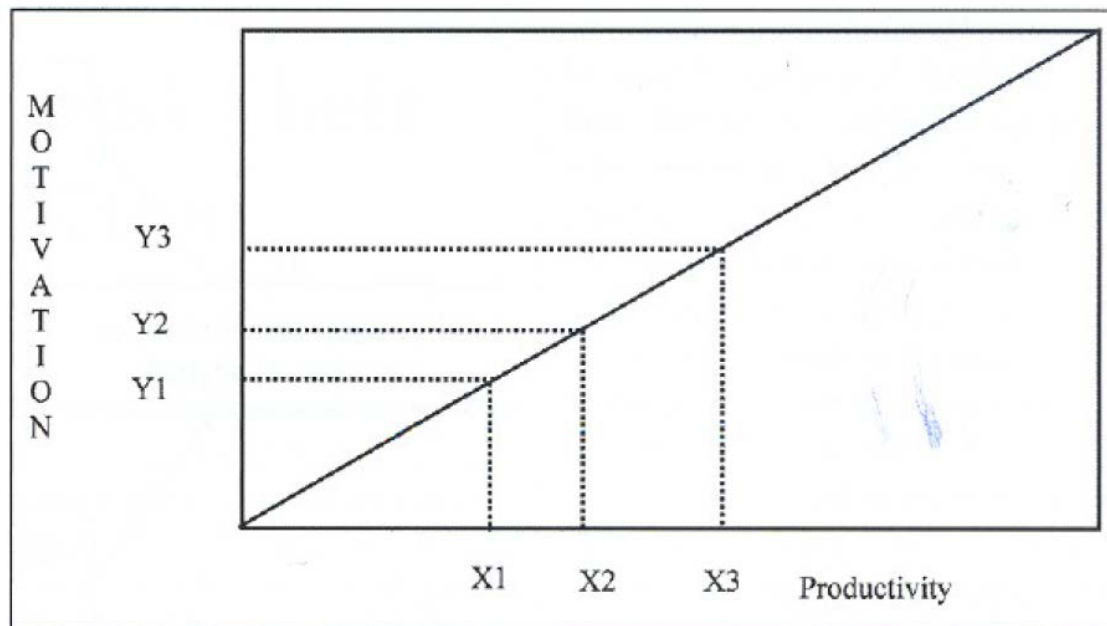
Improving performance, therefore, secures the greatest return on investment by addressing the human element.

Motivating workers

❑ Many techniques can be used to **motivate workers** in the construction environment.

❖ They include:

1. Goal setting,
2. Incentives,
3. Positive reinforcement and
4. Worker participation.



Worker motivation and job satisfaction are highest when

a project is well planned and

all the resources are available to enable everyone to be productive.

Motivating workers

☐ Different strategies used on different people

Produce **different results** at **different time**

☐ Some of theories of motivation:

1. Cassin's Approach or Management by Threat
2. Maslow's Theory of “Hierarchy of Needs”
3. McGregor’s Theory X and Theory Y
4. Expectancy Theory
5. Herzberg’s Theory



Motivating workers – Cassin's Approach

☐ The more you yell and curse at laborers

The more productive they will be

☐ 1950s and 1960s in the US

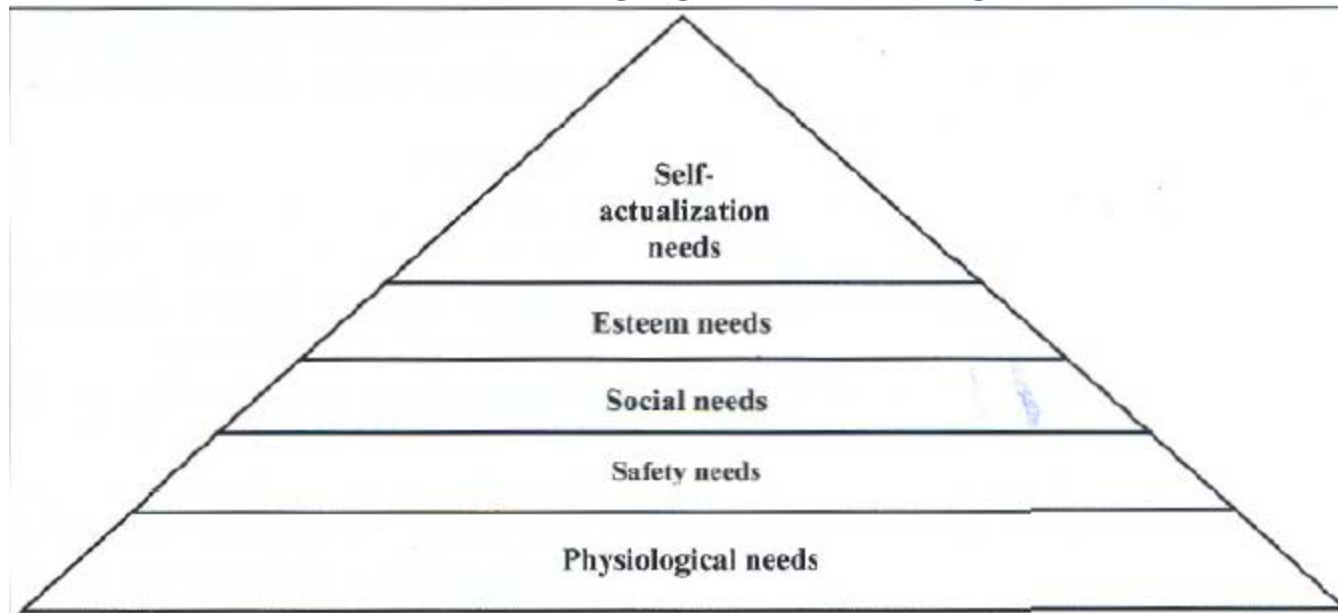
☐ Did not have desired effect

☐ Still used to some extent in developing countries



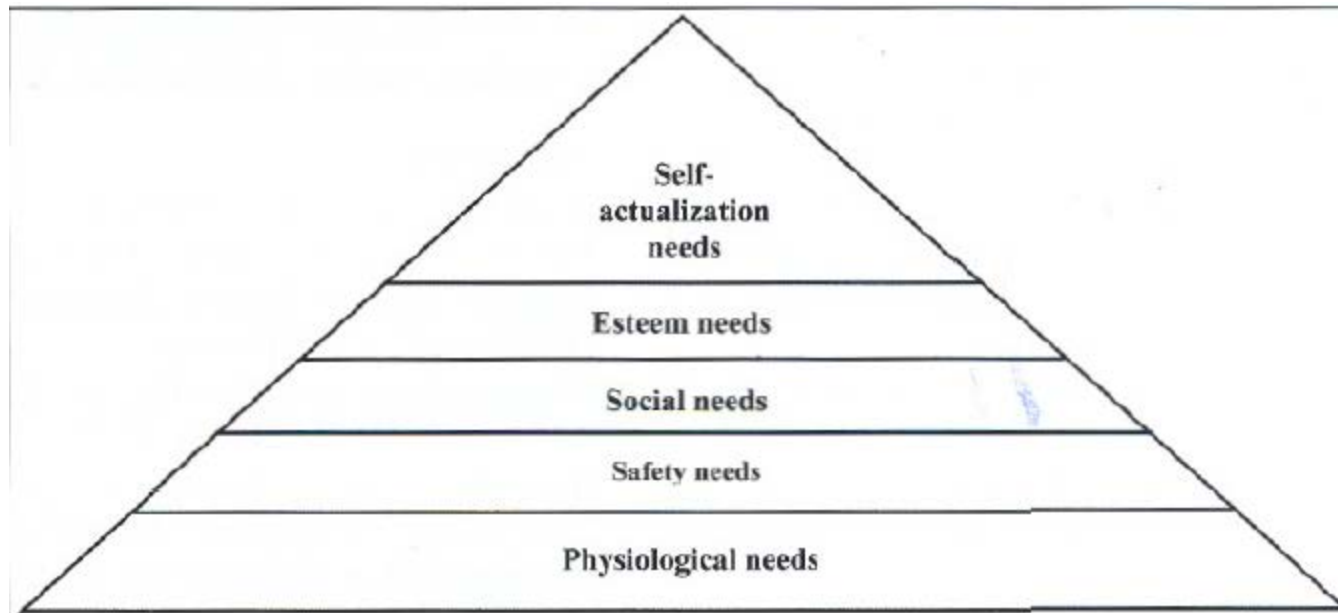
Motivating workers – Maslow’s “Hierarchy of Needs”

- ☐ **Physical needs:** Wages and working conditions
- ☐ **Safety needs:** Job security, safe working conditions
- ☐ **Social needs:** Team work, relationships with coworkers
- ☐ **Esteem needs:** Positive feedback, opportunities for advancement
- ☐ **Self-actualization needs:** Challenging and simulating tasks

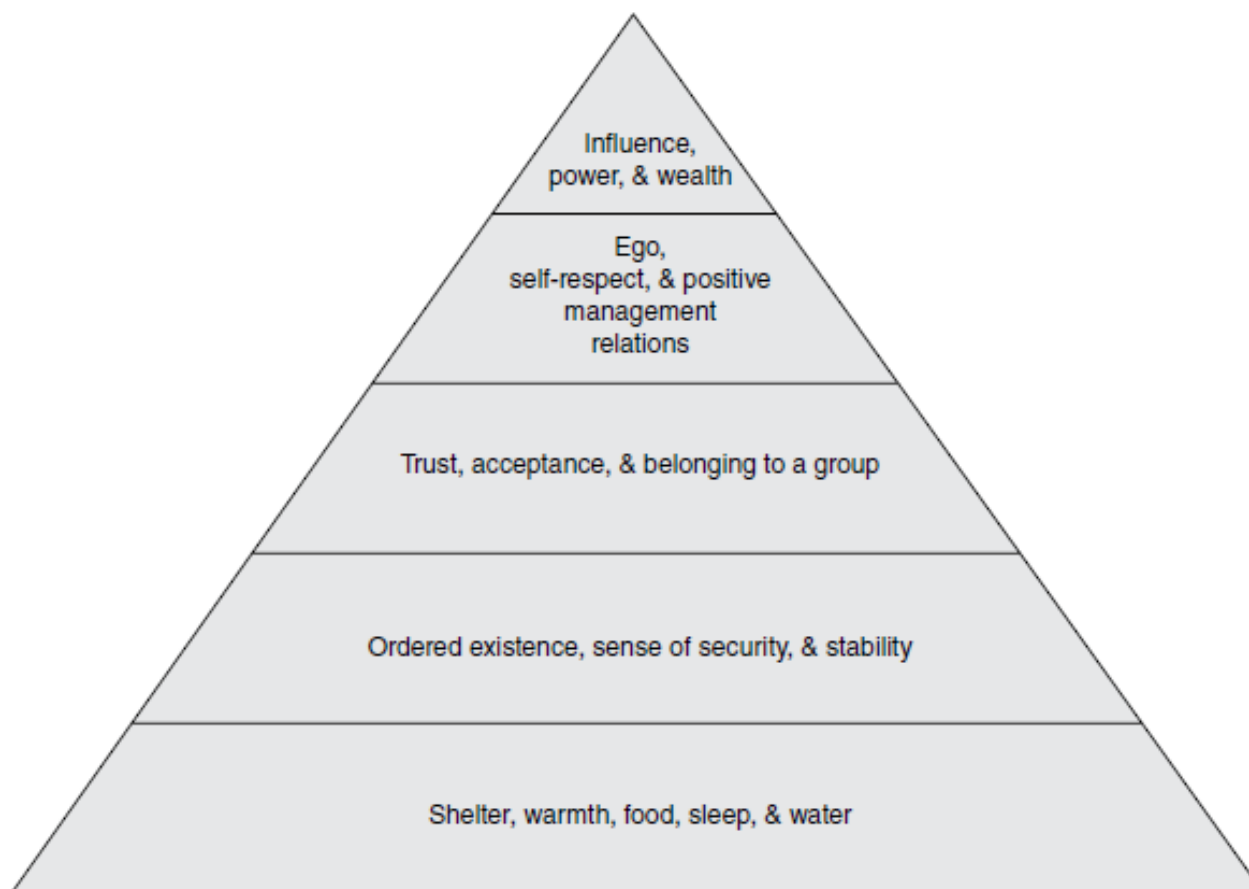


Motivating workers – Maslow’s “Hierarchy of Needs”

- ❑ Lower level needs are not motivating factors for construction workers
- ❑ Esteem needs and self-actualization needs can be fulfilled by:
 1. Praise
 2. Listening
 3. Involvement



Motivating workers – Maslow’s “Hierarchy of Needs”



Motivating workers – McGregor's Theory X

❑ Management **assumes** that workers:

- ❖ Are indolent
- ❖ Lack aspiration
- ❖ Avoid work when possible
- ❖ Do not take responsibility
- ❖ Put themselves before the organization
- ❖ Oppose changes
- ❖ Are easily fooled
- ❖ Should be punished for their wrong doings
- ❖ Should be rewarded for their extra efforts

Motivating workers – McGregor's Theory Y

❑ Management **is the cause why** workers:

- ❖ Are indolent
- ❖ Lack aspiration
- ❖ Avoid work when possible
- ❖ Do not take responsibility
- ❖ Put themselves before the organization
- ❖ Oppose changes
- ❖ Are easily fooled
- ❖ Should be punished for their wrong doings
- ❖ Should be rewarded for their extra efforts

Motivating workers – McGregor's Theory

- ☐ If **management has confidence** in its workers and
- ☐ If **workers are given the freedom** to work in their own way

Workers will be ***motivated and productive***

Motivating workers – Expectancy Theory

❑ Motivation depends on:

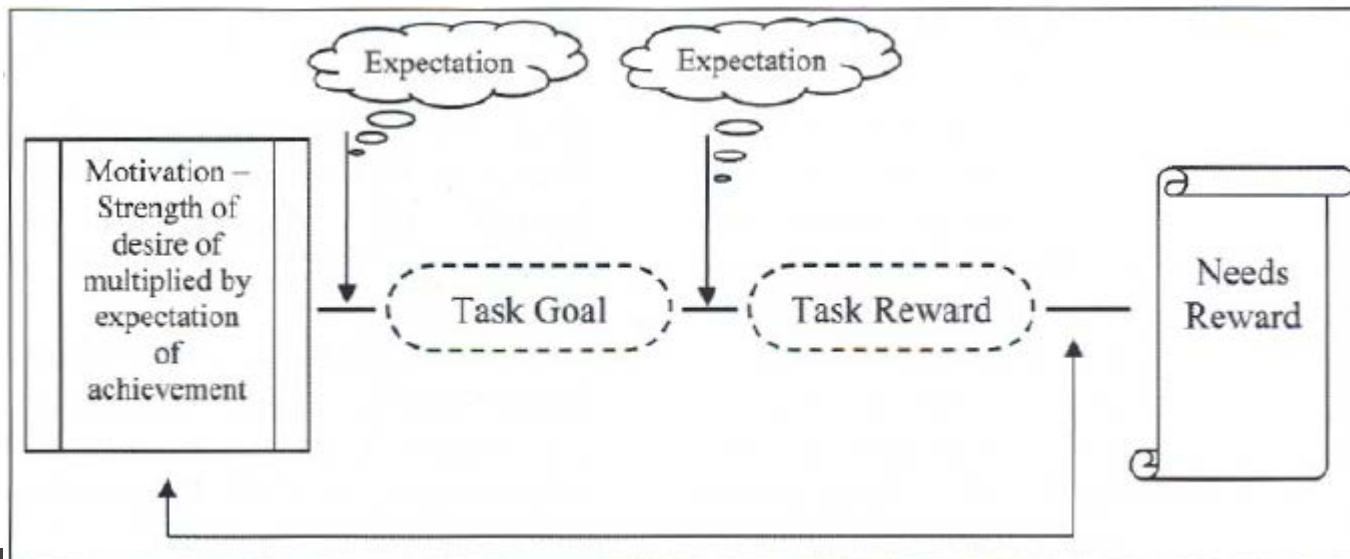
1. The **individual's perception** of his/her capabilities
2. The **reward associated** with the accomplishment of the job
3. The **value he/she places** on the reward

*"This theory emphasizes the **needs for organizations** to*

1. *Relate rewards directly to performance* and
2. *Ensure* that the *rewards provided are those rewards deserved* and *wanted by the recipients.*"

Motivating workers – Expectancy Theory

- ❑ Figure shows that an **individual's desire of achievement** creates expectation that this **task** or **goal** can be achieved
- ❑ Once achieved, it creates an **expectation for desired rewards** like promotion, increased security, etc.
- ❑ The key point is the **more attractive the reward**, the **stronger perception** will be.



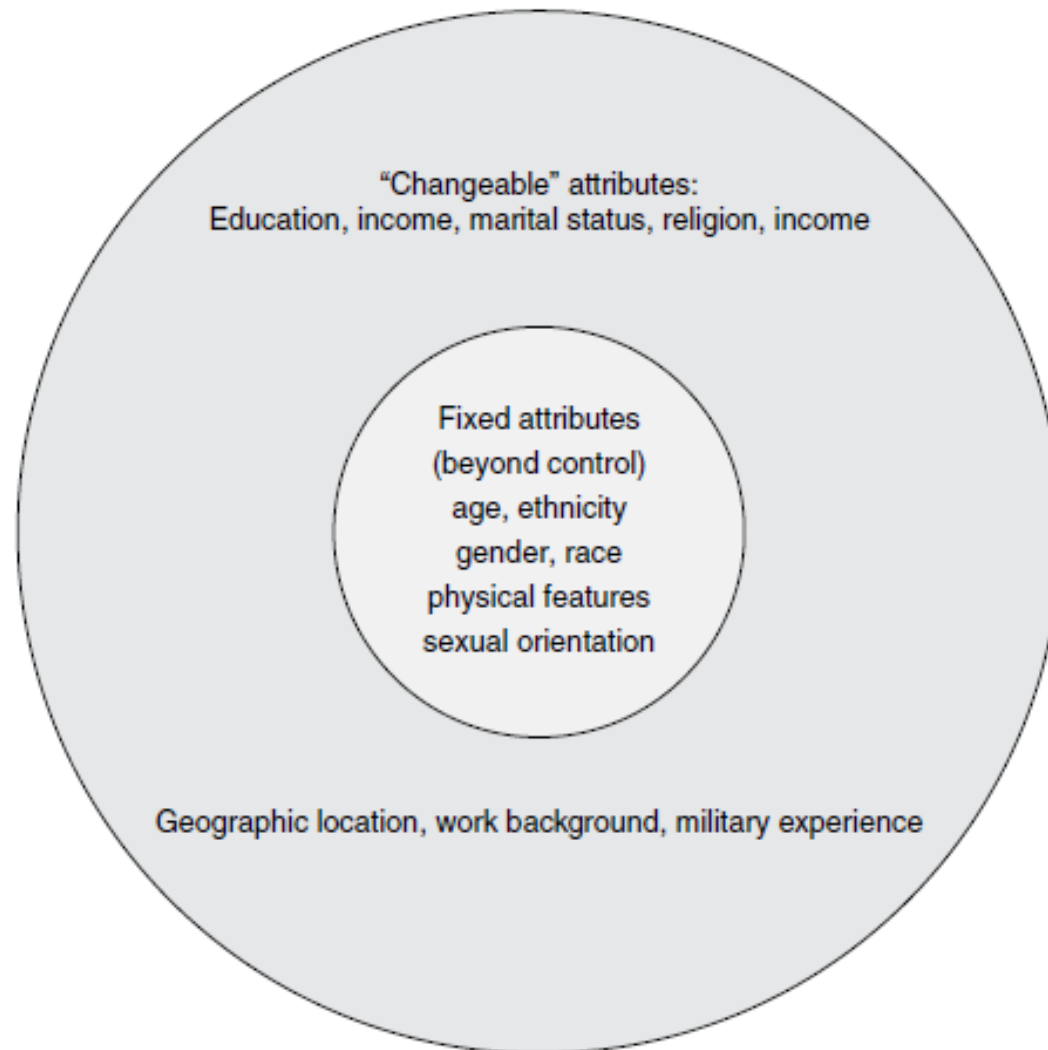
Motivating workers – Herzberg's Theory

1. Motivation factors (enrichment factors)

- ☐ Achievement
- ☐ Recognition
- ☐ Responsibility
- ☐ Freedom
- ☐ Advancement

2. Demotivation factors (hygiene factors)

- ☐ Work conditions
- ☐ Policies
- ☐ Administrative efficiency
- ☐ Style of supervision
- ☐ Relationship between employees



Competition and Collaboration in Organizations

(Integrated Project Delivery)

Integrated project delivery

❑ Integrated project delivery (IPD) is a **project delivery approach** that integrates

1. People
2. Systems
3. Business structures
4. Practices



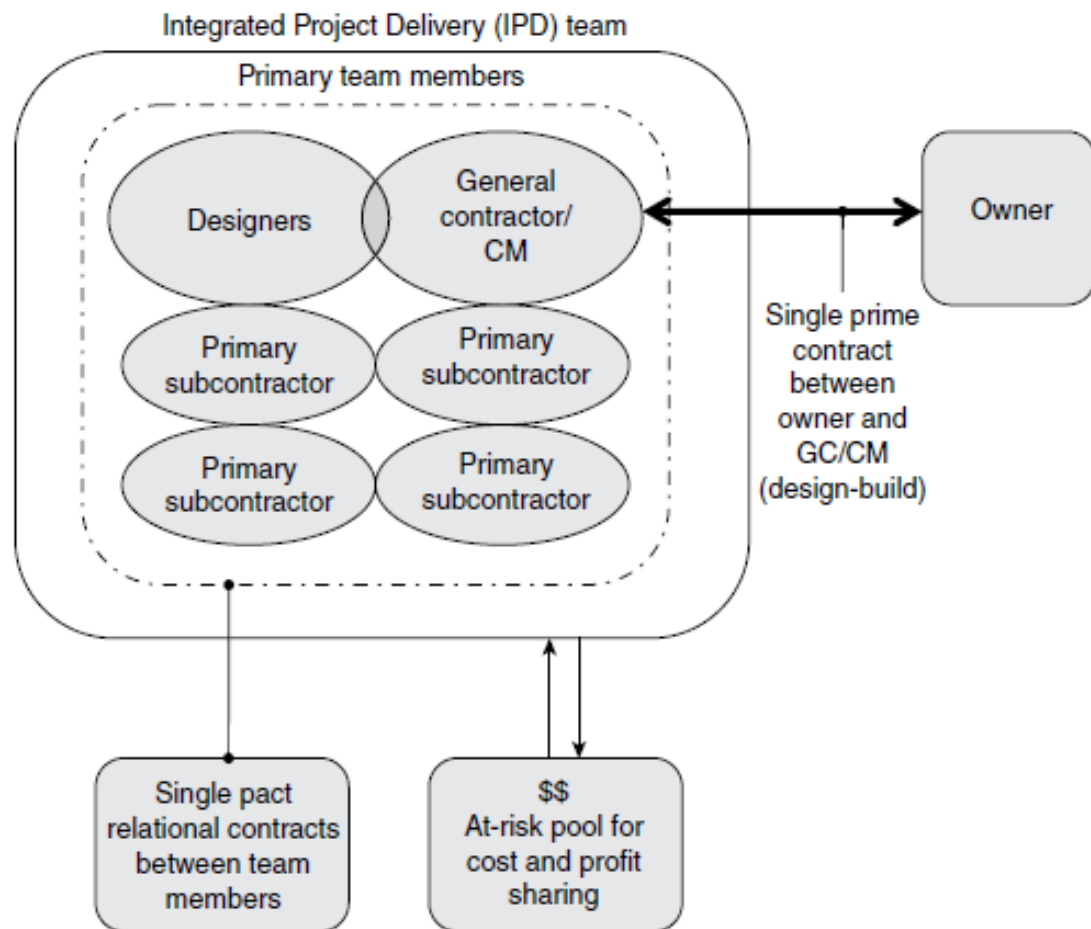
into a process that **collaboratively** harness the talents and insights of **all participants**

to reduce waste and optimize efficiency through all phases of

1. Design
2. Fabrication
3. Construction

-- AIA California Council

Integrated project delivery



Integrated project delivery

What CMAA says?

Integrated project delivery – CMAA

- ❑ There has been a **great deal** of recent industry attention being paid to Integrated Project Delivery (IPD).
 - ❖ However, the **formalization of IPD** as a distinct delivery method is still a relatively new concept and lacks an overall industry consensus.
- ❑ A limited number of projects have **actually employed** the multi-party contractual arrangements
- ❑ Most IPD proponents use to define IPD as a **delivery method** as **opposed** to a collaborative management approach or philosophy.
 - ❖ This definition is, of course, contrary to the traditional convention of defining delivery methods, which has caused many to argue that **IPD is not introducing a new delivery method**, but rather a **new approach**.

Integrated project delivery – CMAA

- ❑ There is a **strong argument** that IPD is most **appropriately viewed** as a set of **best or recommended practices**,

which are **applied to a project** to achieve the **optimum integration** of its design, construction, and operational functions,

while **allocating risks fairly** among the project team.

- ✓ This practice has been **used in the UK and Australia** for many years where they use the **term Alliancing instead**.

*Others argue that it is a **delivery method**, since all parties share the risk collectively and carry the responsibility of completing the project.*

Integrated project delivery

Relation of collaboration and IPD

Collaboration and IPD

❑ Collaboration and IPD are based on principles of:

- ❖ Trust and mutual respect
- ❖ Mutual benefit and reward
- ❖ Collaborative decision-making
- ❖ Open communications

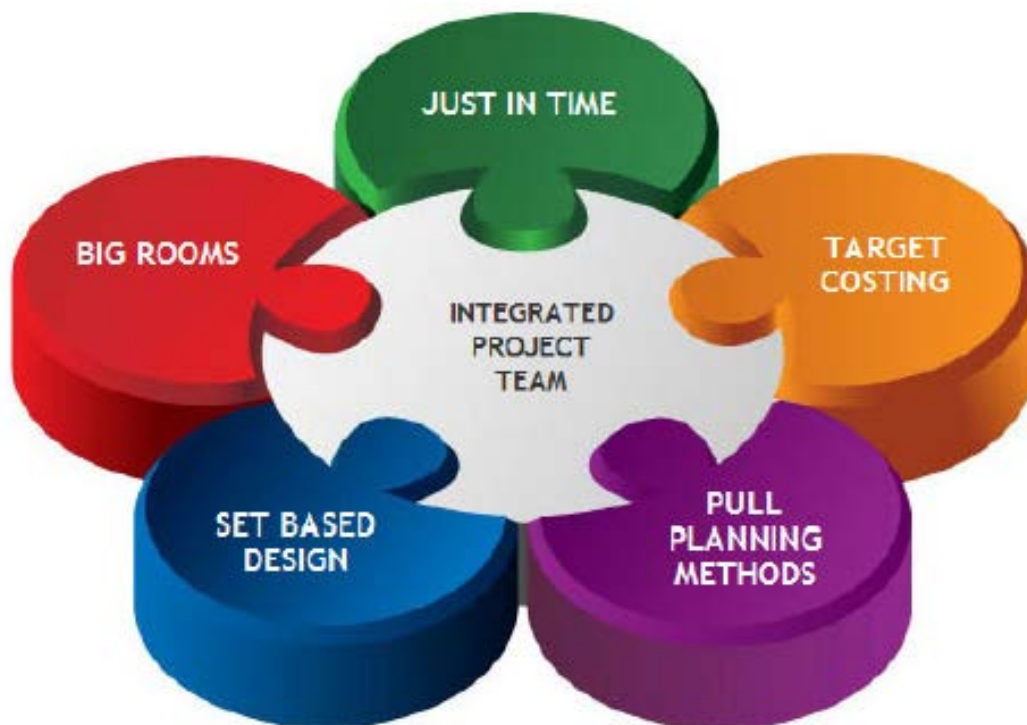
Collaboration and IPD

□ Furthermore, IPD also includes:

- ❖ Early involvement of key project participants
- ❖ Early goal definition
- ❖ Intensified planning
- ❖ Sharing of risks and rewards

Collaboration and IPD

- ❑ All major project stakeholders
- ❑ Implementation of a set of collaborative processes





Integrated project delivery

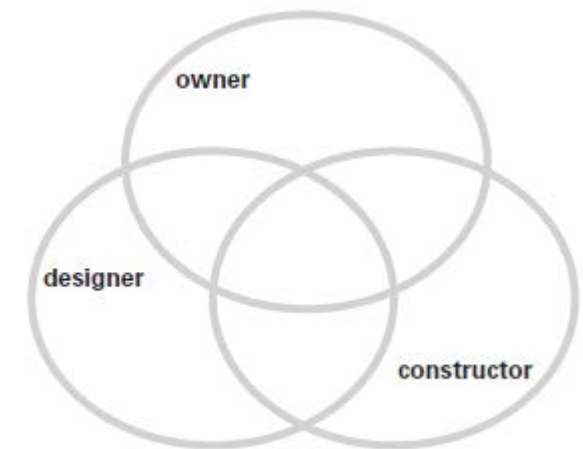
What AIA says?

Integrated project delivery – AIA

❑ **Multi-party agreements (MPA) vary** in form, responding to the specific needs of a project and its participants.

❑ However, these variations share **several key attributes**:

- ❑ The parties are bound together by a single agreement or an umbrella agreement;
- ❑ The agreement creates a temporary, virtual or formal, organization complete with management and decision making processes;
- ❑ Processes are tailored to support the team environment;
- ❑ Decisions are arrived through consensus and seek “best for project” outcomes;
- ❑ Some portion of compensation is tied to project, not individual, success; and
- ❑ Roles are assigned to the person or entity best capable of performing.



Integrated project delivery – AIA

❑ Multi-party agreements (MPA) should be viewed in different parts:

❖ Contractual agreements

❖ Process design

❖ Decision making

❖ Sequencing and phasing

❖ Risks and rewards

✓ Compensation

✓ Dispute resolution

✓ Risk allocation

✓ Closeout

Integrated project delivery – AIA

❑ Common forms of **multi-party agreements** include:

1. Project Alliances

❖ Which create a project structure

where the **owner** guaranteed the construction costs of **non-owner parties**,

but payment of **profit, overhead** and **bonus** depends on project outcome

❖ **Project Alliances** developed to support **oil exploration** in the **North Sea**.

❖ **Parties waived** any **claim** between them, except for **willful default**.

❖ **Extensively used in Australia** for large civil works and vertical construction

❖ **Continued use** in the **UK**, and are beginning to be adopted in the **U.S**.

*An excellent description of the **Australian experience** that contains detailed implementation recommendations, is found in the **Project Alliancing Practitioners' Guide (2006)** published by the **Government of Victoria**.*

Integrated project delivery – AIA

❑ Common forms of **multi-party agreements** include:

2. Single Purpose Entities (SPE)

❖ Which is a temporary,

but formal, **legal structure** created

✓ *SPE can be a corporation, limited liability company, limited liability partnership, or other legal form.*

to realize a specific project; **each party paid for services**

○ *Key participants have an **equity interest** in the SPE based on their individual skill, creativity, experience, services, access to capital or financial contribution.*

but **additional element of compensation** is tied to **overall project success.**

Integrated project delivery – AIA

❑ Common forms of multi-party agreements include:

3. Relational Contracts

- ❖ Which are **similar to project alliances** in that a **virtual organization** is created from **individual entities**,
but it differs in its approach to compensation, risk sharing and decision making.
- ❖ Parties may agree to **limit their liability** to each other,
*but it is **not completely waived**.*
- ❖ If **errors are made**, **conventional insurance** is expected to respond.
- ❖ **Compensation structures** have **project-based incentives**,
*but there **may or may not** be responsibility for **project overruns**.*
- ❖ **Decisions** are developed on a **team basis**,
*but unlike Project Alliance, the **final decisions** made by the **owner** rather than the team.*

Integrated project delivery – AIA

Which one is better?

Integrated project delivery – AIA

- ❑ Because the **balance** of accountability, risk and control in Relational Contracts more closely **follows traditional project structures**,
they **may be better suited** to the **needs and risk profiles** of certain **projects and participants**.
 - ❖ In addition, Relational Contracts may offer a **transitional structure** to a more **completely integrated approach**.
- ❑ Relational contracts are **more common** in other areas of **commercial activity**.

Integrated project delivery

How ARCADIS uses Project Alliances?

Traditional approach: Typical D & C contract



Typical D&C Contract

„The Contractor **shall execute and complete the work** under the Contract in accordance with the requirements of the Contract“

„The Contractor **acknowledges and agrees** that the Contractor **will bear and continue to bear full responsibility** in accordance with the Contract for the execution and completion of the work under the Contract ...“

Main Roads D&C General Conditions of Contract
(based on AS4300-1995)

Alliance approach: Typical alliance agreement

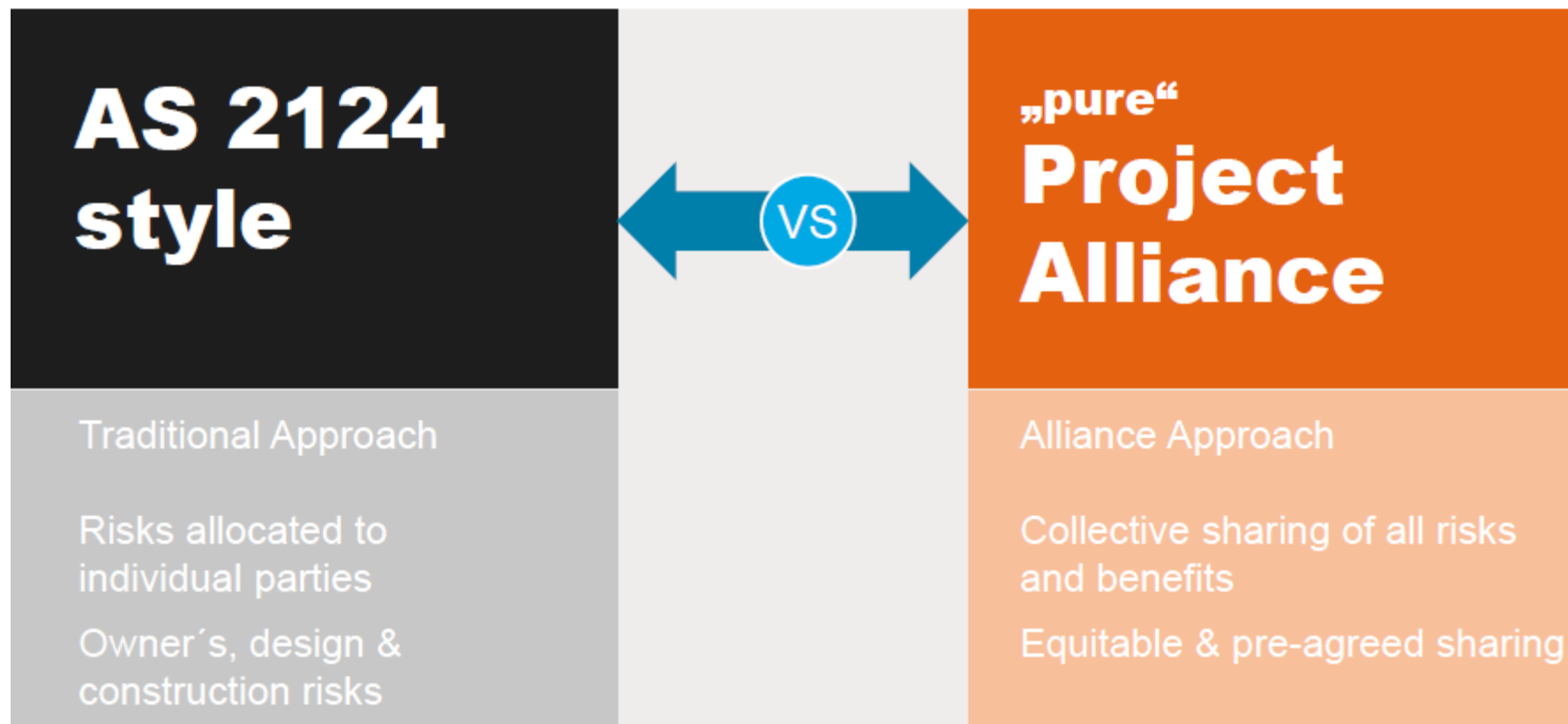
„We will work together in an innovative, cooperative and open manner so as to produce outstanding results in delivering the program and each project included in the program“

„We will share all risks and opportunities associated with the delivery of the program except those which we have specifically agreed will be retained solely by the Owner“

„We will collectively do all things necessary to deliver the Work under the Alliance in accordance with our commitments...“

Typical Alliance Agreement

Traditional approach vs. Alliance approach

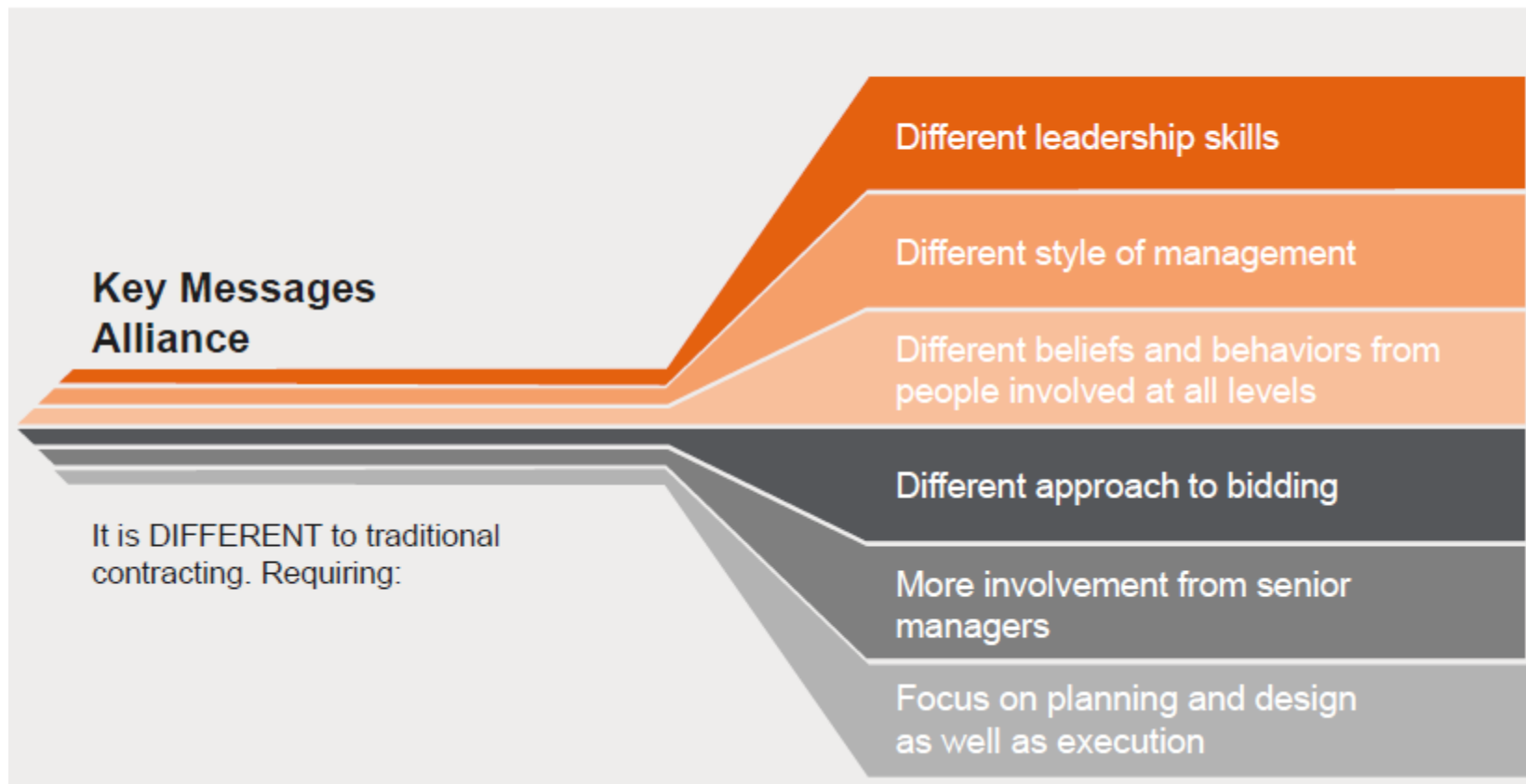


Traditional approach vs. Alliance approach

Alliance vs Traditional

Issue	Traditional	Alliance
Culture	„one to blame“	Collective – „no blame“
Vote	Master / Servant	Equal voting rights
Communication	Same Goals? (hidden agendas?)	Open & honest
Management	Separation Owner/PM/AN	Jointly (PAB) PAB: Project Alliance Board

Traditional approach vs. Alliance approach



Traditional approach vs. Alliance approach



Contracts & value for money

Contracts & Value for Money



3-stage Compensation Model

[Stage 1]

Direct Costs and project-specific Overheads

[Stage 2]

Corporate Overheads and „normal“ Profit

[Stage 3]

„Gainshare / Painshare“

- Clear collaborative and transparent contract set-up where transactions follow „open book“, no litigation and indemnity within alliance

Governance structure & processes

Governance structure & Processes



- 3-level governance / management structure incl. equal voting rights for each participant
- Collective control over project and costs
- Conflict management, transparency and joint agreements
- „best for project“ decisions, collective responsibility
- Collective C&R Management leads to innovations and ideas

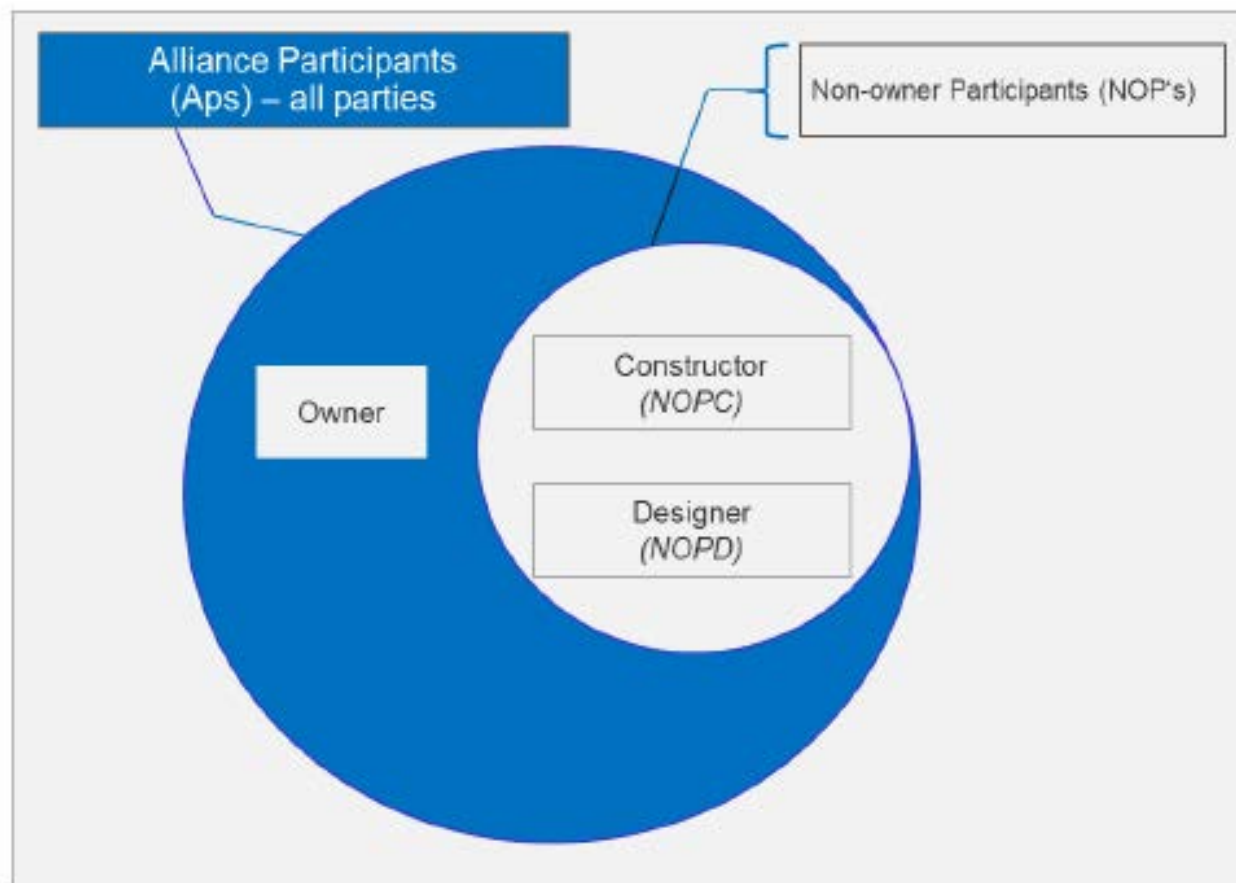
Communication & collaborative culture

Communication & Collaborative Culture



- Collective understanding of goals
- Integrated Teams: All win or all loose
- „No blame, No dispute“-Culture
- Trust, Integrity and Respect
- Open and honest communications
- Cost optimisation through ideas and innovations
- „Outstanding performance“ und „best person for the job“

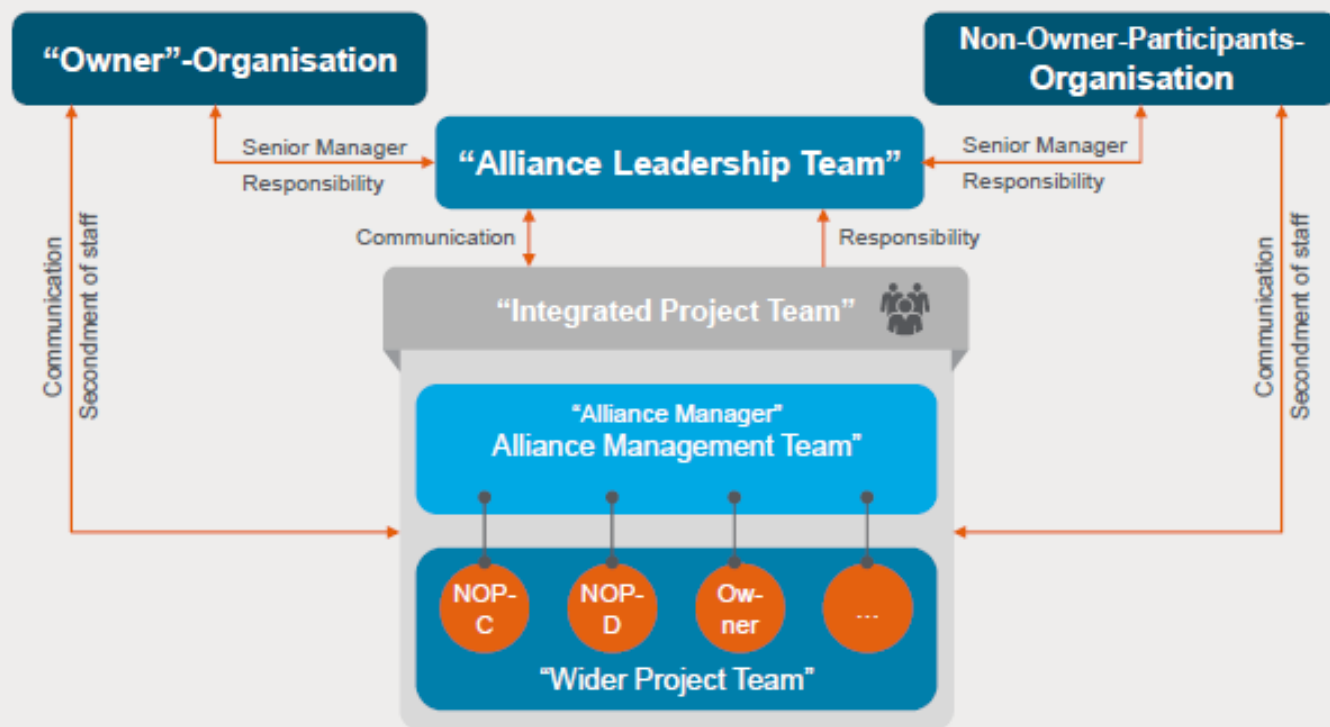
Alliance terminology



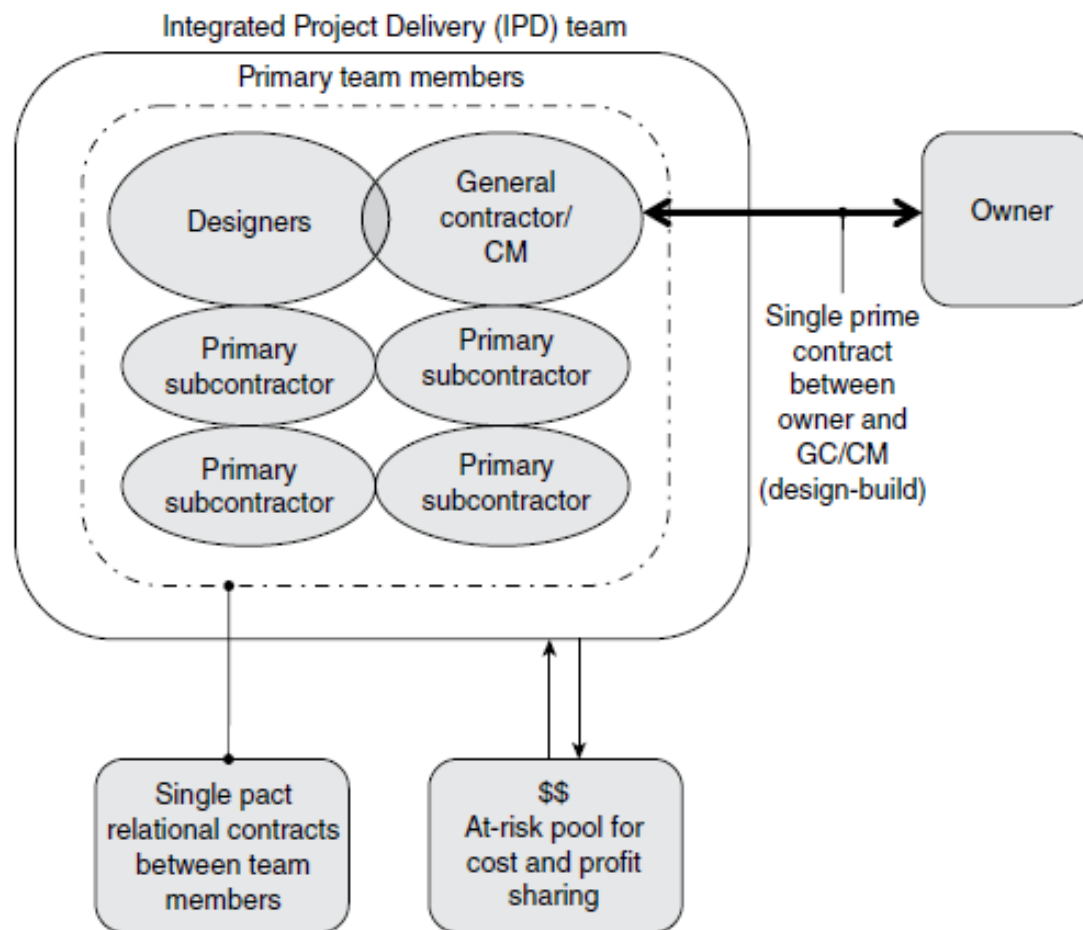
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Organizational structure overview

Organisational Structure Overview



Project structure overview

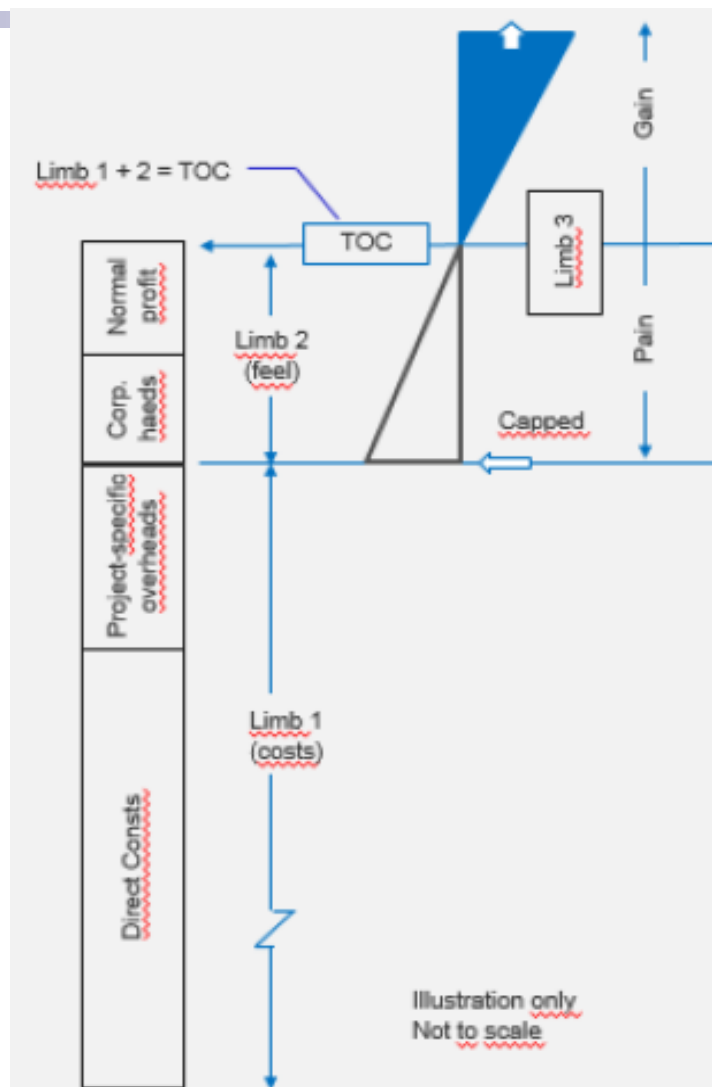


Circumstances suited to alliancing

- Scope cannot be defined
- High likelihood of scope changes
- Numerous complex and/or unpredictable risks
- Very tight timelines
- Need to work closely together to manage challenges and respond effectively when faced with adversity
- Increasing complexity and uncertainty
- Shifting business or political imperatives
- A need to owner interference or significant value-adding by owner
- Threats and/or opportunities that can only be managed collectively

Compensation model

- Parties jointly develop/agree targets
- Owner pays actual cost of doing the work (limb 1)
- A fee to cover overhead and normal profit (limb 2)
- Pain/gain model designed to suit the circumstances (limb 3)
- Focus on what is important to the owner
- Must be equitable but NOPs must have enough at risks so that outcomes are always win:win or lose:lose
- Detailed financial audit regime is critical – up-front and on-going. Must not leave to blind trust



Target cost estimate (TCE)

In all cases the „Target Cost Estimate“ is intended to be the **best estimate** of what the integrated team thinks it will cost (or would normally cost) to deliver the scope of work that is being undertaken by the alliance, within the agreed Target Schedule, using normal standards of performance excepted of that „best-in-class“ team.

Principles of pain/gain

When tested against all possible outcomes the result should be either win:win or lose:lose

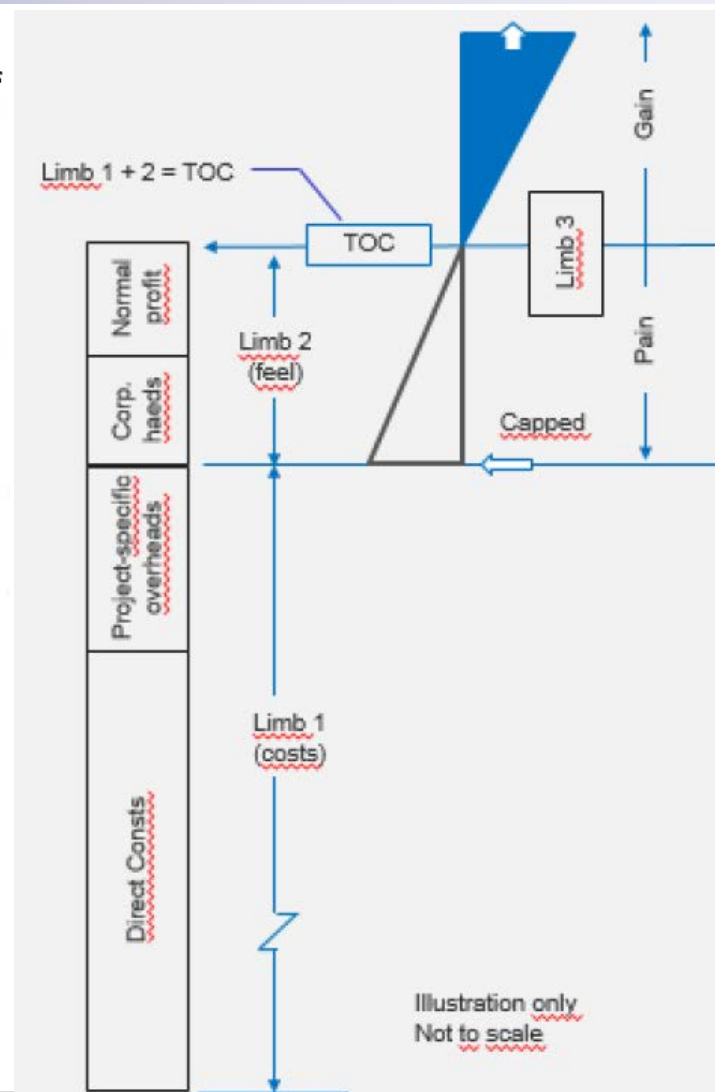
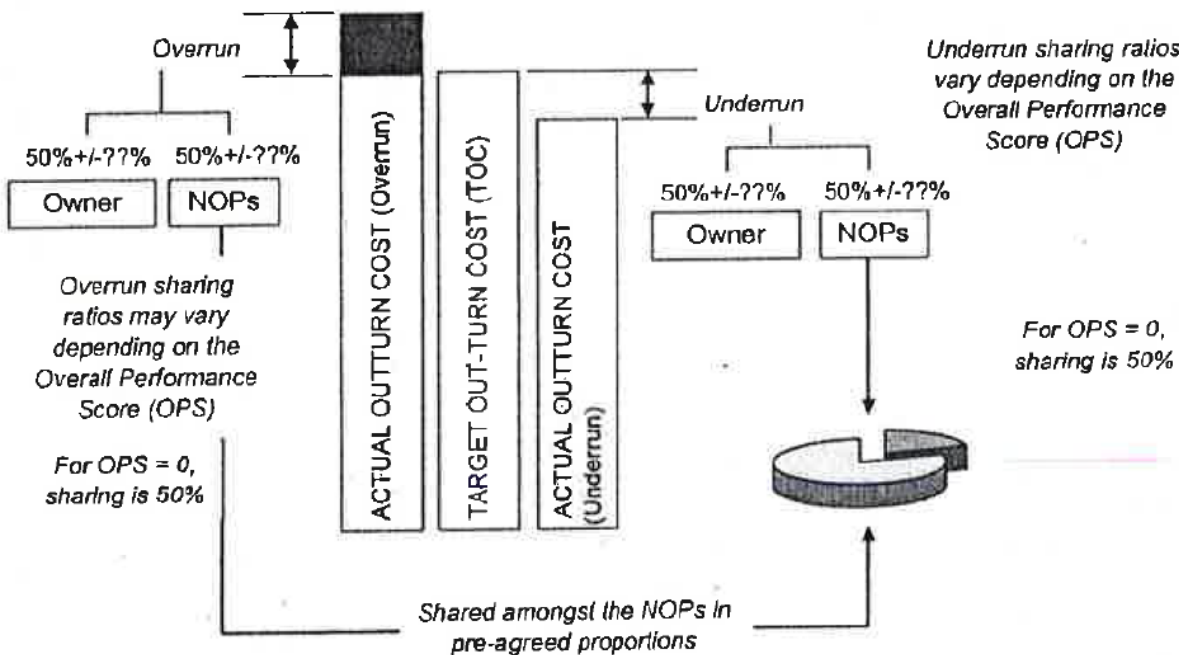
Risk.reward linked to outcomes which add to (or detract from) the **value to the Owner!**

Risk.reward outcomes based on performance spectrum so that: performance better than expected
→ better than BAU **BAU = Business as usual**

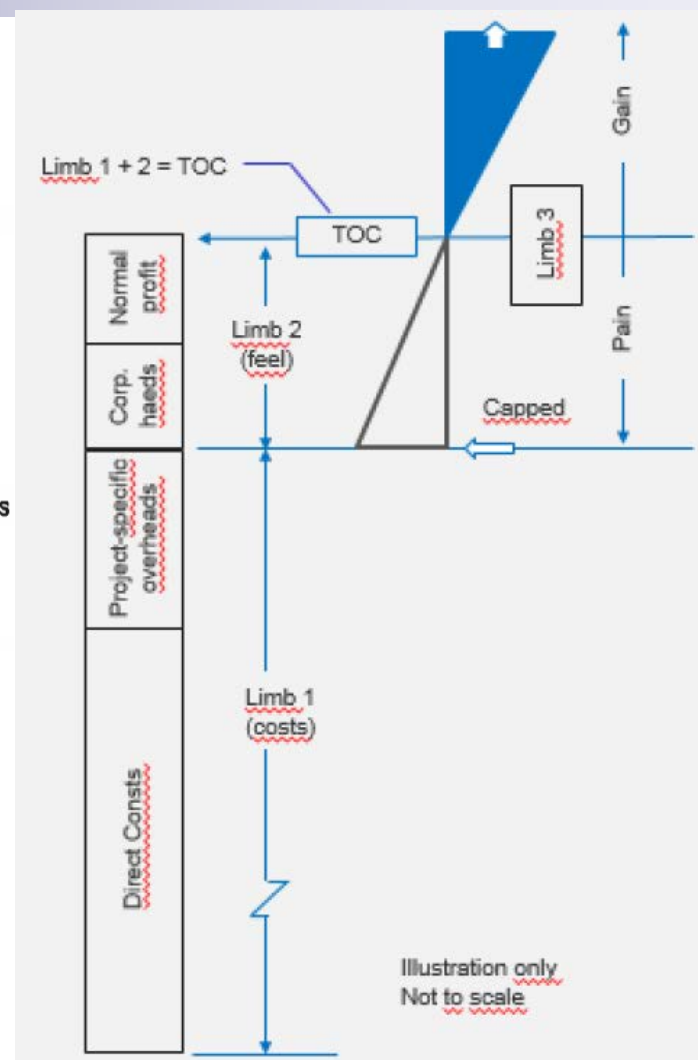
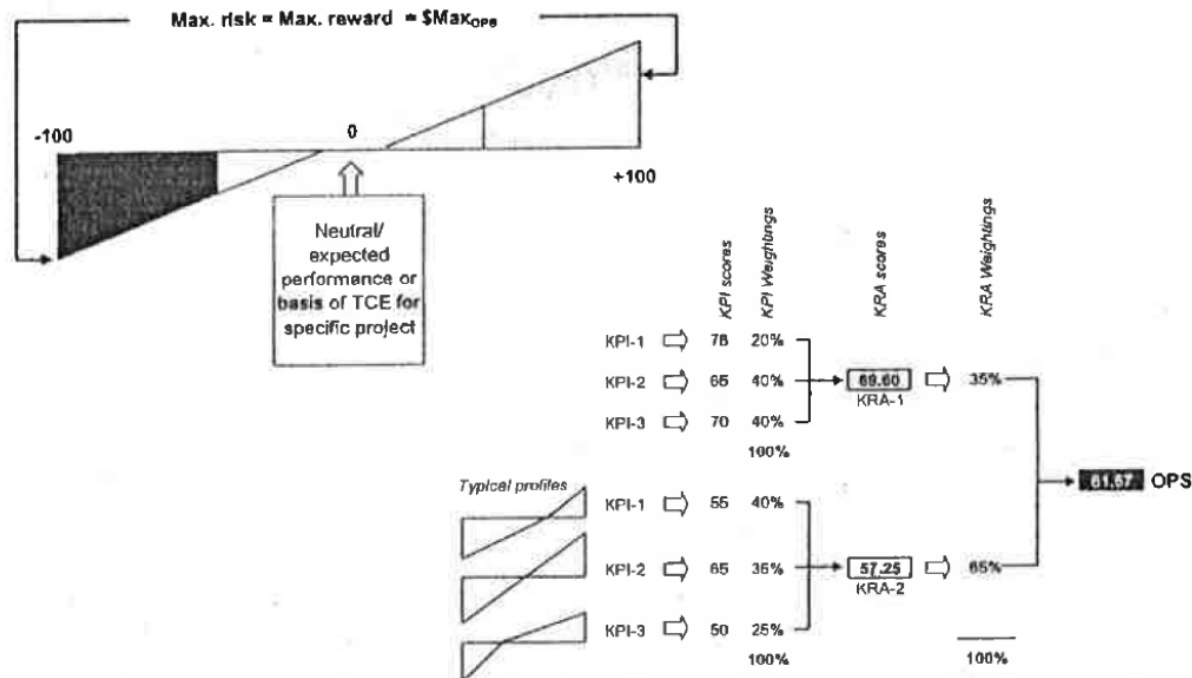
Performance worse than expected → worse than BAU

The mechanisms should be **interlinked** so as to discourage any tendency to sacrifice performance in one area in order to secure rewards in other areas
The risk:reward mechanisms should be as **simple** as possible

Sharing cost outcome pain/gain



Limb 3 – Non-Cost KPI



Integrated project delivery

What is IFOA?

Integrated form of agreement (IFOA)

❑ The IFOA binds all the parties —

client/owner, designers, constructor and trade partners —

into a single agreement which requires them to share risks and rewards.

Alan Mossman

❖ If the project as a whole loses money, everyone loses money.

❖ If it saves money, everyone shares the savings.

❑ This encourages everyone in the team to think of the project first because their financial interests are clearly bound up with the overall success of the project.

Integrated form of agreement (IFOA)

❑ The IFOA (according to Alan Mossman):

- ❖ Sets performance and results **expectations**
- ❖ Creates a **collaborative environment**
- ❖ Creates an **integrated team**
- ❖ **Optimizes** the project
- ❖ Encourages superior **risk management**
- ❖ Uses **owner's business plan** is the basis for design requirements
- ❖ Incorporates **lean project delivery** - including **last planner®**
- ❖ Incorporates language of **reliable promising & commitments**
- ❖ Establishes a **collaborative governance structure** for the project

Integrated form of agreement (IFOA)

- ❑ *The Associated Schools of Construction is the professional association for the development and advancement of construction education, where the sharing of ideas and knowledge inspires, guides and promotes excellence in curricula, teaching, research and service.*

See “Sample IFOA IPD Agreement”



اجرا و مدیریت پروژه به روش اصول ناب (Lean Project Management)

فصل اول: مفاهیم، اصول و ابزارهای روش ناب (Lean)
بخش دهم: سیستم Last Planner

ارائه دهندگان:

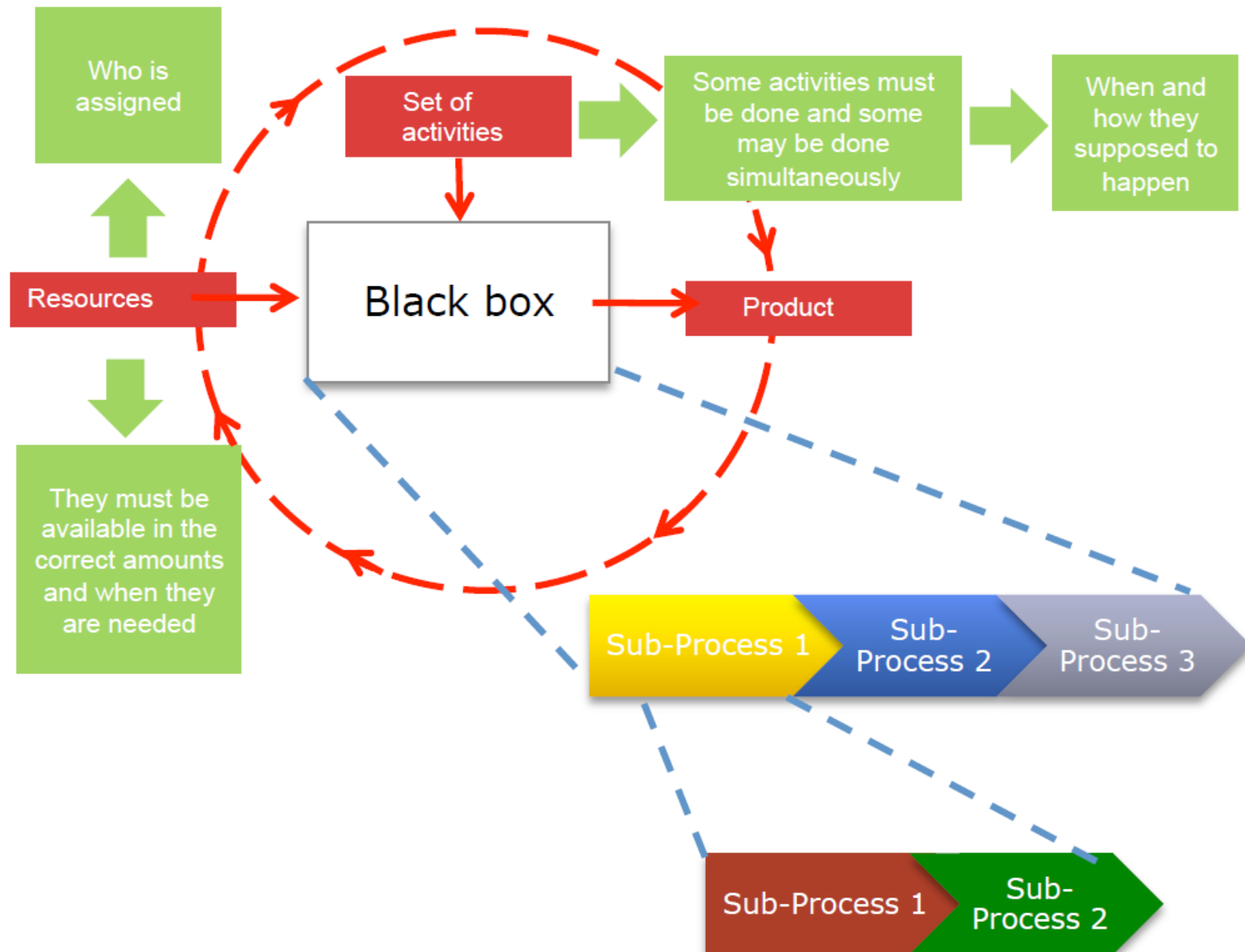
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Reasoning behind planning in construction



Levels of Planning



- **Project Planning:**

- Produces a Masters schedule with a panoramic view on project processes.
- Facilitate cost analysis and resource allocations

- **Look Ahead Planning:**

- Plans details, adjustments, and optimization of the initial schedule and scope of work in the near future (three or four weeks)

- **Commitment Planning:**

- Handles weekly work assignments based on actual resource capacity and completion prerequisites

What is the problem?



- **Construction Work is exposed to uncertainties**
 - Workflow is interrupted. Example: Discrepancies between actual and planned resource/information availability.
- **Construction is a complex process.**
 - ✓ It is not possible to account all factors in planning.
 - ✓ Scheduling is not concerned with details of resource delivery and information acquisition
 - ✓ Workflow tends to be fragile and tends to deviate from the originally planned sequence

Last Planner System



- **Last Planner System (LPS) was created by Glenn Ballard and Greg Howell from the Lean Construction Institute (LCI)**
- It involves a progression of gradually more detailed planning and scheduling, supported by three critical “human” activities:
 1. Building relationships
 2. Creating conversations
 3. Securing commitments to actions at the right level and at the right time throughout the process

Who are the Last Planners®?



- The Last Planners are those who are closest to the work at the lowest level of responsibility who can commit resources or have the authority to make decisions during planning meetings.

Why use the Last Planner® System?



1. Those closest to the work know the work best and plan the work - the “Last Planners”
2. Leverage the collective experience of the team to plan
3. It delivers bad news...

Some benefits of the Last Planner® System



1. Better project outcomes
2. “Articulates and activates” a routine of conversations that lead to commitments
3. Produces reliable work plans and reduces variability which leads to greater trust and facilitates efficient execution of work

Development of the Last Planner® System



- Early 1990s and continues to be developed today
- Ballard & Howell surveyed 7 construction companies 450 foremen's weekly work plans
- What % of the time did foremen deliver on their promises?

Ranged between 33% and 70%

Average 54%

What Happens when Commitments are Missed?



- “Promising”, particularly the ability to make and elicit reliable promises, is the primary skill needed for working in the LPS and is key to coordination... (Hal Macomber and Greg Howell, 2003)



What role does the Last Planner® System play within a Lean Project Delivery System?



1. Social system and backbone of Lean Project Delivery.
2. Stabilizes workflow variation towards continuous flow for Last Planners.
3. Dictates the pace of production by making work ready so what **SHOULD** be done **CAN** be done. Once it **CAN** be done promises are elicited for work that **WILL** be done. Promises are tracked daily (**DOING & DID**) to ensure the team **LEARN** from any plan failures and prevent reoccurrence.

What is the Last Planner® System?



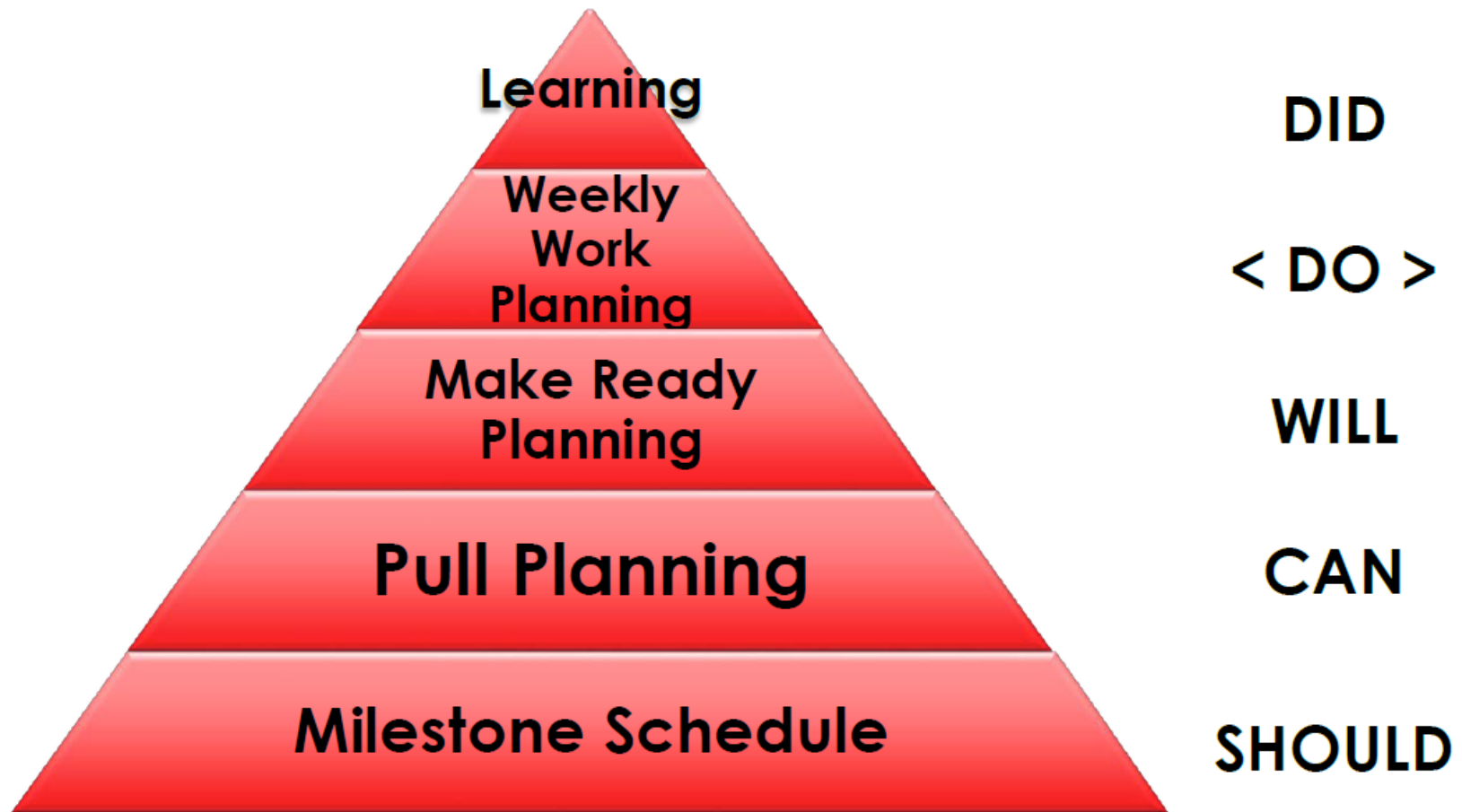
- A social system used for production planning & control to improve workflow, plan reliability, coordination and the predictability of work on projects. The basic premise is **those who do the work, plan the work, and make commitments to complete work** (reliable promises) to other members of the team.

Should-Can-Will-Did-Learn



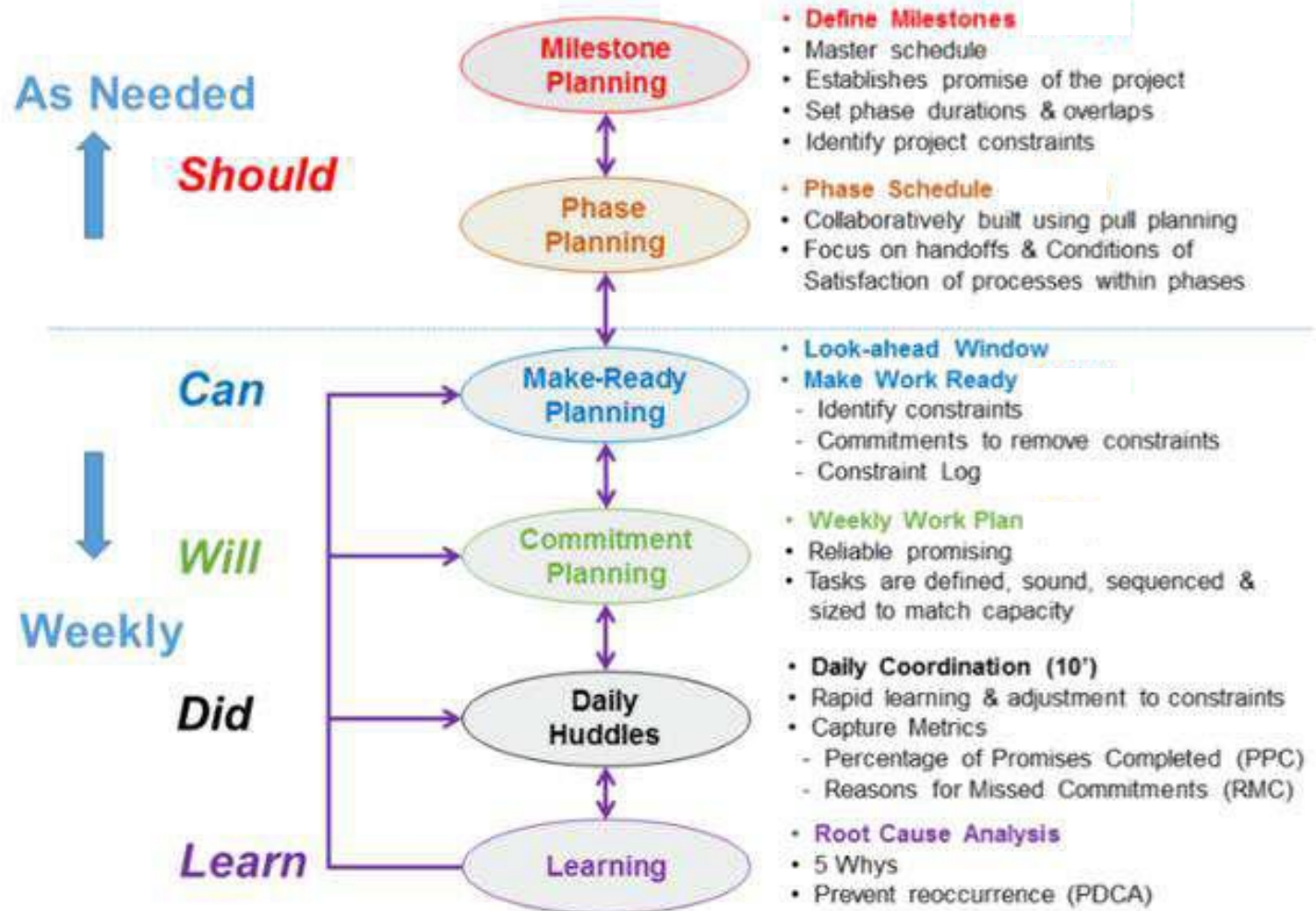
Figure 1: SHOULD-CAN-WILL-DID

Should-Can-Will-Did-Learn



LPS Pyramid Graphic Courtesy of On Point Lean

What is Last Planner System



Creating and maintaining reliable workflow

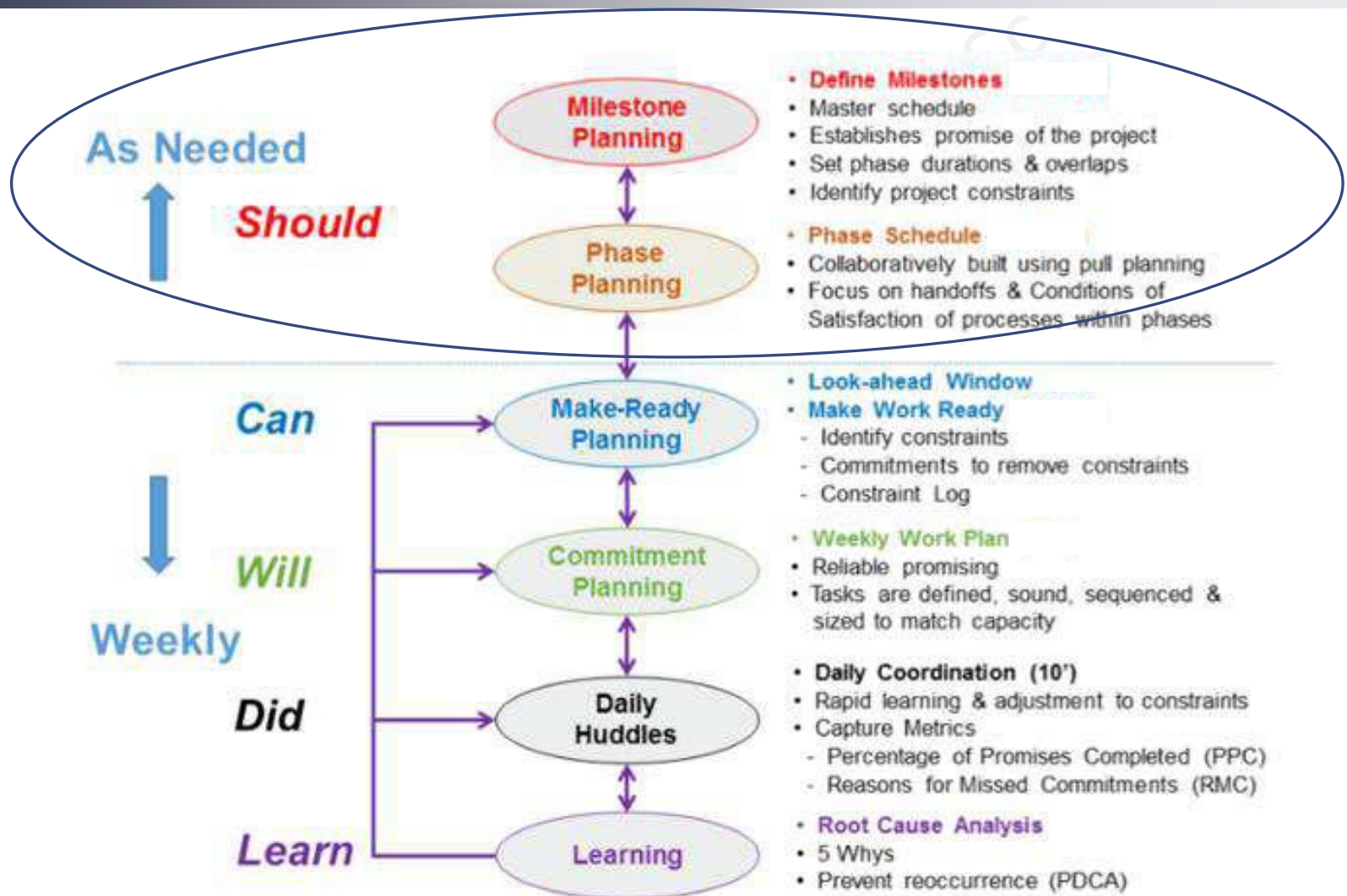
After Glenn Ballard, Greg Howell & Hal Macomber

Last Planner has 8 Elements



1. Master planning
2. Phase planning
3. Make Ready Process
4. Last Planner Weekly Meets
5. Weekly work plans
6. Daily production meetings
7. Dashboards – weekly metrics to a common format
8. Improvement projects driven by reasons for non-completion of plan

Should: Milestone & Phase Planning



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Should: Milestone Planning



Should: Developing the Master Schedule



- **The general contractor** works with the owner to develop basic agreed-upon project milestones
- The GC then takes this information and more fully develops the milestone or CPM schedule
- The GC coordinates with subcontractors on the basic logic of the milestone schedule as well as durations of the major activities



Should: Phase Schedule



- In a Lean environment, this stage is performed collaboratively
- The range of outcomes of a collaboratively developed Phase Schedule include:
 - A work plan of the activities that SHOULD be done
 - An organization chart of WHO performs each activity
 - An agreement between trades or designers about WHEN to start and WHEN to finish each activity
 - A logistics plan that defines WHEN we need specific resources (materials, labor, drawings, etc.)
 - A control tool for workflow control and activity sequence
 - A basis and tool for monitoring progress

Should: Steps for Phase/Pull Scheduling



1. **Define the work** to be included in the phase; e.g., foundations, building skin, etc.
2. Determine the **completion date** for the phase, plus any major interim releases from prior phases or to subsequent phases.
3. Using **team scheduling** and Post-It Notes (i.e., sticky notes) on a wall, develop the network of activities required to complete the phase, working backwards from the completion date, and incorporating any interim milestones.
4. **Apply durations** to each activity, with no contingency or float in the duration estimates
5. **Reexamine logic** to try to shorten the duration.

Should: Steps for Phase/Pull Scheduling



6. Determine the **earliest practical** start date for the phase.
7. If there is **time left over** after comparing the time between start and completion with the duration of the activities on the wall, decide what activities to buffer or pad with additional time.
 - Which activity durations are most fragile?
 - Rank order the fragile activities by degree of uncertainty.
 - Allocate available time to the fragile activities in rank order.
8. Is the team comfortable that the available buffers are sufficient to assure completion within the milestone(s)?
 - If not, either re-plan or shift milestones as needed and possible.

- to accelerate
time completion



Should: Phase Planning

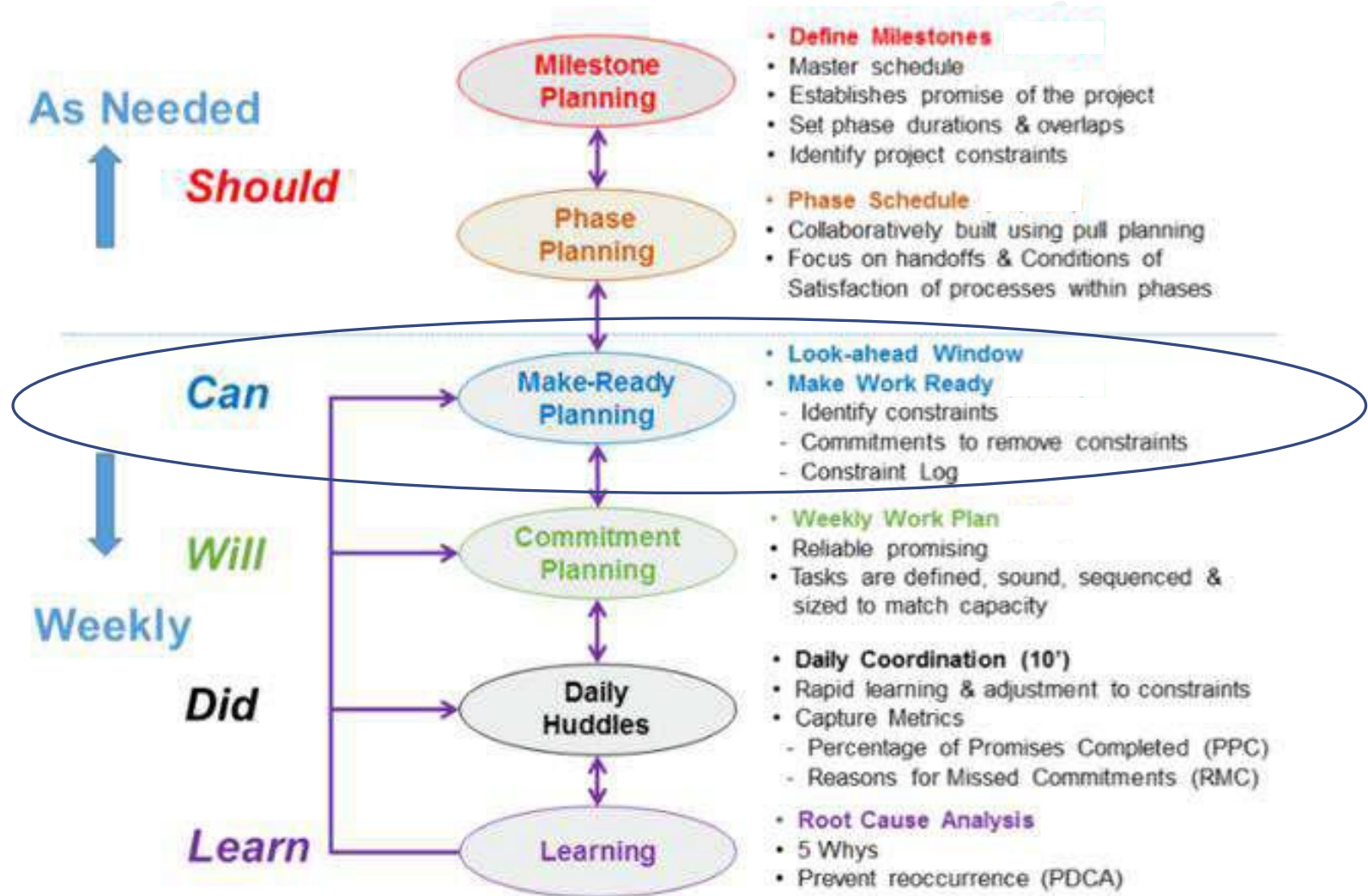


Why use Pull Planning?



- Can you say the alphabet?
- Can you say it backwards?
 - Why is it so difficult?
- Flush out predecessors and constraints that release work
- Gain a better understanding of each actors work and the project as a whole
- Helps deliver bad news at the wall and not in the field

CAN: Make Ready Planning (1,000')



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Can: Make Ready Planning



1. Look ahead plan
2. Make work ready (Ready To Build)
3. Identify constraints
4. Commit to removing constraints
5. Constraints log

- Aim:

To be able to start an activity, when it is planned to start. At either master plan level or weekly last planner level.

Do we really have everything we need to start the work?



Client / Project		Prepared by	
Phase		Date	
Area			

[illegible]

Can: Constraints Summary

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
		Ready to Build Summary															
Client/Project Digital Hub		Prepared by		A N Other													
Phase		Date		5/8/2013													
Area																	
Task Details				Information				Prerequisites		Inputs							
Ref	Task Description	Task Start Date (Week Number)	Trade	Tech Sub signed off	design checked	no outstanding RFIs	method statement/ risk assessment	preceding tasks complete	access	Labour	Labour clearance	Plant / Tools	Materials ordered	Materials on site	Proceed	Ready to Build score	Comments
35	Electrical distribution	4		y	y	y	y	y	y	y	y	y	y	y	y	11	
49	Install new drainage	3		y	y	y	y	y	y	y	y	y	y	y	y	11	
43	Excavate new route	2		y	n	y	y	n	y	y	y	y	y	y	y	9	
P25	Erect Boundary Fence	1		y	n	n	n	y	y	y	y	y	y	y	y	8	
sfacc1	Erect scaffolding	1		y	n	n	y	y	y	y	y	y	y	y	y	9	
sfacc1	Erect scaffolding	1		n	n	n	n	n	n	n	n	n	n	n	n	0	

Information				Prerequisite
Tech Sub signed off	design checked	no outstanding RFIs	method statement/ risk assessment	preceding tasks complete
y	y	y	y	y
y	y	y	y	y
y	n			
y	n			
y	n			
n	n			



Niall Stone

+alanwoods@designergrp.com

☒ Assign to Alan Woods

The assigned person will be notified and responsible for marking as completed.

By: Alavipour, PhD, PM
By: K.Kordani PMP, M

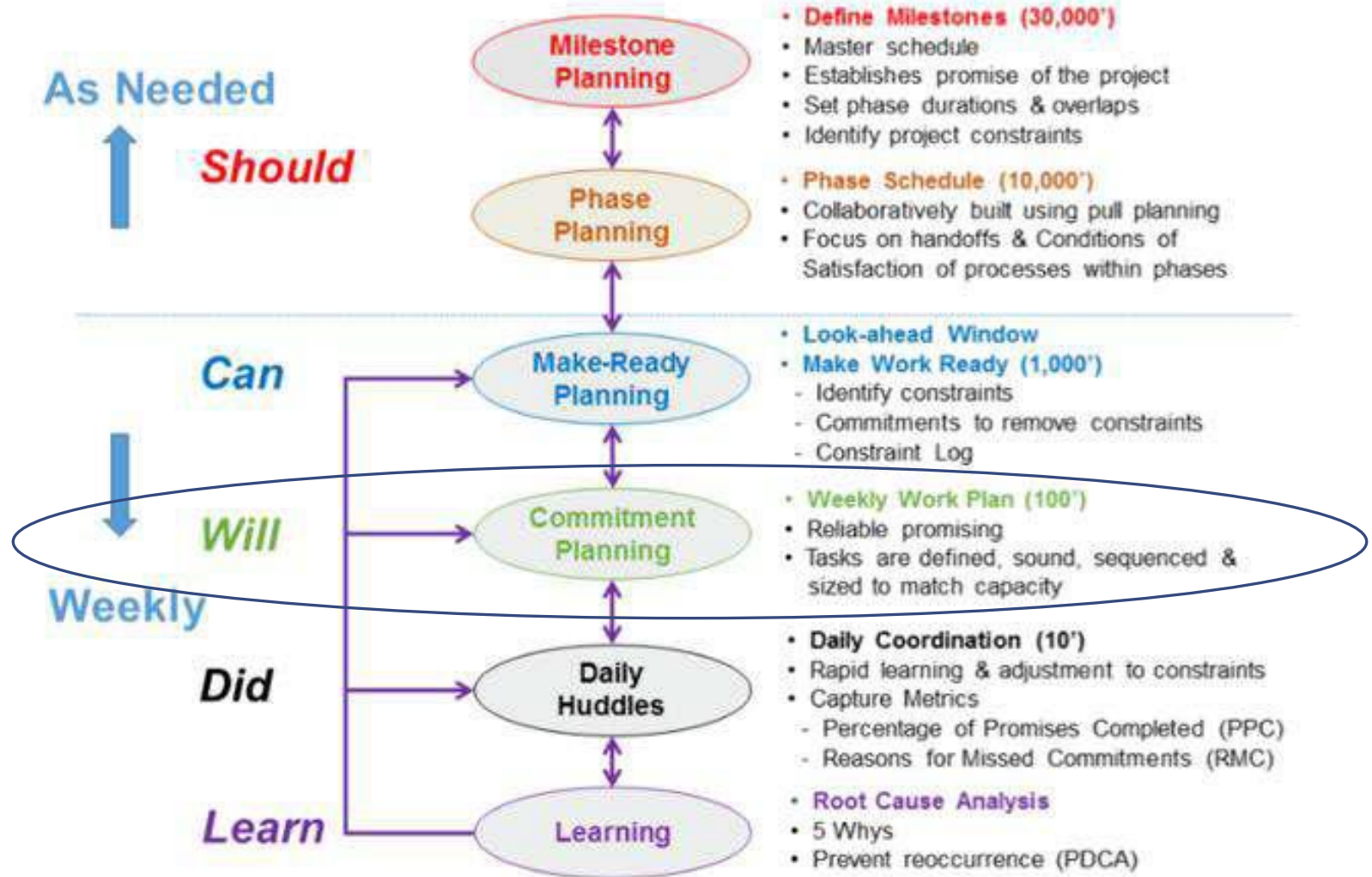
ذکر مطالب فوق تنها در صورت ذکر منبع

Benefits of Make Ready Planning



- Avoid delays and disruptions
- Supports teamwork
- Maximize productivity
- Ensures that we have everything in place to start the work on time
- Issues can be highlighted and addressed before work commences rather than as a task commences..
- Supports the Weekly Planning Process
- Help to increase the Planned Activity Rate

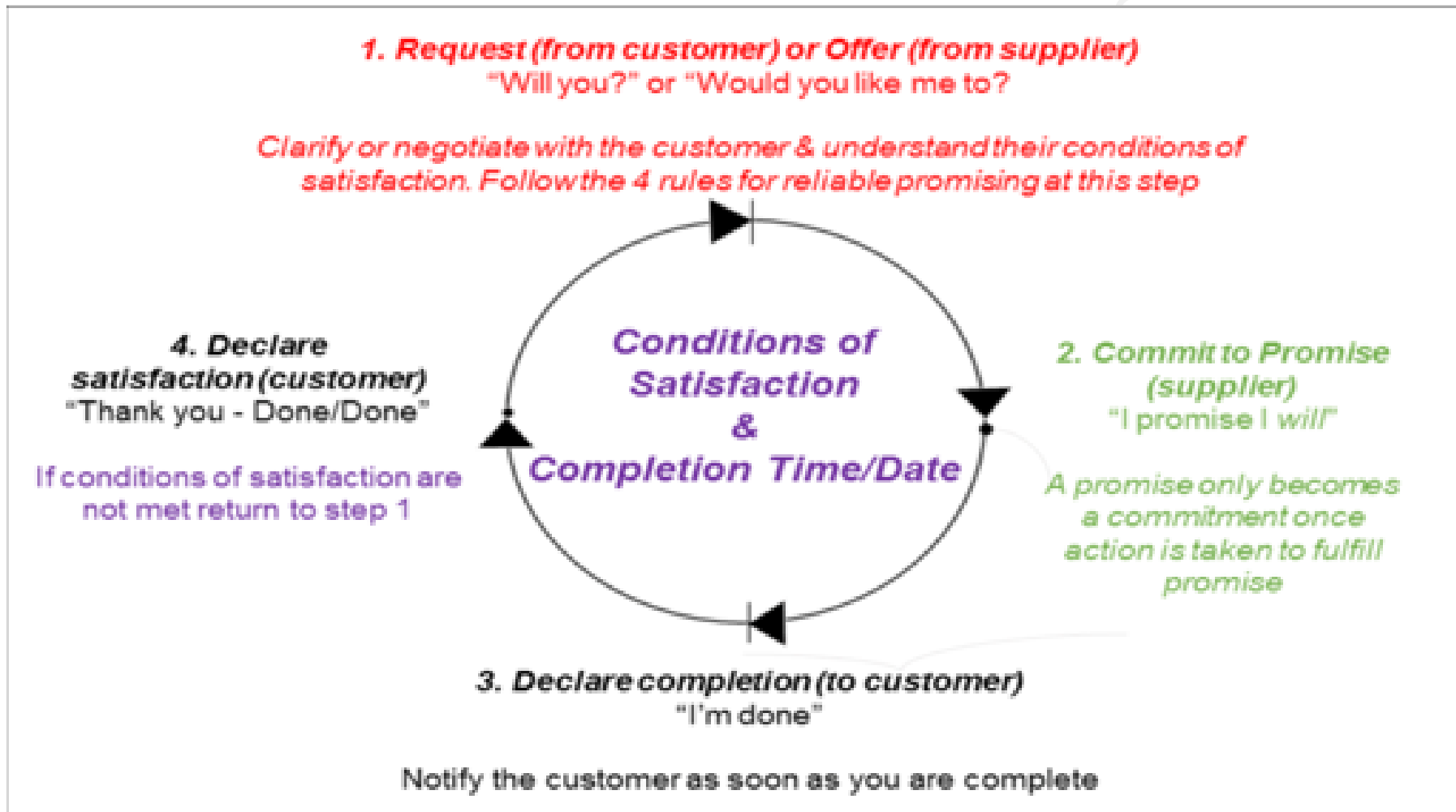
WILL: Commitment Planning (100')



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WILL: Reliable Promising

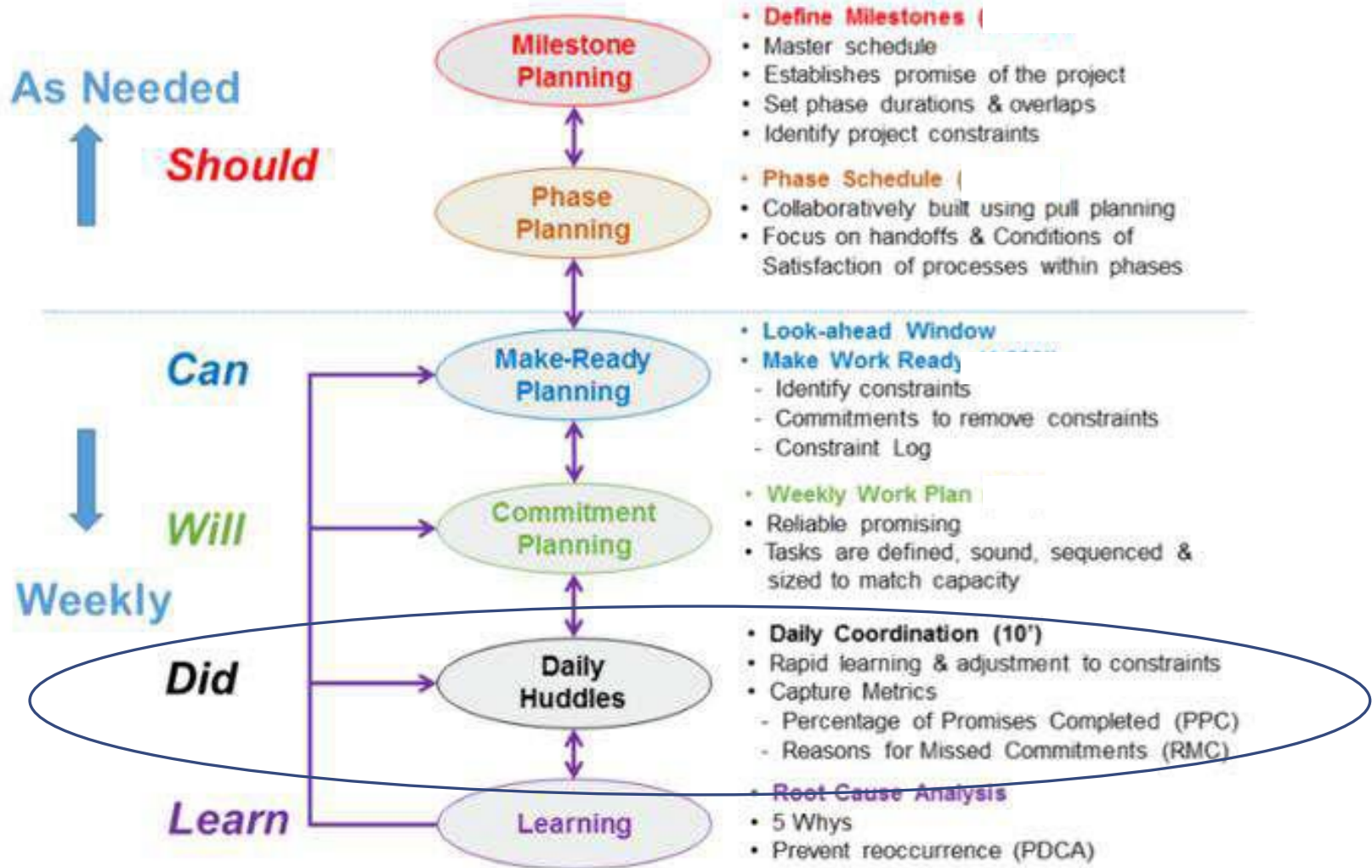


The Conversations for Action Cycle (after Flores, 2013 and Macomber and Howell, 2003)

WILL: Weekly Work Coordination

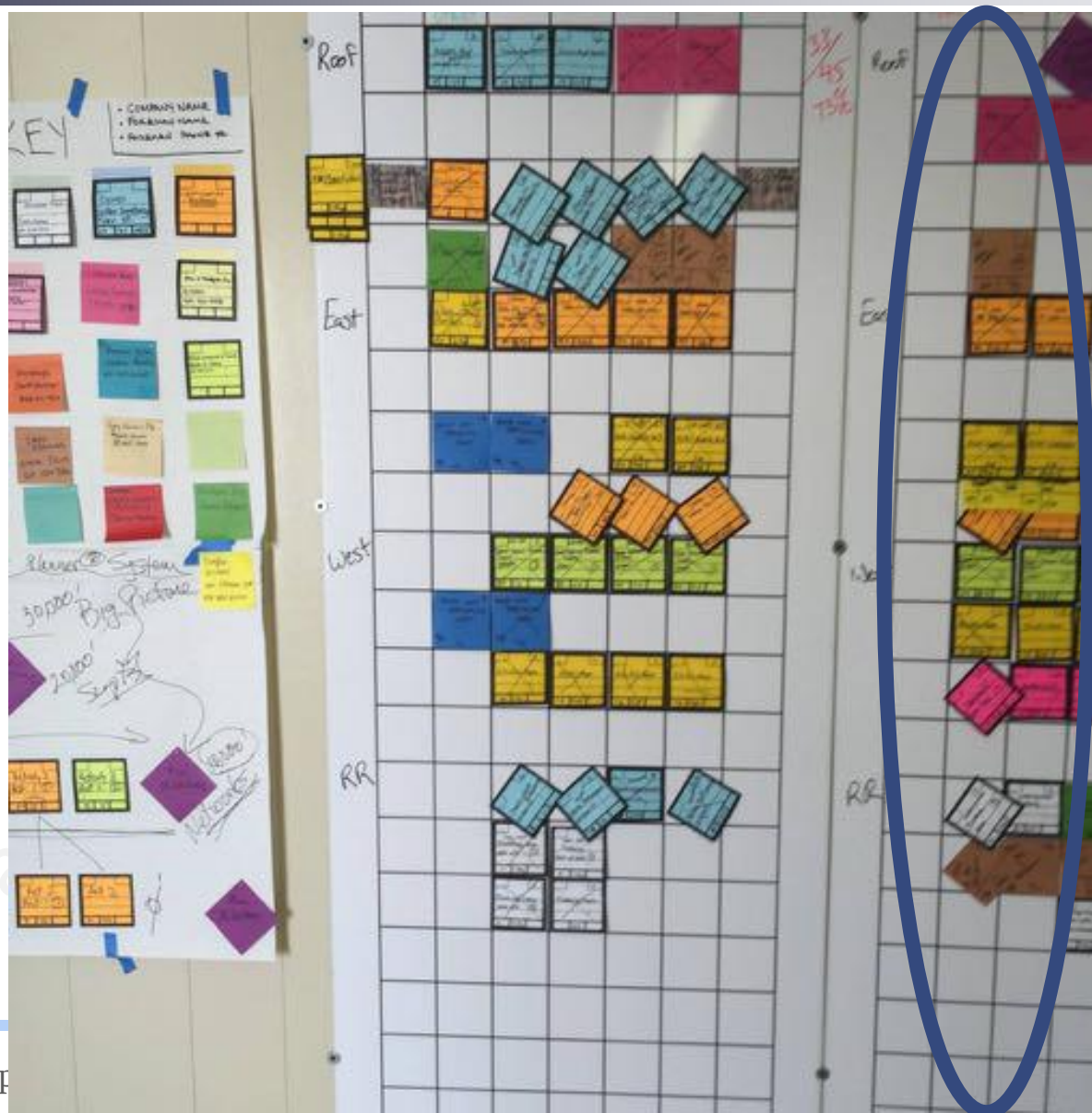


DID: Daily Huddle

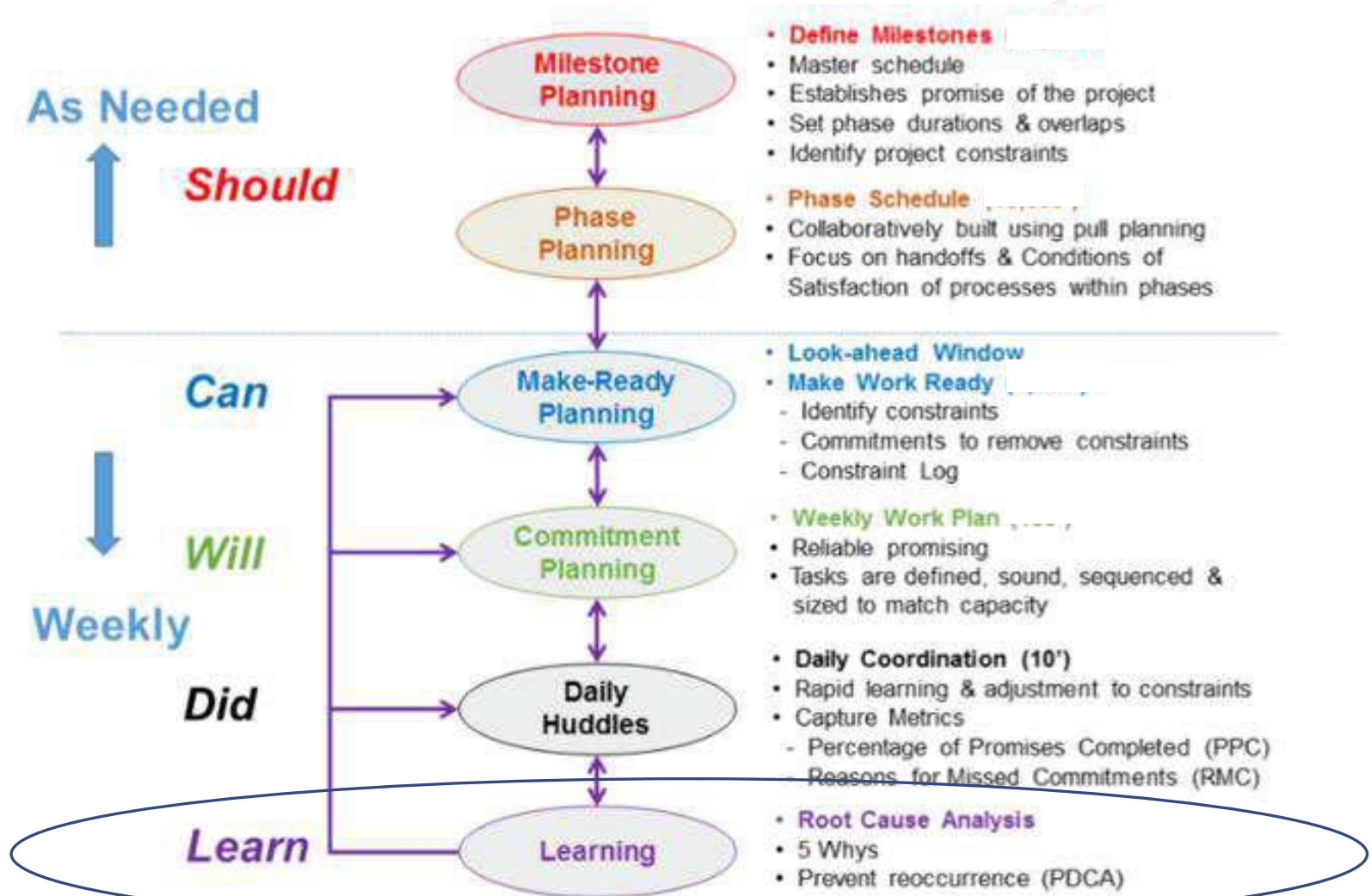


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DID: Daily Huddle



LEARN: Improve the System



Creating and maintaining reliable workflow

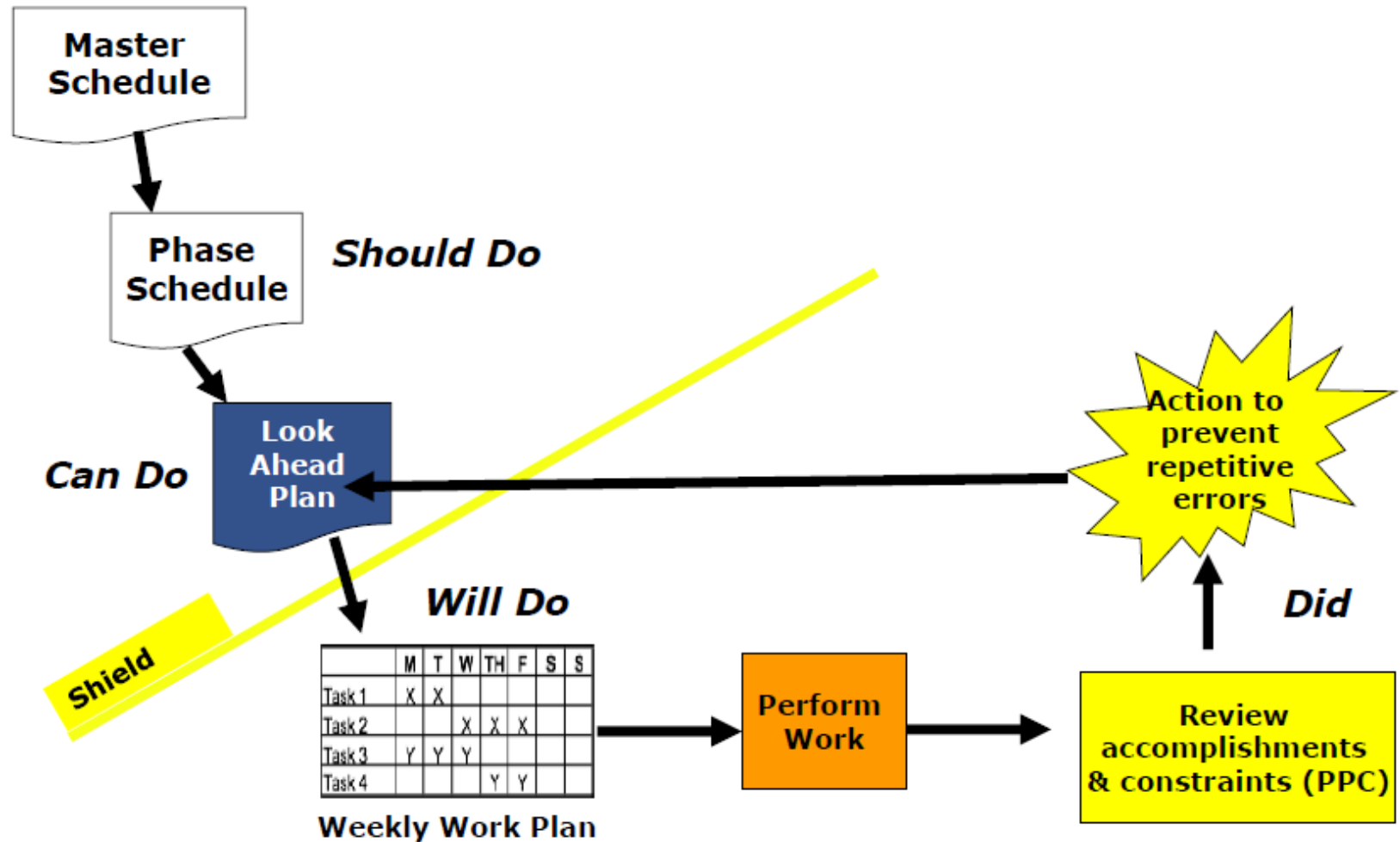
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LEARN: Who is Blamed when Projects Slip?

- The person?
- The system?
- Both?



Last Planner System



موسسه مهندسی و مدیریت ساخت علوی پور

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