THE SCIENCE OF IMPROVING INNOVATION

Visual Management and Innovation

Case study: key success factors, barriers to excellence

Dan Caputo

New Product Development and Technology Innovation

October 4, 2023

DAN - BACKGROUND

UC SANTA BARBARA mechanical engineering
BSME

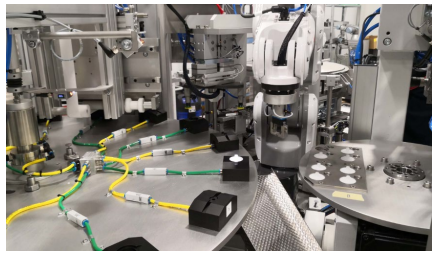
SJSU SAN JOSÉ STATE UNIVERSITY
Masters, Engr Mgmt

UC San Diego | Extension
Executive Program
for Scientists and Engineers

BUSINESS Executive Education
Innovation Leadership Program

IBM

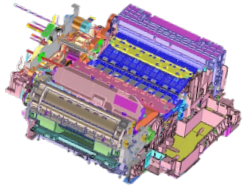
San Jose, California



Manufacturing Engineering and Automation

hp

San Diego, California



Technology Strategy Executive
R&D Project Management
Program Management
Mfg Engineering
Procurement Engineering

Over 35 years developing and bringing new products to market
Strategist, Systems Thinker, Program Excellence and Innovation Champion

Today’s journey

- Intro and context 5 min
- Visual Management system for Programs 5 min
- Key success factors and obstacles 20 min
- Summary 10 min

LPD history at HP Inkjet – two significant engagements

2004-2005

Allen Ward/Durward Sobek

Technical innovation engine

KBD in R&D

knowledge creation, visible knowledge, trade-off curves, asset development…

2018-2022

Argo Consulting

Innovation engine challenges
Operational Excellence

7+1 Principles

applied to whole (Inkjet) organization

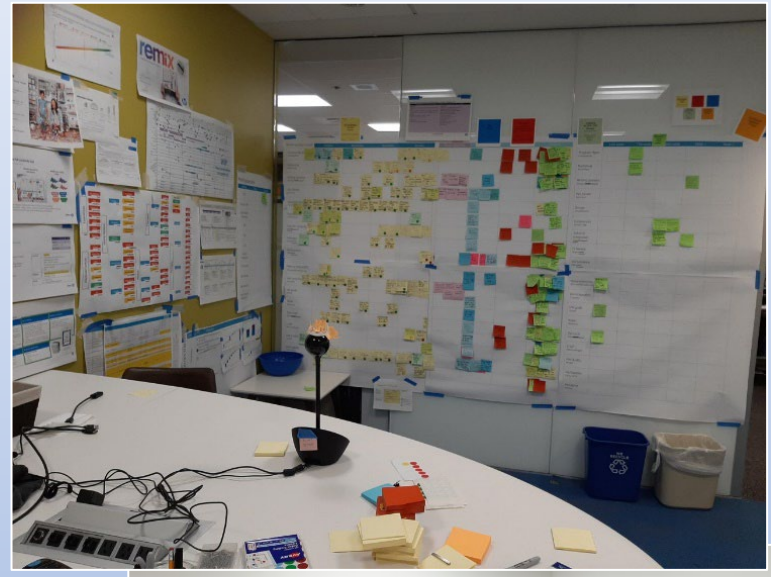
VM System for Programs

VM directly connects to *Operational Excellence*

VM: SEE together, **KNOW** together, **ACT** together

- Visualize the work, see the issues
- Collaborate for faster issue resolution
- Help-chains to remove barriers, unblock teams

Obeya = large room



VM plays a crucial role for *Innovation* too

VM: SEE together, **KNOW** together, **ACT** together

- Visualize the work, see the issues

  See the intent!

- Collaborate for faster issue resolution

  Better understanding, coordinate the right actions

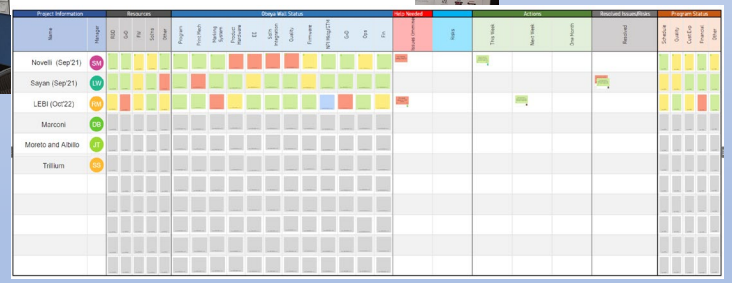
- Help-chains to remove barriers, unblock teams

  Gain support

Customer and market information

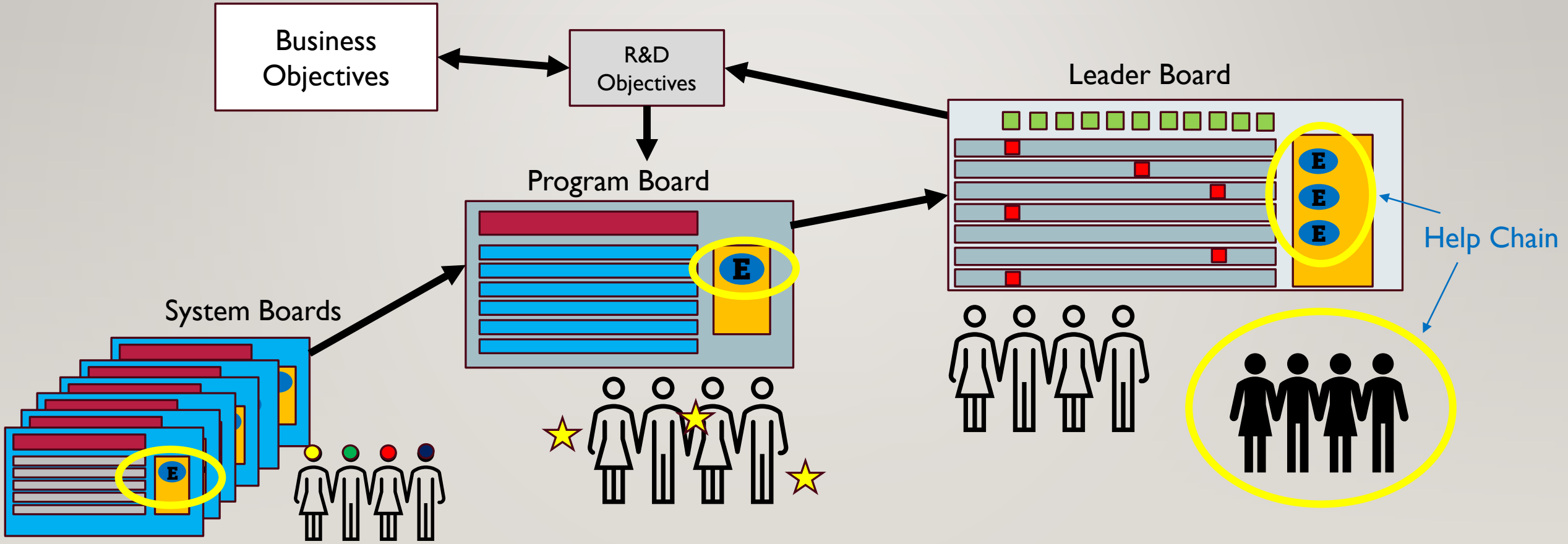
Innovation investigation actions

Innovation efforts Leaderboard

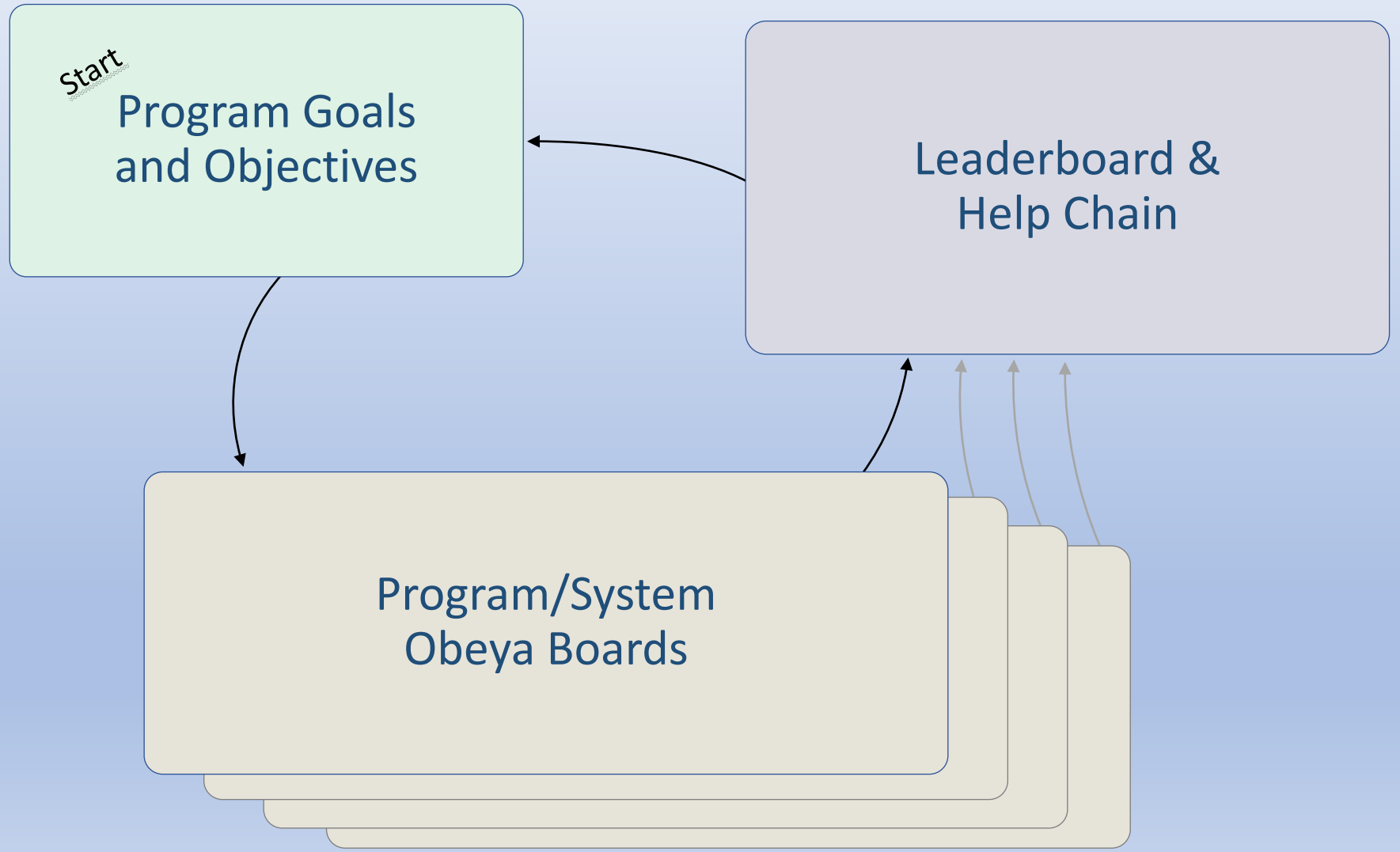


VM impact on Innovation: it changes your lens, changes your discipline, and super-charges other principles

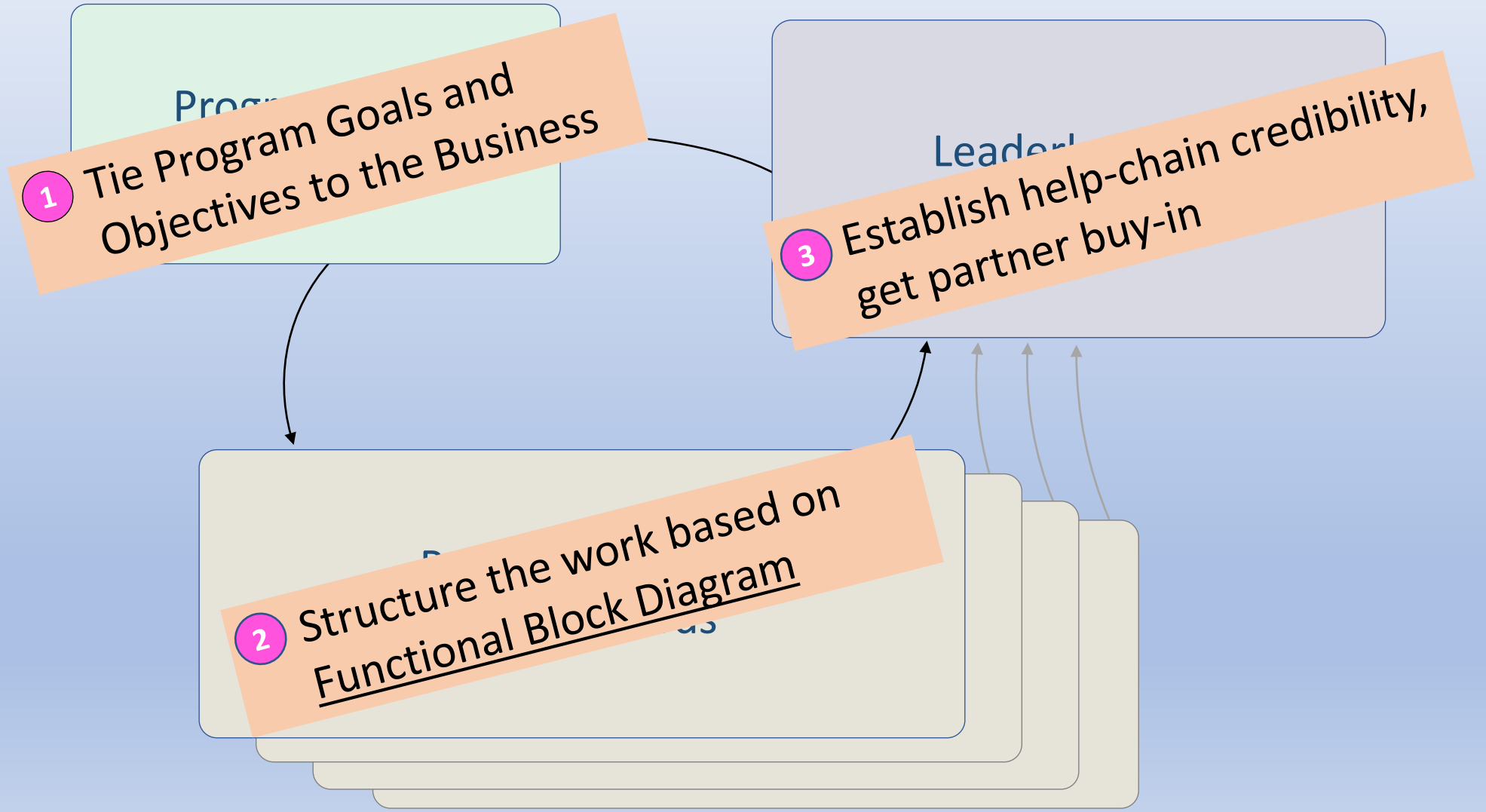
VISUAL MANAGEMENT SYSTEM FOR PROGRAMS



Three key elements of our Program VM System



Key Success Factors



Key success factors
Obstacles to overcome
Barriers to excellence

1

Program Goals and Objectives

Tie Program goals and objectives to the Business

Starting with Compass Management approach…

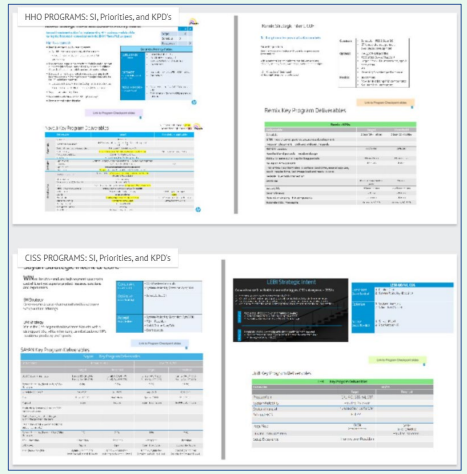
- e.g. Hoshin Kanri, Northstar process, Cascading Objectives, etc.

… connect Program Goals and Objectives to the Business

Business Unit Goals and Objectives

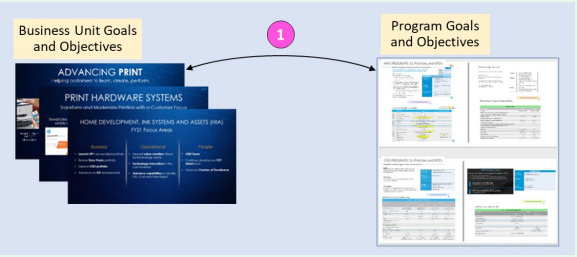
1

Program Goals and Objectives



1

Tying Program goals and objectives to the Business

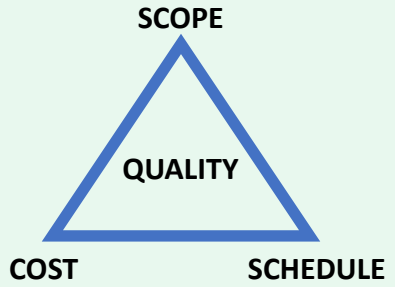


1. STRATEGIC INTENT and BUSINESS PRIORITIES MATRIX

Early/Pre-Program

a. SI: what is the product's "purpose for being"
   a. in the Market;
   b. for the Customer; and
   c. for the Business

b. Business Priorities (flexibility matrix): what strategic elements are least flexible (constrain), have some flexibility (optimize), and are most flexible (accept)



2. KEY PROGRAM DELIVERABLES

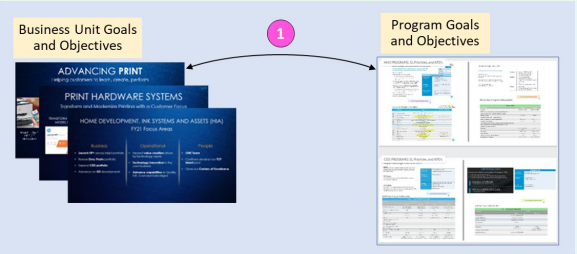
End of Definition phase

- ~15-20-ish Program definition items that best describe the strategic definition of the product and Program.

	Deliverable	Target	Threshold
Tier 1	Improve text optical density	1.3	1.2
	Improve power up time	20 sec	30 sec
Tier 2	Meet Regs to launch in country x (new)	By launch	By launch + 4 mos
	Improve Net Promoter Score	60	40
	Launch schedule	Oct	Aug
Tier 3	Enable extended warranty	36 mo	30 mo
	Gross margin	$110	$113
	Enable transition to new mfg partner	SOR + 6	SOR + 12

1

Tying Program goals and objectives to the business



Obstacles encountered:

- Abuse of Strategic Intent/Business Priority matrix
- Silo behavior, escalations and mandates

Warning signs:

- VP's pet Product Definition items disguised as strategic statements
- Organizations jockeying for position, overriding the team's work
- Overloading the LEAST FLEXIBLE bucket
- Not having the discipline to identify what is MOST FLEXIBLE (no tradeoffs allowed!)

IWWIWWIWI!

Which leads to:

- Lack of clarity – no discernment of what's really important, "I want it all!"
- Team disempowerment – is there ownership of the goals anymore? Who owns the decisions?
- Disengagement – "Work extra hard with partners to do something outstanding? I don't think so!"

Barrier to excellence:

- Silo objectives and reward culture

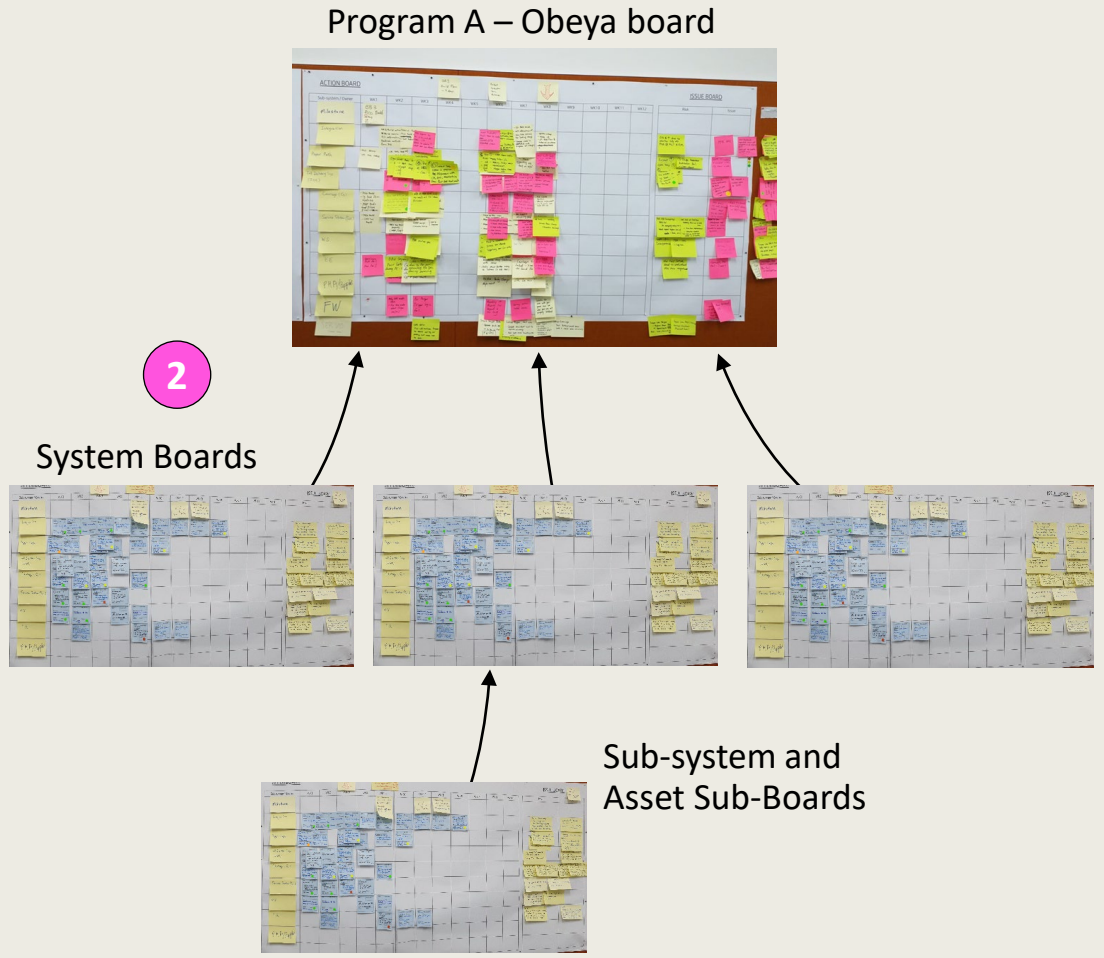
2

Program/System Obeya Boards

Structure the work based on Functional Block Diagram

Create cross-functional development teams

Create Program Obeya rooms/boards

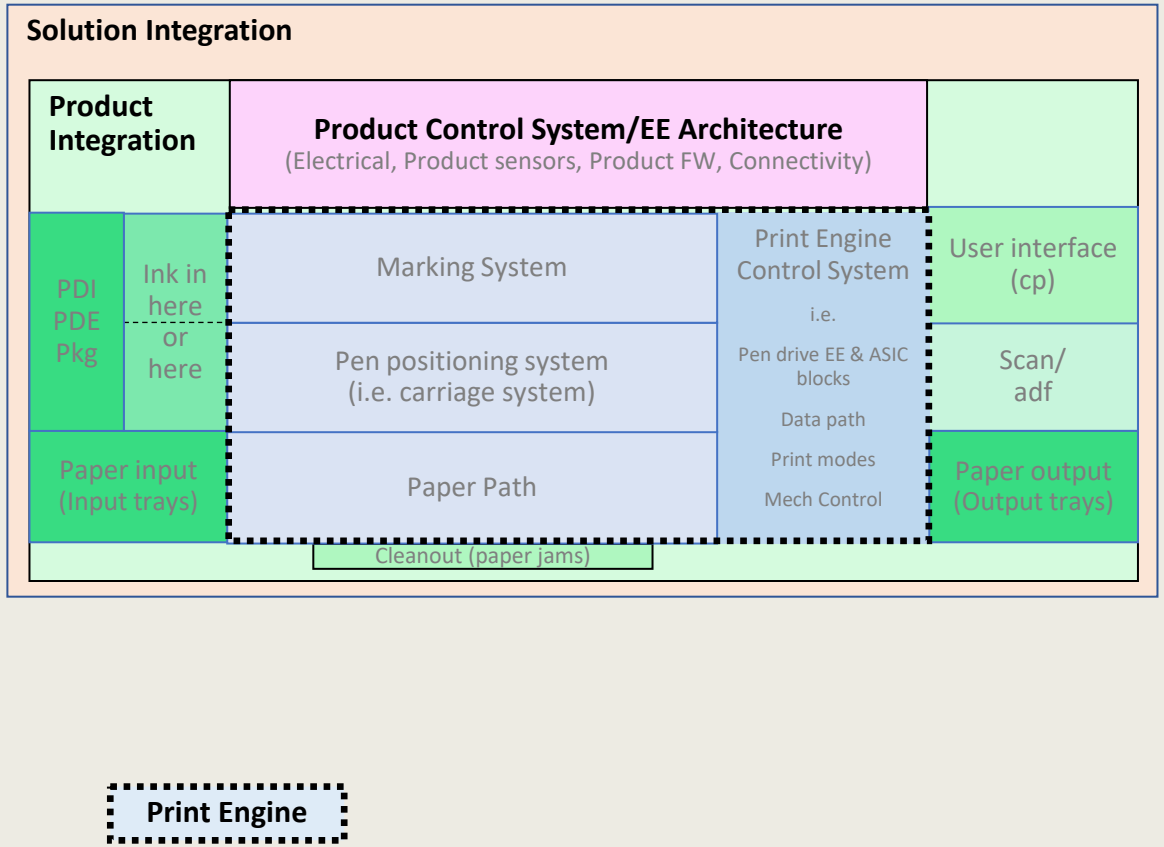


2

The starting point – create Functional Block Diagram

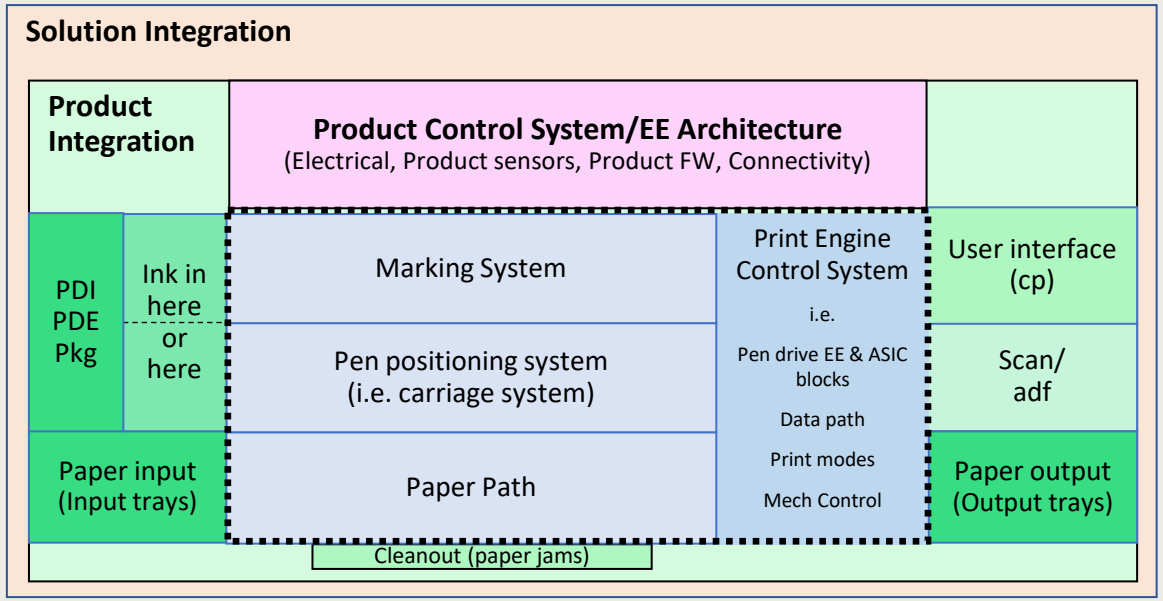
System representation of product

- Product functions – end-user perspective
- Identify high complexity areas – make that the core
- Build product map by system
  - Where are seams, interactions, dependencies?
  - Iterate
- Assign functional and customer performance specs to the lowest subsystem possible that can actuate the goal.
- What are the more complex, derived system performance specs – where are they best assigned?



2 Tips

Customer-centric performance expectations become front-and-center

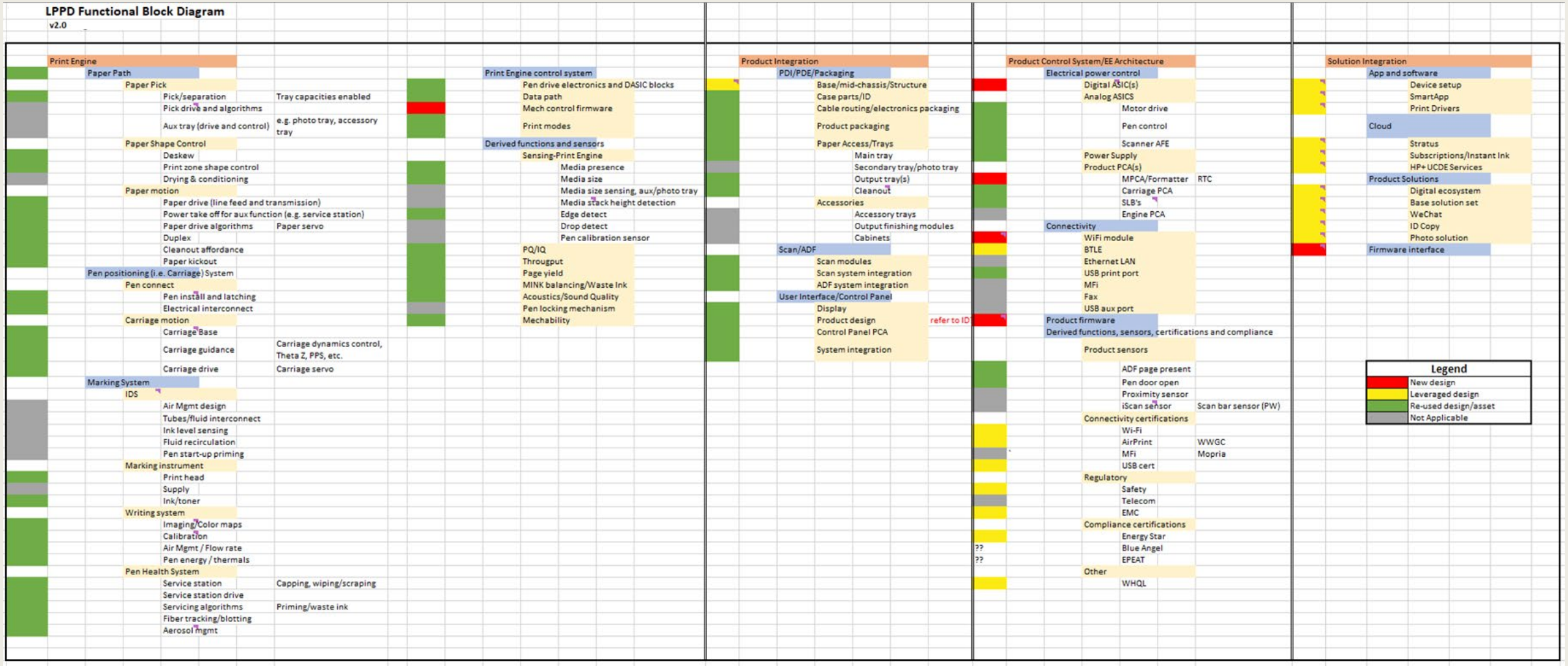


- Focus on end-user value and customer-centric performance
- No perfect representation – create one that makes sense. Iterate over time.
- A good FBD does two things:
  1. Visualize development scope, risk, and innovation areas at a glance
  2. Distributes the performance goals to the right place
     - Focuses the dialogue
     - Enables the work in most customer-centric manner

2

FBD used to visualize development scope and risk

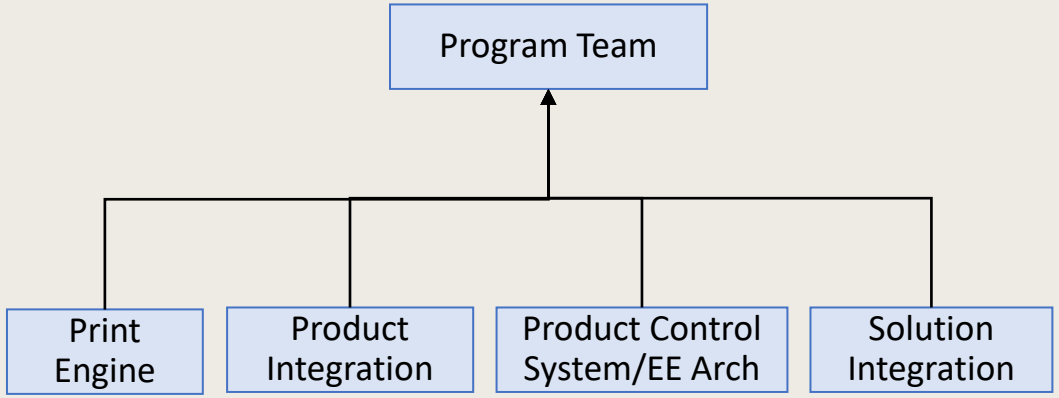
High-level view of reused/leveraged/new design elements; where are the areas of innovation or risk?



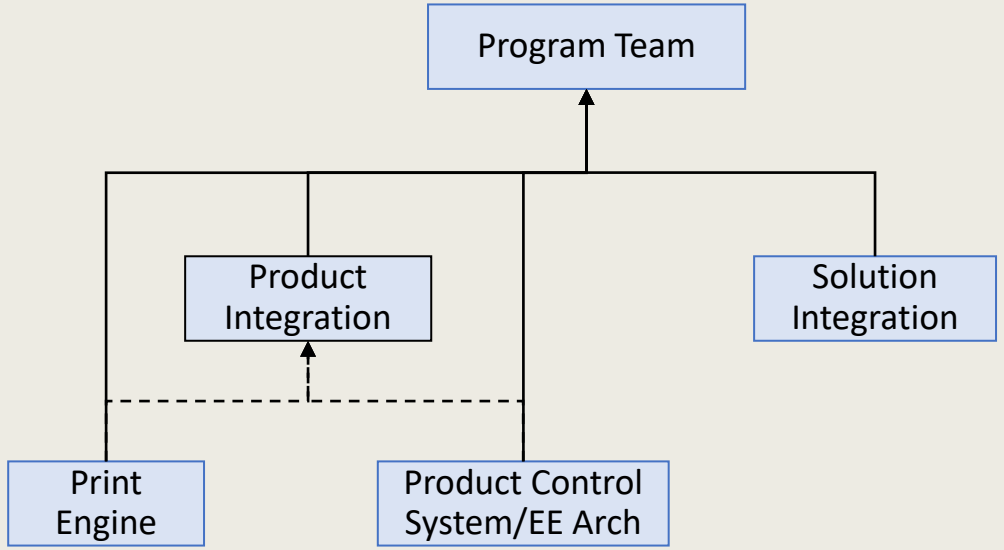
2

FBD ~~determines~~ *informs* the structure of the team forums

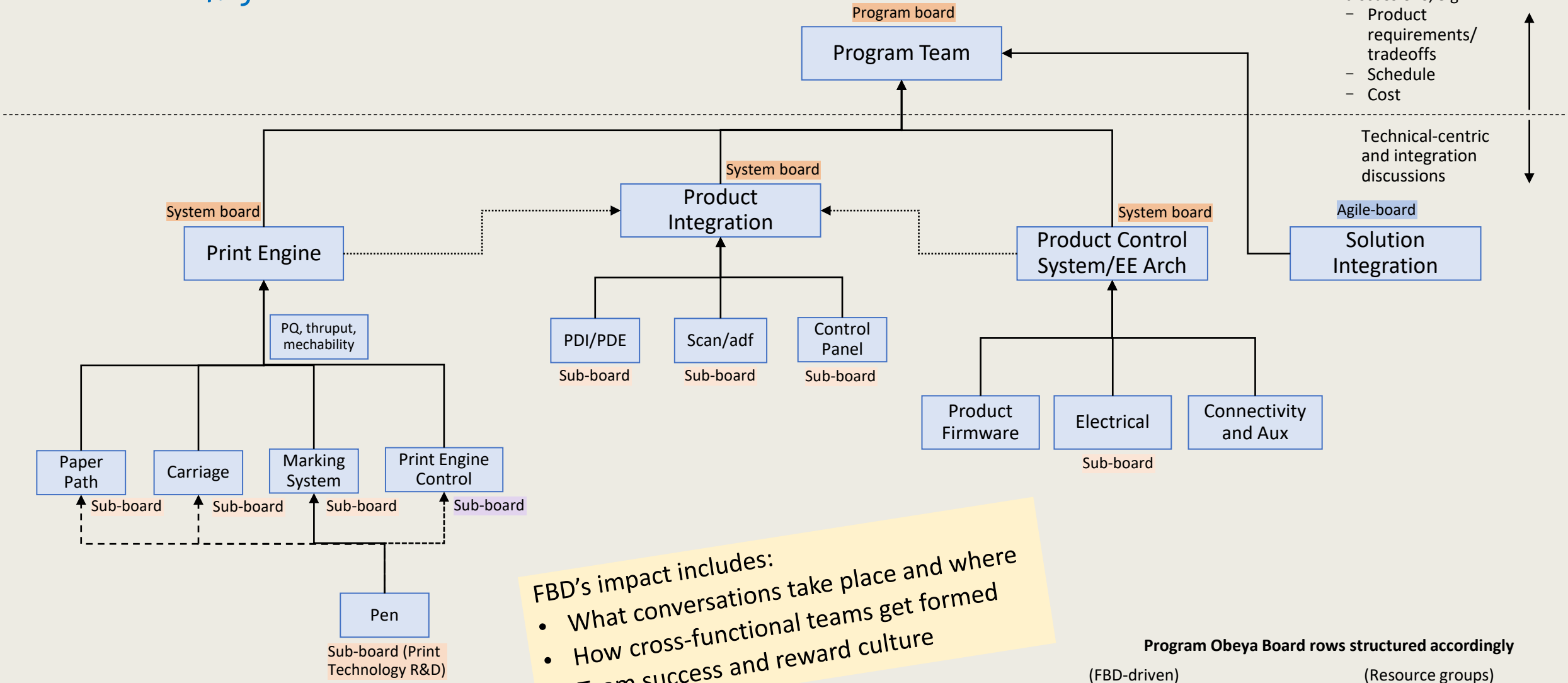
1st-pass



As implemented



2 FBD *informs* the structure of the team forums



FBD's impact includes:

- What conversations take place and where
- How cross-functional teams get formed
- Team success and reward culture

System board and Sub-board = required

Sub-board = optional; required if high level of newness/scope

Program Obeya Board rows structured accordingly

(FBD-driven)

1. Program
2. Product Integration
3. Pen
4. Print Engine
5. Product control sys/EE arch
6. Solution integration

(Resource groups)

7. Marketing
8. Design – ID/Ux
9. FW
10. Quality
11. Operations
12. Finance

2

The Functional Block Diagram

Obstacles encountered:

- Buy-in to FBD-based team accountability
- Full FBD-engagement by partner organizations

Warning signs:

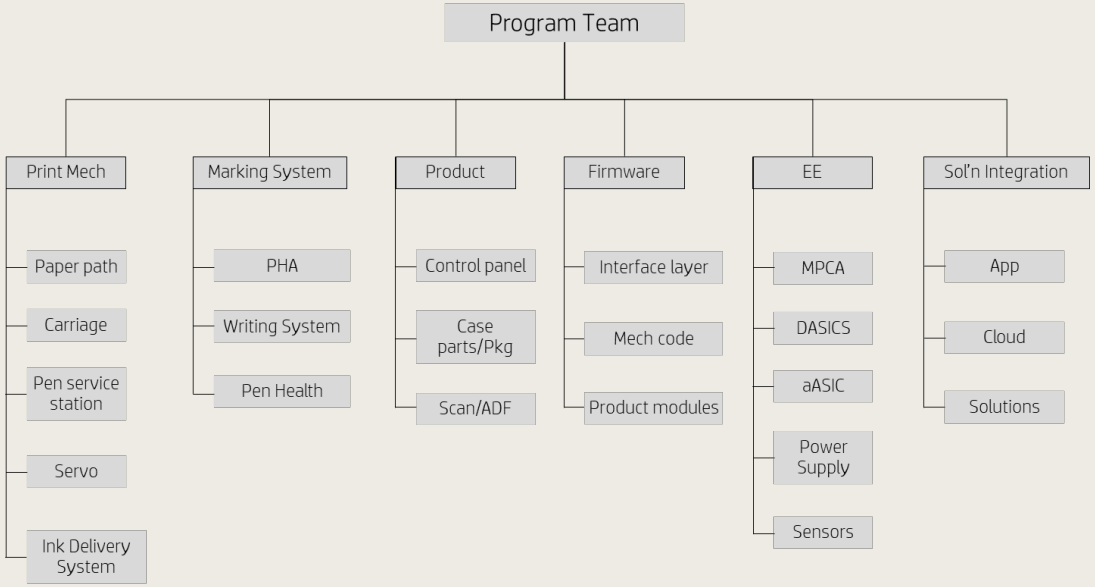
- Many resource-oriented forums
- Review meetings by discipline/organization
- System discussions/decisions only at higher levels
- Partners engage only at high levels

2

FBD makes for more effective innovation

Resource-oriented

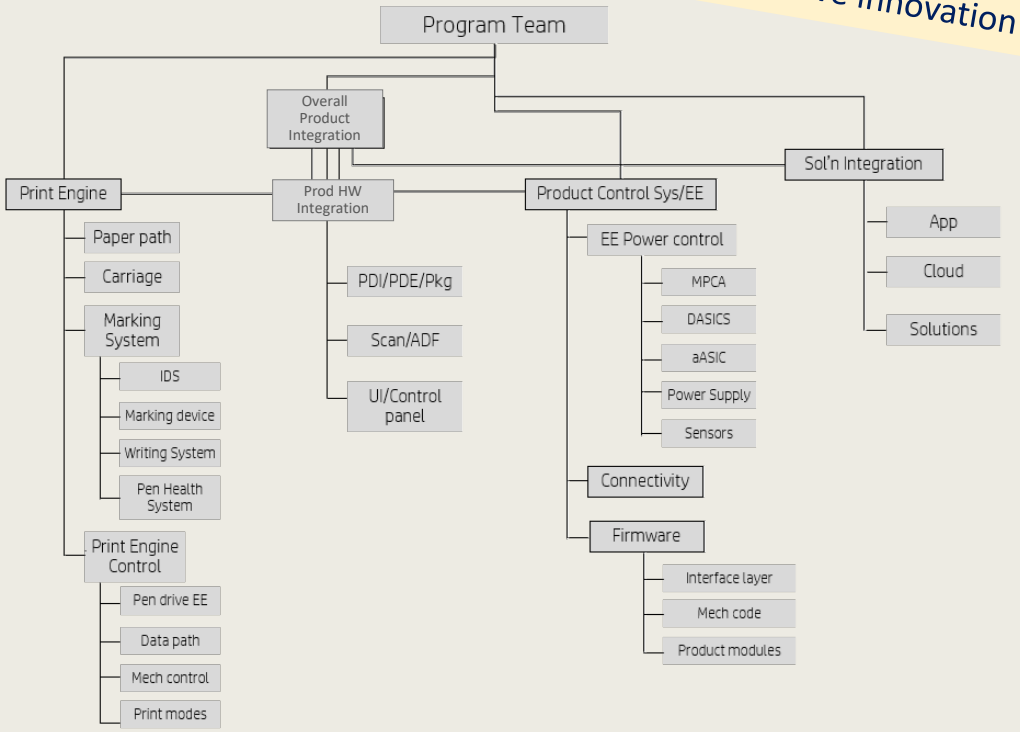
- Partial, incomplete resource-oriented innovation efforts
- Many arcs of discussion to drive innovation, decision-making, and issue resolution
  - Innovations tend to become more narrow, take longer
- Integration point is at top-level Program Team
  - 40-50+ people to listen/engage in decision discussions
  - Barriers erected, further escalations occur regularly



FBD-based

- Small groups with the right cross-functional members all along the way
- Customer-focused innovation, tradeoff discussions, and decision-making funneled to the right subsystem team
- Program Team focuses on highest Program-level tradeoffs and business decisions

Focusing on customer-centric outcomes leads to more effective innovation



2

The Functional Block Diagram

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- Buy-in to FBD-based team accountability
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Warning signs:

- Many resource-oriented forums
- Review meetings by discipline/organization
- System discussions/decisions only at higher levels
- Partners engage only at high levels

Which leads to:

- Sub-optimum, incremental innovations at resource level
- Lost opportunity for more effective, customer-centric innovation
- Unclear decision makers

Barrier to excellence:

- Empowering subsystem/system teams

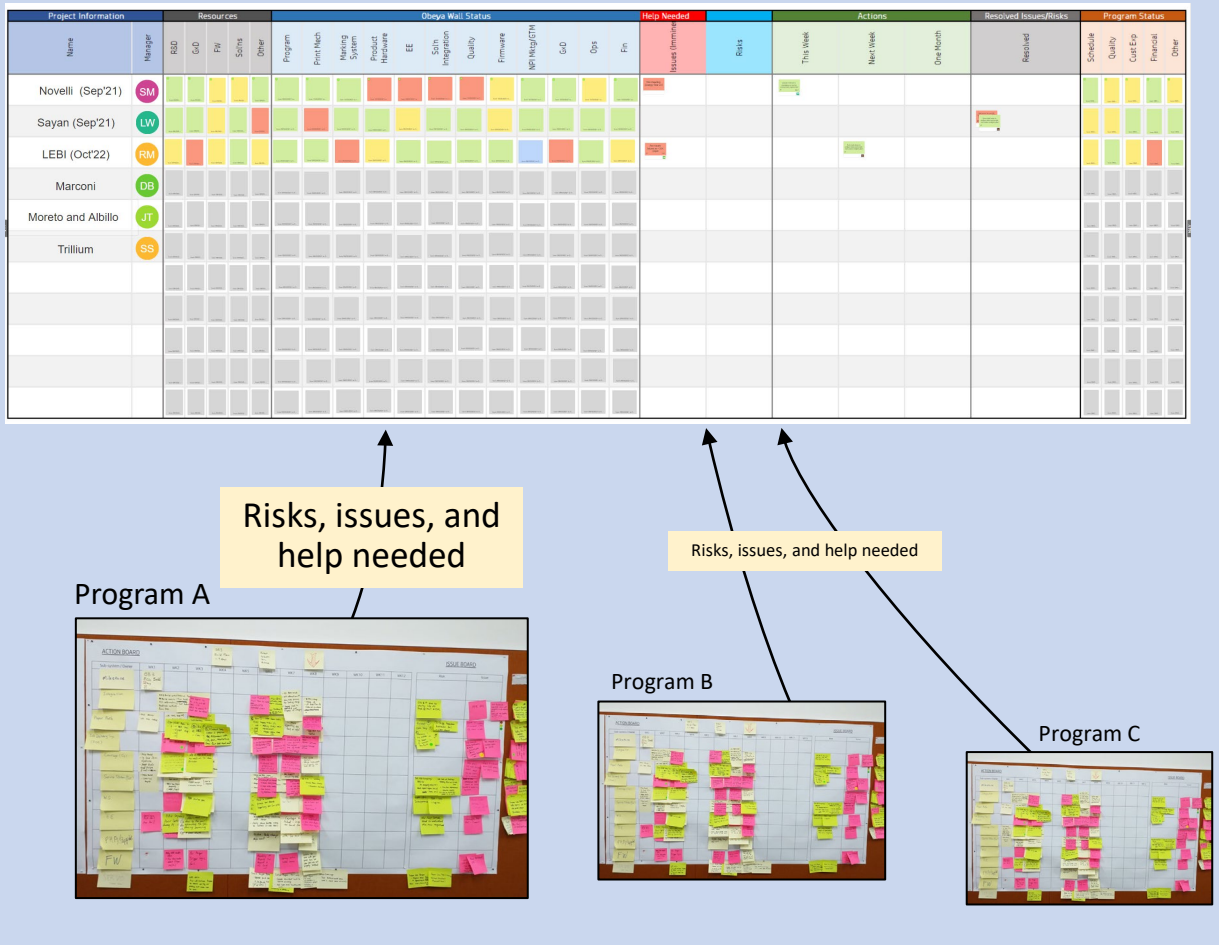
3

Leaderboard

Credibility of help-chain process with partners buy-in

- Establish Leaderboard and help-chain process
- Engage partners to get buy-in to the process

3 **Leadership Board– single-page view of all programs**



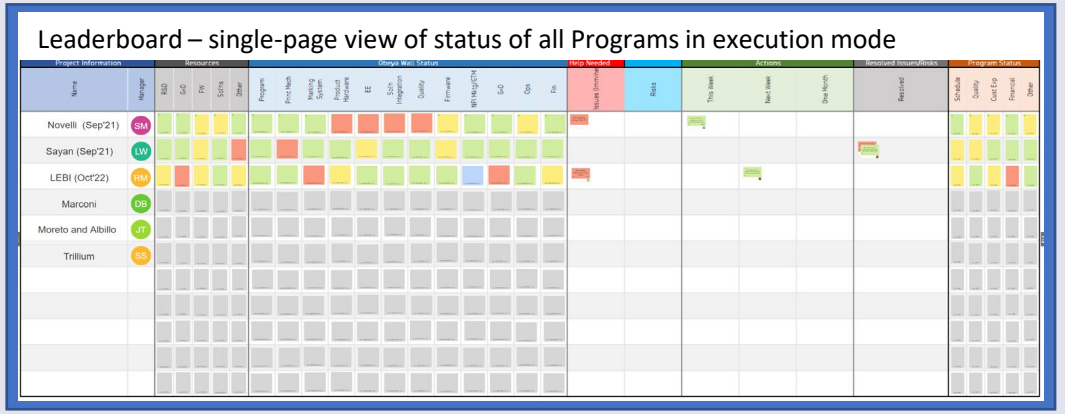
3

The Program Leaderboard – overview

Remove barriers, unblock the team

- Single-page view of all Program Obeya status
- Short (< 30 min) weekly meeting with Directors from all functions and partners
- Program Manager articulates where team is blocked to meet next integration milestone (~ 2-3 months)
- Specific help is asked for; Directors are empowered to take action
- Action and/or decisions expected within one week, occasionally two

Leaderboard – single-page view of status of all Programs in execution mode



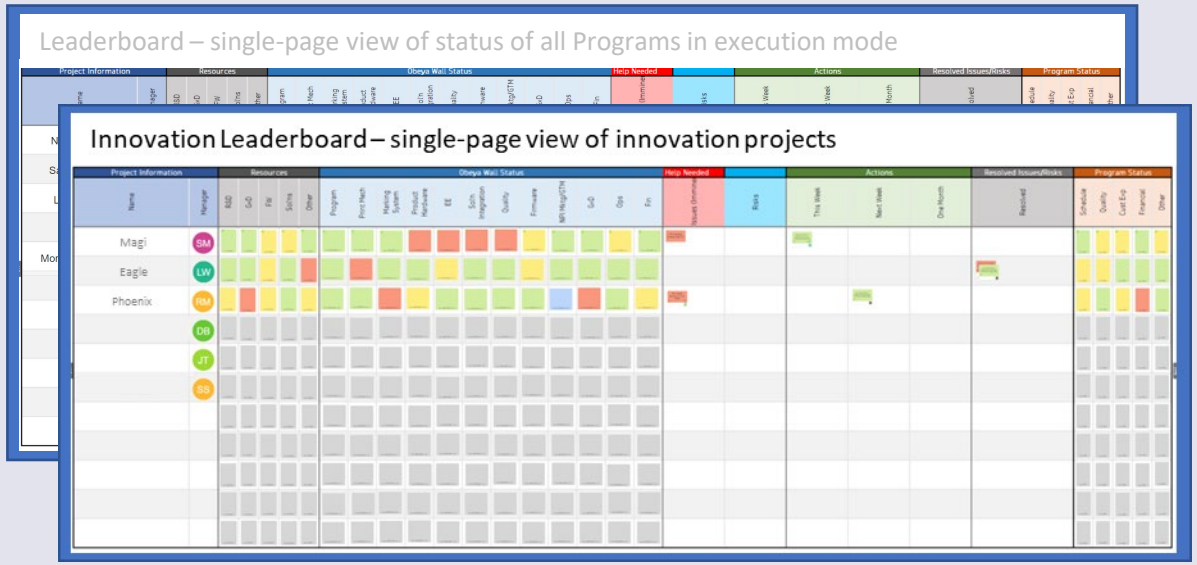
Direct connection to Operational Excellence

3

Introducing the Innovation Leaderboard

Early innovation efforts were not being covered well in the normal Program Leaderboard process

- Single-page view of all off-cycle, pre-Program, and early stage Innovation projects status
- Short-ish (< 1 hour) weekly meeting with Directors from all *necessary* functions and partners
- Project lead articulates where team is blocked to meet next “demonstrate” milestone (~1-2 months)
- Specific help is asked for. Directors are empowered to take action.
- Action and/or decisions expected within a couple weeks.



Intent: create traction and pull, remove barriers, and focus the effort

3

The Leaderboard and Help-Chain

Obstacles encountered:

- Normalizing expected behaviors
  - Program Managers
  - Directors
- Establishing credibility in the process

Warning signs:

- Many off-cycle review and preview meetings
- “Asking 20 questions” to interrogate, refute the issue, or push the issue back onto the team
- Erecting high-overhead hurdles for the team before actioning
- Few decisions made

Which leads to:

- Unempowered Leaderboard meeting
- Not wanting to bring up issues because of burden placed on Program Manager/team
- Reverting to a series of less-effective, ad-hoc review meetings – high overhead and slow!

Barrier to excellence:

- Empowering Directors

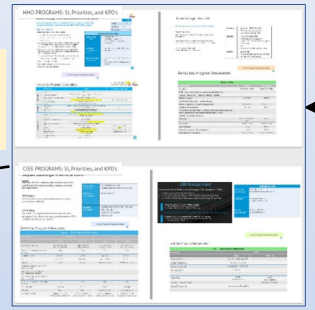
Summary

Three key elements of the overall VM System

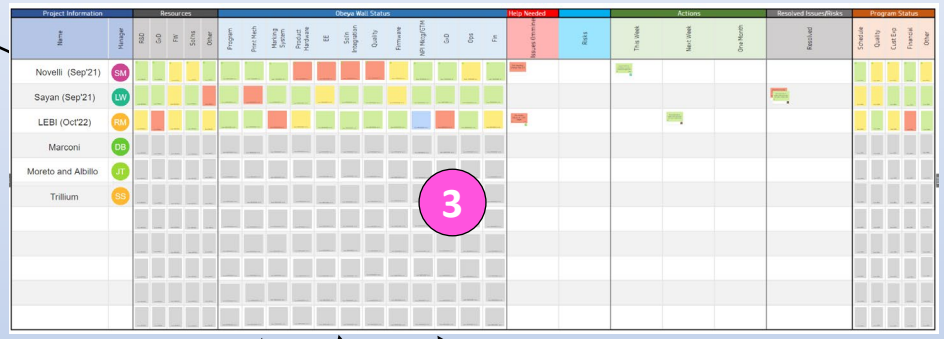
Business Unit Goals and Objectives

1

Program Goals and Objectives



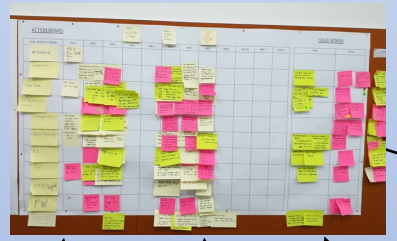
Leadership Board– single-page view of all programs



3

Actions

Program A – Obeya board

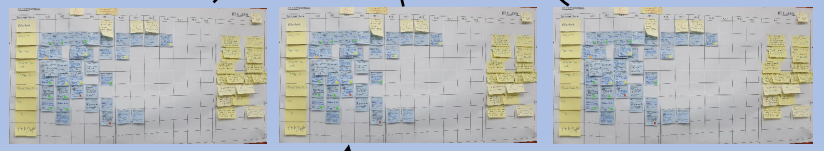


2

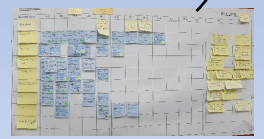
Risks, issues, and help-needed

Risks, issues, and help needed

System Boards



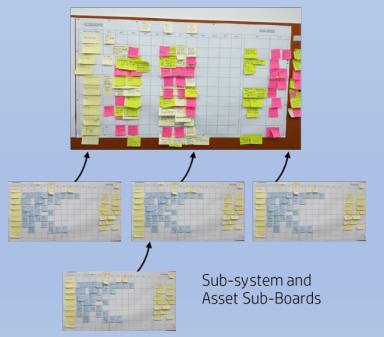
Sub-system and Asset Sub-Boards



Program B – Obeya board

Sub-system and Asset Sub-Boards

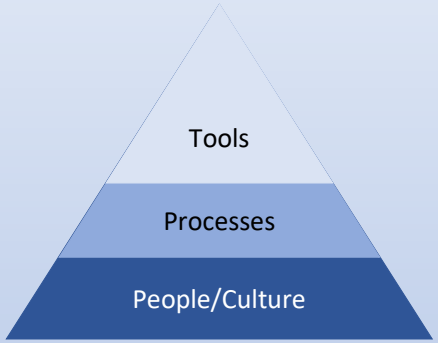
Program C – Obeya board



Sub-system and Asset Sub-Boards

VM plays a powerful role in the Innovation process

- VM is as crucial to Innovation as it is to Operational Excellence
  - Becomes the eyes and ears of the Innovation process
  - It changes the lens, changes the discipline of the entire organization



- All three elements of the VM system needed for best results
  - Connect entire team and organization to strategic pieces and create shared purpose
  - Focus team on end-user and customer-centric performance targets via FBD-based action
  - Create pull, maintain momentum, and get the support you need from Leadership

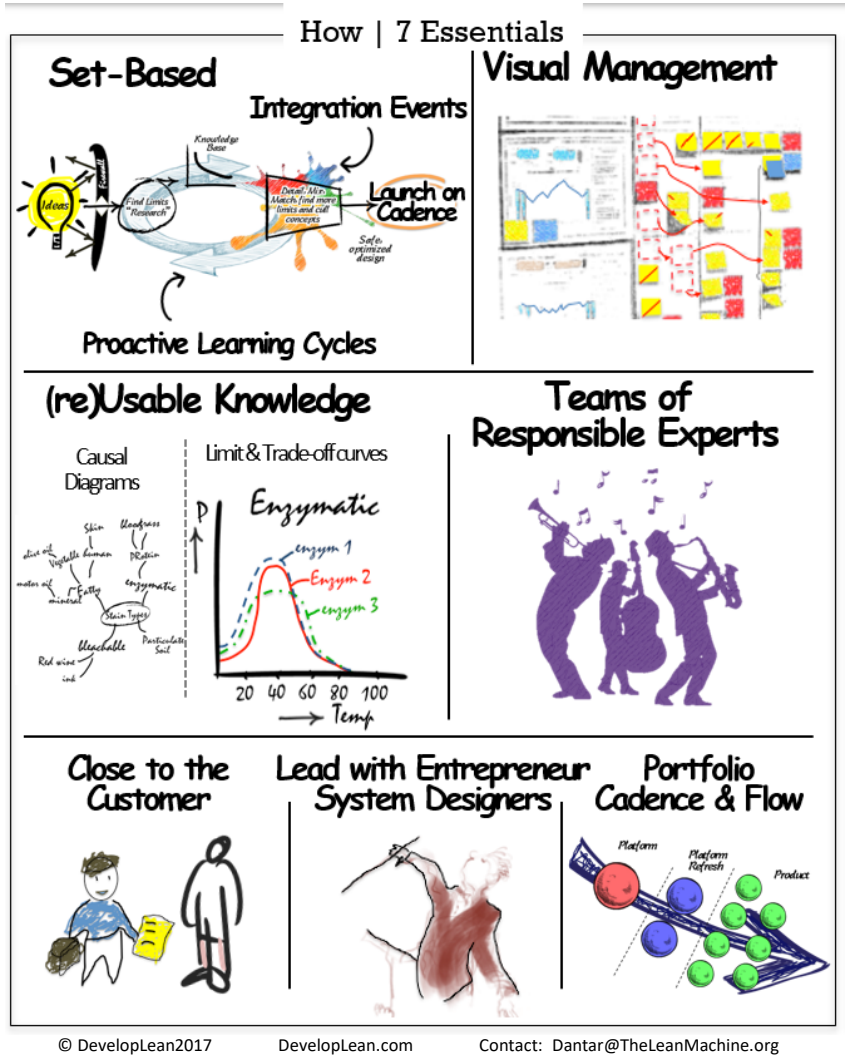
- Systemic barriers are ever-present; it takes time, effort, and diligence to achieve excellence
  - Management ecosystem: Command-and-Control → Lean & Agile Leadership behaviors
    - i.e. Change the CULTURE, change the REWARD STRUCTURE, build TRUST and EMPOWERMENT

Thank You!

backup

Seven Lean Product & Process Development (LPPD) principles

A **system** to create more effective "**development flow**" and optimize **output** of the development engine

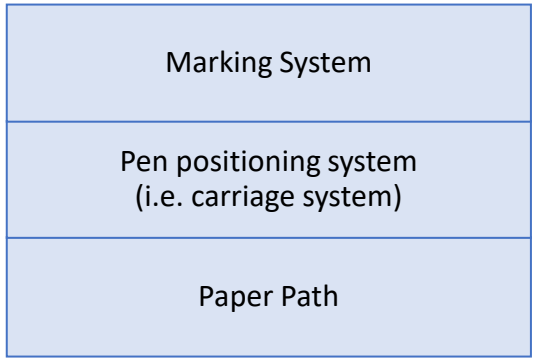


- **Set-Based**: test a set of options, learn, then integrate best ideas into product; discovery of knowledge is key
- **Visual Management**: visual product/program status; leads to timely understanding of blocking and off-track issues; help chain to address and resolve
- **Reusable Knowledge**: creating knowledge in the path of work
- **Teams of Responsible Experts**: highly skilled teams of subject-matter experts; flexibly deploy across projects
- **Close to the Customer**: live in the customer shoes, truly understand how customers use the product
- **Entrepreneur System Designer (ESD)**: leads and orchestrates the action for a segment; acts like a founder
- **Portfolio Cadence Pull & Flow**: pull and integration events on a cadence; match work to capacity to drive effectiveness and efficiency

Reference and backup

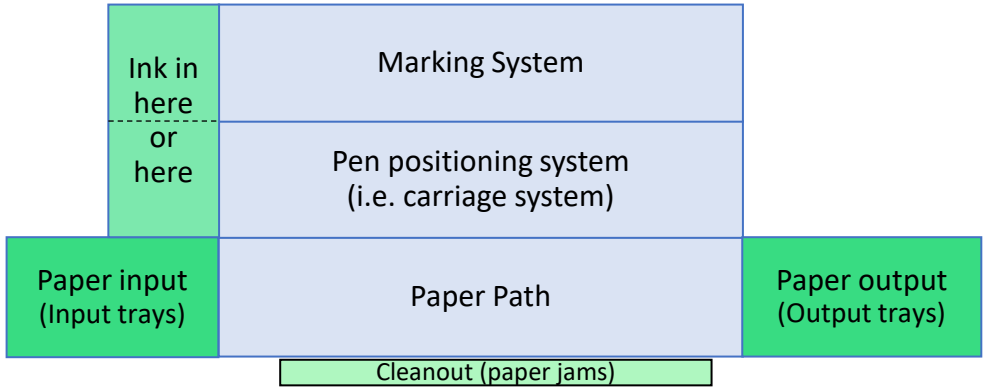
FBD build-up

FBD build-up



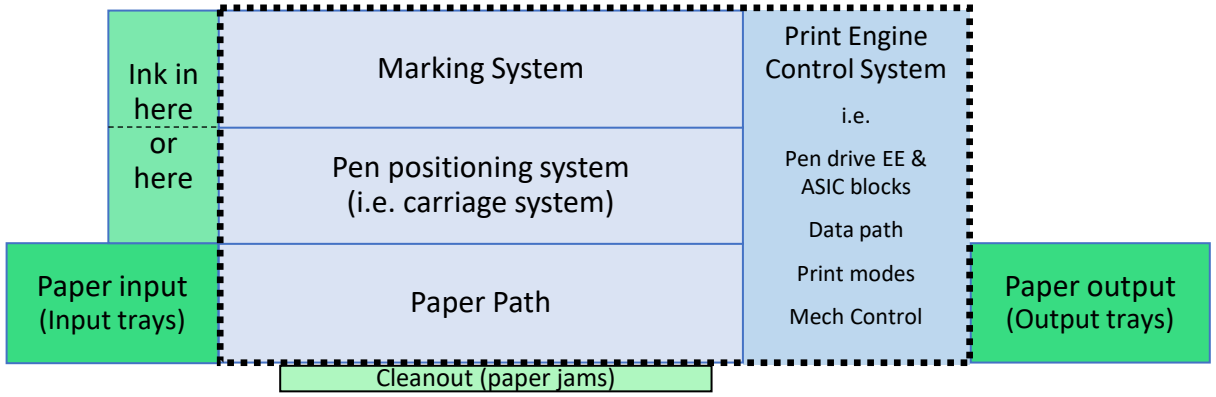
- Start with the three basic systems of the Print Engine

FBD build-up



- Start with the three basic systems of the Print Engine
- Add elements, identify seams between systems

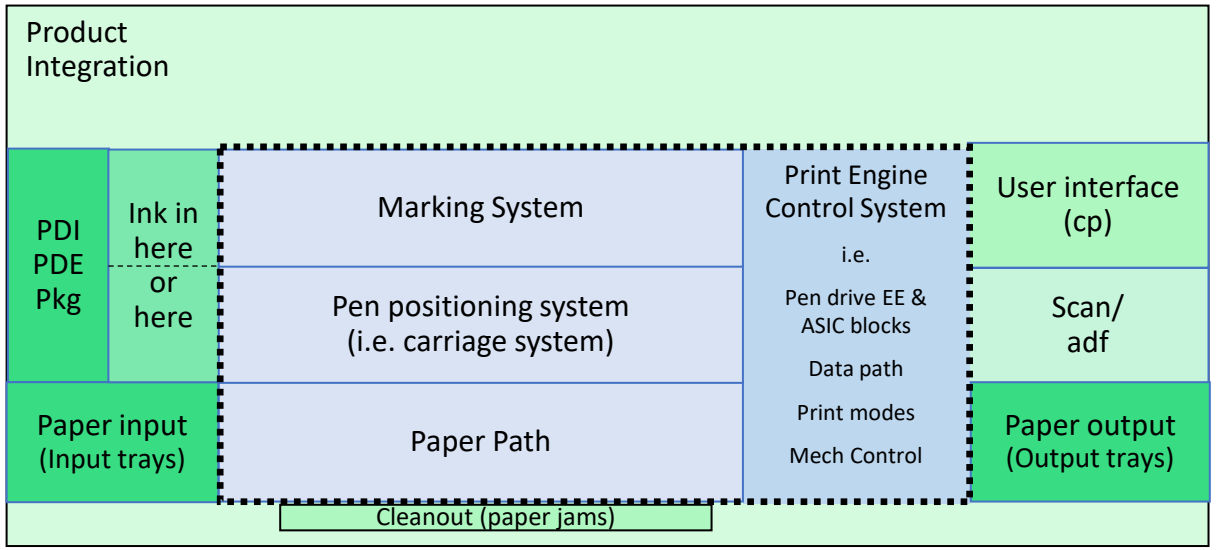
FBD build-up



- Start with the three basic systems of the Print Engine
- Add elements, identify seams between systems
- Add missing Print Engine Control System element

Print Engine

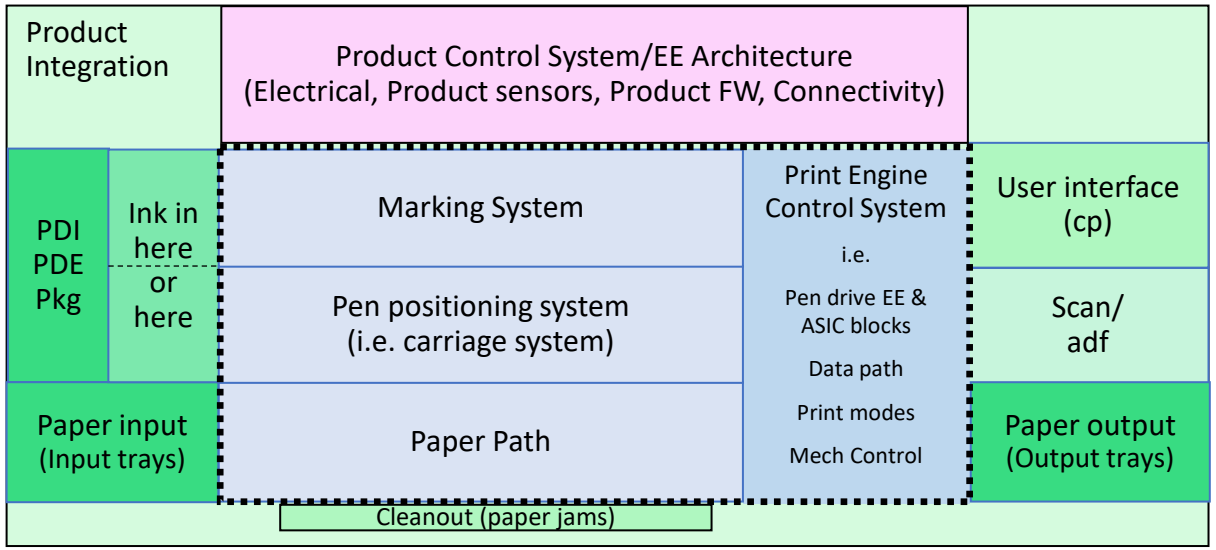
FBD build-up



- Start with the three basic systems of the Print Engine
- Add elements, identify seams between systems
- Add missing Print Engine Control System element
- Build further

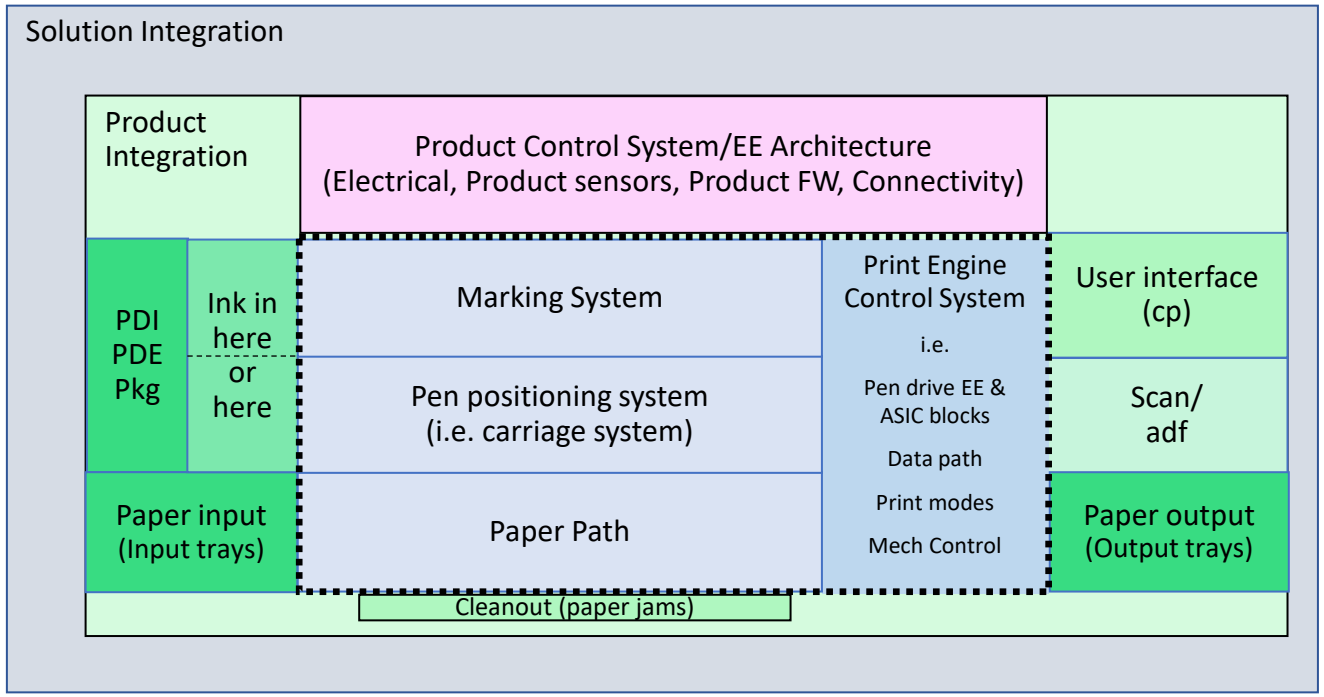
Print Engine

FBD build-up



- Start with the three basic systems of the Print Engine
- Add elements, identify seams between systems
- Add missing Print Engine Control System element
- Build further
- Add overall Product Control System

FBD build-up



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- Add missing Print Engine Control System element
- Build further
- Add overall Product Control System
- Add Software Solutions

End