

# Supplier Development

-

*The Practical Path To A Better Supply Chain*

Kris Gorrepati and Hiren Shah  
**Cambrian Lab**

# Agenda

- About Cambrian Lab
- Supplier Development - More Important That Ever
- Supplier Development Progression and Elements
- Demo
- Q&A
- Getting Started

# About Cambrian Lab

**Mission:** To Provide Effective and Practical Solutions for New Product and Supply Chain Development

## Team

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

## Expertise

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

## Industries

Automotive, High-tech, Semiconductor Equipment, Medical Devices, Consumer Products



## Locations

SF Bay Area, Detroit, Boston, Houston

## Offerings

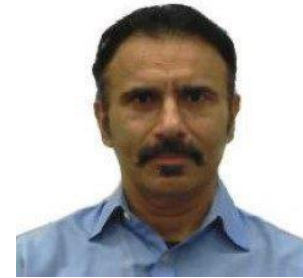
**ZFlow** – Digital Workflow for the Modern Supply Chain

# Panelists



Kris Gorrepati

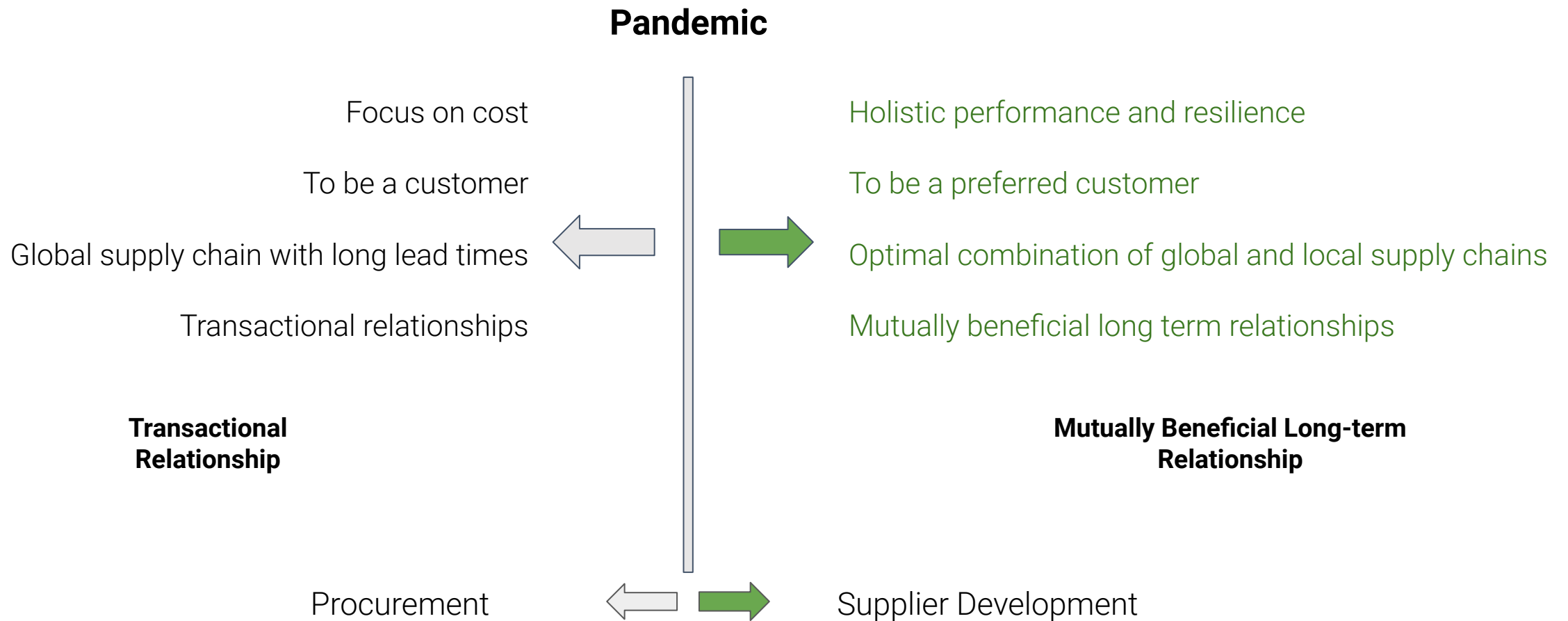
- 20+ years experience in New Product Development and Introduction and Supply Chain Manufacturing
- SAP, Samsung, Ford, Caterpillar
- Auto, High-tech, Software
- Michigan Tech (Mech Engg.), UCLA



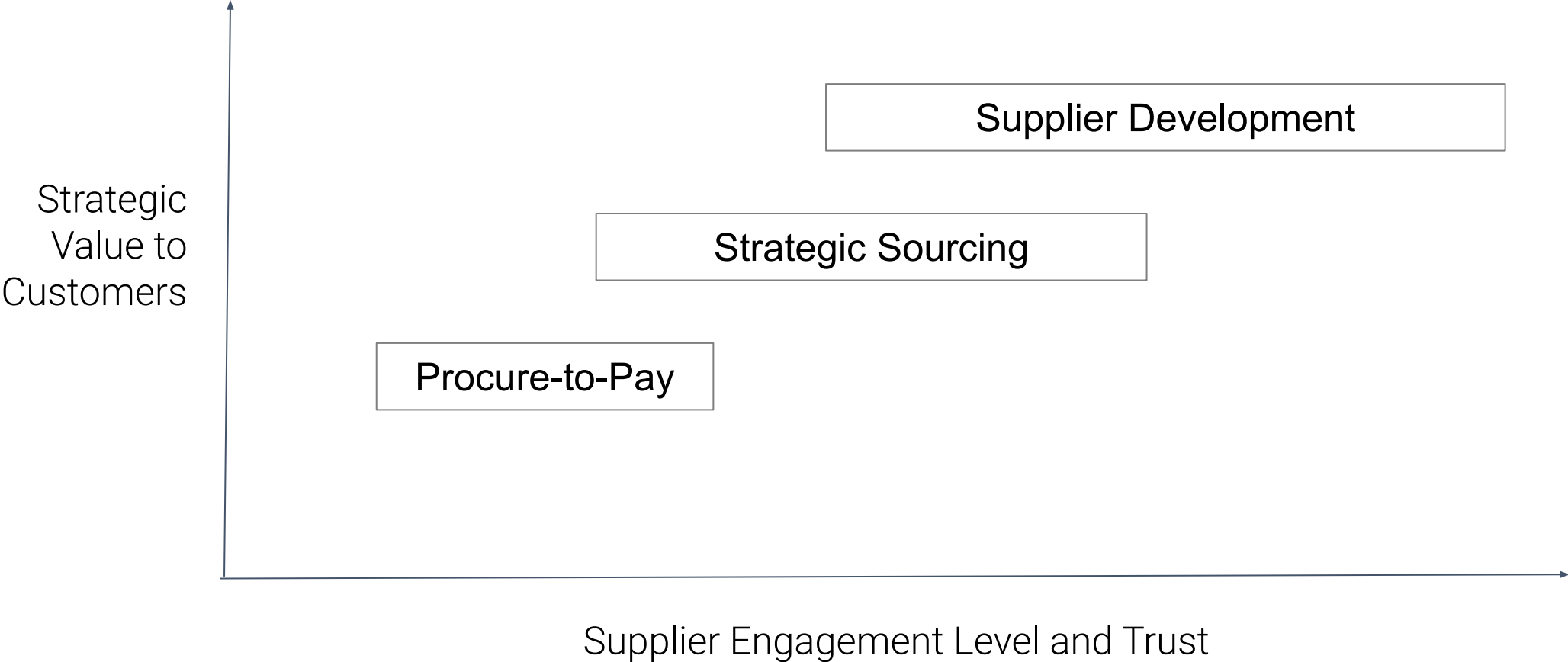
Hiren Shah

- 20+ years experience in ERP, CRM, Finance, Manufacturing
- SAP, Ford, Samsung..
- Auto, High-tech, Software
- Michigan Tech (Elec Engg.), University of Chicago

# Pre and Post Pandemic Supply Chains



# Strategic Value of Supplier Development



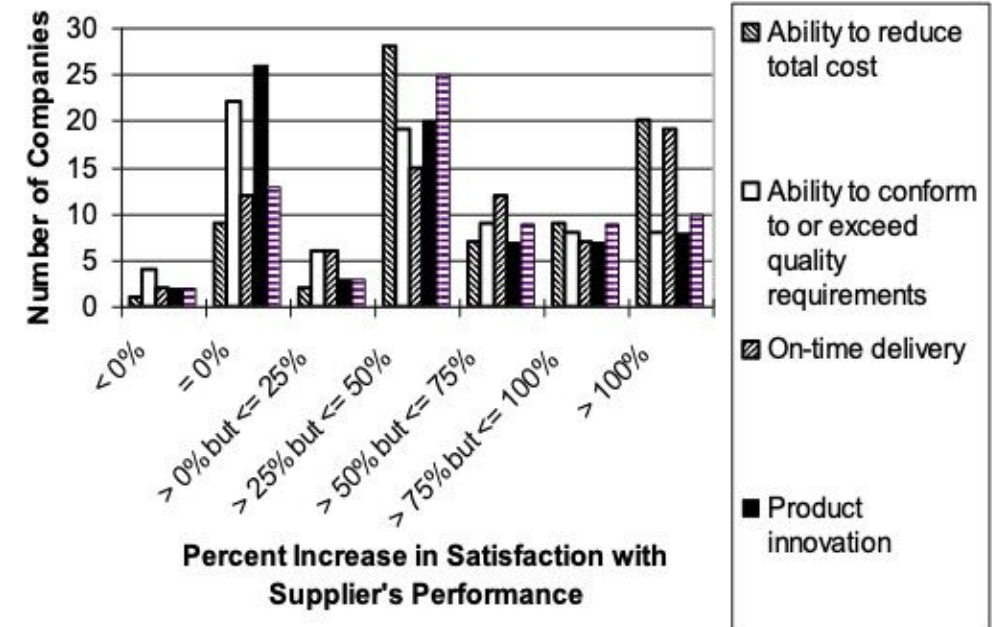
# The Business Case for Supplier Development

Figure 2 - Supplier Development Results

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

| <i>Criteria</i>                              | 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 %                    |

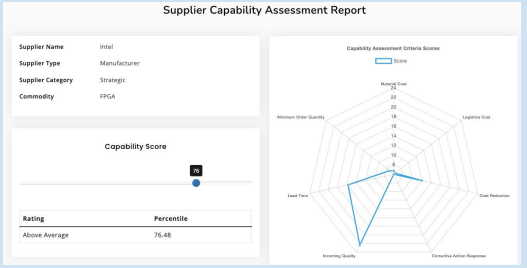
Figure 3 - Satisfaction



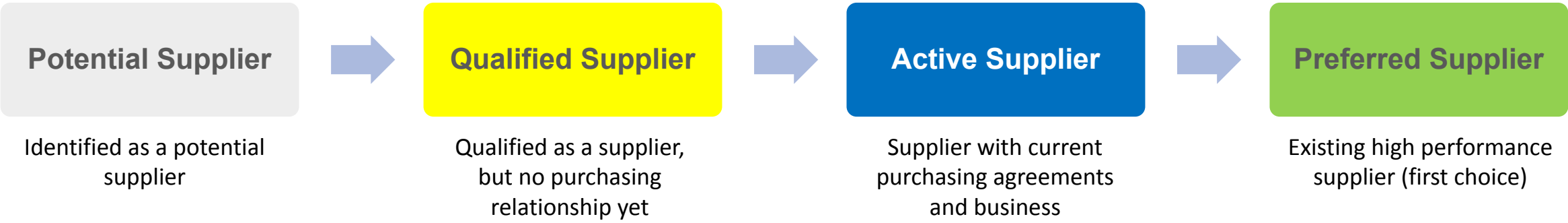
Source: Executive report of key results of recent research on supplier development strategies and outcomes – Dr. Robert Handfield

# Supplier Development Progression

## Evaluation, Audit and Performance Assessment

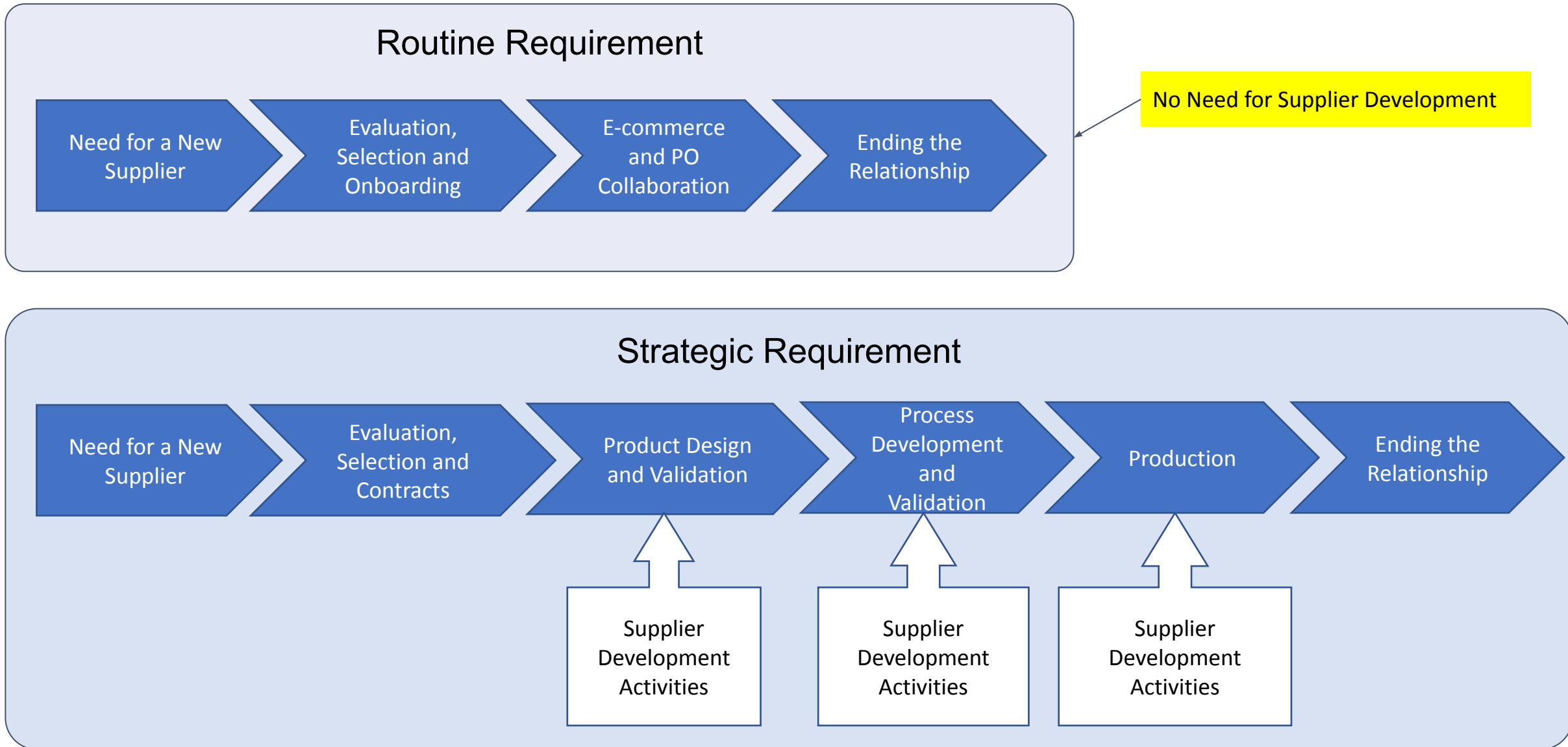


| Capability         | Area              | Performance Criteria | Question                                     | Program | Weighting Factor | Score | WOCS |
|--------------------|-------------------|----------------------|--|---------|------------------|-------|------|
| Quality            | Yield  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



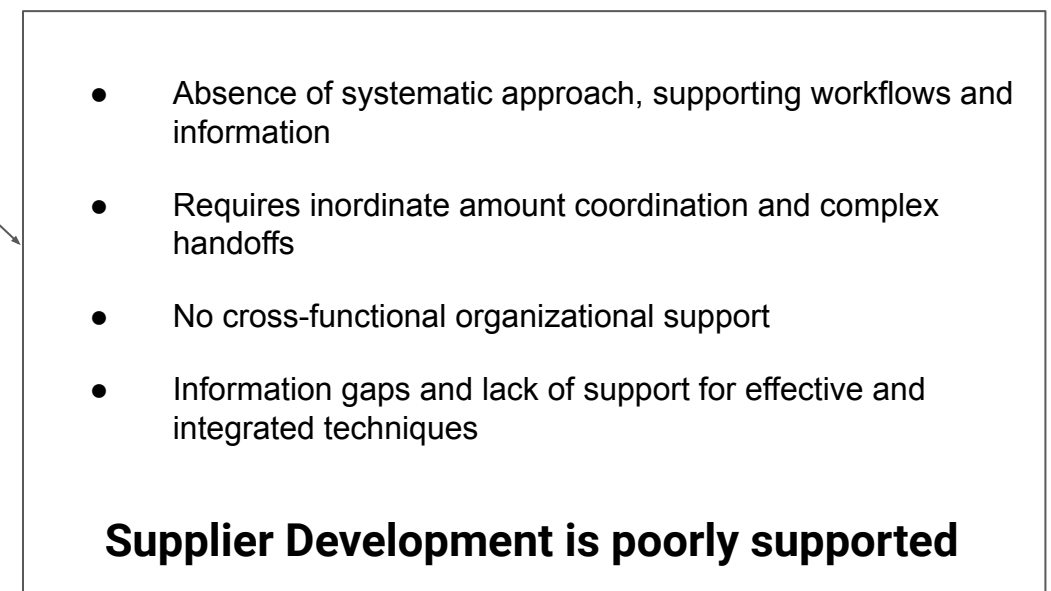
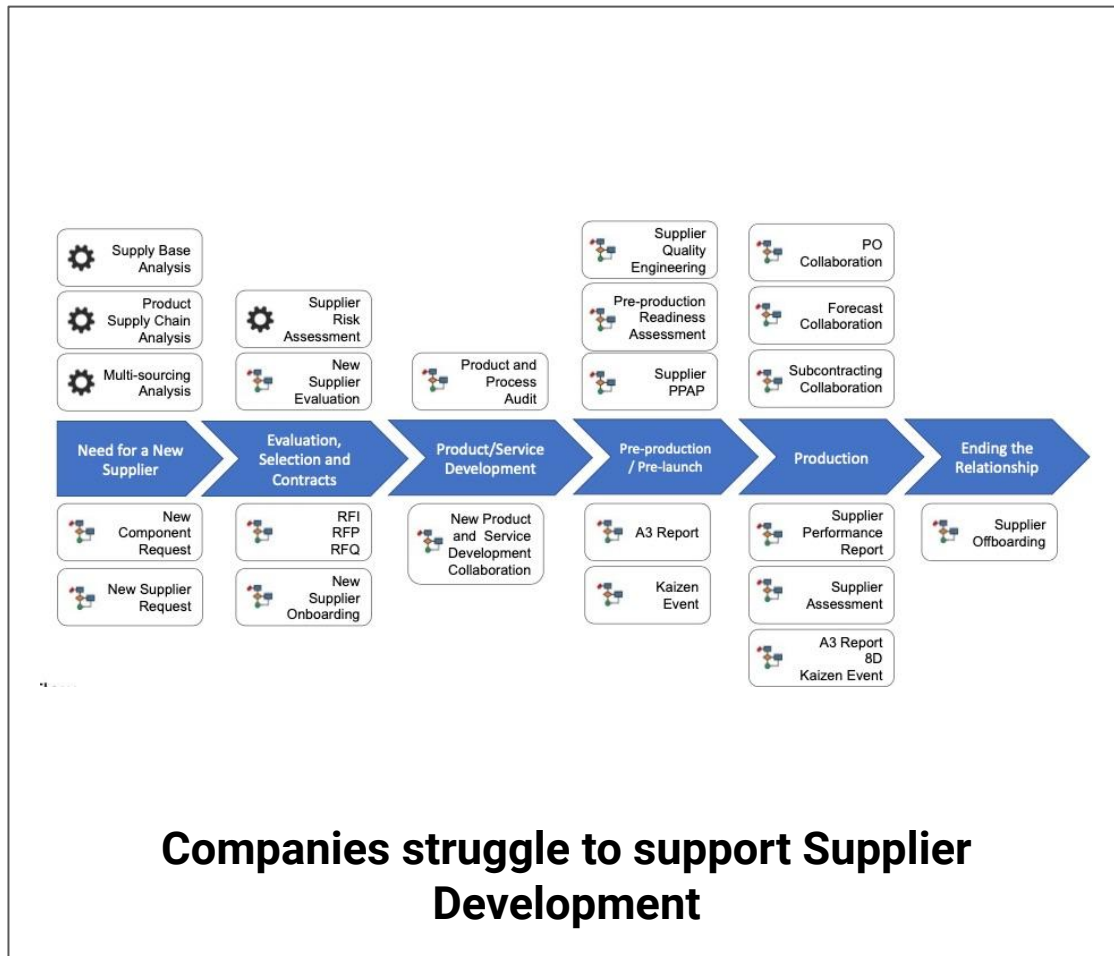


# Different Levels of Supplier Development for Different Needs



# Supplier Development Today

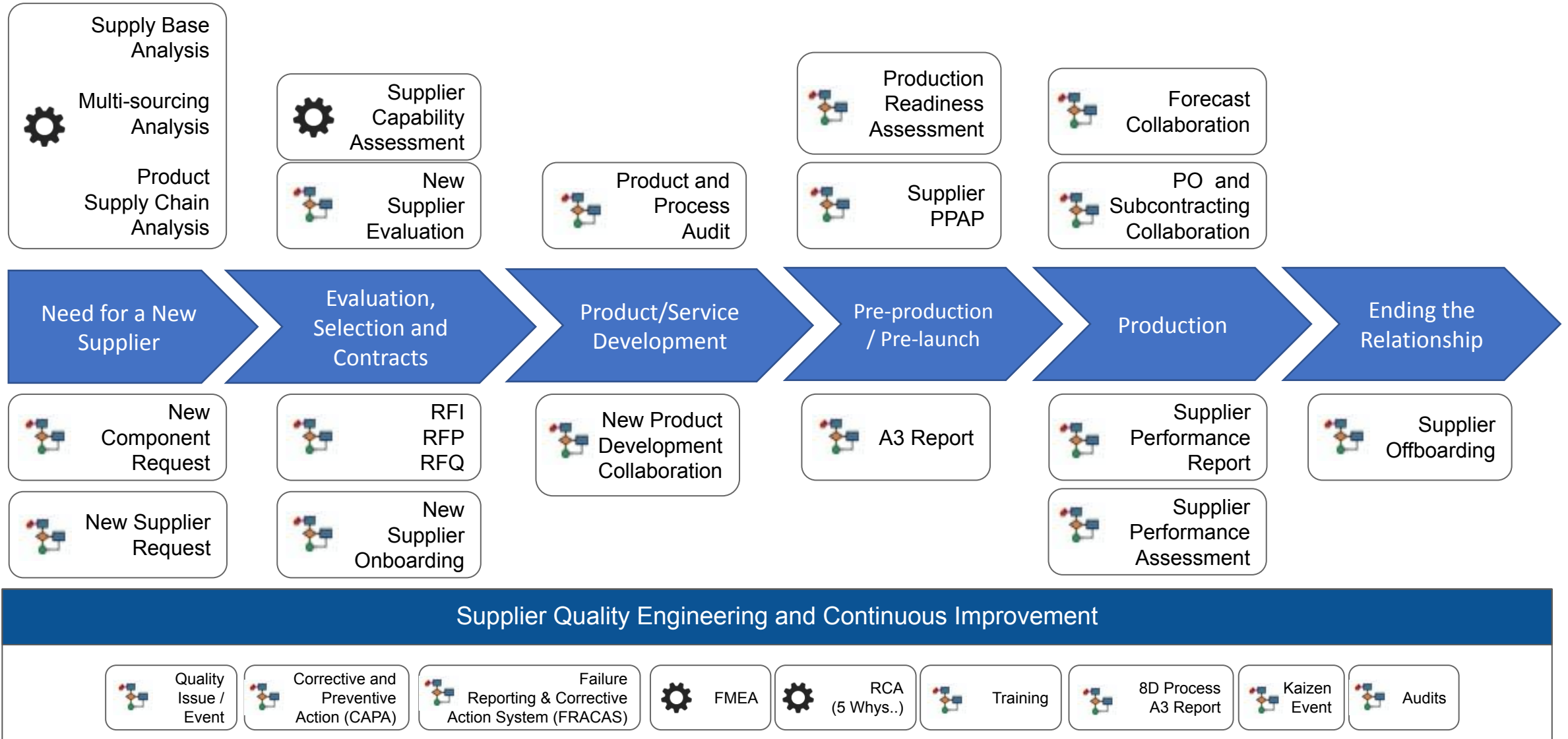
## *Not a Systematic Process Nor Supported Well*



Effect

Root cause

# ZFlow for Supplier Development



# ZFlow – Digital Workflow for the Modern Supply Chain

Systematic approach  
(framework and workflows)  
to Supplier Development

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

Zero-code



Involves Right People at  
the Right Time

***Supply Chain Ready***

Integrated and effective  
assessments and  
techniques

# ZFlow for Supplier Development

**Z** [Home](#) [Launch Pad](#) [Administration](#) [Data Maintenance](#) [New Process](#) [Repository](#) [Reports](#) [My Profile](#) [New Search](#)

### Launch Pad for Administrator

|   |  |   |   |   |
|---|--|---|---|---|
| <b>Product Supply Chain Risk Analysis</b><br>Active(1)   Find   New | <b>Supplier Performance</b><br>Active(6)   Find   New                  | <b>Supplier Risk Assessment</b><br>Active(6)   Find   New           | <b>Supply Chain Risk Assessment</b><br>Active(1)   Find   New | <b>New Supplier Evaluation</b><br>Active(1)   Find   Insights   New     |
| <b>New Supplier Request</b><br>Active(4)   Find   Insights          | <b>RFP</b><br>Active(1)   Find   Insights   New                        | <b>RFP Response</b><br>Active(2)   Find   Insights   New            | <b>RFQ</b><br>Active(0)   Find   Insights   New               | <b>RFQ Response</b><br>Active(0)   Find   Insights   New                |
| <b>Supplier Audit</b><br>Active(2)   Find   Insights   New          | <b>Supplier Corrective Action</b><br>Active(7)   Find   Insights   New | <b>Supplier Initiated PPAP</b><br>Active(0)   Find   Insights   New | <b>Supplier PPAP</b><br>Active(3)   Find   Insights           | <b>Supplier Performance Report</b><br>Active(1)   Find   Insights   New |
| <b>Vendor Assessment</b><br>Active(2)   Find   Insights   New       | <b>Voice of Supplier Survey</b><br>Active(1)   Find   Insights   New   | <b>Supplier Profile</b><br>List(22)   Find   Insights               | <b>Supplier</b><br>List(36)   Find   Insights                 |   |

#### Supplier Collaboration

|  |  |  |   |  |
|--|--|--|---|--|
| <b>Forecast Collaboration</b><br>Active(0)   Find   Insights   New   | <b>Purchase Order Collaboration</b><br>Active(6)   Find   Insights | <b>Subcontract Purchase Order</b><br>Active(4)   Find   Insights   New | <b>Supplier Batch Manufacturing Record</b><br>Active(1)   Find   Insights   New | <b>Supplier Product Development</b><br>Active(2)   Find   Insights   New |
| <b>Vendor Managed Inventory</b><br>Active(0)   Find   Insights   New |  |  |   |  |

#### Crossfunctional Quality

|   |  |   |   |  |
|---|--|---|---|--|
| <b>Corrective Action Request</b><br>Active(4)   Find   Insights | <b>Failure Report</b><br>Active(2)   Find   Insights   New | <b>Custom Corrective Action Report</b><br>Active(1)   Find   Insights   New | <b>Nonconformance Report</b><br>Active(2)   Find   Insights | <b>Quality Issue</b><br>Active(12)   Find   Insights   New |
|---|--|---|---|--|

# Innovative Supply Base, Product Supply Chain and Multi-sourcing Assessments

**Supplier Risk Assessment - Intel A10X**

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

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

| 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              |

ZFlow-Digital Workflow for the Modern Supply Chain

View site information //zflow/nui/main.jsp?external\_win=true&link=.../servlet/zapp%3Fcommand%3Dview%26cls%3DProductSupplyChainRiskAnalysis%26scope%3DR...

**Product Supply Chain Risk Analysis - ZPhoneX**

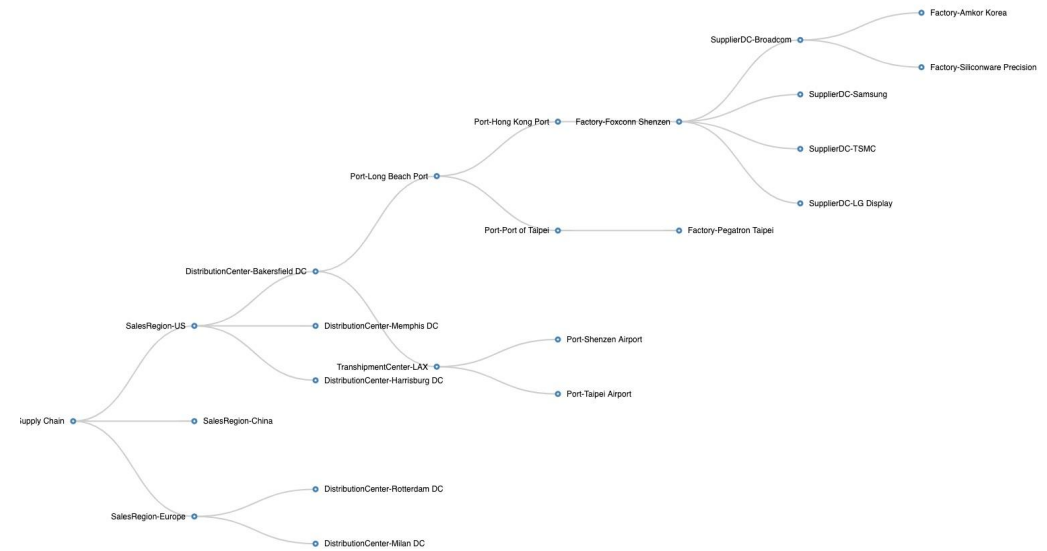
App ID: PSRA00001

**Part Info**  
Part Number: ZPhoneX Part Name: ZPhoneX

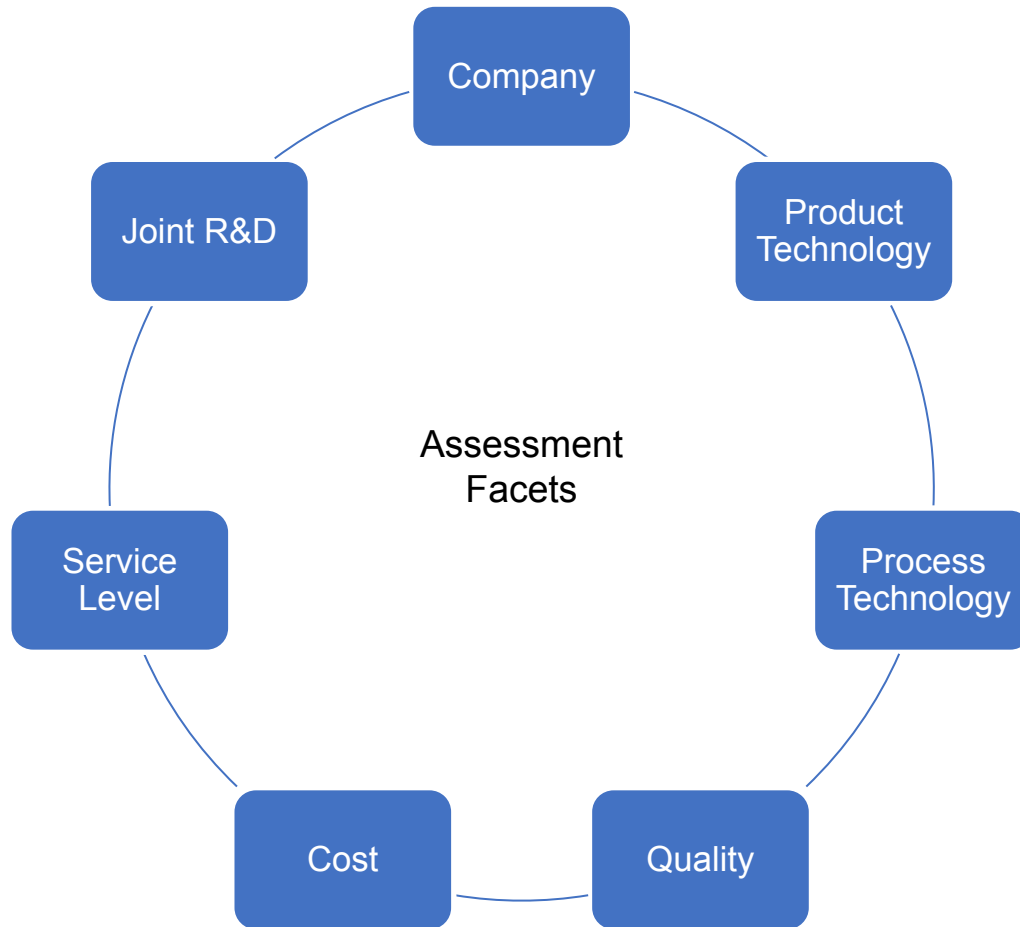
**Sourcing Risk**  
Overall Sourcing Risk: Low  
Single Sourcing Risk: Low  
Component Availability Risk: Low  
End Of Life Risk: Low

**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:



# Evaluating and Selecting New Suppliers



**New Supplier Evaluation - NPD000008-Prototype D**

Process Info | **Current Step** | Process Projects | Process Data | Members | Roles | Workflow | Reli

Current Activity: **New Supplier Eval Set Up** | Current Status: **You are a Performer**

Instructions: Please enter data in the form below and save or add files to the process then click to continue pr

Program Name:

Supplier Name:

Requirement Type:

Notes:

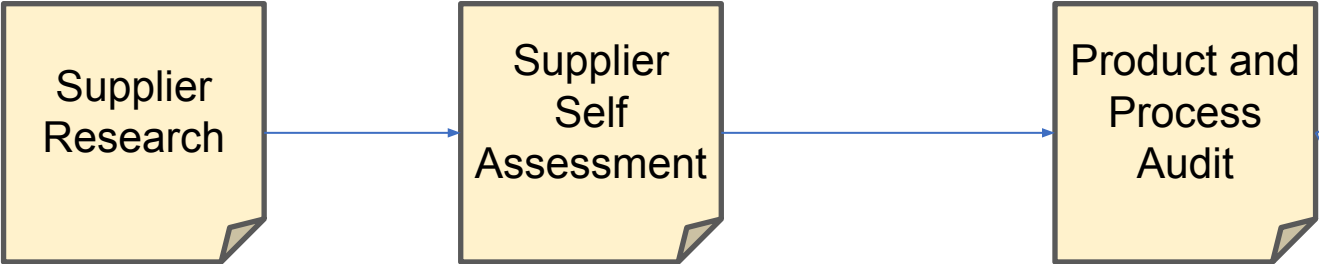
**New Supplier Eval Crit** (Add New Supplier Eval Crit Delete All New Supplier Eval Crits Paste Data)

| #  | Seq No. | Area Of Concern | Eval Criteria  | Eval Crit Score | Supplier A | Supplier B |   |
|--|---------|-----------------|----------------|-----------------|------------|------------|---|
| 1  | 1       | Cost            | Total Cost     | 1               |            |            |   |
| 2  | 2       | Cost            | Initial Cost   | 3               |            |            |   |
| 3  | 3       | Quality         | Certifications | 4               |            |            |   |
| 4  | 4       | Delivery        | Lead time      | 4               | 2          | 4          |   |
| 5  | 5       | Product         | Ease of        | 5               | 4          | 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%        |   |

Degree of fulfillment: 1=low, 2=medium, 4=high



# Research, Assessment and Audits for Evaluating and Selecting New Suppliers



IATF, VDA, ISO 13485..

|           |   |
|-----------|---|
| <b>P2</b> | <b>Project management</b>   |
| 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 ?  |
| <b>P3</b> | <b>Planning the product and process development</b>   |
| 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 ?  |

Supplier Audit - Supplier Audit for Intel - At Supplier

Process Info | Current Step | Process Projects | Process Data | Members | Roles | Workflow | Related Processes | Process Log | Process Graph | Process Report

Current Activity: Review Supplier Response | Current Status: started | Performers: ZFlow Admin

Instructions: Please review the data in the form below or in the files section then click to continue process

|  |   |
|--|---|
| Design control and risk management procedures are established and applied? (ISO 13485:2016: 7.3)   | ✓ |
| Audit Answer: Yes  |   |
| Design and development stages are identified? (ISO 13485:2016: 7.3.2)  | ✓ |
| Review, verification, validation, and design transfer activities at each stage are appropriate? (ISO 13485:2016: 7.3.2)  | ✓ |
| Responsibilities for design and development are defined? (ISO 13485:2016: 7.3.2)   | ✓ |
| Management Controls -  |   |
| ★ Quality Manual defines scope of QMS, procedures (or reference to) within QMS, and description of the interaction of processes within QMS? (ISO 13485:2016: 4.1, 4.2.2) | ✓ |
| ★ Firm has established and conducts Management Reviews, at least annually? (ISO 13485:2016: 5.1(d), 5.6)   | ✓ |

FOOD AND DRUG ADMINISTRATION

GUIDE TO INSPECTIONS OF QUALITY SYSTEMS



# Different Evaluation Techniques at Different Stages



Potential Supplier Assessment

Preliminary Product and Process Audit

Production Readiness Assessment (PPAP.)

Production Assessment

Process Audits, Performance Monitoring and Assessment

Supplier PPAP - SPPAP

Process Info | Current Step | Process Projects | Process Data | Members | Roles | Workflow | P

Current Activity: PPAP Phase 1 Review Current Status: You are a Performer

Instructions: Please review the data in the form below or in the files section then click to continue process

Supplier Name:  Initial  Fa

Part Number:  A10X  Pa

Part Description:  A10X SOC

Submission Level:  Level 3

PPAP Due Date:  2021/06/30

Sup PPAP Check List Item (Add Sup PPAP Check List Item Delete All Sup PPAP Check List Items Paste Data)

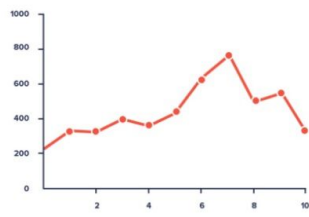
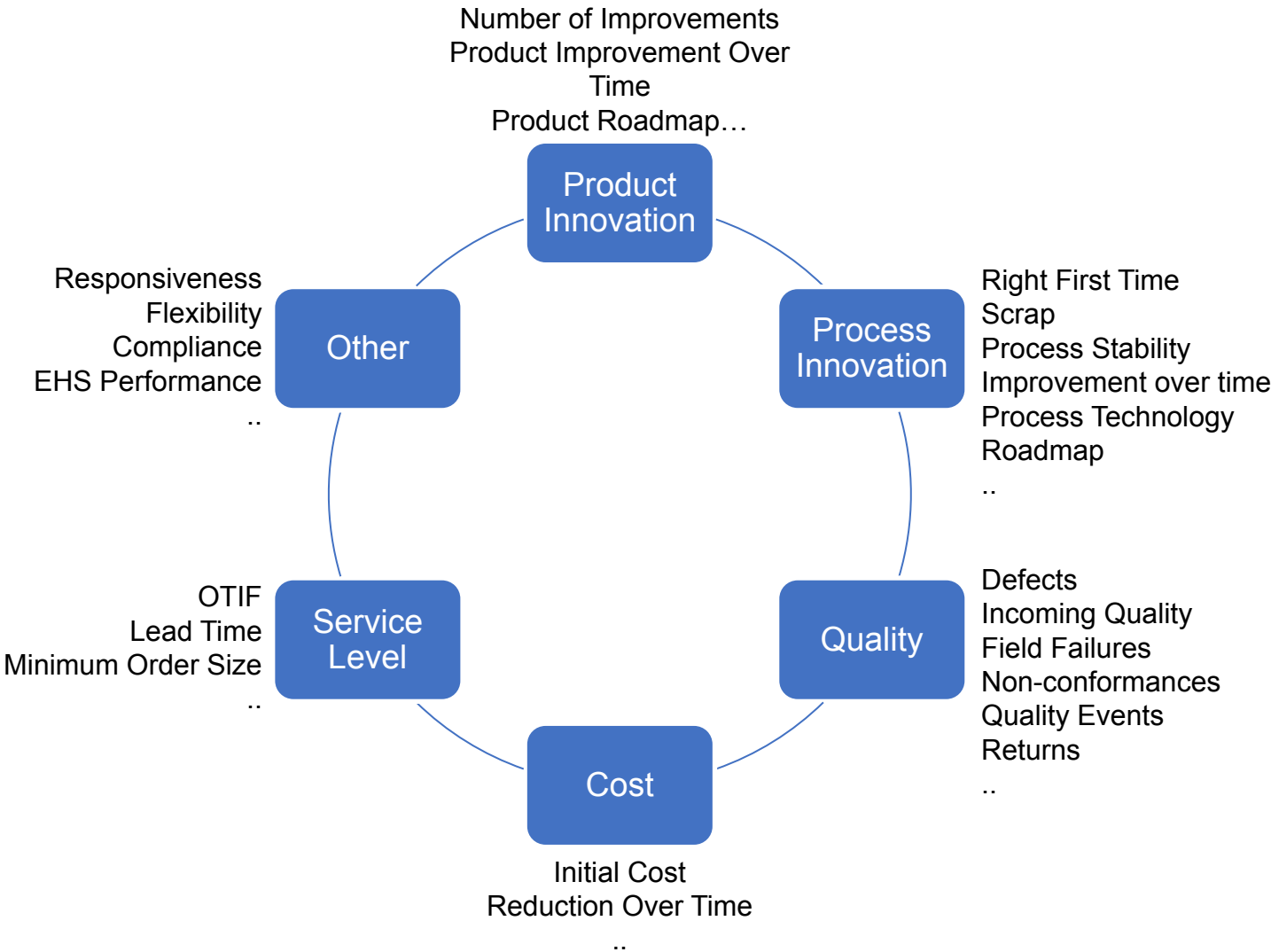
| #                        | Seq No. | Item Name                 | Item Need | Supplier Comment     | Com                      |
|--------------------------|---------|---------------------------|-----------|----------------------|--------------------------|
| <input type="checkbox"/> | 1       | Part Specific Requirement | Required  | <input type="text"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | 2       | Part Submission Warrant   | Required  | <input type="text"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | 3       | Design Records            | Required  | <input type="text"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | 4       | Design FMEA               | Requested | <input type="text"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | 5       | Process Flow              | Required  | <input type="text"/> | <input type="checkbox"/> |

# Supplier Quality Engineering

Key Aspect of Supplier Development



# Supplier Performance Reporting and Assessment



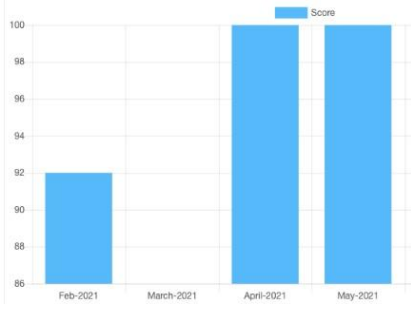
- A3 Report
- 8D
- Kaizen Event

Rating Period July, 2021

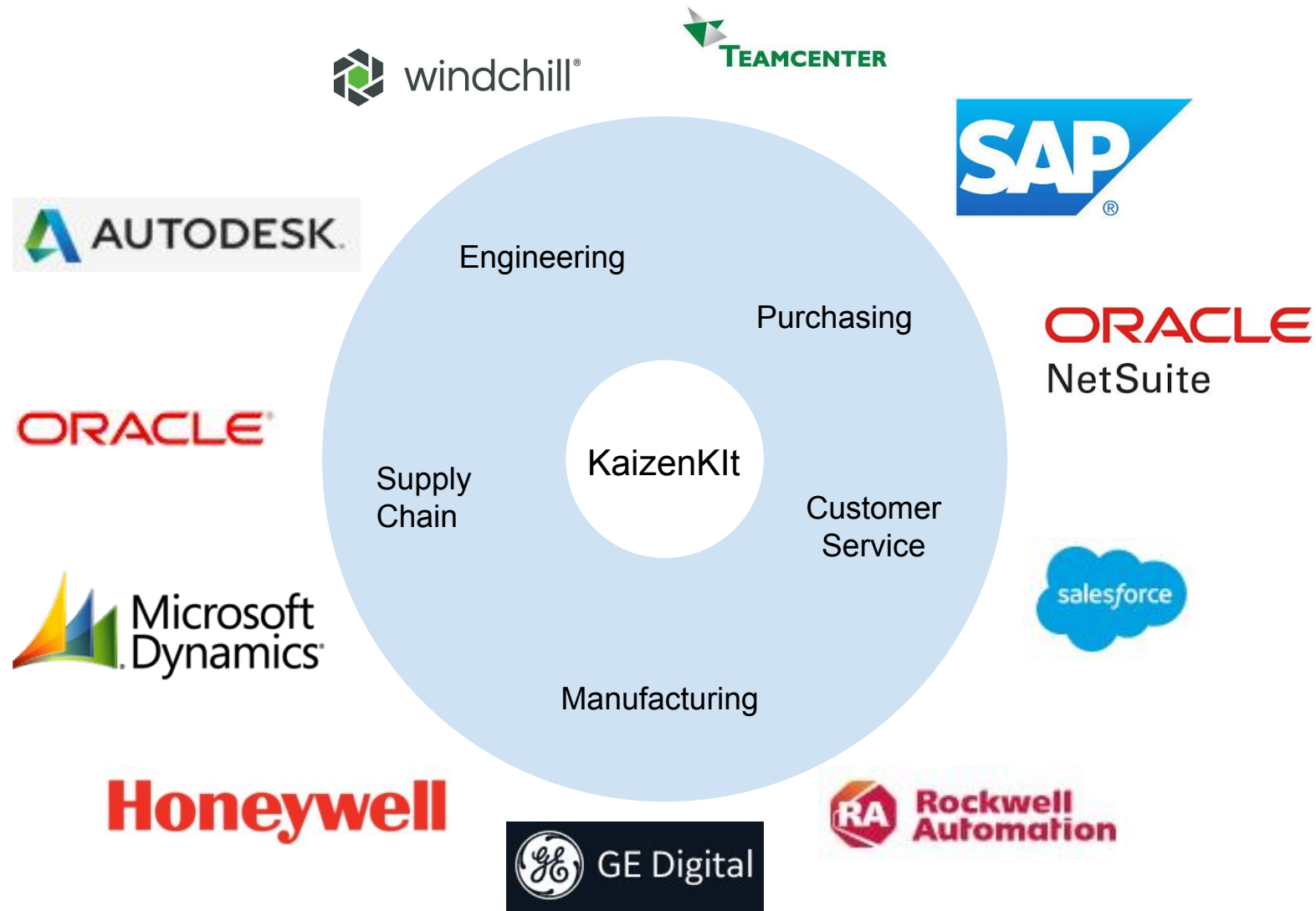
| Score | Ranking | Percentile |
|-------|---------|------------|
| 88    | Average | 85         |

Analogue of Supply Base Performance

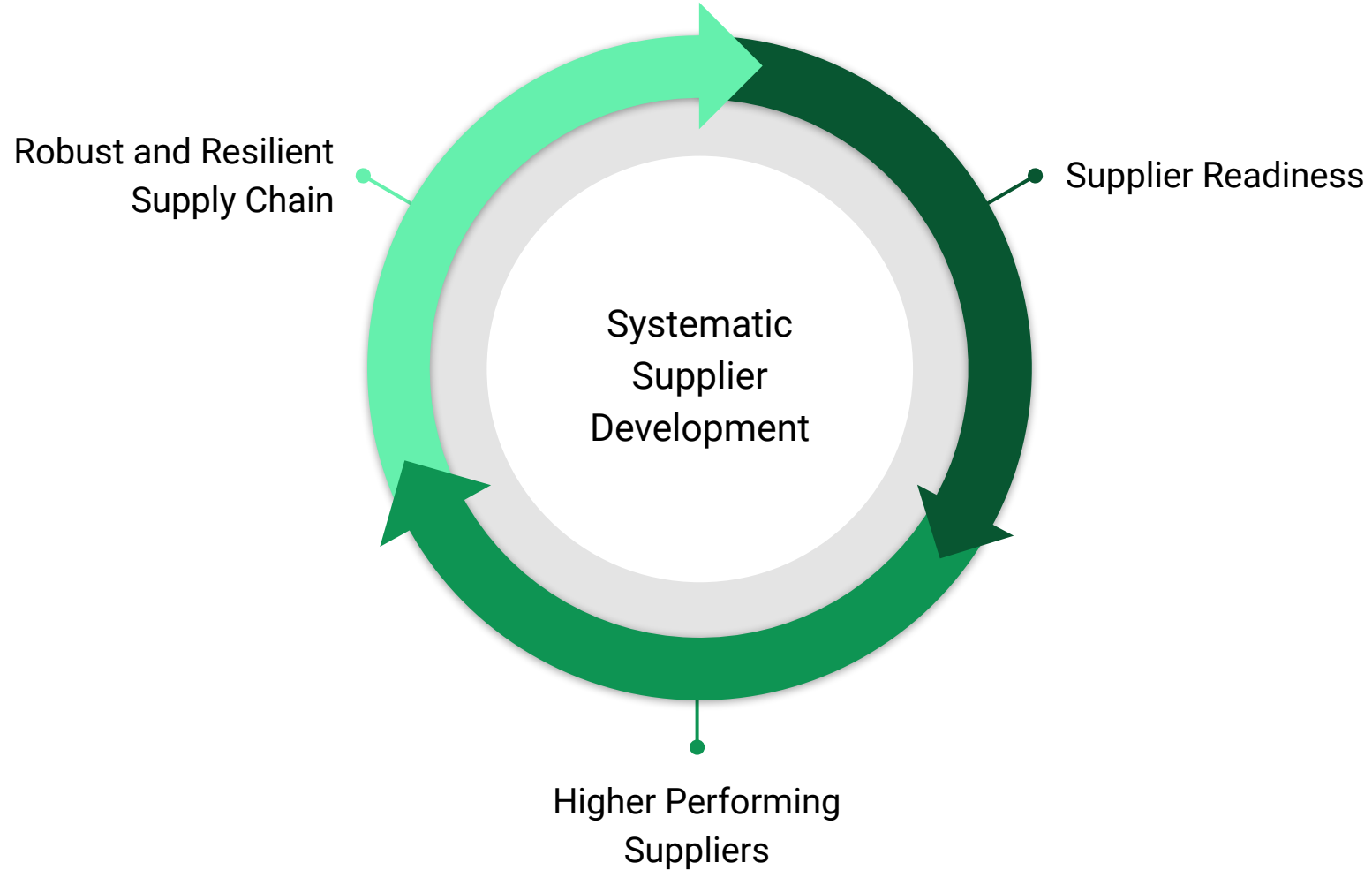
| Score | Percentile |
|-------|------------|
| 100   | 100        |
| 98    | 90         |
| 96    | 80         |
| 94    | 60         |
| 88    | 40         |



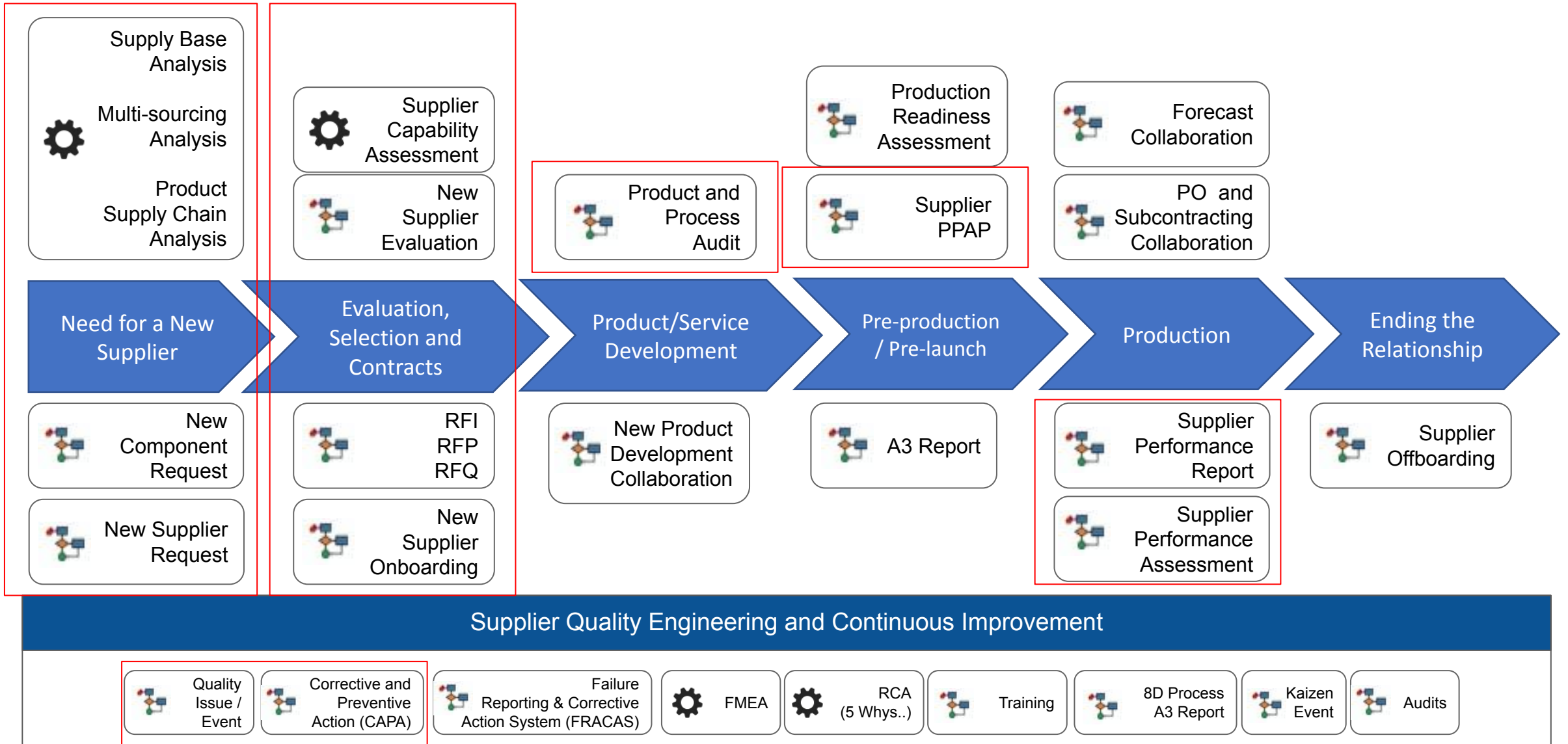
# Rich Capabilities for Integrating to ERP, Design, Manufacturing and Supply Chain Applications



# 3 Reasons for Systematic Supplier Development



# Demo



# Summary

- ZFlow supports Supplier Development in a holistic manner
- Easy to adopt Internally as well as with the Supply Chain
- Easy to get started

[Test Drive ZFlow](#)

[Free Proof-of-concept](#)

[Free Pilot](#)

# Contact Us

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<https://www.zflow.io>