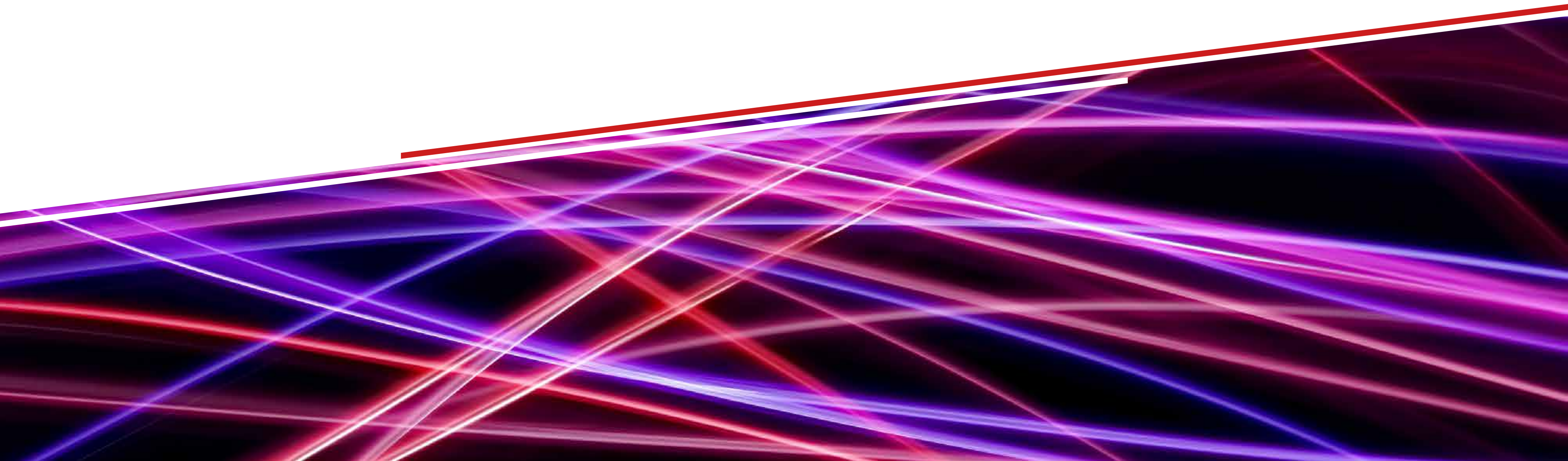# Strategic Insights into Product Variation Management
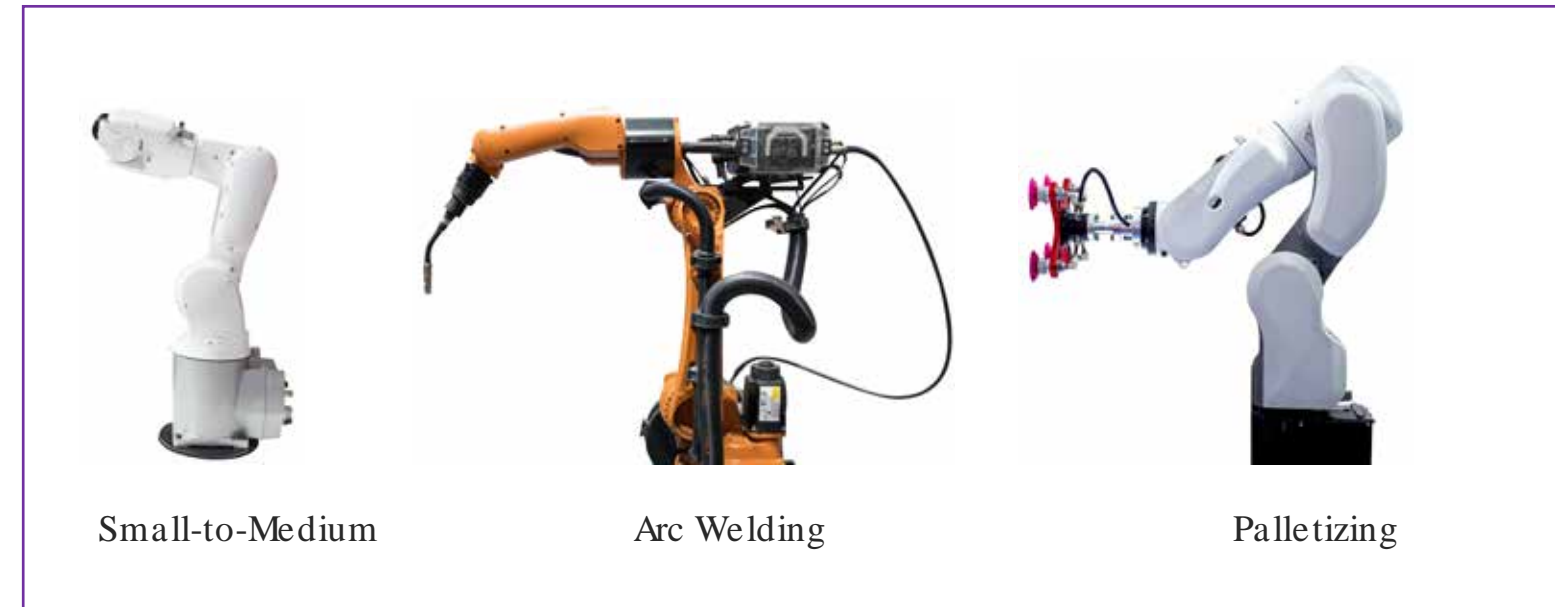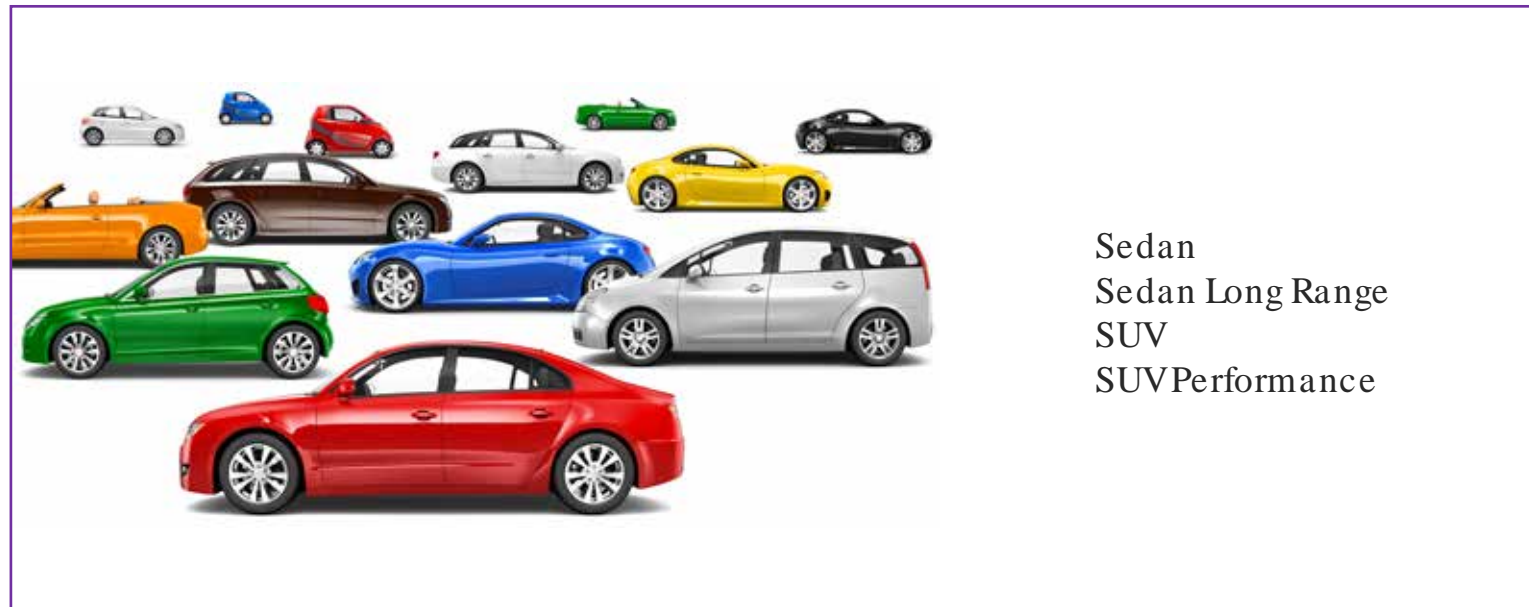
Ayla Singhal

March 5, 2024

Product Variation

Companies across the industries provide variation in their product offerings

+ Strategic tool for driving growth, enhancing customer satisfaction, and staying relevant in a rapidly changing landscape

- Presents challenges related to complexity, costs, inventory management, and brand management
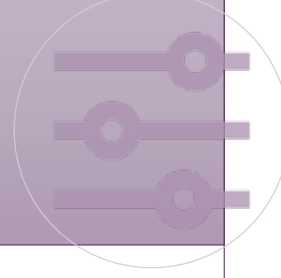
Sedan
Sedan Long Range
SUV
SUV Performance

Small-to-Medium   Arc Welding   Palletizing

32GB RAM
1TB SSD
Graphite

16GB RAM
256GB SSD
Platinum

Onshore wind   Offshore wind

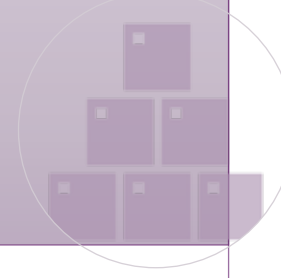# Factors Impacting Product Variation

Manufacturing Approach

§ Make to Stock

§ Configure to Order

§ Engineer to Order

§ Level of customization in the products

Complexity of Variability

§ Amount of Choices

§ Discrete vs. Continuous

§ Change Frequency

Complexity of Product

§ Product

§ Technological Advancements

§ Regulatory Requirements
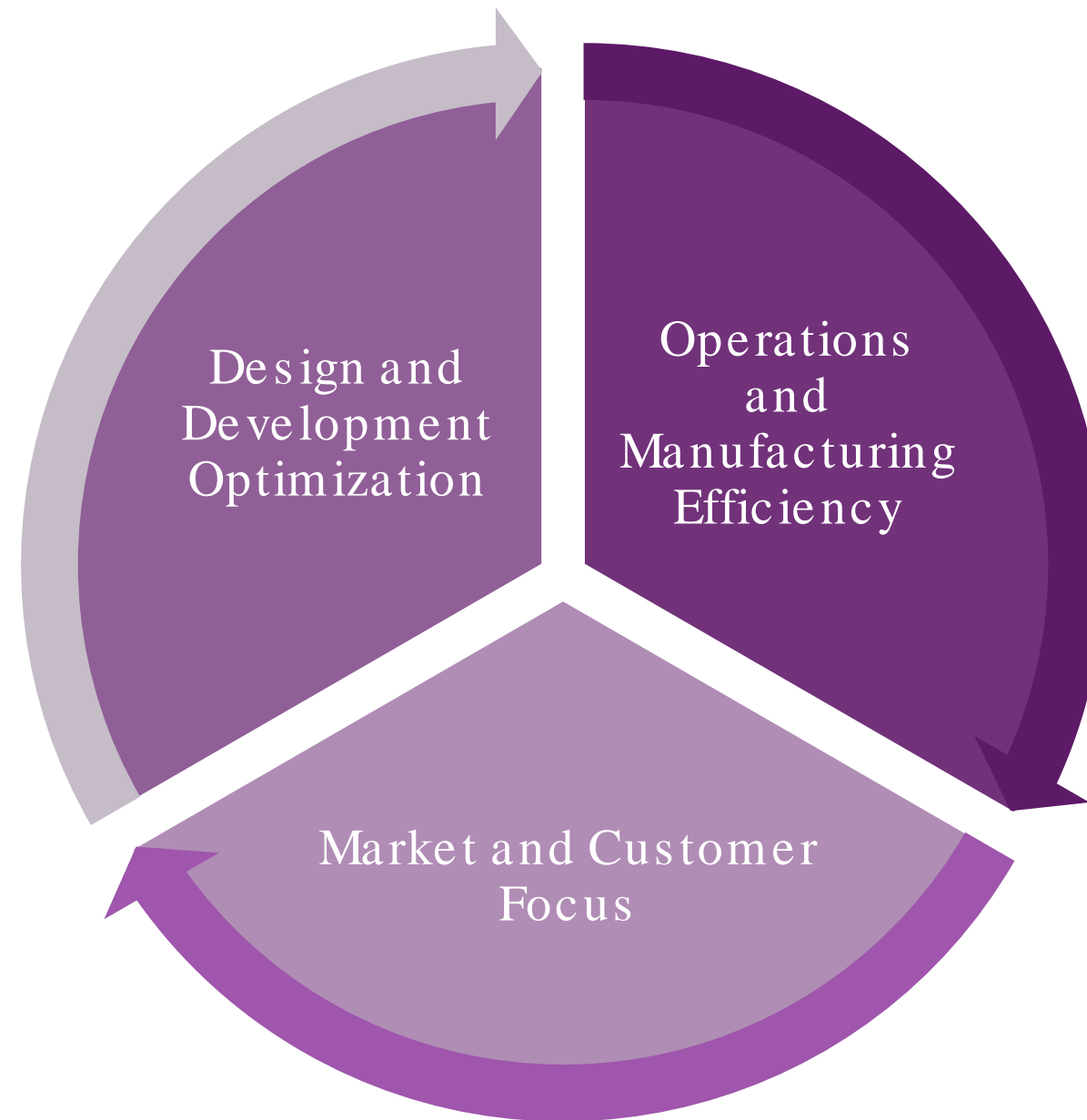
§ Globalization and Localization

Others

§ Market Demand

§ Competitive Landscape

§ Brand Strategy / Innovation

§ Economic and geopolitical conditions

Challenge: Manage product variation to meet customer needs, drive growth, and maintain competitiveness while staying profitable

Strategies for Handling Product Variation

PLM for seamless data connectivity across all
teams and stages of the product lifecycle

§ Modular Design
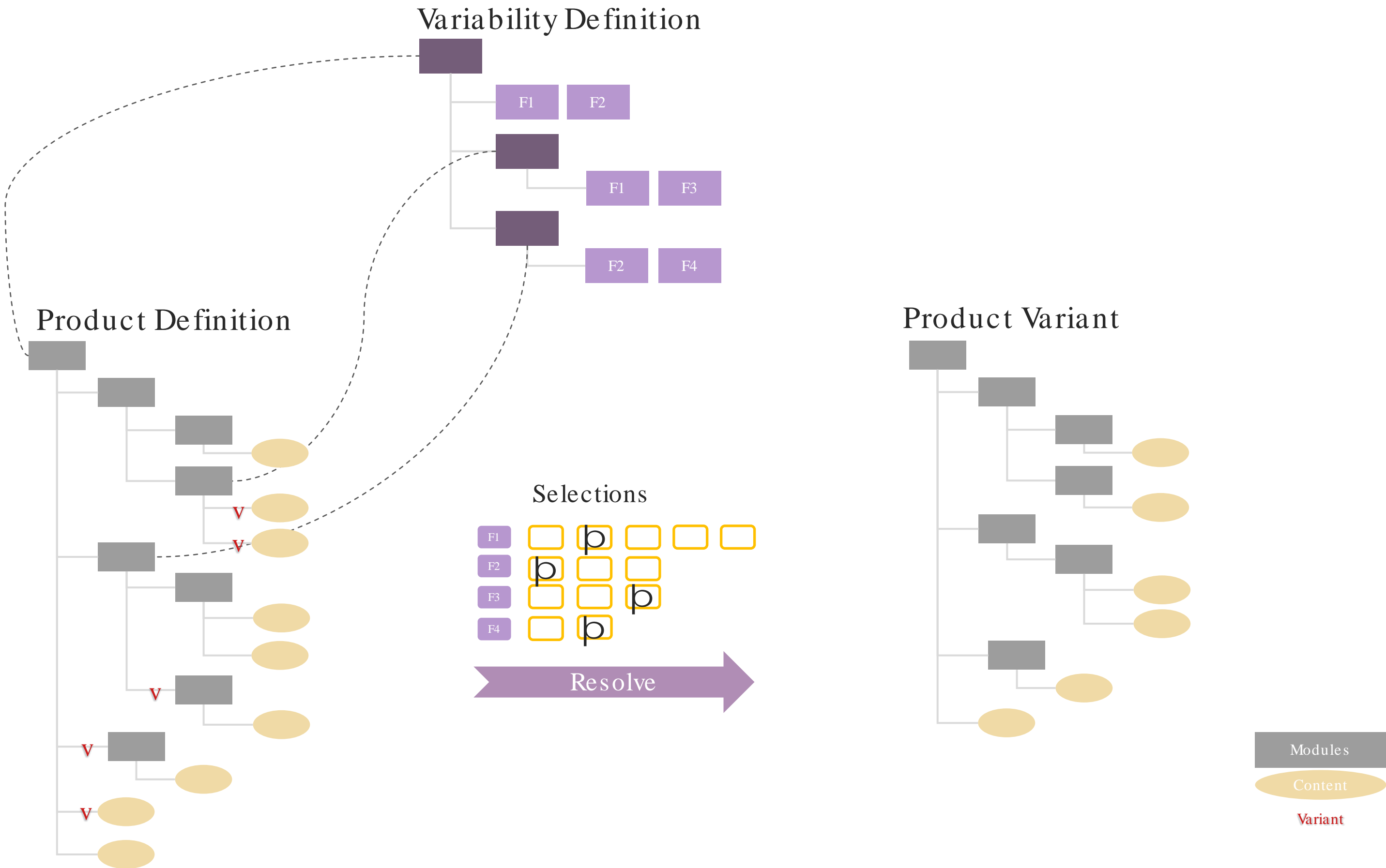§ Standardization
§ Collaborative Cross-Functional Teams

§ Flexible Manufacturing Processes
§ Dynamic Inventory Management
§ Responsive Supply Chain

Design and Development Optimization

Operations and Manufacturing Efficiency

Market and Customer Focus

§ Customer-Centric Approach
§ Data-Driven Analysis
§ Continuous Improvement

Aras Variant Management

Aras Variant Management | Overview

Variability Definition

F1 F2

F1 F3

F2 F4

Product Definition

Product Variant

Selections

F1
F2
F3
F4

Resolve

Modules

Content

Variant

Effective Approaches to Streamline Variability Definition

Structured Variability

- Enables the division of variability into more manageable segments, simplifying usability and handling

- Supports the application of pertinent variability scopes at different levels of product definition

- Facilitates collaboration among teams in defining variability, aligning with their specific areas of expertise
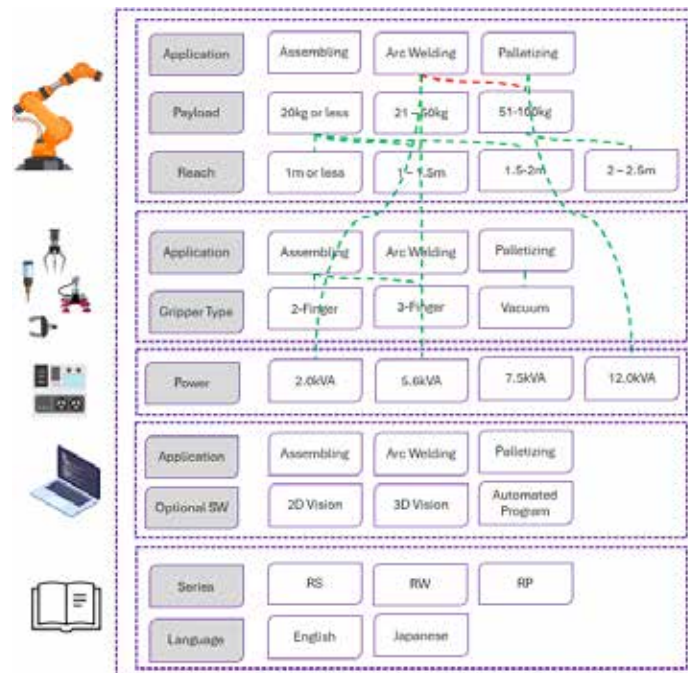
Decoupled Variability

- Allows consistent variability and rule definitions to be applied to multiple structures and across multiple domains

- Enables configuration experts and content engineers to work with a degree of independence while remaining linked
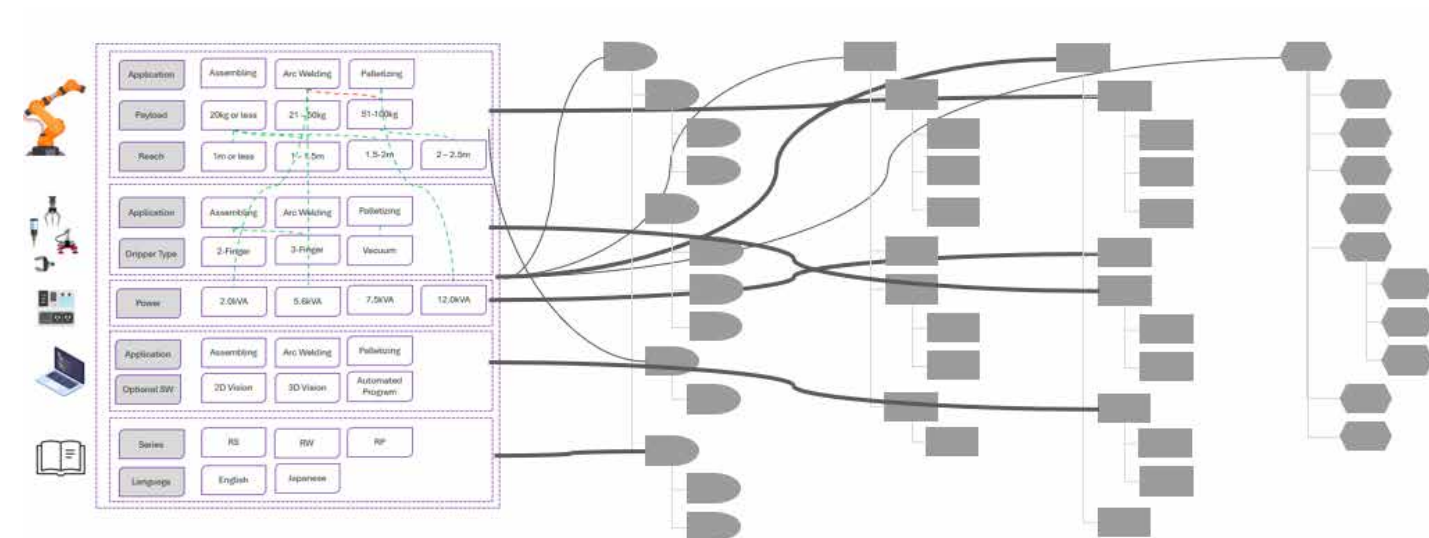
Variability Definition in Aras – Key Values for Your Business

§ Manage structured, harmonized, consistent and independent definition of variability across multiple domains

§ Accelerate variability validation process with rapid access to pertinent rules

§ Improve ease of validating the list of permissible configurations in your range of product variants

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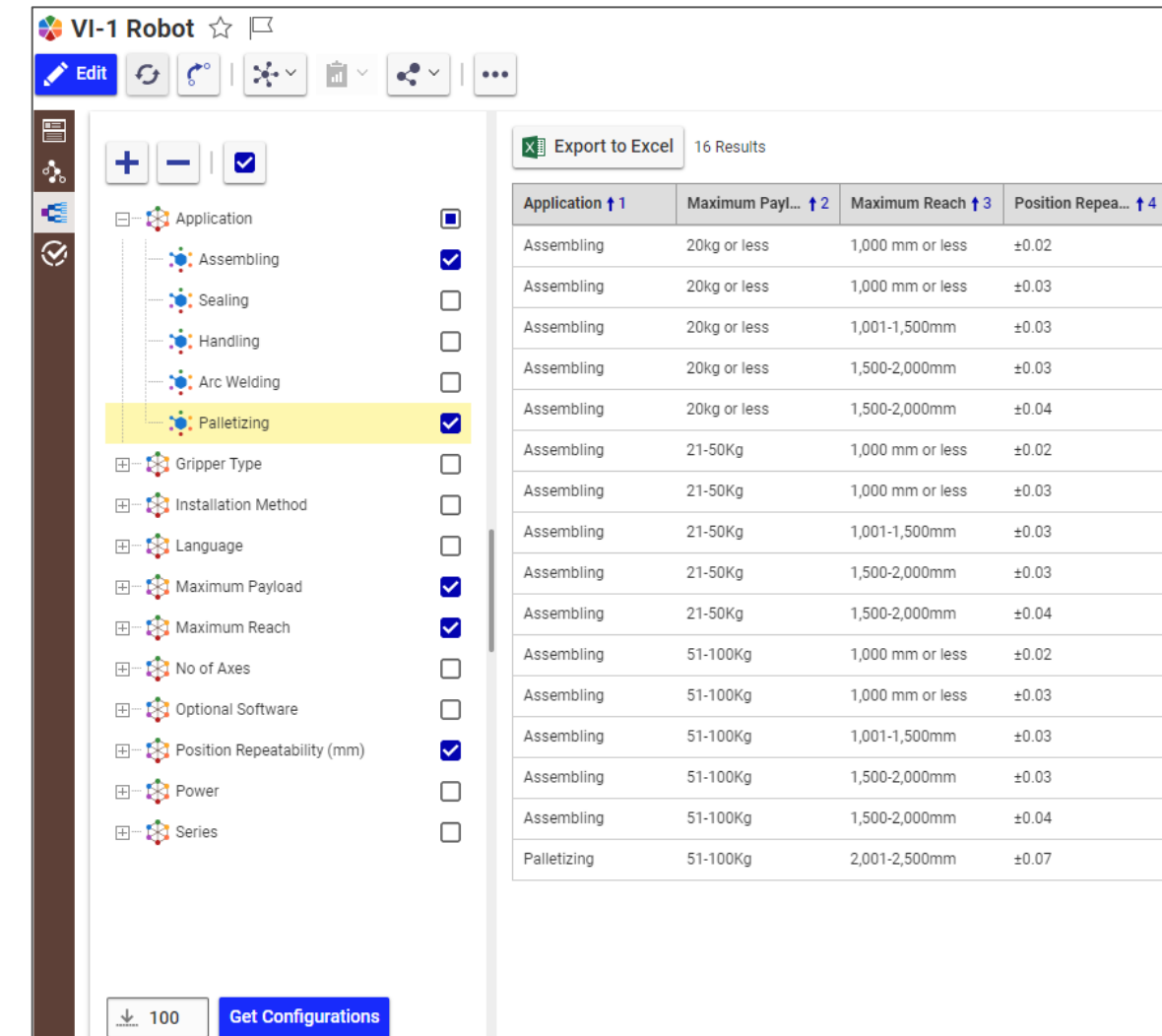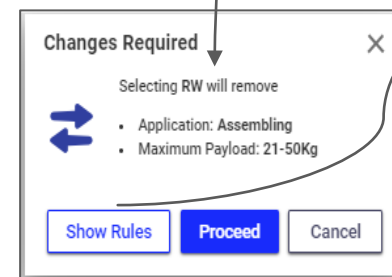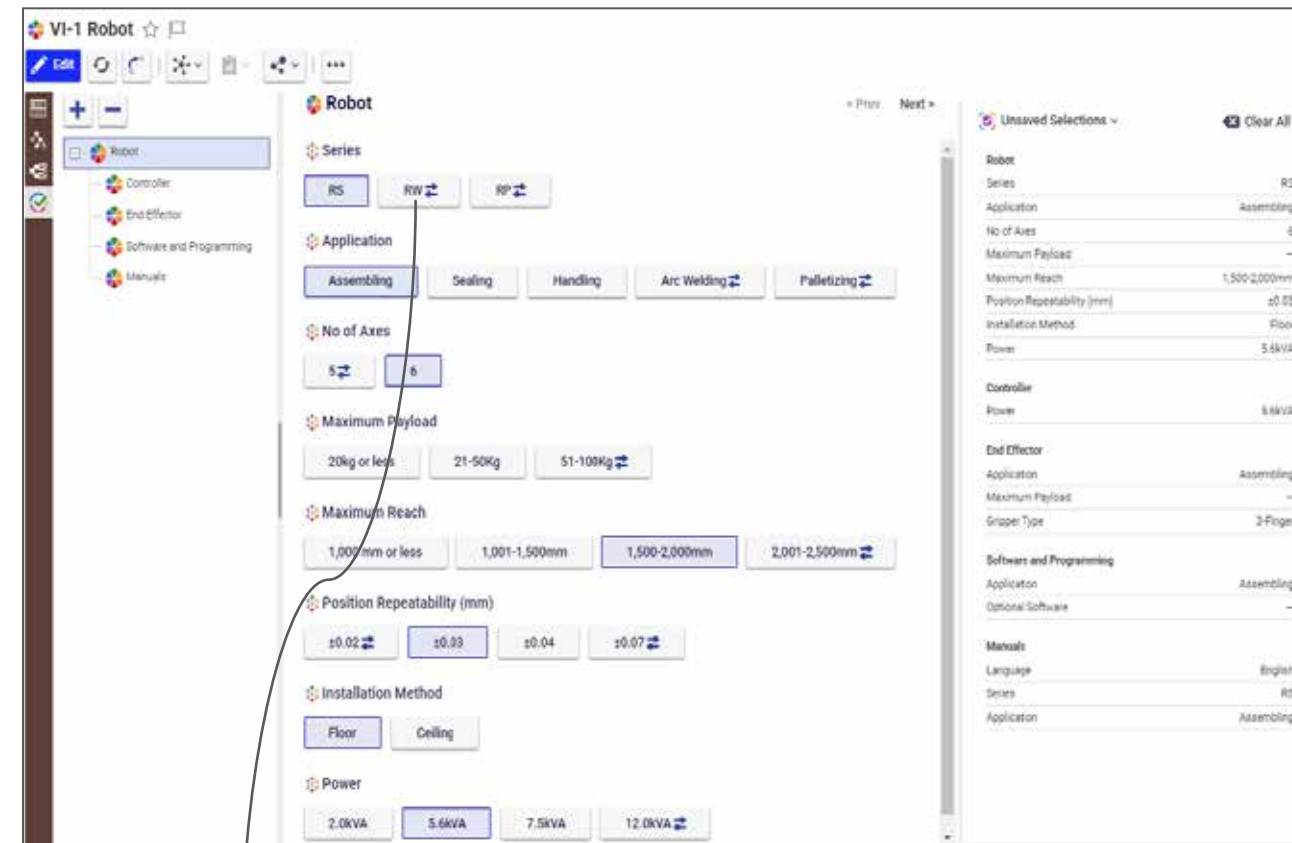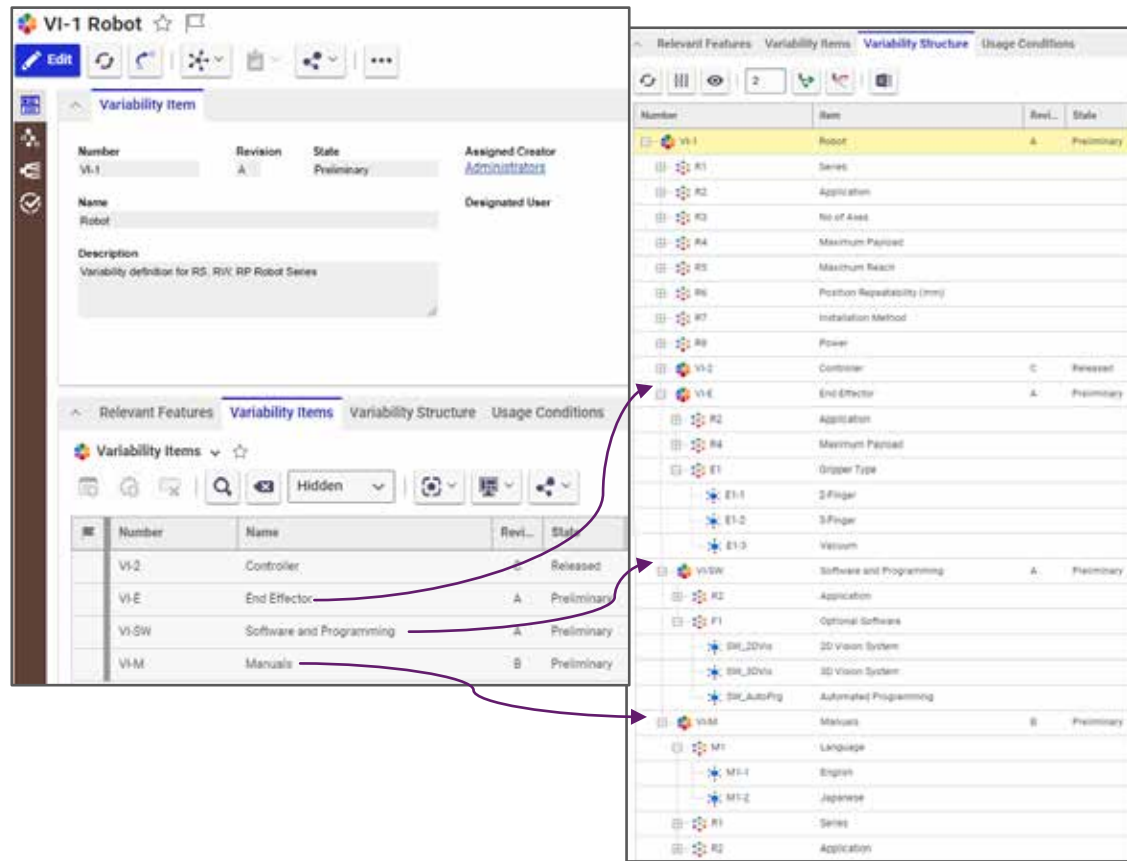
Variability Definition

Terminology

⬡ Feature – Product characteristic with different options

⬡ Option – Choices for a Feature

⬡ Rule – Determine which Options can or cannot be combined

§ Due to technical feasibility, sales decisions, compliance, etc.

§ Without rules, all option combinations are possible

§ Rules reduce number of allowed option combinations

⬡ Variability Item – Defines variability of a scope (e.g., product, system, module)

§ Using Features, Options and Rules

§ Can be structured into multiple levels

⬡ Application

⬡ Assembling

⬡ Arc Welding

⬡ Palletizing

⬡ Payload

⬡ 20kg or less

⬡ 21-50kg

⬡ 51-100kg

⬡ If Application=Arc Welding, then Payload=20kg or less

Demonstration
Variability Definition

Effective Approaches to Manage Configurable Products

Modularization and Standardization

§ Divides a product into modular components or modules that can be independently designed, produced, assembled, and replaced

§ Modules are standardized to be interchangeable, allowing for flexibility in product configuration and customization

§ Individual modules can be easily combined or replaced, without requiring significant changes to the overall product architecture

Commonality and Variability

§ Commonality ensures shared features or components across different product configurations, promoting efficiency and consistency

§ Variability allows for customization and flexibility in product design, enabling adaptation to different configurations

§ Balancing commonality and variability is crucial for optimizing production efficiency and minimizing costs while providing product variation

Product Definition in Aras – Key Values for Your Business

§ Maintain configurable product definition with common and variable content, under configuration management

§ Link relevant variability scopes across product definition levels for simplified complexity presentation

§ Generate a variant from the configurable product definition with guided selection

Product Definition

Breakdown Item – Modular blocks with structure, combined to create varied product configurations

Variable Component – Collects assets that serve a specific function in the product, with variable feature and options
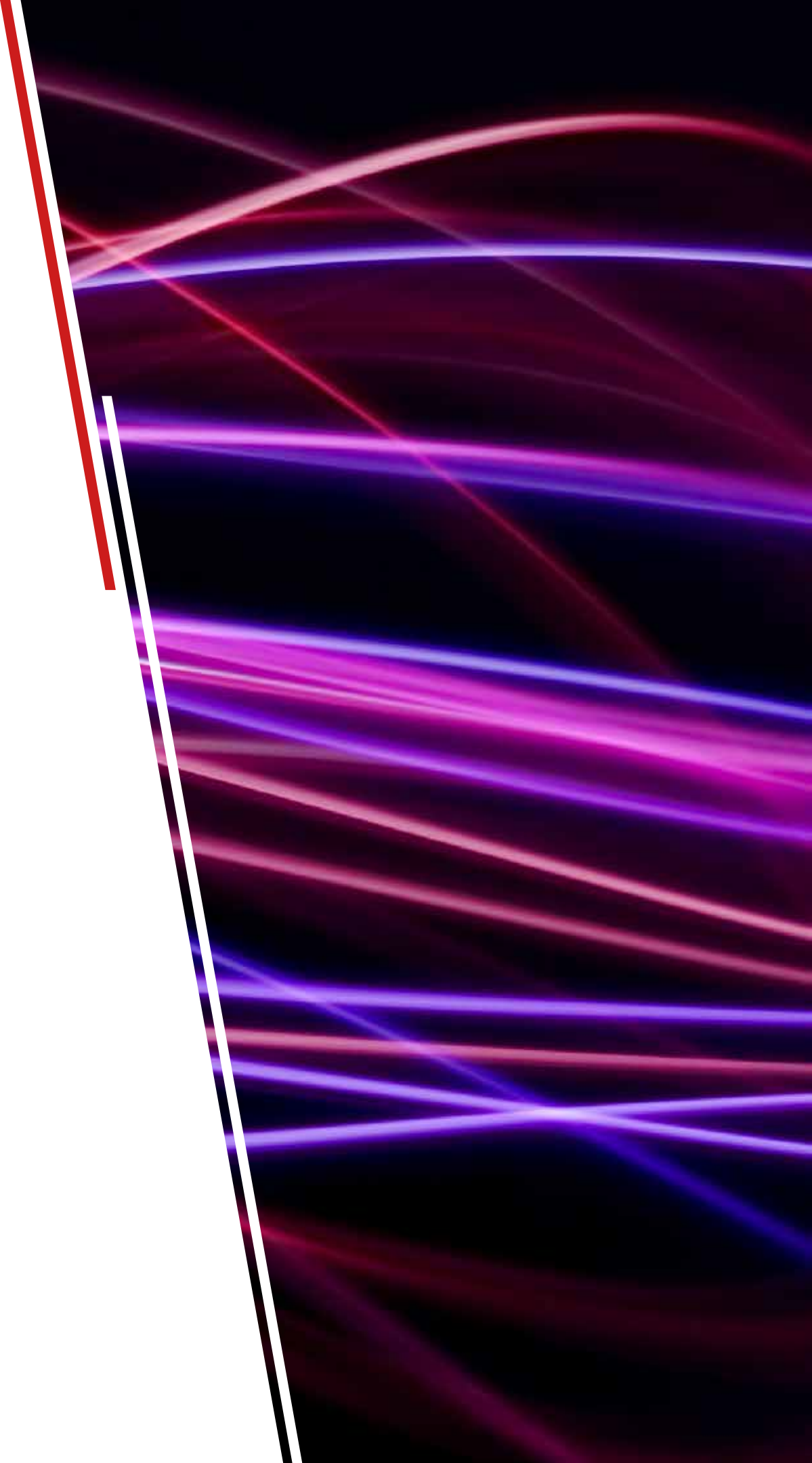
Asset – Resources that contribute to the creation, functionality, or value of the product

§ Physical components, software, data, documentation, etc.

Content – Items used in constructing the breakdown items

Usage Condition – Criteria defining item utilization in product configuration

End Effector

Arch Welding — Application=Arc Welding

AW-Attach

AW-Cable

Grippers — Application=Assembling or Palletizing

GRP-2-20 — Type=2-Finger and Payload=20kg or less

GPR-3-50 — Type=3-Finger and Payload=21-50kg

GRP-V-100 — Type=Vacuum and Payload=51-100kg

Manuals

INSTALL-AW-EN — Application=Arc Welding and Language=EN

INSTALL-PLT-JP — Application=Palletizing and Language=JP

Demonstration
Configurable Product Definition

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Thank You

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