Building A Better Supply Chain

-

A Systematic, Pragmatic, and Cross-functional Approach

April 25, 2024

ZFlow

Designed by

Cambrian Lab

ZFlow

Agenda

- Panelists
- Brief Intro
- Changes in Supply Chain Development Strategies
- Making it Systematic, Practical, and Cross-functional
- Demo
- Q&A

About Cambrian Lab

Mission: To Provide Practical and Effective Solutions for Supply Chain Excellence

Team

Supply Chain, New Product Introduction, and Technology Experts from SAP, Samsung, Siemens, GM, Ford, Applied Materials

Industries

Automotive, High-tech, Semiconductor Equipment, Medical Devices, Consumer Products
(**From Fortune 100 to Start-ups**)

Locations

SF Bay Area, Detroit, Boston, Houston

Expertise

- New Product Development/Introduction, Supplier Development and Quality Management
- Enterprise and Supply Chain Technology (ERP, SCM, Manufacturing, CRM, Sourcing, Finance)

Panelists

Kris Gorrepati
Product Management

Cambrian Lab

Manish Mathur
VP of Engineering

Cambrian Lab

Our Work with Different Industry Customers

Embedded Systems, Memory and HPC Computing Systems Manufacturer

Product Engineering, Component Engineering, Sustaining Engineering

Global Industrial Manufacturer

New Product Introduction, Supplier Quality

Tier 1 Global Automotive Supplier

Product Release, PPAP, Design Quality..

Global Network Equipment Manufacturer

Supplier Development and Collaboration

Global CPG Company

Supplier Collaboration Portal

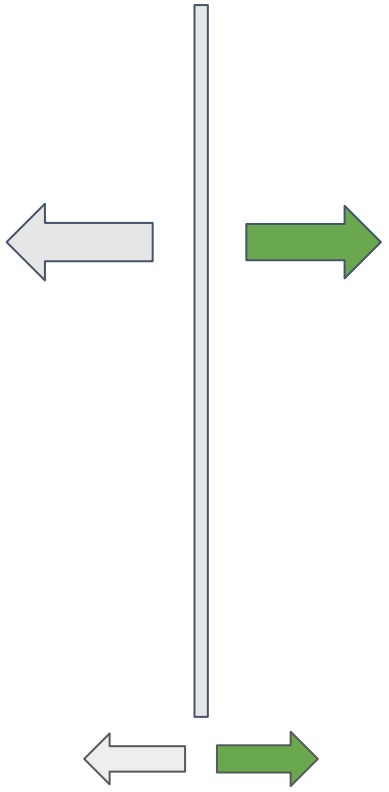
Building A Better Supply Chain

Focus on cost

Supplier consolidation

Global Supply Chain with long lead times

Transactional relationships



Holistic performance and resilience

More Suppliers and Multisourcing

Optimal combination of global and local supply chains

Mutually beneficial long term relationships

Not Effective

Effective

Building A Better Supply Chain Requires Extra Effort

ZFlow

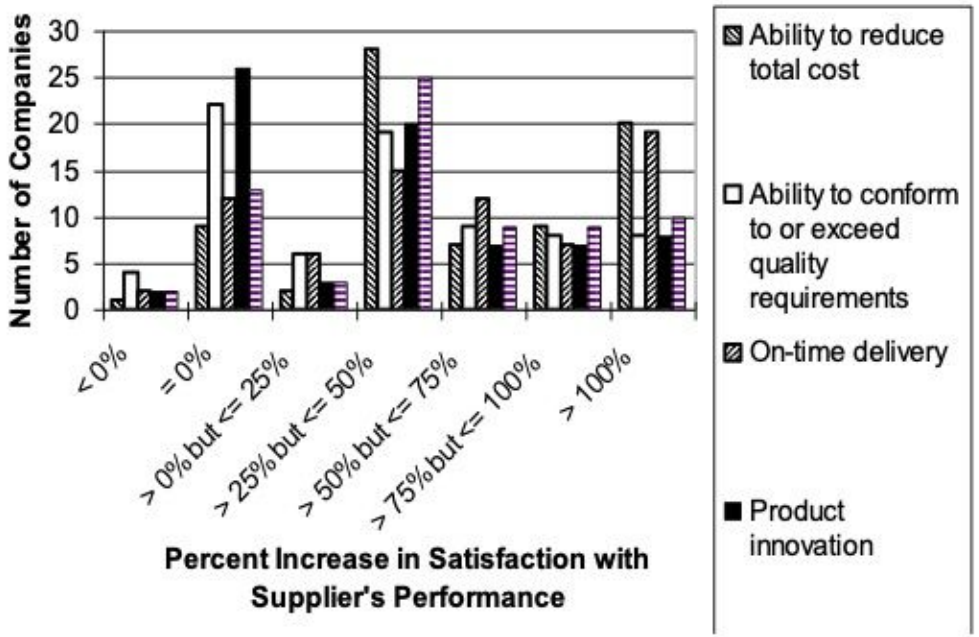
The Business Case For Extra Effort Is Compelling

Figure 2 - Supplier Development Results

Krause, 1997, Survey of 527 firms
Respondents: NAPM members

Criteria	Before Supplier Development	After Supplier Development
Incoming defects	11.65 %	5.45 %
% on-time delivery	79.85 %	91.02 %
Cycle time (from order placement to receipt)	35.74 days	23.44 days
% orders received complete	85.47 %	93.33 %

Figure 3 - Satisfaction



Source: Executive report of key results of recent research on supplier development strategies and outcomes – Dr. Robert Handfield

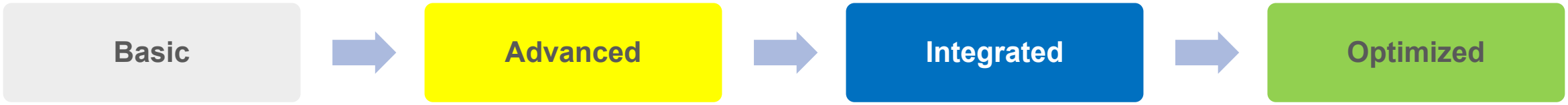
Your Company is Only as Good as the Least Proficient Supplier

Beyond that were the problems that a Boeing engineer, L. J. Hart-Smith, had foreseen in a prescient white paper that he presented at a 2001 Boeing technical symposium. With outsourcing came the possibility that parts wouldn't fit together correctly on arrival. "In order to minimize these potential problems," Hart-Smith warned, "it is necessary for the prime contractor to provide on-site quality, supplier-management, and sometimes technical support. If this is not done, the performance of the prime manufacturer can never exceed the capabilities of the *least* proficient of the suppliers."

Boeing is in talks to buy back fuselage maker Spirit AeroSystems after spate of quality defects

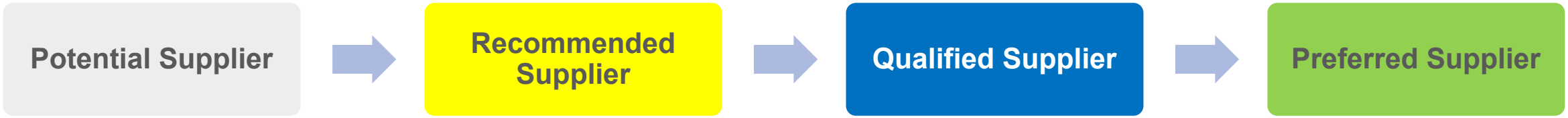
Focus of Building A Better Supply Chain is Improvement

Supplier Capability



Supplier Performance

Supplier Relationship



ZFlow

Not Required for Every Supplier

Strategic

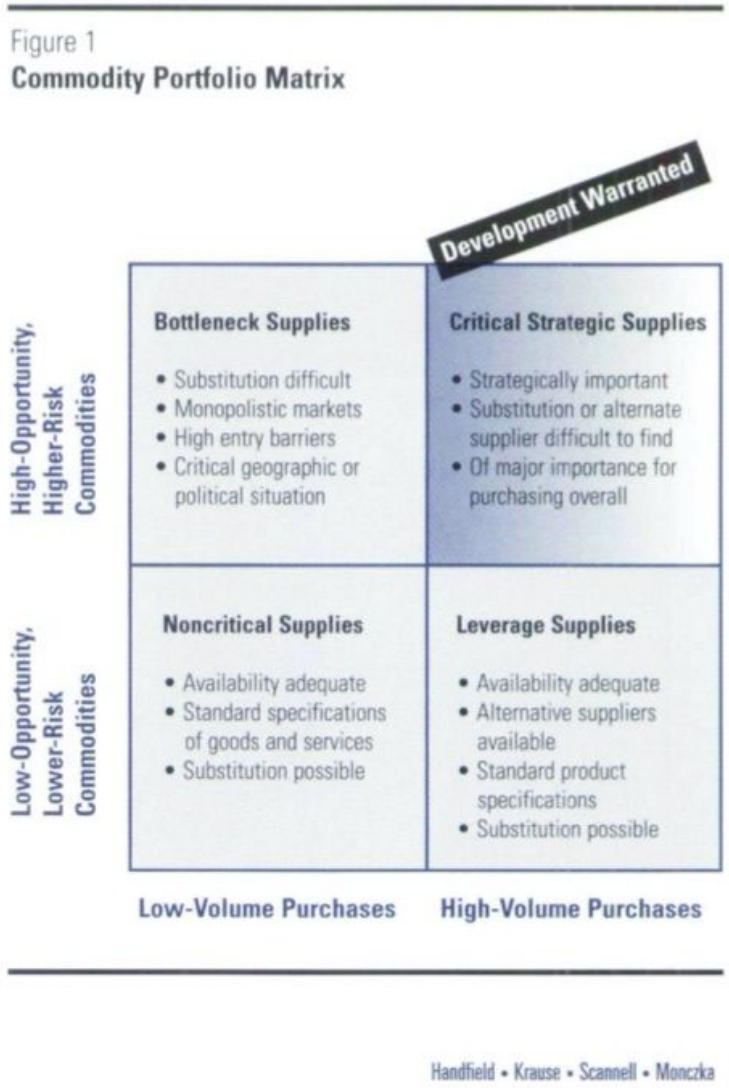
- Right supplier is key to program/company success
- High Value
- Complex Specifications
- Quality and timeliness are essential
- Cross-functional collaboration needed

Non-strategic

- Not essential for program/company success
- Specifications are not complex
- Supplier selection is simpler

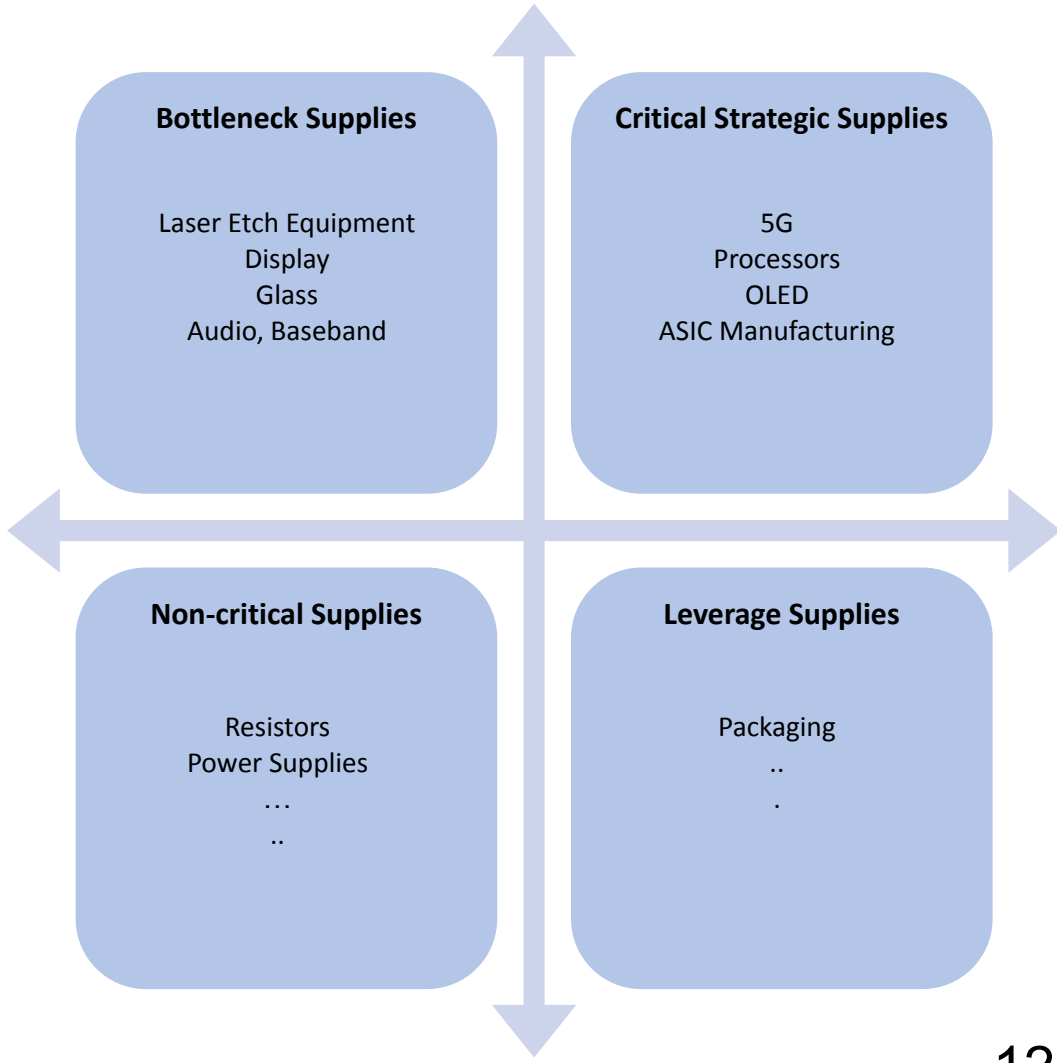
Routine

- Low value and standard goods
- Specified good and agreed price
- Streamline ordering and payment procedure
- Use of E-Commerce

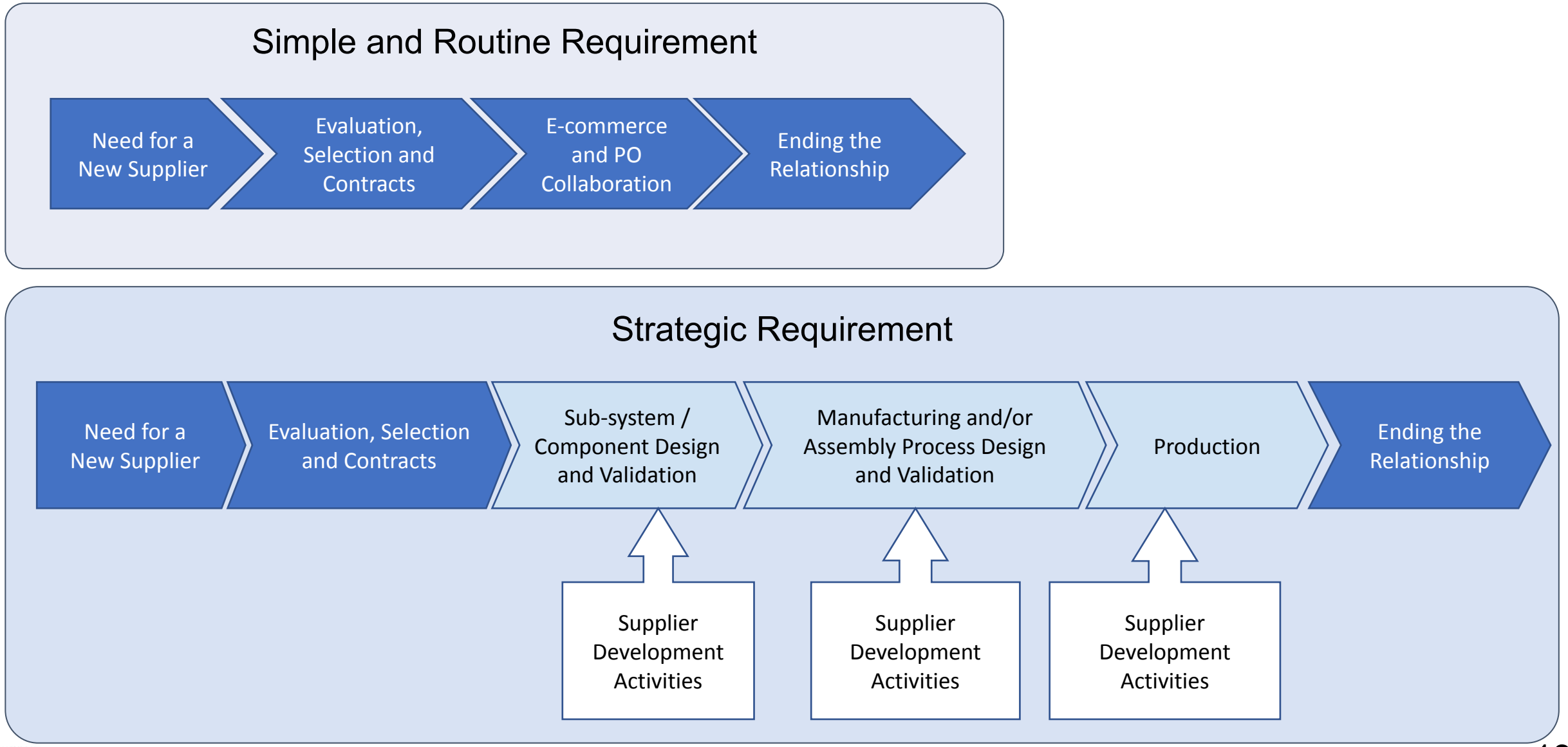


Fictitious, but Illustrative Example

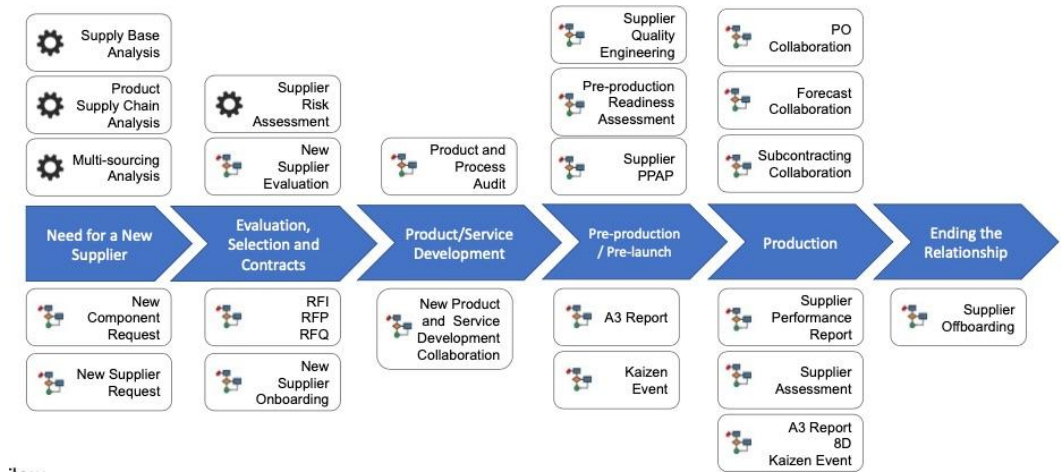
Strategic	• Taiwan Semiconductor (ASIC Manufacturing) • Qualcomm (5G chips) • Foxconn (Assembly and Test) • Samsung, LG Display (OLED Display) • Corning..(Gorilla Glass)
Non-strategic	• TI, Skyworks, Broadcom…. • Pegatron, ON Semiconductor, Renasas, Micron.. • Jabil..
Routine	• Amphenol, Diodes….



Different Levels of Engagement for Different Requirements



Usually not a Systematic Process nor Supported Well



Companies struggle to support Supplier Development

Effect

Poor Supply Chain Performance

Lack of Supply Chain Readiness

Supply Chain Disruption

New Product Launch Delays

Poor Product and Service Quality

High Warranty Cost

Uniformly bad consequences

Root cause

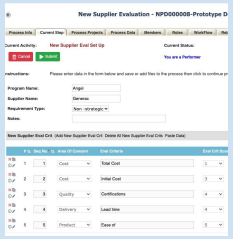
- Absence of systematic approach, supporting workflows and information
- Requires inordinate amount coordination and complex handoffs
- No cross-functional organizational support
- Information gaps and lack of support for effective and integrated techniques

Supplier Development is poorly supported

ZFlow

Needs to be Systematic, Pragmatic and Cross-functional

Evaluation, Audit and Performance Assessment



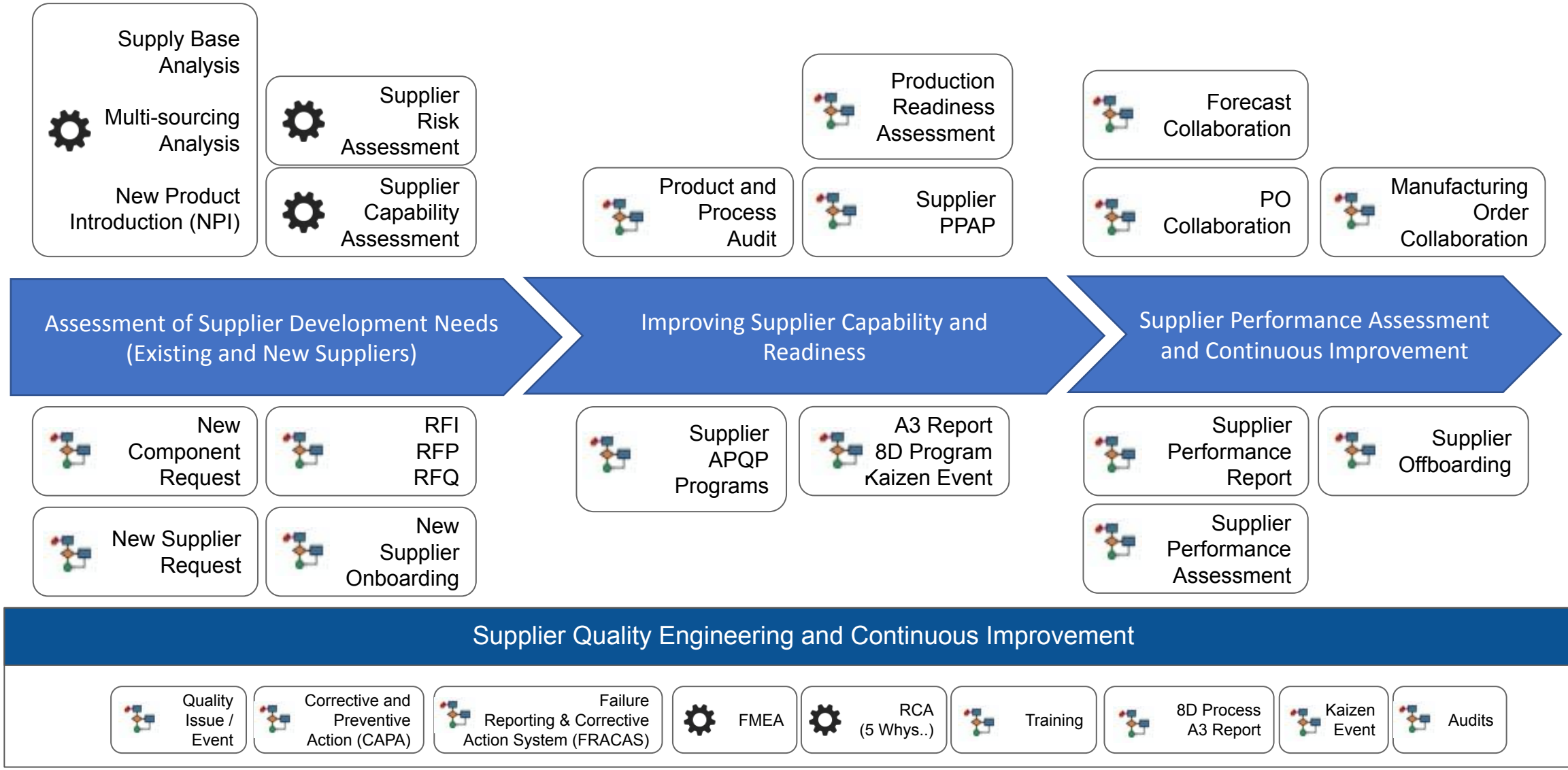
Capability	Area	Performance Criteria	Question	Program	Weighting Factor	Score	WDOS
Quality	Yield	Yield during startup	How long did it take to hit the target yield	ModelZ	0.00000	8	0
				ModelY	0.00000	9	0
				ModelX	0.00000	9	0
	Defects	Number of Defects	Number of observed defects	ModelZ	0.00000	9	0
				ModelY	0.00000	8	0
				ModelX	0.00000	8	0
Product Technology	Hardware	Fit and Finish	Panel gaps	ModelZ	0.00000	7	0
				ModelY	0.00000	7	0
				ModelX	0.00000	5	0
Process Technology	Process Stability	Throughput	How long did it take to hit the target	ModelZ	0.00000	5	0
				ModelY	0.00000	5	0
				ModelX	0.00000	3	0
Cost	Initial Cost	Initial Cost	What is the initial cost	ModelZ	0.00000	6	0
				ModelY	0.00000	7	0
				ModelX	0.00000	7	0

At Risk → **Needs Improvement** → **Meets Requirement** → **Consistently Exceeds Expectations** → **Sets the Standard**

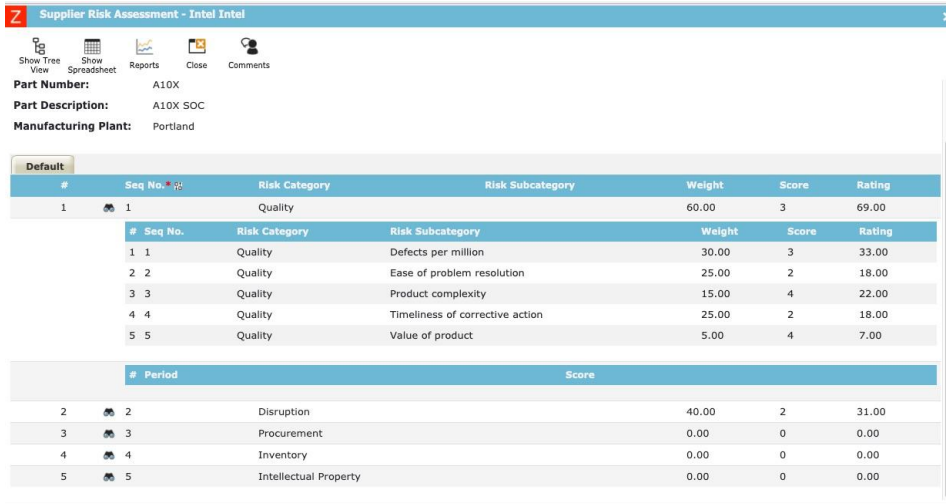
Supplier Development Activities

- Training
- Investment
- Engineering Support
- Supplier Quality Engineering
- Corrective Actions
- 8D / A3 Report / Kaizen Event
- Recognition and Reward

Incorporated Into Supplier Lifecycle Management



Existing Supply Base, New Product Introduction (NPI) Sourcing and Multi-sourcing Assessments



Supplier Risk Assessment - Intel Intel

Show Tree View | Show Spreadsheet | Reports | Close | Comments

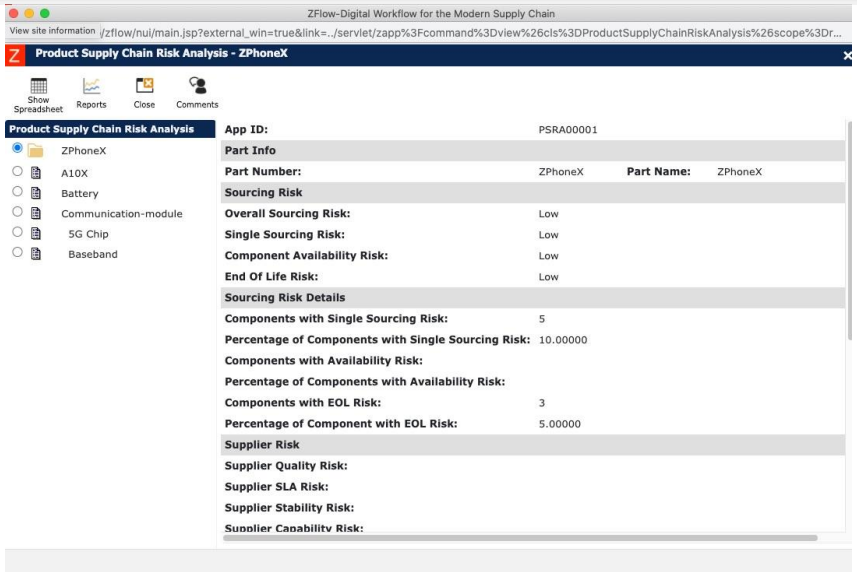
Part Number: A10X
Part Description: A10X SOC
Manufacturing Plant: Portland

Default

#	Seq No.	Risk Category	Risk Subcategory	Weight	Score	Rating
1	1	Quality		60.00	3	69.00

#	Seq No.	Risk Category	Risk Subcategory	Weight	Score	Rating
1	1	Quality	Defects per million	30.00	3	33.00
2	2	Quality	Ease of problem resolution	25.00	2	18.00
3	3	Quality	Product complexity	15.00	4	22.00
4	4	Quality	Timeliness of corrective action	25.00	2	18.00
5	5	Quality	Value of product	5.00	4	7.00

#	Period	Score
2	Disruption	40.00	2	31.00
3	Procurement	0.00	0	0.00
4	Inventory	0.00	0	0.00
5	Intellectual Property	0.00	0	0.00



ZFlow-Digital Workflow for the Modern Supply Chain

Product Supply Chain Risk Analysis - ZPhoneX

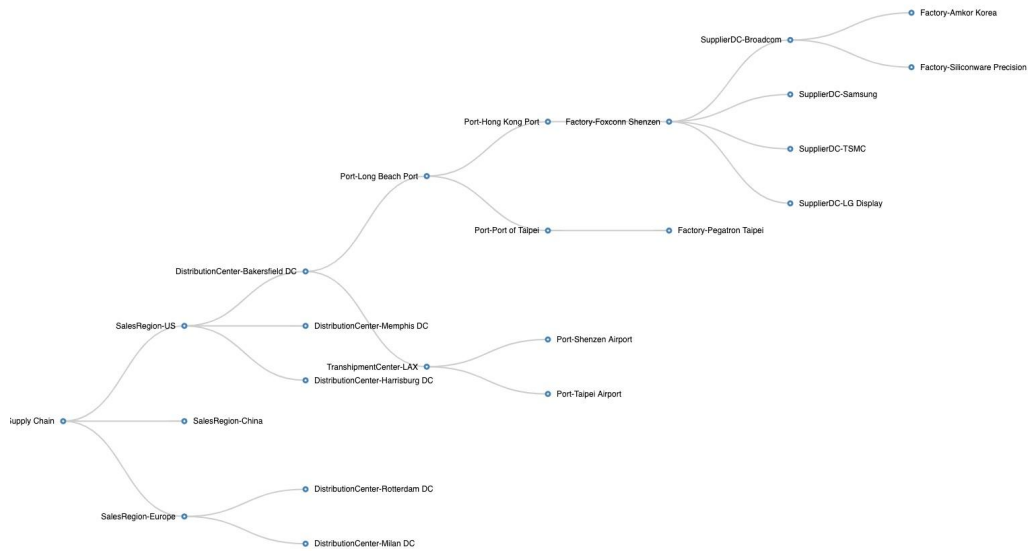
Show Spreadsheet | Reports | Close | Comments

Product Supply Chain Risk Analysis

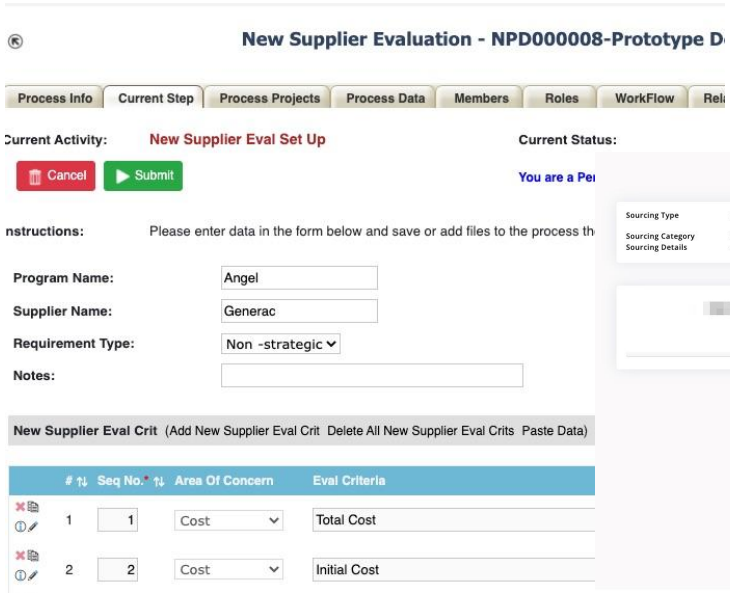
- ZPhoneX
- A10X
- Battery
- Communication-module
- 5G Chip
- Baseband

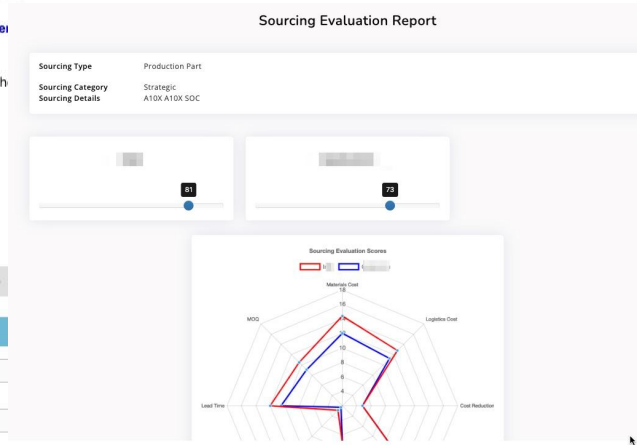
App ID:	PSRA00001
Part Info	
Part Number:	ZPhoneX **Part Name:** ZPhoneX
Sourcing Risk	
Overall Sourcing Risk:	Low
Single Sourcing Risk:	Low
Component Availability Risk:	Low
End Of Life Risk:	Low
Sourcing Risk Details	
Components with Single Sourcing Risk:	5
Percentage of Components with Single Sourcing Risk:	10.00000
Components with Availability Risk:	
Percentage of Components with Availability Risk:	
Components with EOL Risk:	3
Percentage of Component with EOL Risk:	5.00000
Supplier Risk	
Supplier Quality Risk:	
Supplier SLA Risk:	
Supplier Stability Risk:	
Supplier Capability Risk:	

Part Number	Source	Supplier Name	Supplier Relationship Status	Supplier Maturity Level
ZPhoneX	ExternalManufacturing			
User Interface	ExternalSource			
Cameras	ExternalSource	LG Innotek	Preferred	Integrated
Mechanical	ExternalManufacturing			
A10X	ExternalSource	Intel	Preferred	
Memory	ExternalManufacturing	Micron	Preferred	Integrated
Power Management	ExternalSource			
Communications-module	ExternalManufacturing			
Display	ExternalSource	Huizhou Desay	Qualified	
Glue Logic	InternalSource			
Electromechanicals	ExternalSource			
Battery	ExternalSource	Honcell	Qualified	Basic
Box Contents	ExternalManufacturing			
Cameras	ExternalSource			
Camera-Lens	ExternalSource	Yujingguang Kantatsu Largan	Qualified Qualified Qualified	Basic Advanced Advanced
Communications-module	ExternalManufacturing			
GN-Receiver	Procured	Qorvo	Qualified	
Baseband	Procured	Skyworks Broadcom	Preferred Preferred	
BT-WLAN-Module	Procured	Broadcom	Preferred	
BT-GNSS-Frontend	ExternalSource	Broadcom	Preferred	
RF Frontend	Procured	Analog	Active	Advanced
RF Transceiver	Procured	Qualcomm	Qualified	
RF Frontend	Procured			
Envelope Tracking IC	Procured	Texas Instruments	Preferred	Integrated



Evaluating and Selecting Suppliers for the Need



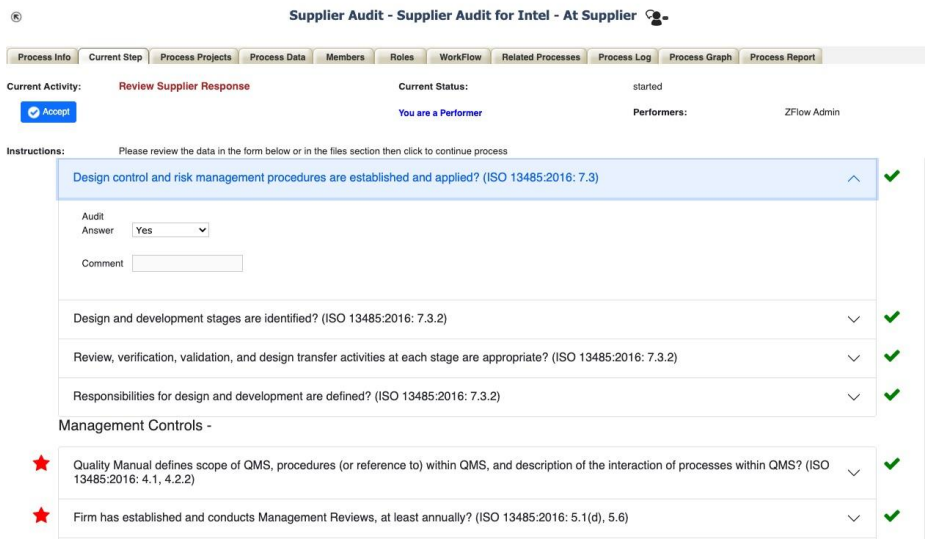


Criterion	Buyer's weighting 1=low, 2=medium, 4=high	Degree of fulfillment 1=low, 2=medium, 4=high	
		supplier A	supplier B
Product technology	4	2	4
Process technology	2	4	2
Acquisition and additional costs	2	2	1
Delivery and payment terms	1	2	4
Service level and delivery reliability	4	2	4
Short lead times in flow of goods	2	4	2
Capability for custom production	1	4	2
Capability for joint R&D	2	2	4
Financial stability	4	4	2
Importance of buyer rather low	2	4	1
International support	2	4	2
Total score (number of points)	Max. = 104 (= 26·4)	78	70
100% minus gap	Max. = 100%	75%	67%

Assessment and Audits for Evaluating Supplier Capability and Selecting Suppliers

IATF, VDA, ISO 13485..

Supplier Research → Supplier Self Assessment → Product and Process Audit



P2	Project management
2.1	Is the project organisation (project management) established and are tasks & authorities specified for the team leader and team members?
2.2*	Are the resources required for the project development planned and available and are all changes displayed?
2.3	Is there a project plan and has this been agreed with the customer?
2.4	Is change management in the project ensured by the project organisation ?
2.5*	Are the responsible personnel within the organisation and in the customer's company involved in the change control system ?
2.6	Is there a QM plan for the project ? is this implemented and monitored regularly for compliance ?
2.7*	Is there an established escalation process and is this implemented effectively ?

P3	Planning the product and process development
3.1	Are the product and process-specific requirements laid down ?
3.2*	Has manufacturing feasibility been assessed in a cross-functional manner, based on the requirements which have been determined for product & process'
3.3	Are there plans for the product and process development ?
3.4	Have the necessary resources been taken into account for the product and process development ?
3.5	Is QM planning arranged for sourcing bought-in products and services ?

Different Assessment Techniques at Different Stages

Need for a New Supplier → Evaluation, Selection and Contracts → Product Design and Validation → Process Development and Validation → Production → Ending the Relationship

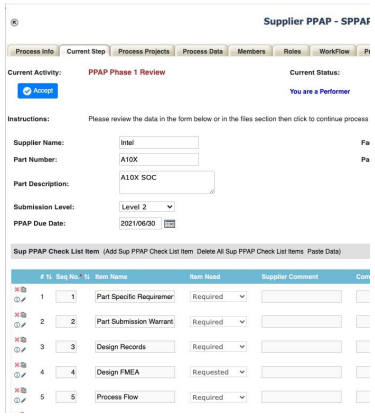
Potential Supplier Assessment

Preliminary Product and Process Audit

Production Readiness Assessment (PPAP.)

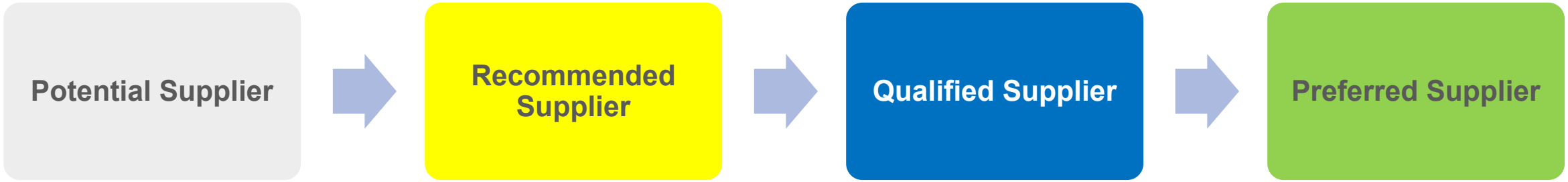
Production Assessment

Process Audits, Performance Monitoring and Assessment



Supplier Quality Engineering

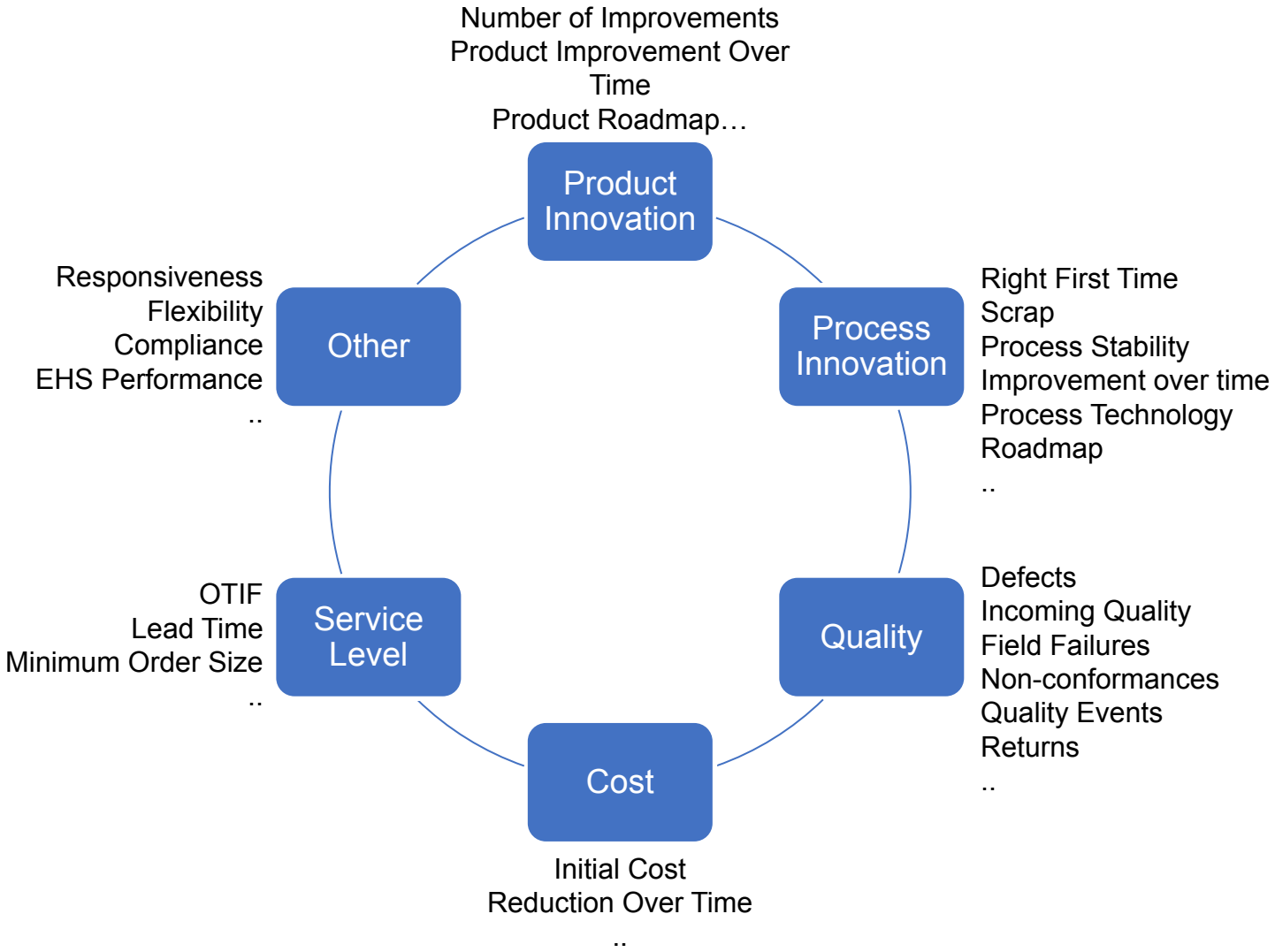
Key Aspect of Supplier Development

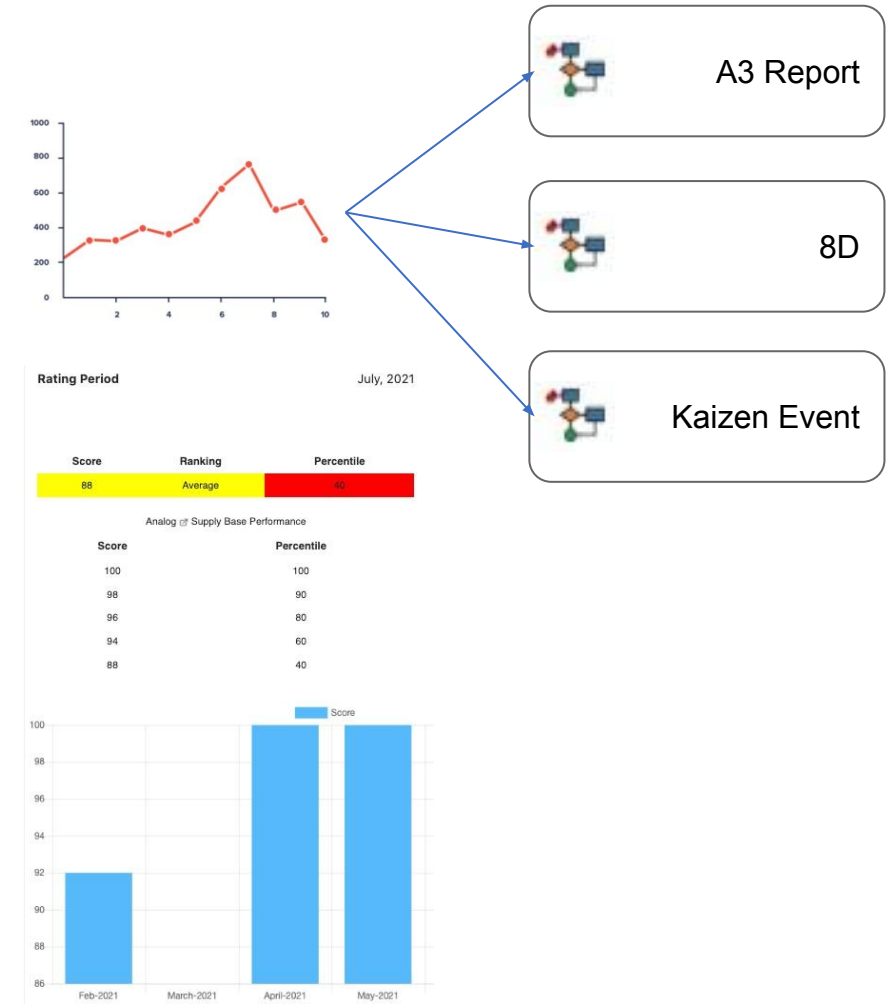


- Quality Management System Training
- Product and Process Audits
- Post-audit Corrective and Preventive Actions
- Statistical Process Control
- Gemba walks

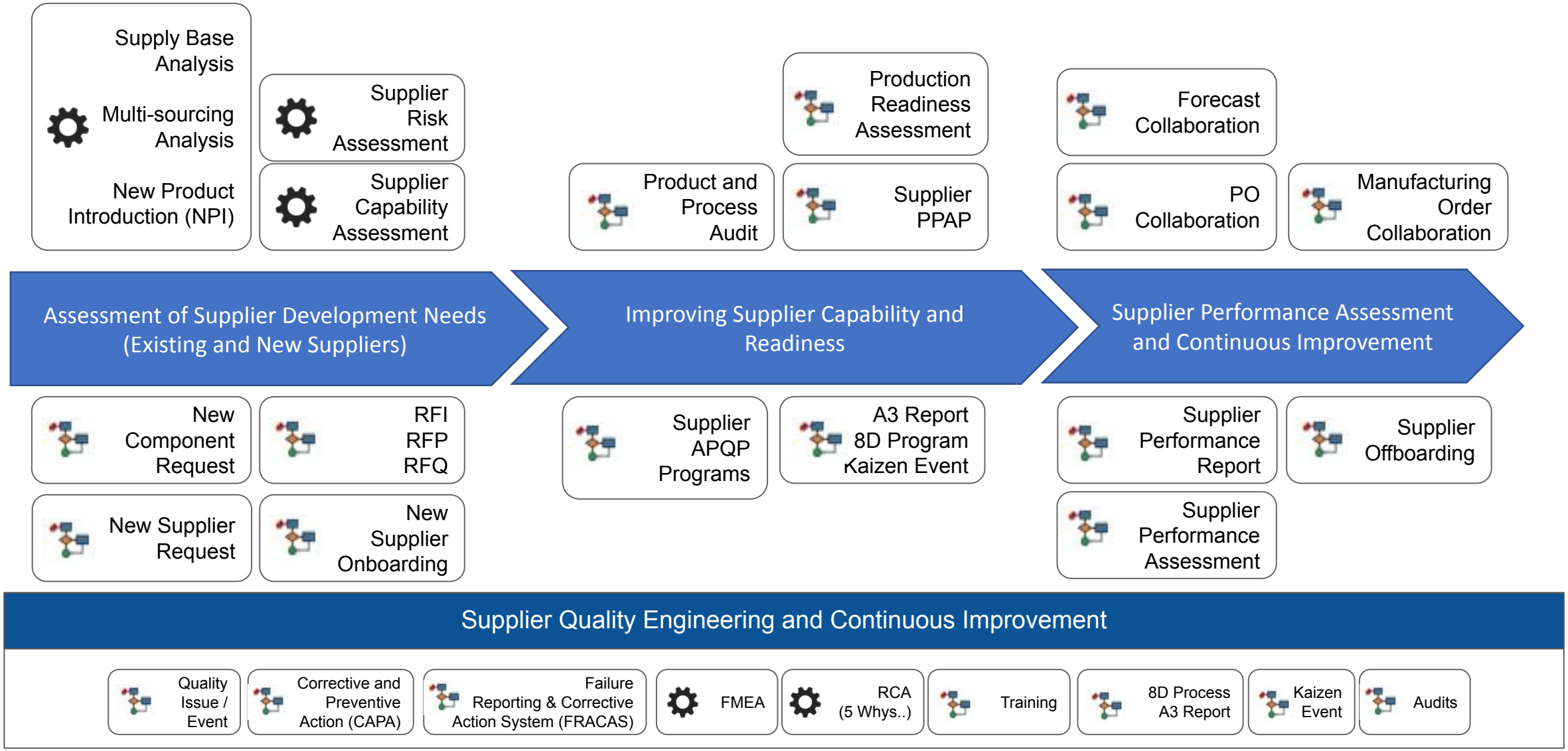
- Quality certifications
- Part and process specific qualification and training
- Advanced Product Quality Planning (APQP)
- Production Part Approval Process (PPAP)
- Continuous Improvement Projects (A3, 8D..)
- Failure Reporting and Analysis
- Corrective and Preventive Action System

Supplier Performance Reporting and Assessment

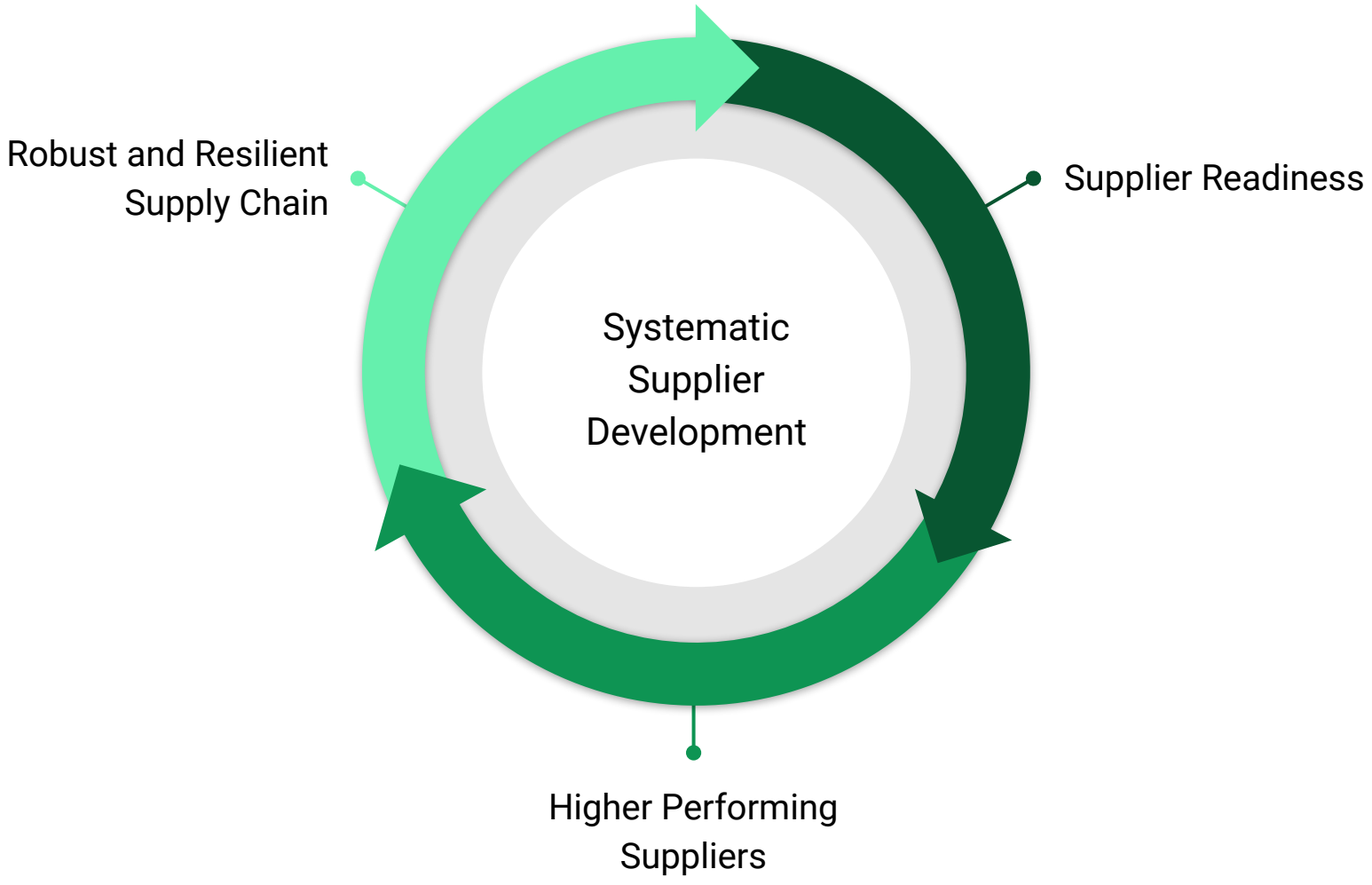




Demo


Supply Base Analysis
Multi-sourcing Analysis
New Product Introduction (NPI)
Supplier Risk Assessment
Supplier Capability Assessment
Production Readiness Assessment
Product and Process Audit
Supplier PPAP
Forecast Collaboration
PO Collaboration
Manufacturing Order Collaboration
Assessment of Supplier Development Needs (Existing and New Suppliers)
Improving Supplier Capability and Readiness
Supplier Performance Assessment and Continuous Improvement
New Component Request
RFI RFP RFQ
New Supplier Request
New Supplier Onboarding
Supplier APQP Programs
A3 Report 8D Program Kaizen Event
Supplier Performance Report
Supplier Offboarding
Supplier Performance Assessment
Supplier Quality Engineering and Continuous Improvement
Quality Issue / Event
Corrective and Preventive Action (CAPA)
Failure Reporting & Corrective Action System (FRACAS)
FMEA
RCA (5 Whys..)
Training
8D Process A3 Report
Kaizen Event
Audits

3 Reasons for Systematic Approach to “Building A Better Supply Chain”



About ZFlow - Used in the Demo

Digital Workflow for the Modern Supply Chain

Systematic approach to Building A Better Supply Chain

Out-of-the-box Integration to ERP, Sourcing, PLM, Supply Chain systems

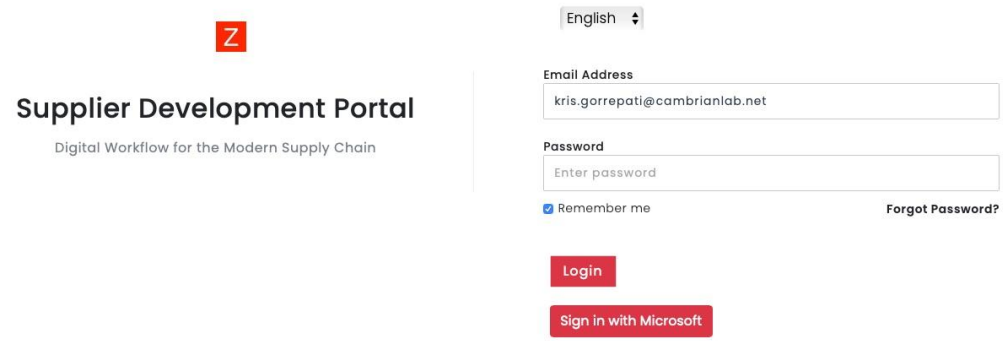
Zero-code

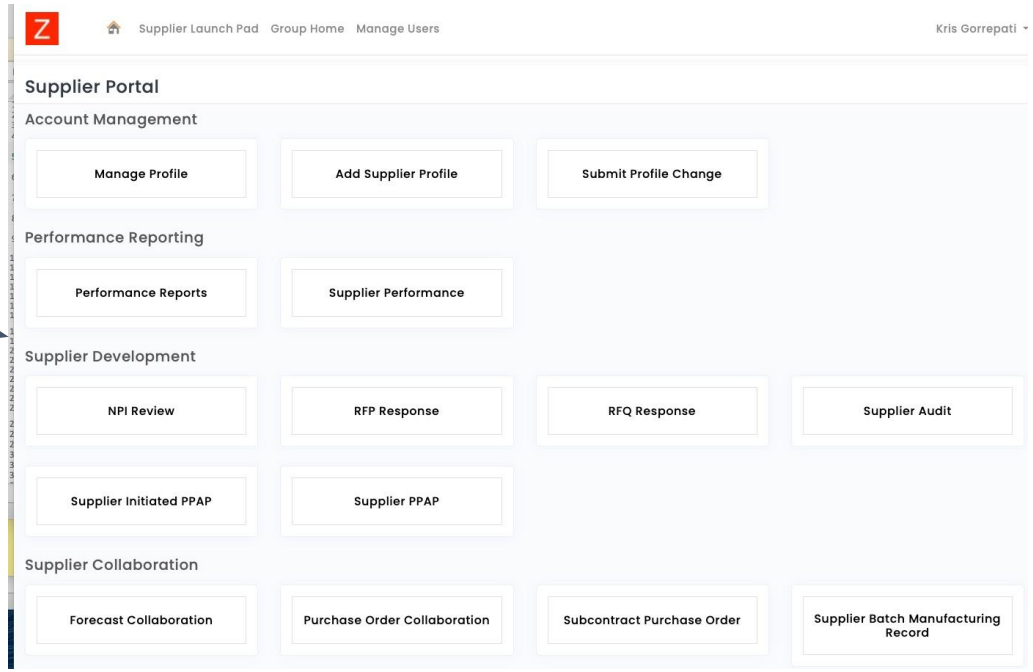
Cross-functional - Involves Right People at the Right Time

Supply Chain Ready

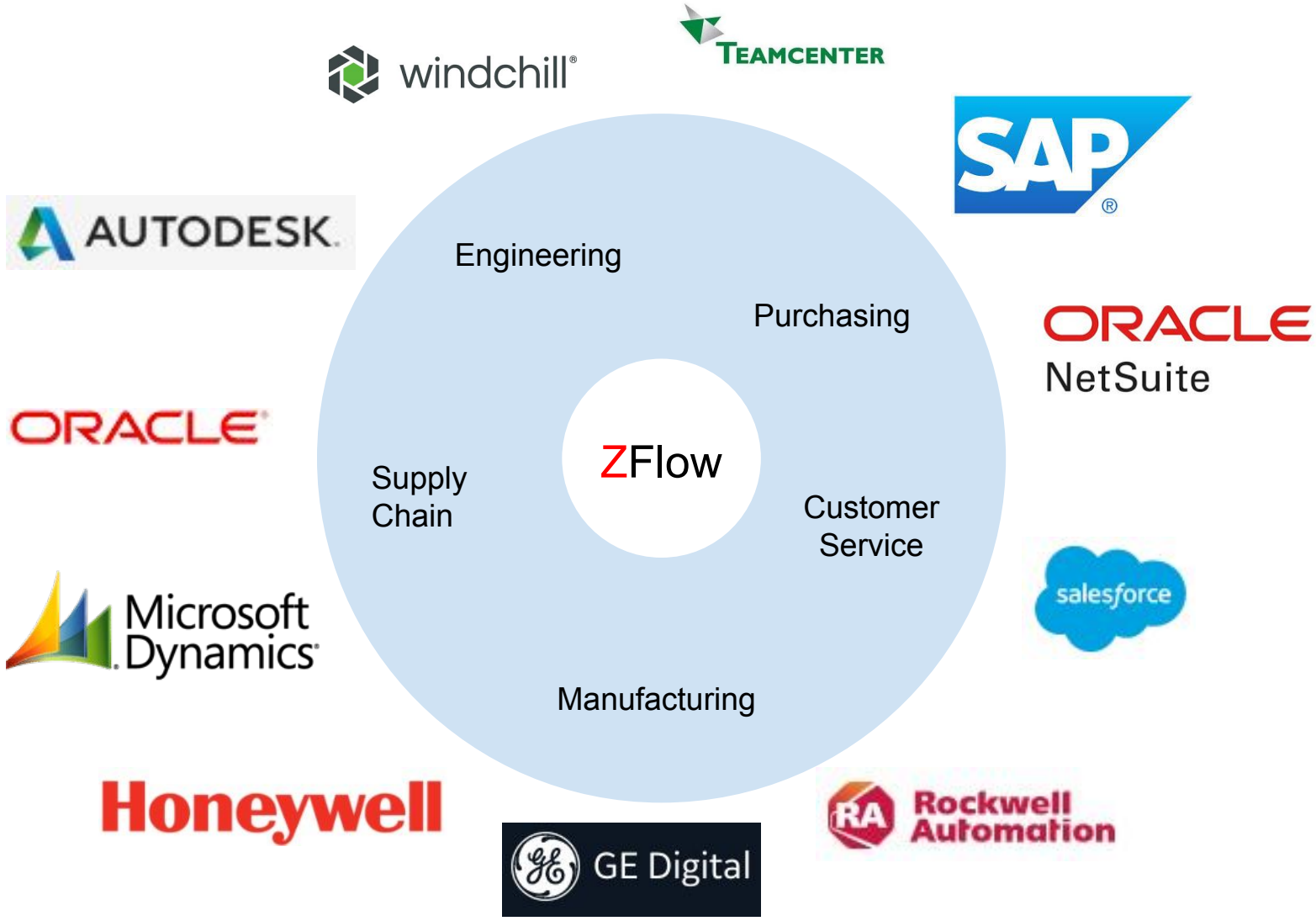
Integrated and effective assessments

Easy and Secure Cross-functional Engagement with Existing and Prospective Suppliers





Rich Capabilities for Integrating to ERP, Design, Manufacturing and Supply Chain Applications



Summary

- ZFlow supports a Systematic Approach for Building A Better Supply Chain
- Easy to adopt Internally as well as with the Supply Chain
- Easy to get started

Test Drive ZFlow

Free Pilot

More at

https://www.zflow.io