

4Pk Assessment: A Guide to Mastering Lean Excellence

Lean Enterprise Institute
2024 Lean Summit

Meet the Presenters:



Frank Paluch

- Senior Partner, Inscape Development Group
- Former Senior Executive Honda Automotive (35-year automotive/aircraft career)
- Adjunct Professor LPPD, The Ohio State University



Lara Harrington

- CEO, Inscape Development Group
- Former Senior Leader Honda R&D Americas (33-year automotive/aircraft career)
- Adjunct Professor LPPD, The Ohio State University

Today's Goals

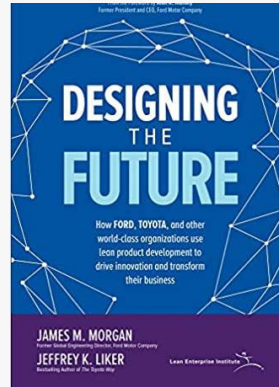
- Describe the 4Pk framework, covering product, process, people, perfection, and knowledge, as outlined in *Designing the Future*.
- Overview the 56 key assessment areas within the 4Pk framework, understanding their role in evaluating an organization's lean maturity.
- Learn efficient scoring techniques to quickly gauge your organization's lean maturity.
- Discover how the different assessment areas interconnect, fostering improved synergy within your organization.
- Acquire practical skills for conducting a comprehensive yet swift company lean assessment.

Today's Schedule

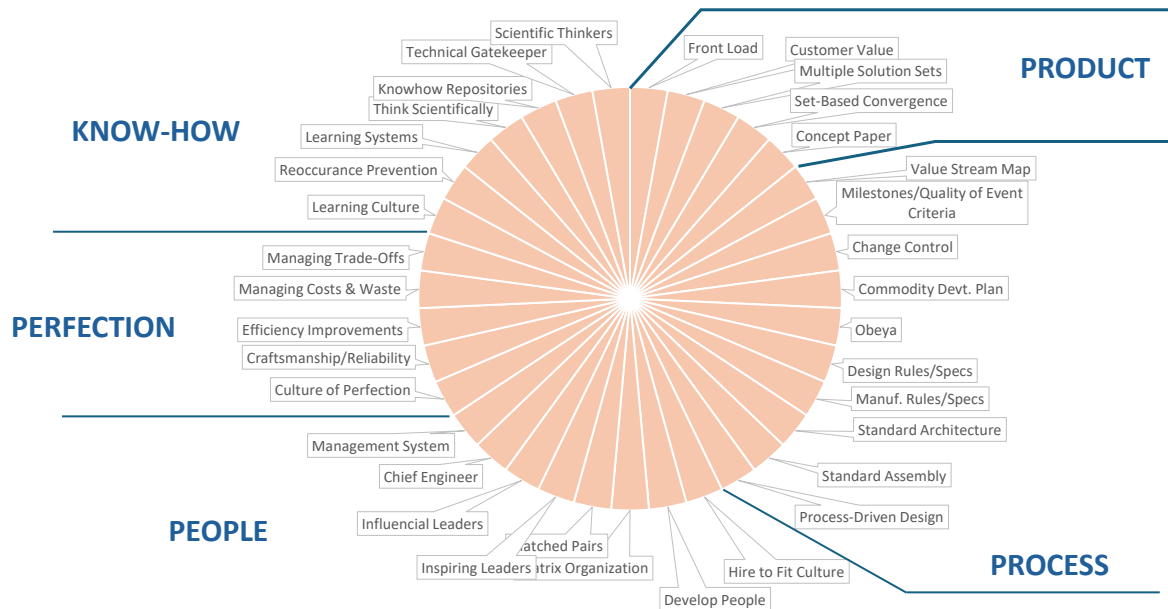
1. LPPD 4PK Framework Introduction (30 minutes)
2. Exercise – 4PK Self-Assessment (10 minutes)
3. Collaborative Discussion on Self Assessment (20 minutes)
4. Q&A (10 minutes)

Key Material

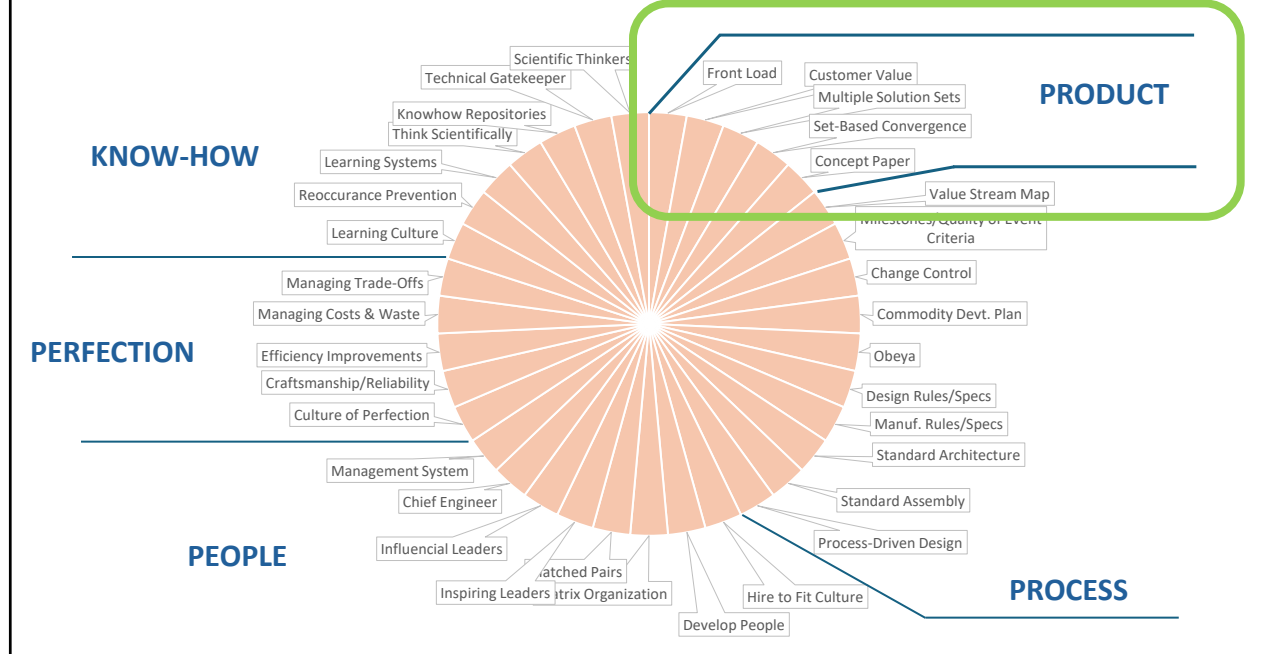
- Today's content draws from the groundbreaking book 'Designing the Future' authored by James Morgan and Jeffery Liker.



4PK ASSESSMENT: OPERATIONAL EXCELLENCE FRAMEWORK



4PK ASSESSMENT: OPERATIONAL EXCELLENCE FRAMEWORK

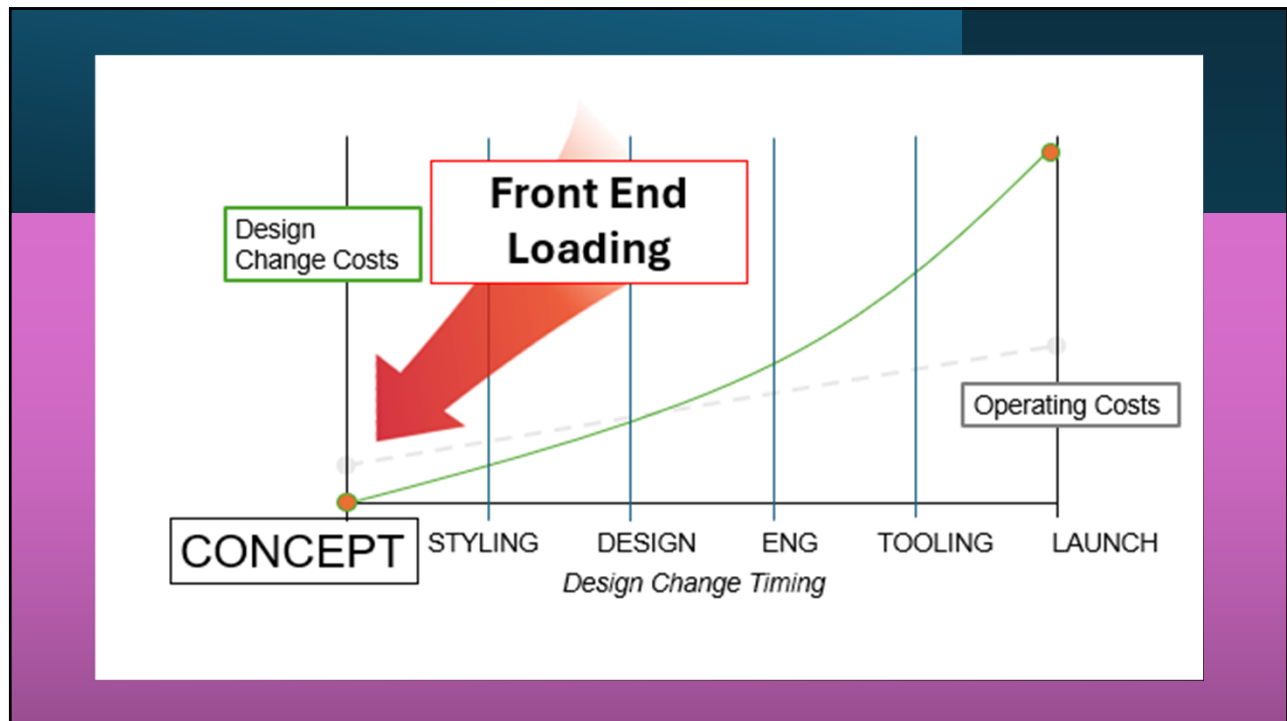


Creating the Right Product

- ❖ Front-End Load Development Team
- ❖ Understand what Your Customer Values → Go to the Gemba
- ❖ Generate Sets of Solutions for Providing Customer Value
- ❖ Converge Carefully
- ❖ Create a Concept Paper

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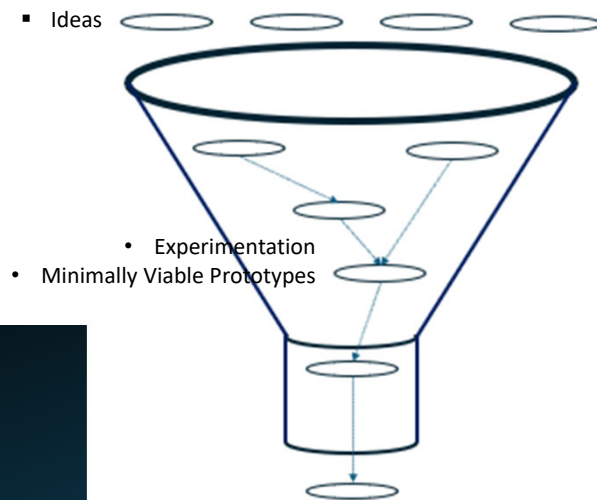
Understand What Your Customer Truly Values



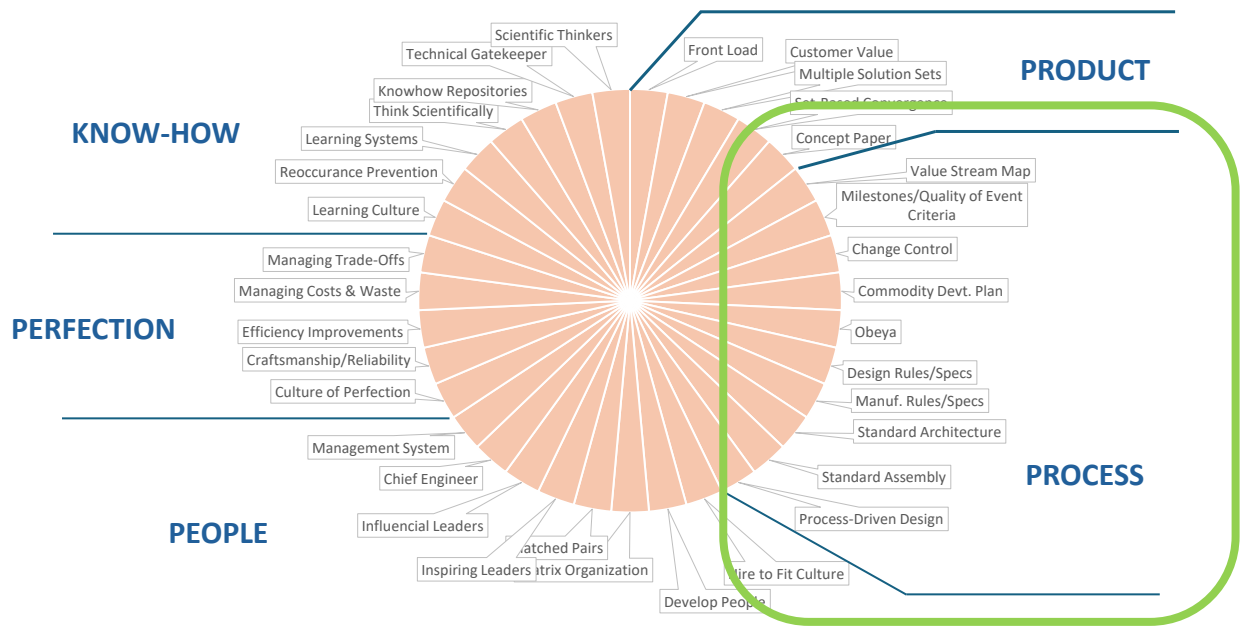
Go to the Gemba (Actual Spot)

- The 2019 Passport team:
- Interviewed customers in their homes.
- Visited campgrounds across Ohio.
- Drove along winding roads to Louisville, KY.
- Visited Dealers to understand need.

Set-Based Convergence of Ideas



4PK ASSESSMENT: OPERATIONAL EXCELLENCE FRAMEWORK



Lean Process

Delivering with speed and precision:

- ❖ Synchronize workflows across Functional groups
- ❖ Obeya system ~ central planning and communication site.
- ❖ Value stream map (VSM) ~ create the IDEAL flow

Process Excellence: Speed and Precision

Synchronized flow of work:

4PK LPPD Model → Process Excellence

4) Standardize product development with continual PDCA (Plan-Do-Check-Act)

TRADITIONAL waterfall Model:

LPPD FLOW: Integrated & Simultaneous

Front loading of development ~ Sales, engineering, test, suppliers, manufacturing all working together

Compatibility before completion making sure all functions collaborate early in dev't

Developing on time with quality requires standardization for innovation

- Flow is integrated and simultaneous across all functions
- PDCA at each Milestone event
- Checks are done before completion

Early & often collaboration

4PK LPPD Model → Process Excellence

R&D Shadow: Early collaboration is necessary to avoid costly processes or re-work

2) Standardize work and cadence

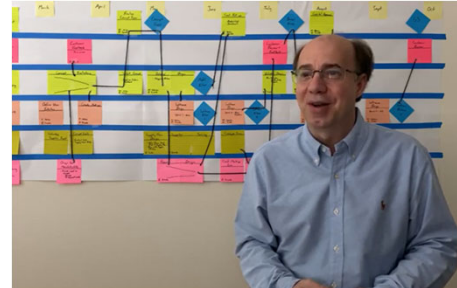
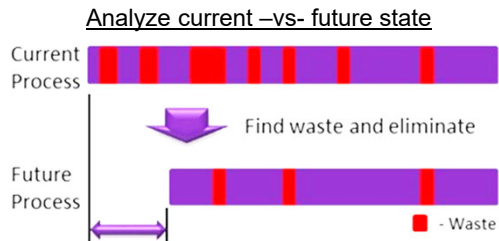
3) Obeya system → normal from abnormal

Early collaboration, standard work cadence and visual management enables success

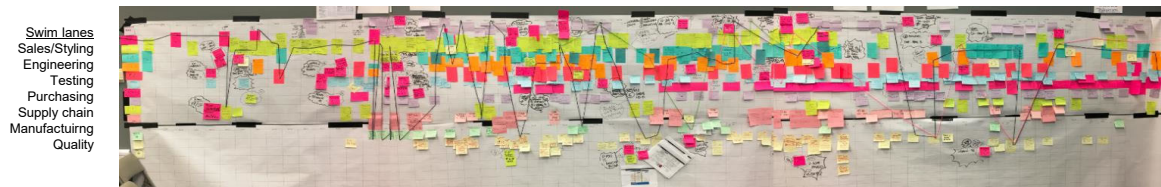
- Early collaboration with R&D is done to ensure collaborative design
- Standard work cadence is established
- Central planning and communication site

Process Excellence: Value Stream Map

Value stream map (VSM) ~ eliminate poor coordination and rework loops



Example: Visualize Workflow See workflow, identify clash in operations



Value stream mapping is a process tool to optimize product development

Lean Process

Part 2: Fixed and Flexible: Yin and yang of development

- ❖ Balance fixed/flexible standards to maximize customer value
- ❖ Design standards ~ rules, standard architecture, Platforms
- ❖ Manufacturing Standards ~ Rules, complexity reduction, Process Driven Product Design

Process Excellence (Fixed vs Flexible)

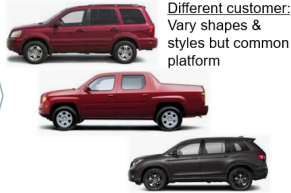
Design standards of development:

Platform that is customer focused yet innovative

2001 - 1st 7 Passenger unibody SUV - Platform



2001 MDX



Different customer:
Vary shapes & styles but common platform

Commodity development ~



Develop and share across projects



Differentiating to meet customer needs creates successful product

- Establish Platforms
- Establish Commodity designs (Carry over) common parts
- Design rules and specifications

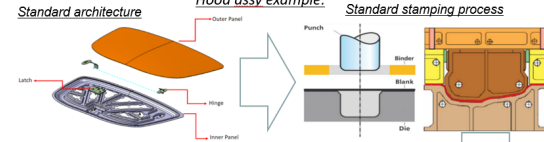
Manufacturing standards:

Manufacturing process standards (1)

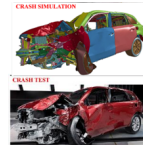
1c) **Standard Architecture** ~ basic arrangement of a product or service

2a) **Standard Assembly process** ~ organized sequence & locator method for parts

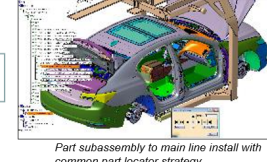
Hood assy example:



Predictable performance results



Standard assembly process



Part subassembly to main line install with common part locator strategy

Standardization allow fast development of many products using the same line

- Standard Architecture
- Standard assembly processes
- Manufacturing rules and specifications

Process Excellence (Fixed vs Flexible)

Design standards of development:

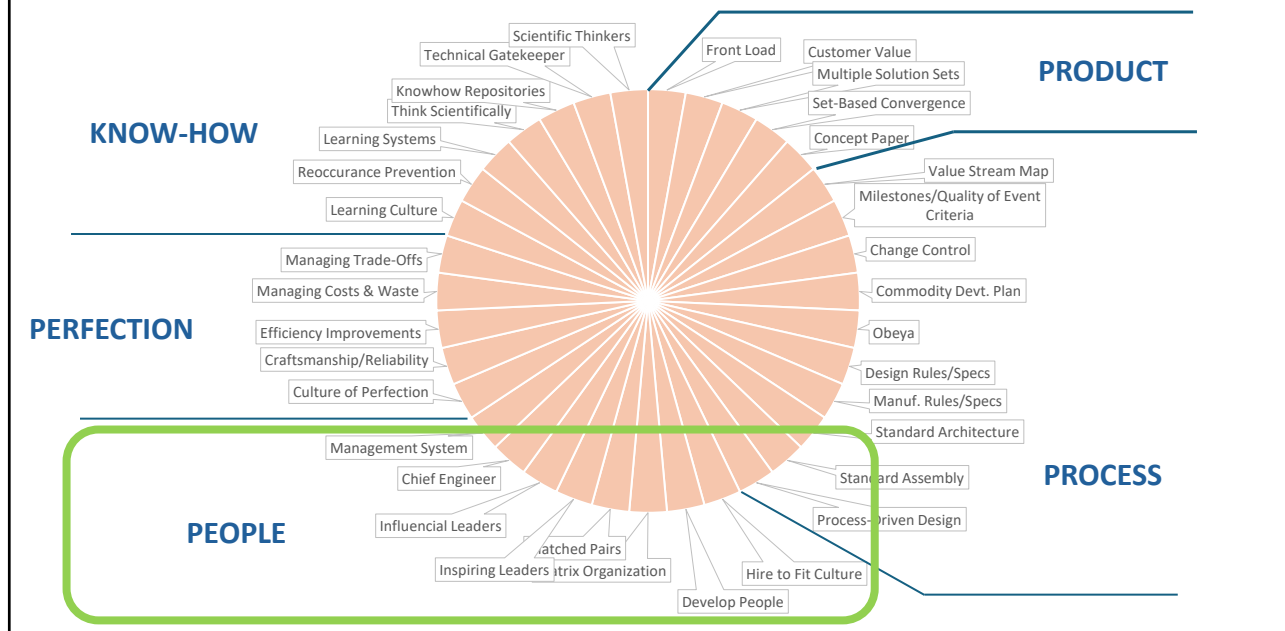
Manufacturing standards:



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- Standard Architecture
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4PK ASSESSMENT: OPERATIONAL EXCELLENCE FRAMEWORK



Developing People

Development

- ❖ Hiring to fit the culture
- ❖ Developing & engaging (Toolkit)
- ❖ Broad experience

Matrix Organization

- ❖ Strong Functional Organizations for deep learning
- ❖ Dedicated teams for each project
- ❖ Chief Engineer Focused on Customer
- ❖ Subject Matter Experts
- ❖ Strong Leaders

Tools – Activities to Constantly Grow People

☐ Experience & knowledge toolbox

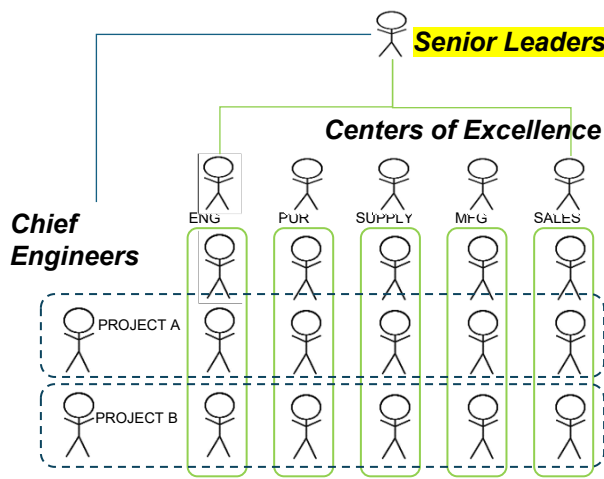
☐ Identify areas of growth potential



Training opportunities	Timing											
	1	2	3	4	5	6	7	8	9	10	11	12
1 Design review	•	•	•	•	•	•	•	•	•	•	•	•
2 VSM	•	•	•	•	•	•	•	•	•	•	•	•
3 Obeya	•	•	•	•	•	•	•	•	•	•	•	•
4 Weekly quality review	•	•	•	•	•	•	•	•	•	•	•	•
5 Overseas assignment/collaboration						•		•				
6 Visit dealership	•											
7 Visit supplier				•				•			•	
8 Drive products on test tracks		•		•		•		•		•		•
9 Talk to operators in assembly plants	•											•
10 Talk to technicians in assembly plants	•											•
11 Talk to supervisors in assembly plants	•			•								
12 Visit stamping plants	•			•								
13 Visit prototype shops				•								
14 Visit tool shops				•				•				
15 Evaluate competitors and summarize				•		•		•		•		
16 Design "Walk arounds"	•											
17 Attend auto shows								•		•		•
18 Evaluate current models	•							•		•		•
19 Evaluate of future models				•						•		
20 Customer quality "Verbatims"				•		•		•		•		
21 Traveled to location of problems				•		•		•		•		•
22 Worked with local dealers/Mechanics				•		•		•		•		•
23 Talked directly to customers				•		•		•		•		•
24 Updated design requirements	•	•	•	•	•	•	•	•	•	•	•	•
25 Attended customer events	•			•		•		•		•		•
26 Attended track events				•		•		•		•		•
27 Attended off road events				•		•		•		•		•
28 Updated Manufacturing requirements	•	•	•	•	•	•	•	•	•	•	•	•
29 detail benchmarking with suppliers				•		•		•		•		•
30 detail benchmarking with mfg				•		•		•		•		•
31 evaluate 3rd party information				•		•		•		•		•

Good companies consistently track & fill up their associate's "Toolbox" of skills

Matrix Organization – Senior Leadership



- Senior Leaders:
- Create the Vision
 - Set the Strategic Direction
 - Develop a relentless execution plan

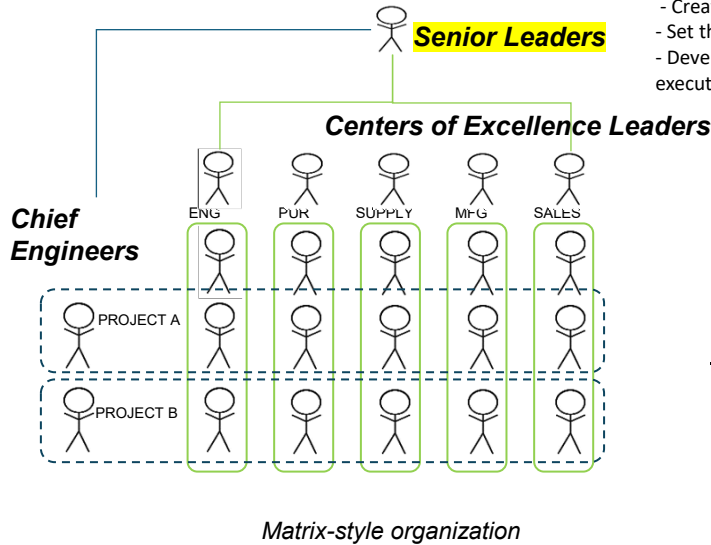
Matrix-style organization



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Matrix Organization – Senior Leadership



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Example:

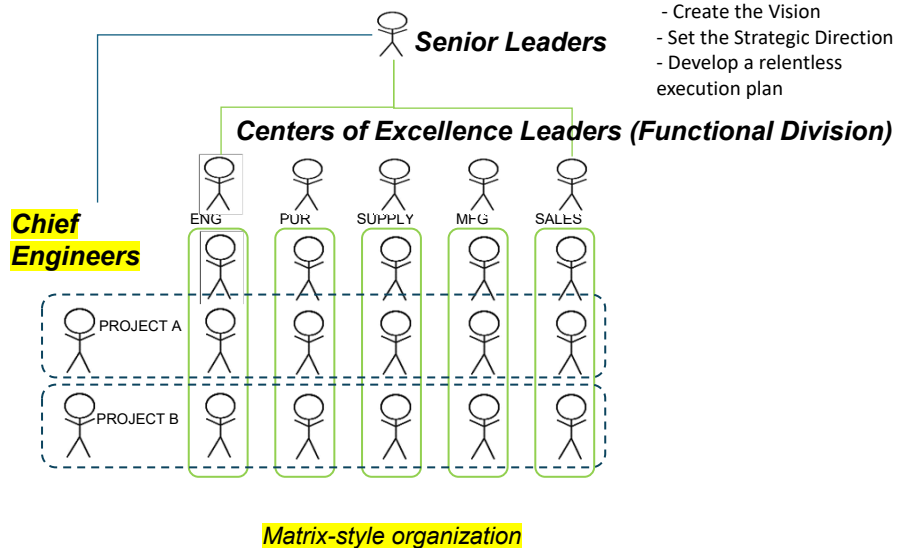
Level 1	Level 2	Level 3	Person ID	Control Num	Plan	Actual	Judge	Comment/Description
Company	Priority	Detail						
Make EV cars	Business Model						OK	
	Platform						OK	
Manufacture	Factory						OK	
	Supplier						OK	
Sell	Logistics						OK	
	Vehicle						OK	
Service	Charger						NO	
	Insurance						NO	

Business Plan →
Easy to understand
normal from
abnormal

Matrix Organization – Chief Engineer

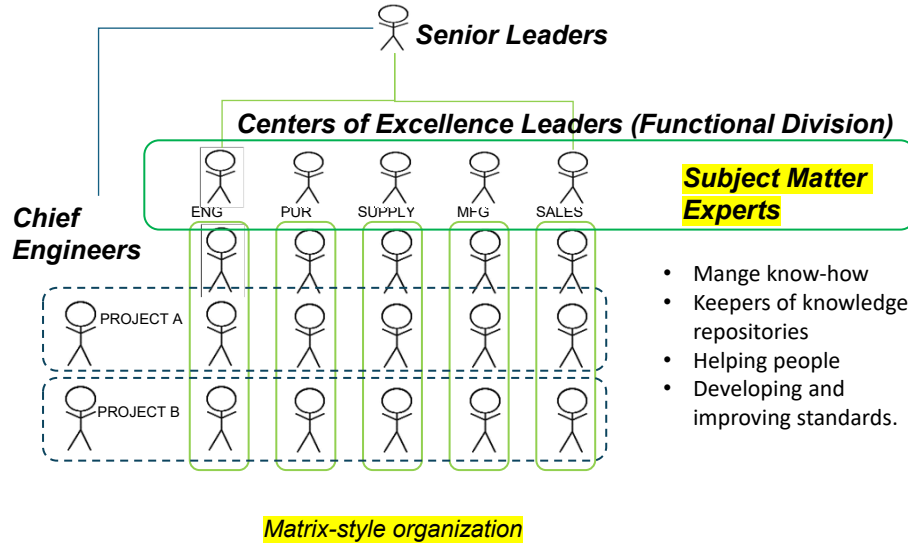
Chief Engineer:
- Total responsibility of development of a product line.

The **chief** engineer leads a small, dedicated team that creates the product concept, develops the business case, leads the technical design of the product, manages the development process, coordinates with production engineering and sales/marketing, and takes the product into production.

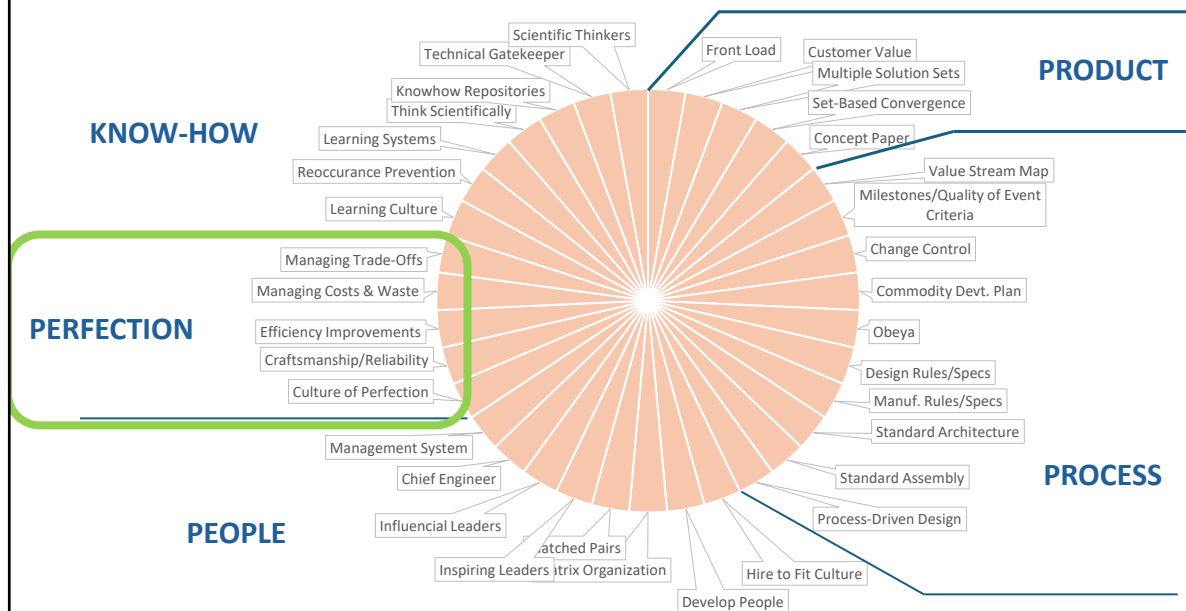


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Matrix Organization – Subject Matter Experts

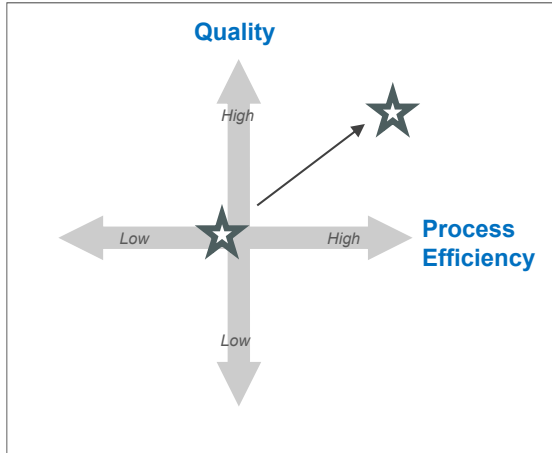


4PK ASSESSMENT: OPERATIONAL EXCELLENCE FRAMEWORK



Product Perfection

Positioning Maps:



- Analyze the gap
- Create the "HOW"

Data Analysis:

Customer loyalty is measure of achieving perfection

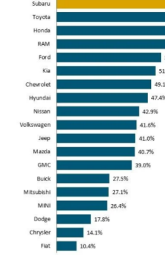
Loyalty-Inspiring Cars that Owners Keep for 15 Years or More
BY JUNE BLACKLEY

Rank	Vehicle	% 15+ Year-Old Cars Kept by Original Owners	Compared to Average
1	Toyota Prius	13.7%	2.2x
2	Toyota Highlander	12.4%	2.0x
3	Toyota Tacoma	11.6%	1.9x
4	Toyota Sienna	11.5%	1.9x
5	Toyota Tundra	11.3%	1.8x
6	Honda CR-V	10.7%	1.8x
7	Honda Pilot	10.4%	1.7x
8	Subaru Forester	9.8%	1.6x
9	Toyota 4Runner	9.4%	1.5x
10	Toyota Sequoia	9.1%	1.5x
	Overall Average	6.1%	-

iSeeCars.com

J.D. Power 2020 U.S. Automotive Brand Loyalty Study™

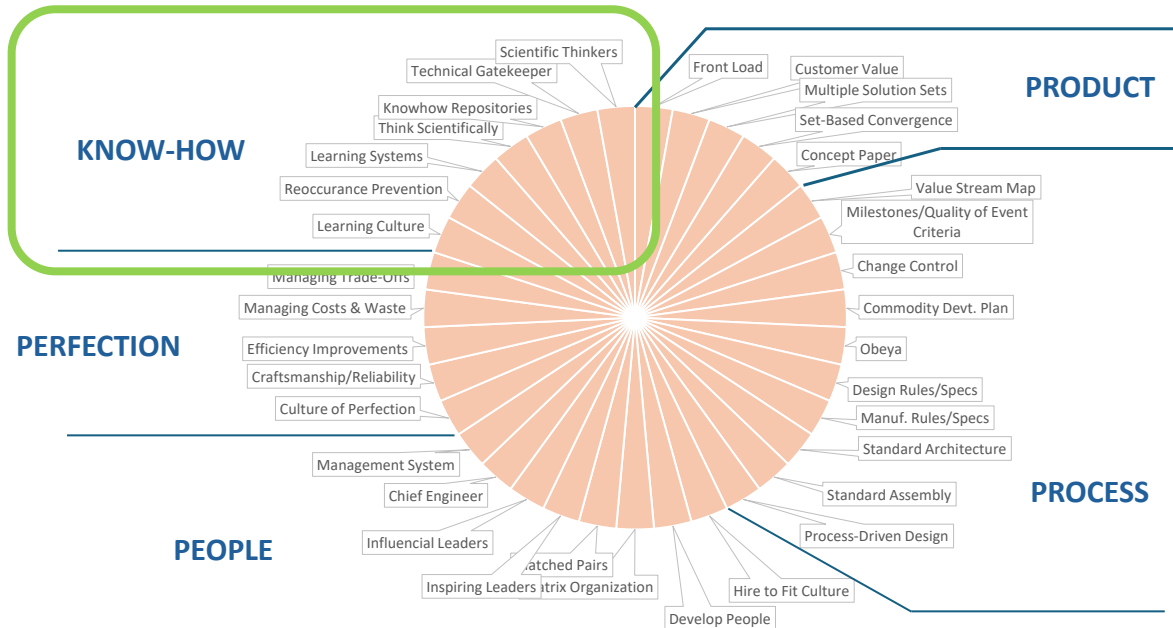
Mass Market Brand Ranking
(Loyalty Percentage)



Objective way to measure value to customer is overall loyalty

- Analyze the gaps
- Asses new target
- Create the "HOW"

4PK ASSESSMENT: OPERATIONAL EXCELLENCE FRAMEWORK



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Know-How Management

- ❖ Create a supportive culture for learning
- ❖ Develop people to think scientifically & systemically (PDCA)
- ❖ Dedicated role of Subject Matter Experts
- ❖ Build learning into the daily work ~ Obeya & Business plans

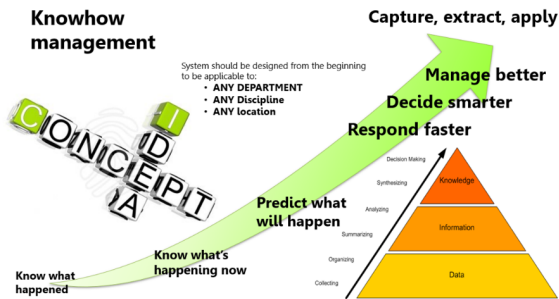
Know-How Management

Culture of learning:

Developing people to act scientifically – PDCA (2)

“Reflective” PDCA built into the daily work

Knowhow management



Total knowhow management uses “Reflective” PDCA to Capture, extract and apply lessons

- Using daily activities to learn with PDCA
- Standard protocol for Problem solving
- Obeya, Business plans and A3 tools for continual learning from problems

Subject Matter Experts:

Technical gatekeepers of the knowledge base (3)

Each area of the company needs to develop their own unique technical gatekeepers:



Technical Gatekeeper's knowhow becomes the company's unique competitive advantage

- Dedicated role and resp in the organization
- All data are reviewed by same person
- Responsibility is to constantly review and update standards according to latest information

Self-Assessment Handout

