



SUPPLIER HANDBOOK

ABB ROBOTICS & DISCRETE AUTOMATION

PURPOSE:

The idea behind the supplier handbook is to communicate ABB Robotics values, expectations, requirements and working principles with our external stakeholders & companies who wish to become suppliers to ABB Robotics. It provides general information and states direct demands, which are important for both parties. The handbook is a guideline to facilitate and sustain a long-term relationship with you as our supplier for Robotics Globally.

LEGAL:

ABB Robotics from this point forward will be referred to as Robotics. This document is intended as an information and guide to companies that are, or wish to become suppliers to Robotics. Legally, business documents such as quotations, contracts and agreements always primarily apply.

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Approved	Public	2021	1	en	2/60

MESSAGE FROM THE ROBOTICS Management Team

Dear ABB Robotics Suppliers,

At Robotics we stay committed to our purpose of creating superior value, pushing the boundaries of technology, and transforming society and industry for a more productive and sustainable future. We aspire to always provide an end-to-end world class experience to all our customers.

Fruitful partnerships and value co-creation with our Suppliers is critical. It enables Robotics to stay true to its purpose and delight customers today and in the future. We value you as Supplier and consider you an integral part of our business value proposition (i.e. a ticket-to-win).

The mutual profitability of our companies is linked to our joint successes or failures to meet the customer's requirements and expectations. Our high demanding end-customers cannot afford to face our non-performance. As Supplier, we ask you to fully integrate this so that our partnership can focus on continuous improvement through prevention rather than unproductive crisis management.

As such, we expect the highest operational standards from you as Supplier in terms of HSE & Sustainability, integrity and compliance, innovation, quality, delivery, agility, productivity, lifecycle management and a permanent focus on cash and cost competitiveness.

Beyond the standards and expectations laid out in this handbook, our mutual success depends on your capability to develop a real partnership with us. We expect you to value but also challenge, if necessary, the options we would like to take, so that customer risk prevention is part of our DNA.

We are looking forward to building a successful partnership and cooperation with you ultimately providing our customers a world class experience.

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Approved	Public	2021	1	en	3/60

I. ABB WAY - PURPOSE

We summarize our purpose as:

- We succeed by creating superior value.
- We push the boundaries of technology to drive performance to new levels.
- We energize the transformation of society and industry to achieve a more productive, sustainable future.

At ABB, we are passionate about **creating success**. This starts with our customers – we enable them to reach new levels of performance. Their success translates into success for all our stakeholders: employees, partners and shareholders.

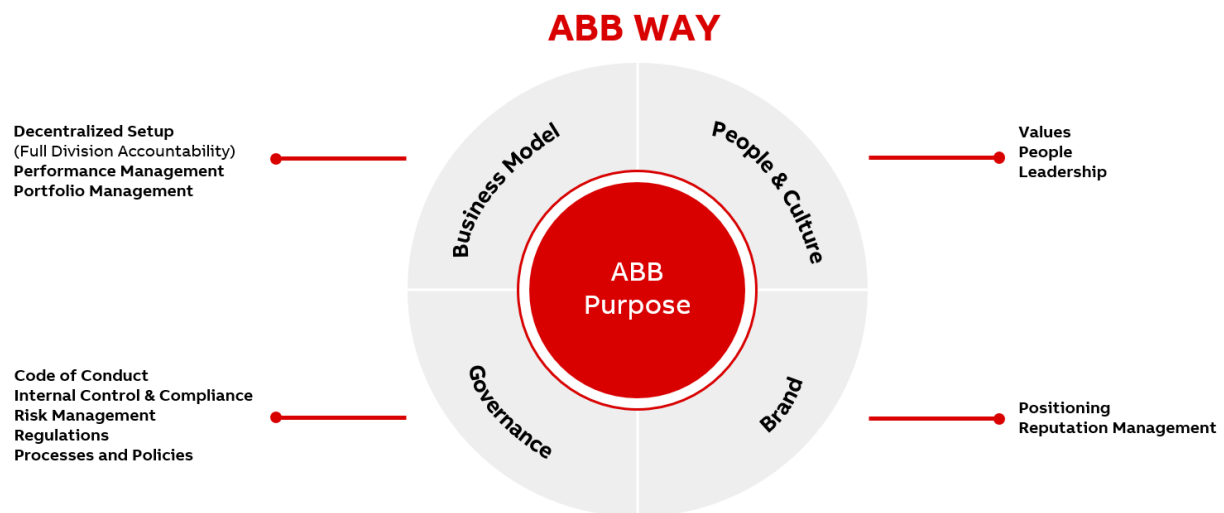
If there is one thing that ABB is recognized for, it's **leading with technology**. Innovation has been in our DNA since we were founded more than 130 years ago to take advantage of a new technology called electricity.

Our people make the difference. Their expertise is why customers come to us with their biggest challenges. Together, we push the boundaries of technology to drive performance, shape new business models and find new ways of working that benefit our customers, partners and society.

As pioneers in electricity and automation, we help to **address the world's energy challenges**. Our solutions make homes, offices, factories and transport more energy efficient and safer, and energy more affordable.

We envisage a future where the physical and digital worlds merge, making operations safer, more intelligent and more productive. By **transforming industries**, we are helping to create a more prosperous and sustainable future.

For us, sustainability is both the right thing to do and a business opportunity. We lead by example by **embedding sustainability** in everything we do. Our solutions reduce harmful emissions and preserve natural resources. We champion ethical and humane behavior to contribute to better lives for people across the globe.



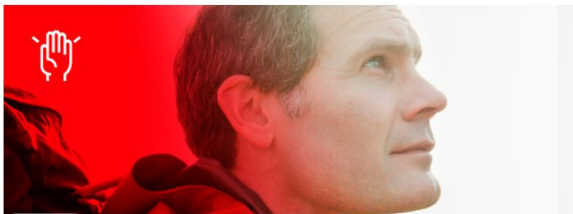
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Approved	Public	2021	1	en	4/60

II. ABB VALUES

Our values are the cornerstone of our culture. They shape everything we do, guide our behavior and interactions with our colleagues, customers, partners, and society as a whole, and help us realize our purpose through our “ABB Way” operating model. By living our four ABB values, we lead by example in how we do business and behave. Robotics encourages its suppliers to adhere to the values below as part of the ABB Group and Robotics ecosystem.

The 4 Values are as below:

COURAGE



- At ABB, we:
- Take action and manage consequence
 - Speak up and ask for help
 - Take calculated risks to create success

CARE



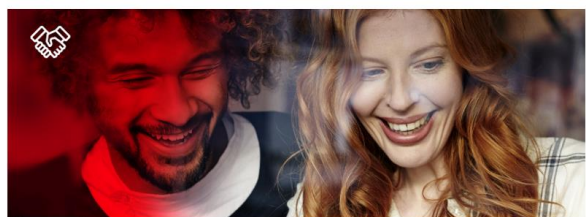
- At ABB, we:
- Take care of our customers, our people, and the environment
 - Respect and value differences
 - Do what is right and act with integrity

CURIOSITY



- At ABB, we:
- Believe there is always a better way
 - Lead with technologies and innovations
 - Learn from failures and successes

COLLABORATION



- At ABB, we:
- Believe smart people collaborate
 - Build on each other's strengths and success
 - Partner with our customers

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Approved	Public	2021	1	en	5/60

III. ABB CODE OF CONDUCT

The ABB Code of Conduct is the framework that explains the behavior ABB expects of every employee and stakeholder around the world. It is based on ABB's business principles: responsibility, respect and determination.

Our principles are about providing our customers affordable products and services without compromising on quality or reliability. But they are also about doing the right thing more generally – following the law, acting honorably and treating each other with respect.

The ABB Code of Conduct provides a framework for employees and stakeholders to put business principles into practice with utmost integrity. It is the foundation so that everything we do in connection to our work at ABB should be, and will be, measured against the highest possible standards of ethics and integrity.

ABB asks its suppliers to go through the [ABB Code of Conduct](#) and adhere to the principles set for the by ABB.

Five integrity principles

- 1 We behave and do business in an ethical way
- 2 We work in a safe and sustainable way
- 3 We build trust with all stakeholders
- 4 We protect ABB's assets and reputation
- 5 We speak up and do not retaliate



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Approved	Public	2021	1	en	6/60

IV. SUSTAINABILITY

Strong supplier performance ensuring resilient, cost-effective, and sustainable supply chains is a key factor in business success, and critical to ABB's growth plans. Furthermore, customers, investors, the media, and our employees have increasing demands on visibility related to sustainability performance and business ethics throughout the value chain.

Environmental Management System

Besides their contractual obligations, our suppliers shall follow the ABB Supplier Code of Conduct, a separate document which requires our suppliers to act environmentally sustainable with a few basic requirements for an environmental management system. We encourage our suppliers to become ISO 14001 certified and to send a copy of the certificate to us.

Hazardous Materials

Additional to the relevant hazardous materials regulations such as the EU Directives REACH and RoHS, ABB has their own list that prohibits or restricts certain hazardous substances in products delivered to us. Our suppliers shall inform us about any substance of that list that is in a product delivered to ABB. The "[ABB List of Prohibited and Restricted Substances](#)" can be found on ABB's website and is updated bi-annually.

Carbon Emissions and a Circular Economy

ABB's strives to become a carbon neutral supplier ourselves. We ask the same from our suppliers. They should evaluate and reduce their carbon emissions by setting ambitious targets. Suppliers should also consider signing up to the Science Based Targets Initiative like we have.

ABB also strives to become a contributor to a circular economy. We thus ask from suppliers to reduce their amount of waste and rejects as much as possible. Use reusable, recycled, or else recyclable materials from a sustainable material wherever possible. This also applies to packaging materials. We encourage our suppliers to inform us regarding their efforts in sustainability and encourage them to propose opportunities for us to reduce carbon emissions and foster a circular economy in our value chain. This especially applies to direct materials, large product development initiatives and project businesses.

Social Responsibility

Supplier shall comply with all applicable international and local laws and regulations regarding human rights, labor rights, fair labor conditions, the requirements set out in ABB Supplier Code of Conduct and contractual obligations to Robotics. The supplier should operate in a socially responsible manner wherever they work.

Robotics has a zero-tolerance policy when it comes to child labor, compulsory or forced labor, modern slavery, poor working conditions for young workers and pregnant or nursing female workers at supplier.

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Supplier should abide principles contained within the Universal Declaration of Human Rights, the UN Guiding Principles on Business and Human Rights, the OECD Guidelines for Multinational Enterprises, the ILO Core Conventions on Labor Standards, the UK Modern Slavery Act and other similar laws and principles support and respect the protection of internationally proclaimed human rights, ensure equality of opportunity, and respect the rights of workers with respect to collective bargaining.

Supplier should establish an effective mechanism have appropriate procedures to evaluate and select sub-suppliers on their ability to meet these principles and to maintain reasonable evidence that these principles are continuing to be met.

Supplier should inform Robotics concerning performances in areas of social responsibility upon request.

Occupational Health and Safety Management

Supplier should comply all applicable international and local laws and regulations regarding occupational health and safety management, the requirements set out in ABB Supplier Code of Conduct and contractual obligations.

Supplier should identify occupational health and safety risks in the scope of their supply to Robotics and make best efforts to provide their employees/contractors/customers/other stakeholders safe and healthy working conditions at supplier's premises, or any other place where they working for the products or services supplying to Robotics.

Supplier is encouraged to implement an occupational health and safety management system, like ISO 45001.

Supplier should inform Robotics concerning performances in areas of occupational health and safety management upon request.

Business Continuity Management Plan (BCM)

Direct material and part suppliers responsible for parts in Robotics' products are required to set up a Business Continuity Management (BCM) Plan. Critical suppliers must develop and maintain contingency plans to ensure predictability and material deliveries. BCM plans include the preparation and occurrence reductions while addressing incidence response actions.

An implemented and approved BCM Plan protects both the supplier and Robotics. Thus, ABB requests that Suppliers consider key elements related to ISO 22301. ABB requests that suppliers develop BCM plans accordingly depending on the organization's operating environment and complexity. Documented Business Continuity Plan ensures that vital business processes and services continue operate in the event of a loss of processing capability or destruction of the facility due to unanticipated disasters or disruption.

The risk management system may include defined management responsible for relevant risks, management reviews including decisions on business continuity and disaster recovery measures; covering risks as single sourcing, long replenishment times, market allocation tendencies, intellectual properties, insolvency risks (Financial Data Rating), sudden interruption or termination of business by catastrophes or force majeure

Sustainable Supply Base Management (SSBM)

To meet these sustainability requirements, Robotics introduced the "Sustainable Supplier Base Management" (SSBM) since 2021.

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The goal is to ensure Robotics’ suppliers comply with the requirements of ABB Supplier Code of Conduct, to support continual improvement of the sustainability performance of Robotics’ suppliers and to provide our customers with a highly competitive, sustainable supply chain.

To verify supplier’s compliance, Robotics reserves the right to audit and inspect supplier’s operations and facilities, at Robotics’ cost and upon reasonable notice, with or without support of a third party. If the results of such an audit or inspection cause Robotics to be of the opinion that supplier does not comply with the ABB Supplier Code of Conduct, supplier shall take necessary corrective actions in a timely manner, as directed by Robotics. Supplier fails to comply with this ABB Supplier Code of Conduct may lead to actions against the supplier, including suspending or terminating supplier’s activities as one of Robotics’ suppliers.

SUSTAINABILITY STRATEGY 2030

With our 2030 sustainability strategy, we are actively enabling a low-carbon society as well as working with our customers and suppliers to implement sustainable practices across our value chain and the lifecycle of our products and solutions. We are equally committed to driving social progress, along with our suppliers and in our communities.

Our sustainability focus is part of ABB’s commitment to responsible business practices, which are at the center of our comprehensive governance framework, based on integrity and transparency. Our framework is underpinned by our five integrity principles in our Code of Conduct, which guides our employees and suppliers to do the right thing and contains a commitment against retaliation. A key part of our 2030 sustainability strategy is to support our customers and suppliers to reduce their emissions and achieve carbon neutrality in our own operations. Our greenhouse gas emissions reduction targets have been validated by the Science Based Targets initiative as being in line with the 1.5°C scenario of the Paris Agreement.

To ensure that we are focused on achieving our goals, our sustainability targets are integrated into our decision-making processes and we have accountabilities and incentive plans in place to drive action.



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Creating Impact across our Value Chain

As a technology leader, we focus on those areas where we can make the biggest impact – reducing carbon emissions, preserving resources and promoting social progress. Our solutions and responsible business practices drive sustainability across our value chain and contribute to the United Nations’ Sustainable Development Goals.

I. We enable a low-carbon society

We are helping to reduce carbon emissions. Our technologies target sectors that account for three quarters of global energy consumption.



Our 2030 commitment:

1. We will support our customers in reducing their annual CO2 emissions by at least 100 mega-tonnes, equivalent to the annual emissions of 30 million combustion cars.
2. We will achieve carbon neutrality across our own operations¹.
3. We engage with our suppliers to extend our impact in reducing emissions across the entire supply chain.

¹We have currently identified areas where we can reduce our scope 1 and 2 CO2 emissions by at least 80 percent and we continuously work on opportunities to do more.

II. We preserve resources

We embed circularity across our value chain. Our solutions reduce waste, increase recycling and foster reusability.



Our 2030 commitment:

1. At least 80 percent of ABB products and solutions will be covered by our circularity approach.
2. Zero waste from our own operations will be disposed of in landfills, wherever this is compatible with local conditions and regulations.
3. At least 80 percent of our supply spend in focus countries will be covered by a supplier sustainability framework, which will include environment, but also social and governance performance (ESG).

III. We promote social progress

We take care of our employees and promote progress around the world. We create safe, fair and inclusive working environments and support community building.

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Our 2030 commitment:

1. Zero harm is caused to our people and contractors – we aim for a yearly reduction in lost time from injuries.
2. We will double the number of women in senior management roles to 25 percent, within our comprehensive diversity and inclusion framework.
3. We are targeting a top-tier employee engagement score in our industry.
4. We provide impactful support for community-building initiatives.

IV. Integrity & Transparency

At ABB, we want to do the right thing and be transparent at every level of our value chain. Performance is measured not only by the results achieved, but also how these results were achieved. A culture of integrity is a prerequisite for a world-class business and ABB’s strength and future success depend on our reputation as a trusted and reliable business partner.

We remain firmly committed to our integrity program and activities to support transparency in our global communication. Different aspects of our governance and policies ensure that our integrity program is adopted by our employees, suppliers and partners, and that we also embed this behavior in all of our business processes with our customers through prevention, detection and resolution.

The main pillar of our approach is our recently updated ABB Code of Conduct, which guides our employees

- to do the right thing
- follow the law, act honorably and treat each other with respect
- and underpins our commitments to ethical behavior and human rights.

The Code contains a commitment against retaliation.

We want to make sure that people can speak up at any level of our organization and value chain and help continuous improvement.

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V. ABBREVIATIONS

3C	-	Computers, Communications, and Consumer Electronics
8D	-	Eight Disciplines of Problem Solving
APQP	-	Advanced Product Quality Planning
BCM	-	Business Continuity Management
CAP	-	Corrective Action Plan
CQP	-	Contractor Qualification Process
CQQ	-	Contractor Qualification Questionnaires
CIPS	-	Chartered Institute of Purchasing & Supply
CO ₂	-	Carbon Dioxide
CTO	-	Configure to Order
DTO	-	Design to Order
E2E	-	End to End
EDP	-	Engineering Delivery Platform
EMS	-	Environmental Management System
ESG	-	Environmental, Social & Governance Performance
ESI	-	Early Supplier Involvement
ETO	-	Engineer to Order
EU	-	European Union
FIFO	-	First In First Out
GDM	-	Global Delivery Model
GUID	-	Global Unique Identifier
HSE	-	Health, Safety & Environment
ILO	-	International Labour Organization
ISO	-	International Organization for Standardization
JIT	-	Just In Time
KPI	-	Key performance Indicator
LCC	-	Life Cycle Cost
MDG	-	Master Data Governance
NDA	-	Non-Disclosure Agreement
OA	-	Order Acknowledgement
OTD	-	On Time Delivery
PD	-	Product Development

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PDP	-	Product Delivery Platform
PO	-	Purchase Order
PPM	-	Parts Per Million
PPO	-	Planned Purchase Order
QM	-	Quality Management
R&D	-	Research & Development
RA	-	Robotics and Discrete Automation
RCA	-	Root Cause Analysis
RFQ	-	Request for Quotation
S&OP	-	Standard Operating Procedure
SBM	-	Supply Base Management
SCM	-	Supply Chain Management
SCoC	-	Supplier Code of Conduct
SoR	-	Speed of Resolution
SPE	-	Supplier performance Evaluation
SQE	-	Supplier Quality Engineer
SSBM	-	Sustainable Supplier Base Management
SSDP	-	Supplier Sustainability Development Program
VAT	-	Value Added Tax
VMI	-	Vendor Managed Inventory

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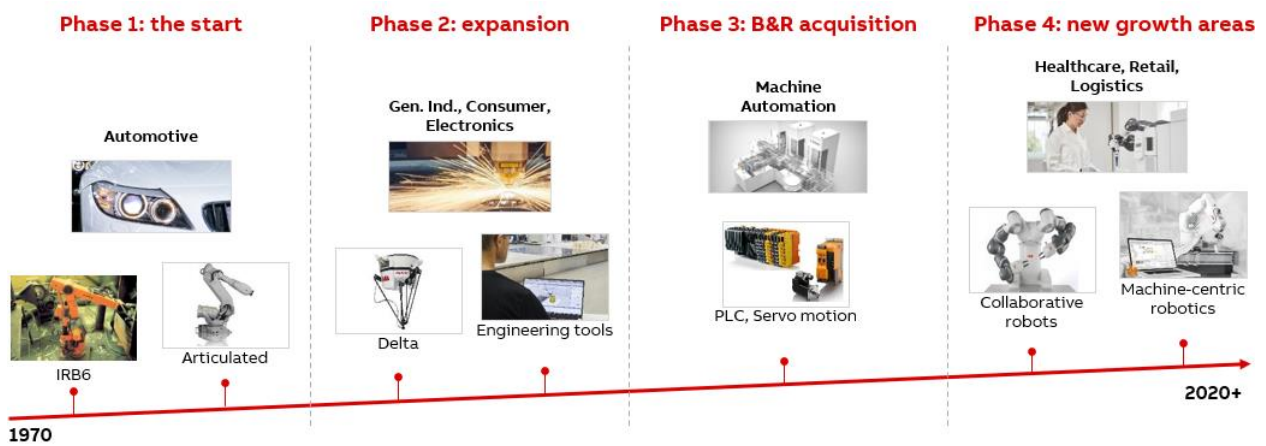
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CHAPTER 1: ROBOTICS AT A GLANCE

In 1974 ABB invented the first microcomputer controlled electric industrial robot, it was quickly adopted to serve the automotive industry. In the following decades, Robotics has grown its portfolio by adding more robot models and software solutions, this has allowed us to enter new segments, like general industry, consumer segment, and electronics. With the acquisition of B&R in 2017, Robotics has added strong machine automation capabilities to its portfolio. Going forward Robotics will continue to innovate and expand its portfolio with products such as machine-centric robotics to enter new segments such as healthcare and logistics.

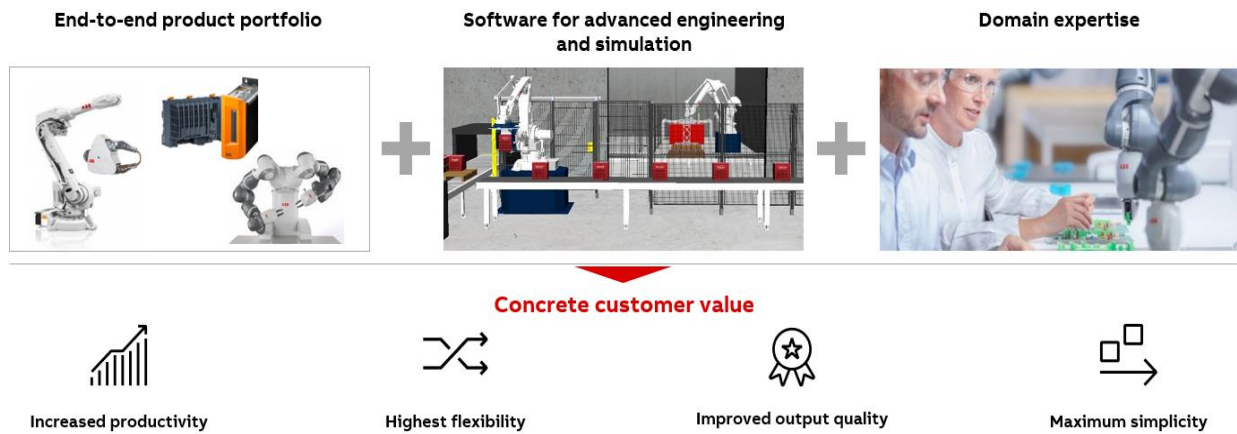


Robotics supports a wide range of customers in various industries.



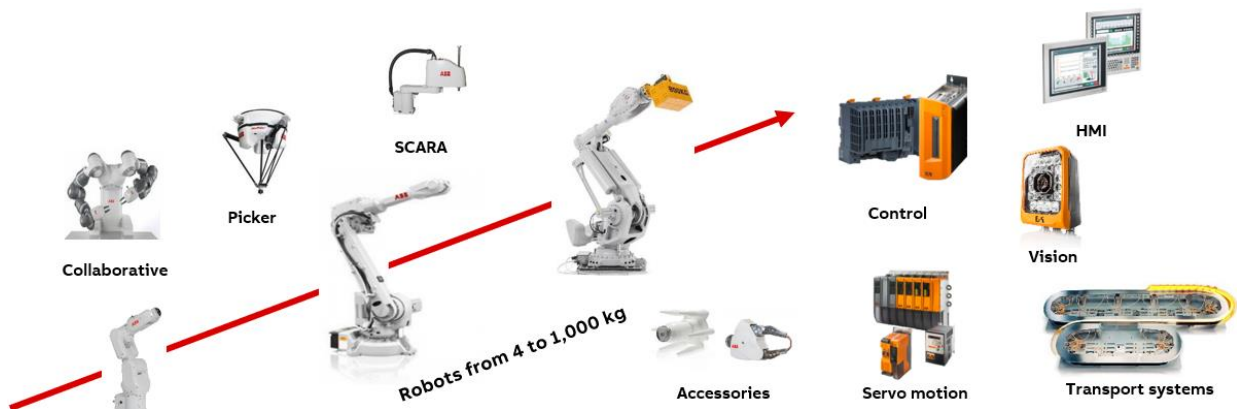
Customers come to us to improve productivity/flexibility, process efficiency, product quality or working environment for their employees.

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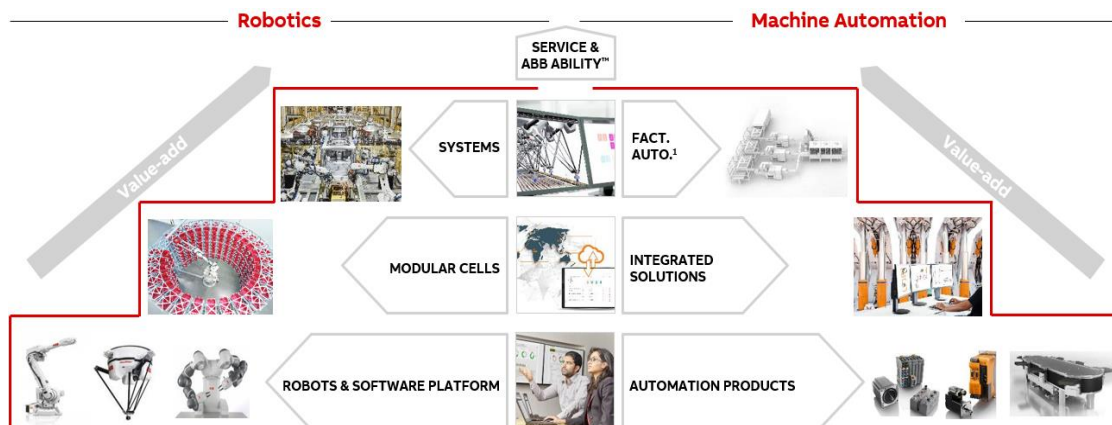


1.1 ROBOTICS PRODUCT OFFERING

Robotics has a broad portfolio of robots with payloads from 4kg to 1 ton, picker, and SCARA robots, as well as collaborative robots like YuMi, GoFa & SWIFTY. With the acquisition of B&R, Robotics has added a strong offering from machine automation including, control, motion, vision, and transport system. Robotics is currently the only player with both robotics and automation offerings under one roof.



Robotics divides its product offerings in three different levels to serve its customer’s needs, selling everything from a “naked” robot to applications and integrated systems.



Robotics also offers spare parts, technical training, and advanced engineering tools such as “Robot-Studio” and “AutomationStudio” to build individual and differentiating automation solutions.

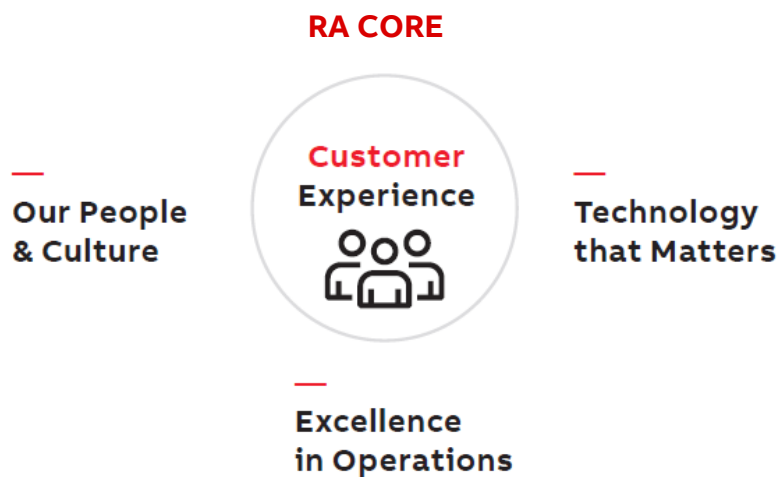
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Robotics constantly faces new challenges to meet customer demands in new applications, to increase quality, providing shorter delivery times and to secure a lower total cost of ownership. The success of the business, to a large extent depends on its ability to collaborate and co-create with its suppliers.

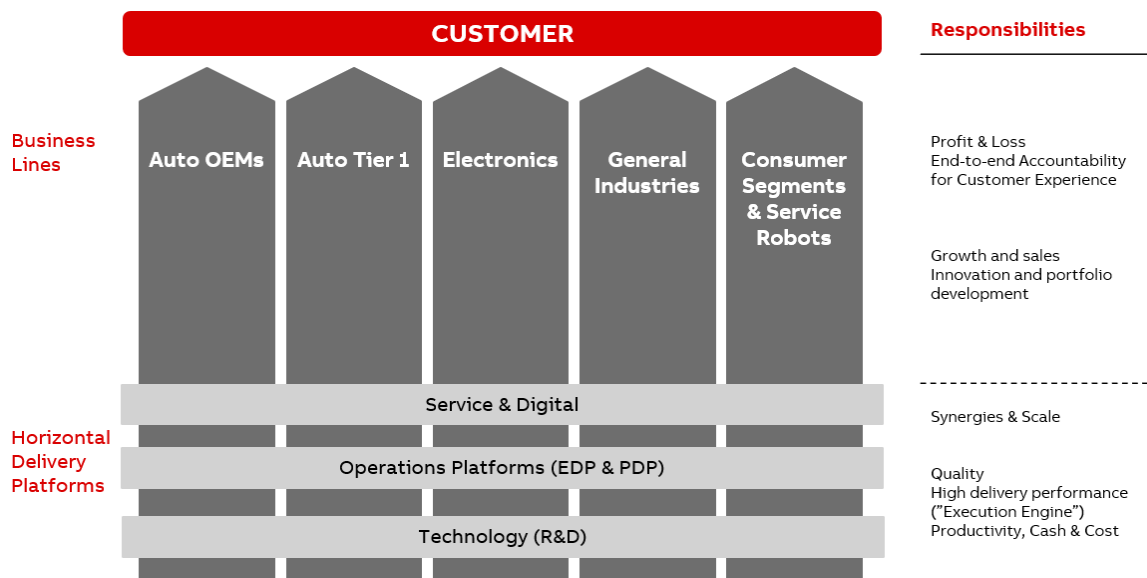
1.2 ROBOTICS OPERATING MODEL

Our customers define the business requirements & what quality means for our business. Therefore, to create outstanding customer experiences, we must put them at the core of everything we do. This way we deliver excellence at every touch point in our customers’ journey. Hence the strategy of Robotics is Customer and People Centered

- Customer at the center, no matter where
- People at the center, no matter where
- Right balance between global scale and local responsiveness
- Refocus on E2E performance (i.e. Operate as a global Platform)



And to achieve this, Robotics has restructured its operations into customer centered business lines with Delivery platforms working together to serve Robotics’ customers as shown below.



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1.2.1 Product Delivery Platform (PDP)

PDP is in short, the entity that manufactures RA's standard portfolio of naked robots and products. In the spirit of collaboration and continuous improvement, please use the links on this page to learn about our organization and the services we provide. We aspire to delight our Customers and inspire our People/Teams whilst driving productivity for a greater return through:

- Safe and Sustainable Execution
- Quality and Agility
- Permanent Focus on Cash and Cost Competitiveness

1.2.2 Service & Delivery

Robotics offers our service globally with over 1,600 service specialists in more than 53 countries and over 100 locations. Our promise is that we will provide world-class services wherever a Robotics robot and systems are installed and be one of the main reasons why customers continue to buy from Robotics. We tailor service packages in close cooperation with our customers– and then we stand ready to help them increase the performance, uptime and lifetime.

1.2.3 Engineering Delivery Platform (EDP)

EDP is, in short, the entity that helps engineer, assemble and test RA's portfolio of value-add to our naked robots, driving industrialization and modularization of cells and function packages. EDP also offers a pool of operation services scaling across Business Lines to support Global Solution Centers and Local Business Lines in over-absorption situations thereby reducing lead times and cost.

1.3 GLOBAL DELIVERY MODEL (GDM)

The **Global Delivery Model (GDM)** consists of a common project model for customer project execution to enable us to achieve our objectives. Common end-to-end process and tools are the foundations of a global company. Better project management and steering will help us to create predictability and transparency on all levels in our organization. With global and common project management we can secure improve the customer experience and provide greater customer benefits.

Figure 1 illustrates the value creation process within Robotics.



Figure 1

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The customer is at the start and end of everything we do. Without our customers we have no reason to exist as an organization.

To understand the customer, we have our Marketing & Sales and Account Management organization. Their function is to listen to the customer and translate their expressed needs into requirements that the rest of the organization can act on.

Once the customer requirements are made known, our R&D and Product Management develop our offering portfolio

If the other functions have done their job properly, we will receive orders from customers that need fulfilment. We breakdown this order fulfilment into three streams; Engineer to order (or ETO), Design to Order (or DTO) and Configure to Order (or CTO). We will discuss these in more detail in a few minutes. Supporting the execution are functions such as HR, IS, Finance and many others. The global delivery model does not specifically focus on these supporting functions; however, they are essential to successful execution and should not be overlooked.

The execution model has three levels to translate the ABB Group goals into actions as shown in Figure 2. The top level consists of common RA processes that apply to all levels within the organization and to all types of delivery. The middle level consists of our execution delivery models that align with the various levels of engineering involved in fulfilling different types of customer orders. The lower level consists of a gate models that define a common execution language. No matter the size or location of the order, the gates and terminology remain the same allowing for consistency and efficiency.

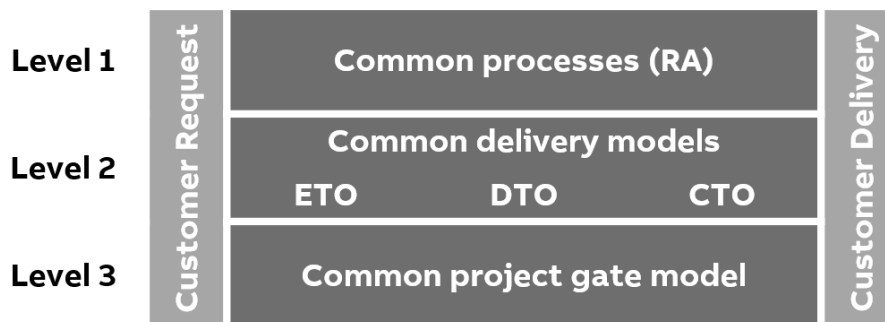


Figure 2

Since we have different types of customer orders, we also have different delivery models. These delivery models are segmented by the amount of engineering effort required to fulfill the order and correlate with our delivery value chain.

Configure to order deliveries do not require any engineering activities. These types of orders consist of naked robots, standard cells and function packages. These orders are generally based on standard or frame agreement pricing and initiated via a purchase order. We consider these orders as “standard portfolio sales”

When we add engineering activities the order becomes a project. In Design to Order the engineering value-add is limited to cells, often with standard interfaces. These orders will generally have a customer RFQ and corresponding Robotics proposal. The order may consist of a purchase order or simple contract.

Engineer to order requires a fully customized solution consisting of integrated cells and systems. The proposal process is detailed and requires up-front development of potential solutions. Most ETO projects have a detailed customer specification, proposal and final contract. Figure 3 summarizes the three different delivery models

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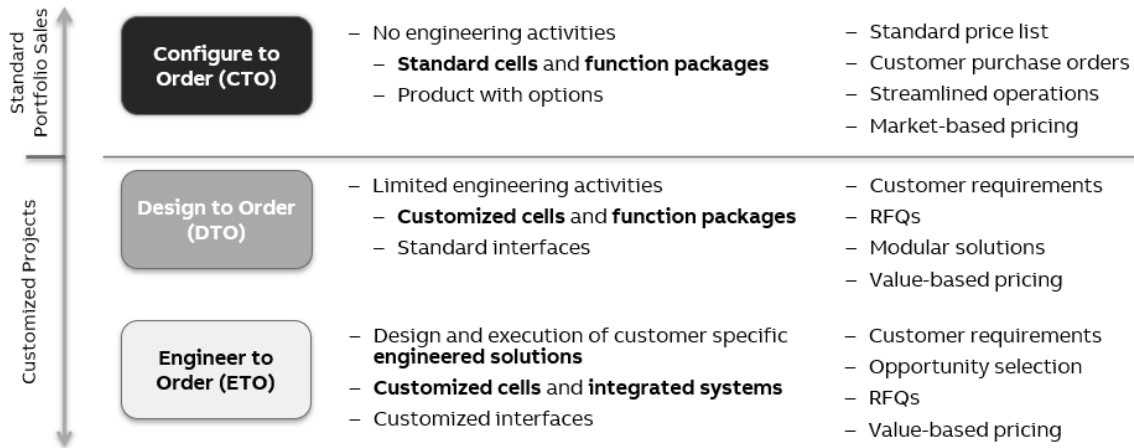
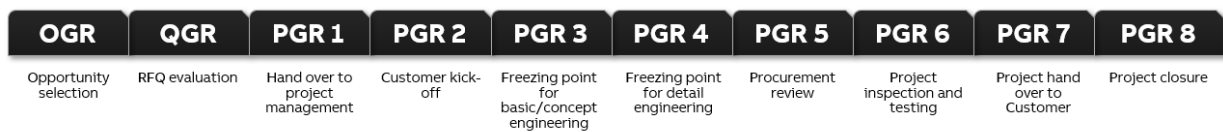


Figure 3

To ensure consistent and efficient execution, a common project gate model has been developed as shown in Figure 4.

A gate model for execution provides a structured process to ensure the execution team has completed all necessary steps before moving on to the next phase of execution. The gates form a standard path for execution to be followed before moving to the next phase, the gate must be passed (or opened) in a formal review meeting.

The output of the gate review meeting is a formal, documented go/no-go decision on proceeding. The delivery model provides a definition of the various aspects of each gate.



The purpose of the gate reviews is to provide a go/no-go decision point on the project based on the project status.

For each project gate, the model defines:

- Responsibilities
- Purpose
- Participants
- Entry criteria
- Required documentation
- Gate meeting agenda

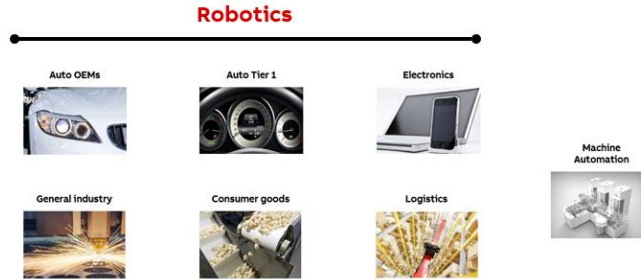
Figure 4

In summary, the Global Delivery Model provides a common language and framework for executing projects and facilitating communications between the execution units and the PDP.

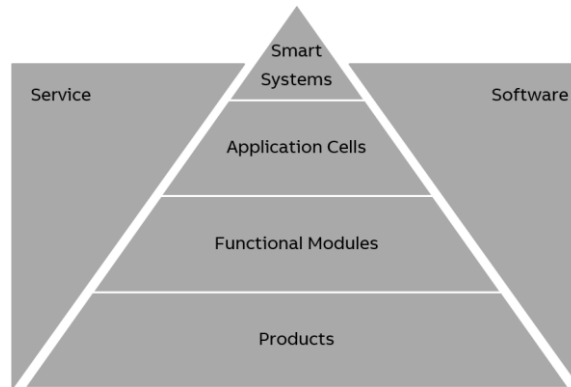
1.4 ROBOTICS STRATEGY 2025

Robotics plans to focus on the 4 levers to true industry leadership to expand market and improve profitability. They are:

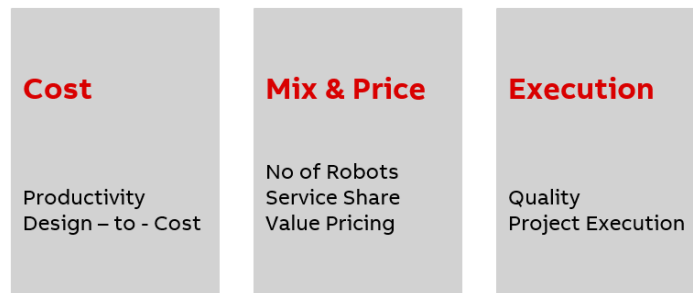
1. Market & Customer Segment Focus



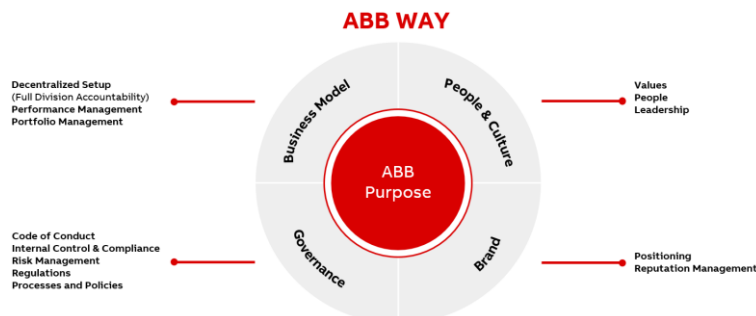
2. Technology & Application Leadership



3. High-Performance Operations



4. People & Performance Culture



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CHAPTER 2:

BECOMING A SUPPLIER TO ROBOTICS

2.1 VISION STATEMENT

Robotics values customer focus, quality and integrity. This means we strive to produce the highest possible quality of goods and services, deliver them to our customers on time and as promised, while following a robust compliance and integrity program. We always want to meet or exceed our customers' expectations.

Our ability to do this depends on our suppliers' collaboration with us. What this means in practice is that our suppliers must comply with our standards, while being committed to making continuous and sustainable improvement in a transparent way.

Our vision is to become a world-leading procurement & logistics function operating at the highest standards, with a balanced approach to quality, speed and productivity, creating greater value for business. Robotics' business strategy is to develop and manage a preferred supplier base that enhances Robotics' competitiveness and success of our customers.

2.2 EXPECTATIONS FROM THE SUPPLIER

2.2.1 Attitude

Robotics requires the following attitude among its suppliers to attain world class performance:

- Strive to continuously Improve
- Demonstrate Innovation and work collaboratively, constructively and is results-oriented.
- Proactively informs Robotics in due time of issues potentially affecting Quality, Delivery or Cost and deals with problems before they occur.
- Follow-up and ensure everything goes as planned.
- Pursues issues urgently and in structured manner.
- High level of responsiveness.
- Strong management commitment and support.
- Formal Communication tools to be used.

2.2.2 Compliance

At Robotics, compliance is the cornerstone of our core principles, customer, shareholder and. Robotics is determined to fulfil high ethical standards on all levels in the organisation and in every place where Robotics operates. Robotics' relationships with customers and other business partners is always built on: Responsibility, Respect and Determination.

Robotics works hard to conduct business ethically with respect towards employees, society and the environment. Robotics has a "zero tolerance" policy towards compliance, integrity, regulatory breaches and unethical business practices.

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Robotics views our Suppliers as part of our “Extended Enterprise” and requests that the Suppliers honor and adhere to the same compliance standards. This includes fair and legal labor conditions, social aspects, occupational health and safety, and environmental responsibility. Robotics conducts business with Suppliers that are not “Sensitive & Prohibited” and with materials that are not “Prohibited”. Robotics works with Suppliers to ensure that Conflict Minerals, REACH and RoHS requirements are satisfied.

ABB’s Supplier Code of Conduct places greater attention on slavery, human trafficking, and forced labor. The Supplier Code of Conduct (SCoC) outlines ABB’s requirements for all companies we conduct business. The **ABB Supplier Code of Conduct** derived from the ABB group Code of Conduct, is a guide for these general principles including:

- Human rights
- Fair labor conditions
- Health, safety and environmental management
- Material compliance and conflict minerals
- Business ethics
- Secure business
- Procurement by supplier
- Inspections and corrective actions
- Access to remedy
- Trade Compliance

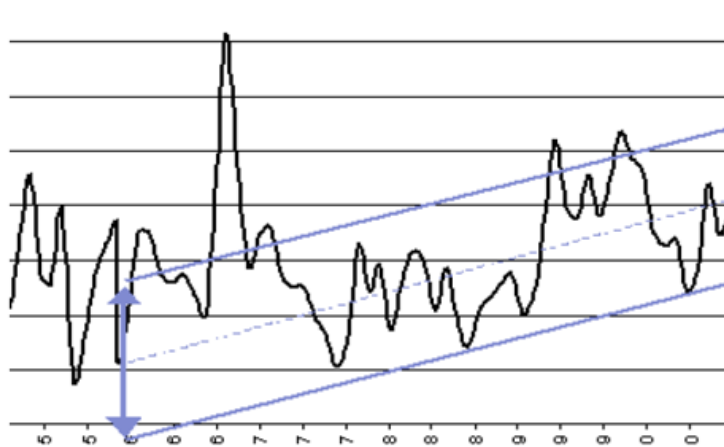
As we operate in a global environment, Robotics complies with applicable trade laws and regulations, including those relating to import and export controls, trade sanctions and customs procedures. We expect our business partners to do the same and to maintain awareness and an updated knowledge and understanding of trade compliance.

An **implementation guide** is available to support our suppliers understand and meet sustainability requirements of the SCoC.

2.2.3 Flexibility

An analysis of Robotics historical production outcome displays Robotics’ need for flexibility in deliveries from its suppliers. The different factors affect Robotics on long, medium, and short term.

The graph below shows the production outcome for a single robot variant during a five-year period.

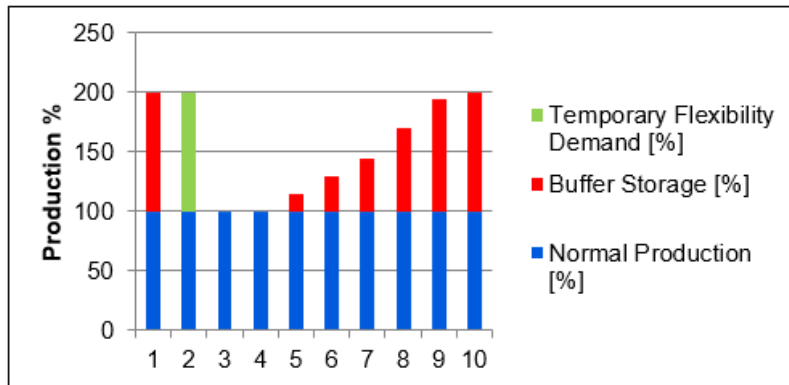


Summarised, Robotics flexibility requirements can be expressed as below if not stated otherwise in the contract:

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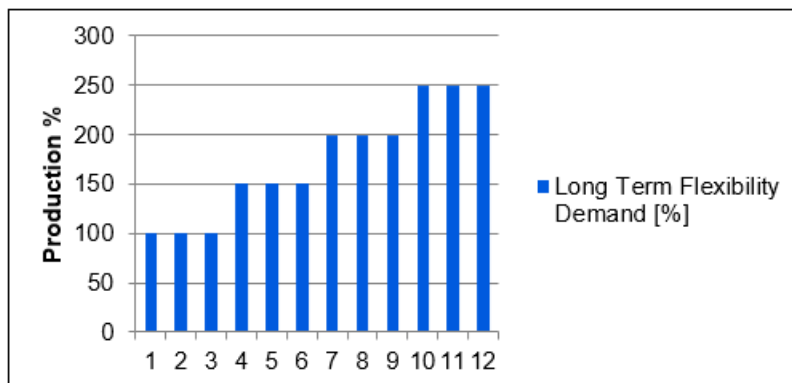
Short term flexibility for volume parts:

- Next coming week forecast: +/- 100 % (Buffer Stock)
- Next coming month forecast: +/- 50 % (increase of production & buffer stock)



Long term flexibility for volume parts:

- Plan of action & capability: Fast & Cost-effective
- After 3 months forecast: +/- 50 % (increase of production capacity)
- After 6 months forecast: +/- 100 % (increase of production capacity)



If Robotics decides to use the short-term flexibility option of 100 % the following week, it will affect the restoration of the buffer stock as pictured above (picture 2.1)

During the period of rebuilding the buffer stock Robotics will not demand a temporary flexibility option of another 100 % until the buffer stock is fully restored. The time period for replenish the buffer stock will be stated in the contract.

The demands on long term delivery flexibility will affect the permanent production capacity as pictured above.

2.2.4 Quality Management

The supplier must agree to introduce and maintain a quality management system according to ISO 9001 (Latest Version), or equivalent third-party certification recognised by Robotics, with the obligation to defect free delivery and to continuously improve performance. Certified suppliers must send a copy of their quality system certifications to Robotics.

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Suppliers who are not certified shall present to Robotics their plan for ISO 9001 registration and management of Quality and will be subject to a Quality Management System audit by Robotics.

2.3 BENEFITS OF BECOMING A SUPPLIER TO ROBOTICS

There are several benefits that come with being a supplier to Robotics. Listed below are some of them:

- **A long-term relation** – Robotics continuously aims at creating long term relations with its suppliers and has the financial strength and patience to do so.
- **Volume** – If the supplier proves to be a best-in-class supplier and has developed a fruitful relationship with Robotics, they may also become supplier to other ABB companies.
- **Global Opportunities** – Robotics is, together with other ABB companies, distinctively global which provides the supplier with the opportunity of becoming a global player.
- **A Sign of Quality** – Robotics is thorough in the choice of supplier and demands high performance in all areas. A supplier approval from Robotics is therefore a desirable sign of quality and an excellent reference.
- **Technology** – Robotics develops and produces high tech products. As such, it is a chance for suppliers to access and/or develop latest advanced technologies to their own benefit.

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CHAPTER 3:

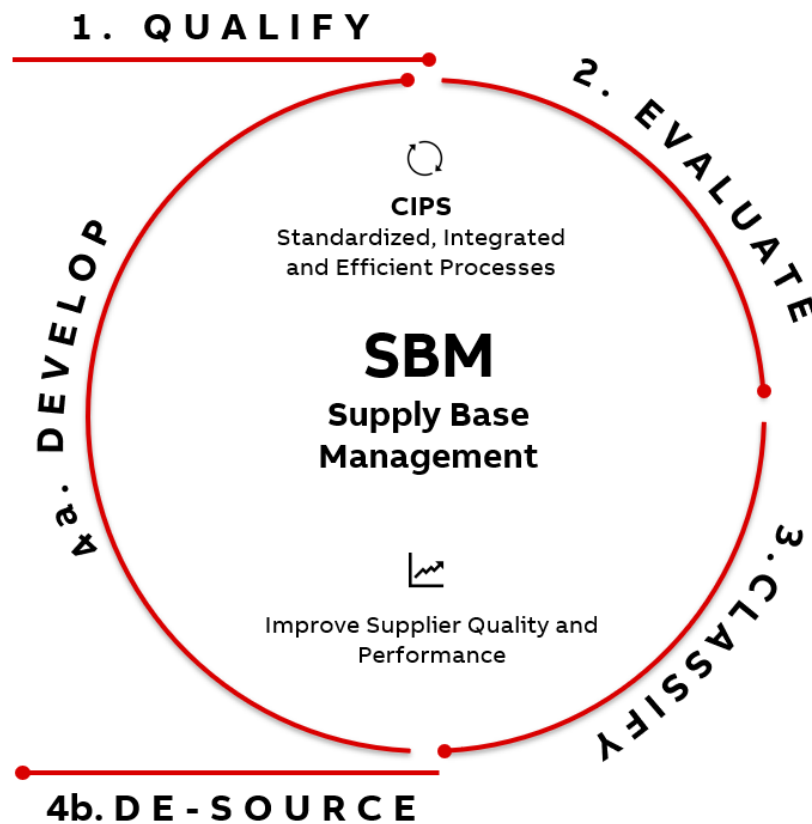
SUPPLY BASE MANAGEMENT

The overall Supply Base Management's purpose is to improve supplier quality, productivity & cost, on time delivery & compliance, while consolidating our supply base and reducing risks for the company and our customers. Within this end-to-end approach the goal is to achieve:

- Qualified & compliant suppliers.
- Classified, consolidated & high performing supply base.
- Global access to relevant supplier information such as reports, evaluations & audit reports.

There are 4 steps in the Supply Base Management circle (based on the CIPS directive) shown below:

- Qualify.
- Evaluate.
- Classify.
- Develop.
- De-Source.



Each of the steps are described below in detail.

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3.1 QUALIFY

Supplier qualification is implemented following Robotics Supplier On-Boarding & Qualification policy. This Policy establishes the process for requesting and onboarding new suppliers to Robotics. It describes the scope, requirements and roles and responsibilities related to the process to be conducted from the time a request to add a supplier is raised, to the time the supplier is available for use as a “Qualified” supplier in Robotics’ supplier management system SAP Ariba.

The objective of the policy is to provide the required governance, information and oversight to ensure that suppliers to Robotics can meet requirements including but not limited to business integrity, financial stability, health and safety, performance and product quality. The policy provides a common approach and standardized tools for all ABB Business Areas and support organizations, with global availability of information so maximizing the use of ABB resources.

The policy provides a high-level description of the relevant processes including requirements for onboarding information, supplier information requests, information validation and risk assessment, and internal approvals necessary for setting up a new supplier in ABB’s systems. The Policy also describes the process for re-validation and evaluation of the supplier to remain available use and under what circumstances this is required.

3.1.1 Process Applicability

This Policy is applicable to all ABB Business Areas, Divisions, support organisations and entities procuring materials or services from external suppliers. The Policy is mandatory for all new suppliers of direct or indirect material and services, including transport and logistics services and information systems.

3.1.2 Process Overview

Supplier Onboarding process is required for each supplier location or entity that requires a unique GUID. Where multiple locations share a common Global Unique Identifier (GUID) then a single process may be followed all locations. At a summary level, the process for requesting and onboarding of new suppliers comprises the following 4 steps which are described in this document:

1. Supplier Request
2. Supplier Registration
3. Supplier Qualification
4. ERP Supplier Creation

NOTE: The process for requesting and onboarding of new suppliers to ABB and supplier management is going to be handled by using the ABB Group-wide tool SAP Ariba, newly introduced replacing the old ProSupply+. Why move to ARIBA is explained in Section 3.6.

3.1.3 CQP - Contractor Qualification Procedure.

If the supplier is required to performed work on-site at an Robotics or customer location, the Contractor Qualification Questionnaire (CQQ) shall always be issued in addition to the correct SQQ, with the exception of services provider under Indirect Services category which do not require CQQ.

In relation to CQQ, SAP Ariba contains 2 versions of the questionnaire, a short form and a long form which will be sent to suppliers based on the different expected annual spending.

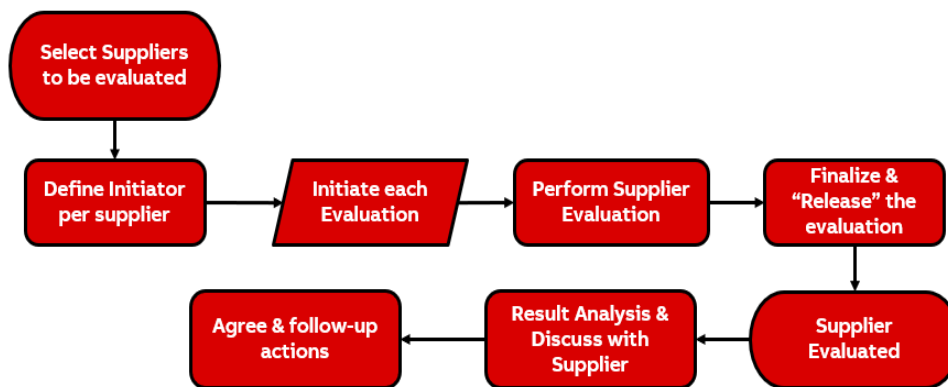
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3.2 EVALUATE

To evaluate our supply base, we use a process called Supplier Performance Evaluation (SPE). SPE is a mandatory process embedded in our new Supplier Management tool SAP Ariba with the main purpose to:

- Evaluate the performance of existing suppliers in a standardized manner (internal & external)
- Provide global internal access to the results
- Provide our suppliers with proper and professional feedback
- Provide input for supplier management as part of Category strategies

Below you can find the high-level process description:



3.2.1 Key Performance Indicators

In order to be able to compare the performance of suppliers we have standardized “what” and “how” we evaluate our suppliers. Looking at “what” we have divided this into 5 different main areas shown below:

- Quality
- Delivery
- Commercial
- Technology
- Sustainability & Risk

To standardize “how” we measure performance we have chosen a few Key performance indicators (KPIs) per measurement area. KPI’s are a set of quantifiable measurements used to gauge supplier’s overall performance over time. Robotics believes in continuously improving its processes, products and suppliers, as a result of this and the fact that our circumstances and requirements are constantly changing, target level for each KPI is reviewed on a yearly basis.

Below follows a short introduction to the measurement areas and their related KPI’s:

I. Quality

Parts per Million (PPM):

PPM is a commonly used quality indicator and measures the level of quality on our direct material. Robotics general quality requirement is **50 failing Parts Per Million (PPM)** and below is how the KPI is being calculated monthly:

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$$\text{Parts per Million (PPM)} = \frac{\text{Non – conforming materials last month}}{\text{Received parts during same month}} \times 1000000$$

Speed of resolution (SoR):

Speed of resolution is essential to Robotics customer and business as most customers are sensitive to uptime and need to rely on quick resolution once they occur. Robotics expect every supplier to act with a sense of urgency whenever a complaint, problem or issue which requires an 8D is raised. Speed of resolution target is **10 working days**.

II. Delivery (OTD):

The customer shall always be the only limiting factor on the capacity of Robotics to deliver. For this reason, On Time Delivery (OTD) is essential for Robotics and its suppliers. Robotics requires a high and over time sustainable OTD from its suppliers. With a target to suppliers to converge towards -3 / +0 days. OTD target is **98%**, unless otherwise stated.

Beside the OTD demand, expected and effective lead-times are vital for Robotics to be able to plan production and customer deliverance. It is also of great importance that the supplier continuously reduces its lead-times in order to increase delivery flexibility. Especially in times where we see greatly increased expectations on fast and flexible deliveries of robot products and robot systems.

III. Commercial:

The Robotics Market is affected by sharp year-on-year price erosion; hence continuous reduction of total cost is Robotics' weapon and a must for long-term survival. Robotics and its suppliers must constantly work together with cost reduction activities to stay competitive. These activities focus mainly on increasing productivity through improvements within the manufacturing processes, organization and product design. With increasing productivity come not only lower costs, it will also raise and stabilize the quality level. Consecutively this will amplify the company's competitiveness and the possibilities to gain profitable market shares.

The KPI to measure commercial performance is cost reduction (CR) and measure of the cost of a purchased product compared to the average of the cost of that same product previous year.

IV. Technology:

Robotics develops and produces high technological products and to always be at the forefront of innovation. This requires suppliers that continuously invest time and resources to collaborate in Robotics led development projects but also to independently develop and improve its own products and offering. Robotics can never achieve the goal of producing the best industrial robots in the world if its suppliers don't have a similar ambition. But innovation also implies to implement enhanced manufacturing processes and present new ideas to Robotics of how modifications of product design, specification and tolerances can improve productivity, quality and costs.

For this measurement area our KPI's are more subjective compared to some others and here we evaluate the level of collaboration in new development projects, ideas of improvements and innovations related to products that supports our business.

V. Sustainability & Risk:

Sustainability has never been more important and in some respects, this is a "ticket to play" for many industries including Robotics. Taking care of our environment effects our reputation and at the end

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of the day our ability to get orders from our customers. We, as a company are with constantly trying to find new ways of working to improve and decrease our footprint and we expect the same from our suppliers. The most concrete way of measuring this is through certificates, audits, a transparent dialogue and with each other.

From a business continuously perspective we also value that you have thought about risks such as, financial, quality, data integrity, political and transportation among others. It is required and appreciated if you communicate early so that we can understand and help to mitigate or reduce the risk identified.

NOTE: On a yearly basis, the major KPIs for the suppliers are evaluated by the cross functional teams and the least performing suppliers from different Categories are selected to participate in the FLOP10 Process that is explained further down in section 3.5.

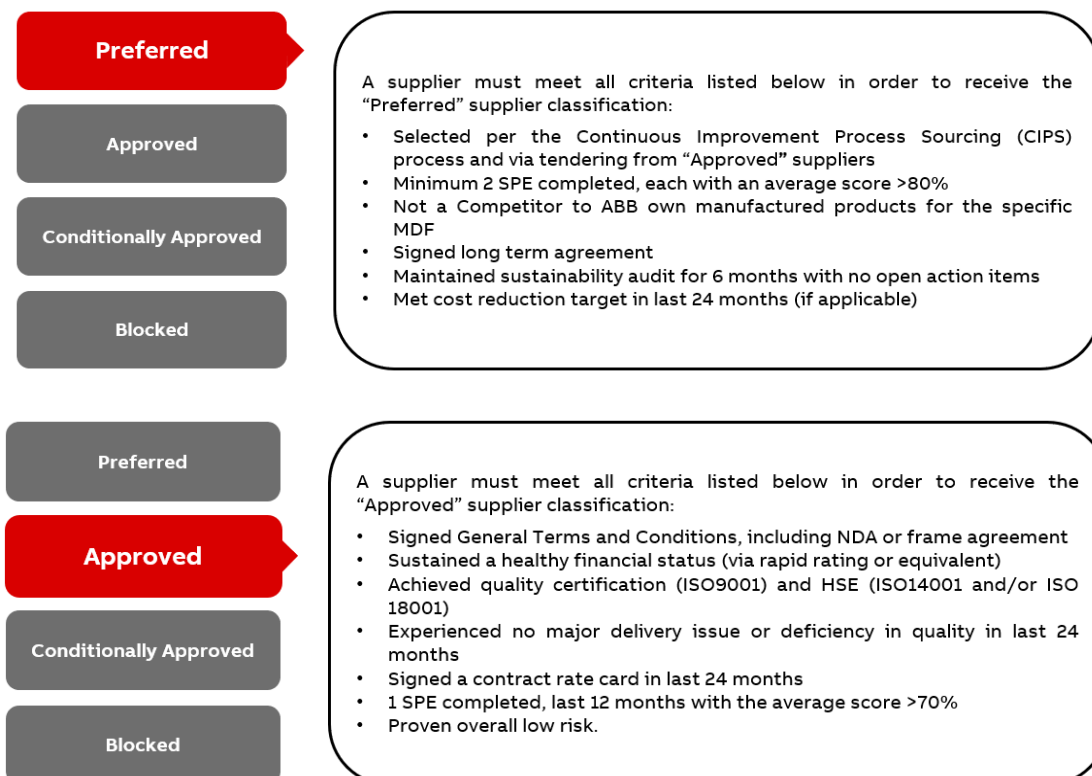
3.3 CLASSIFY

The goal of supplier classification is to:

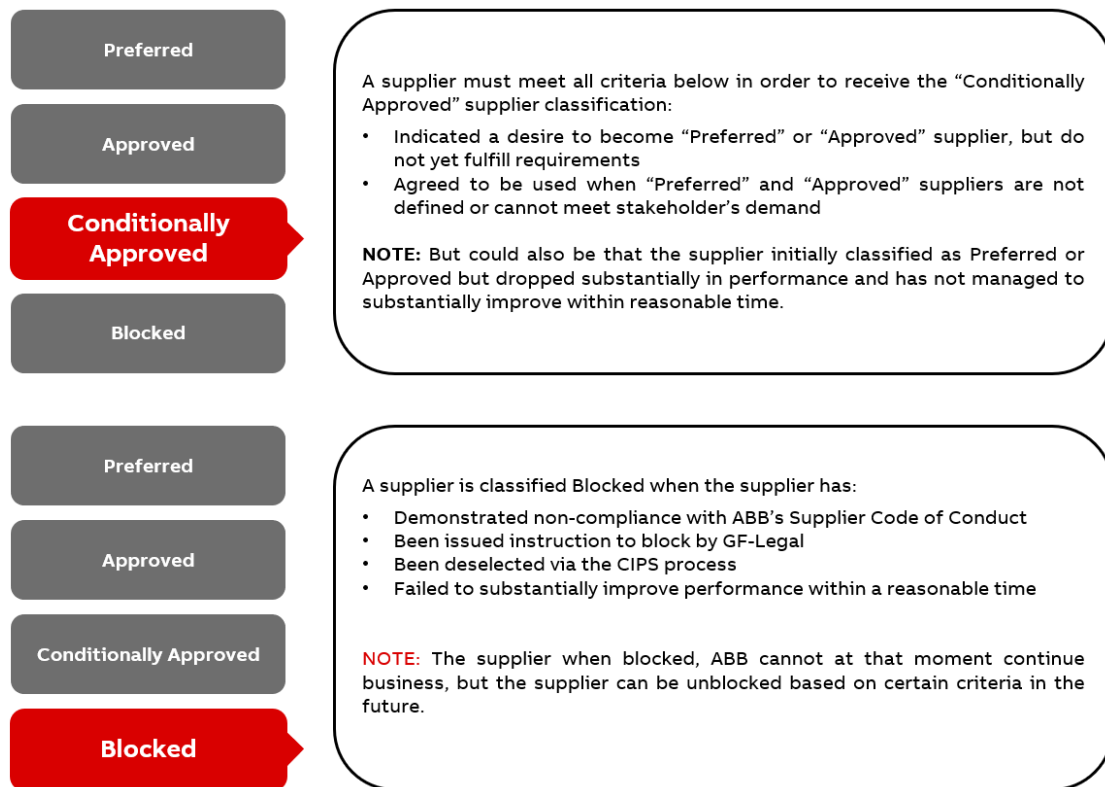
1. Bring category strategy to action, considering the organizational and category dimension within Robotics, by channeling spend to "Preferred" and "Approved" suppliers.
2. Aligning Robotics' supply base with strategic group targets through thoughtful supplier classification efforts, we can ensure consistency in products, services and pricing.

The suppliers of Robotics are classified in SAP Ariba as follows:

- Preferred
- Approved
- Conditionally Approved
- Blocked



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3.4a. DEVELOPMENT

The supplier relationship is often based on the Category Management structure which is organized to make sure we have dedicated people in place to support our suppliers to develop, improve performance and capabilities. Robotics aspires to work close to suppliers to commonly share strategies, ambitions, and targets by utilizing Robotics’ lean Six Sigma approach, workshops for Supplier development, 8D methodology as well as other tools and system. The development areas vary widely, both what we target and how we do it but below are a few examples of what we are trying to achieve together with you as a supplier:

- Continuously improve supplier capabilities that are necessary to meet Robotics’ expectations and requirements
- Improve operational performance matrix’s as Quality, OTD, Delivery Time and more
- Increase supplier service and innovation capabilities (in products and processes)
- Form a relationship that helps Robotics and its suppliers to compete more effectively
- Create and maintain a strong network of competent suppliers
- Increase collaboration and trust between Robotics and its suppliers

We strongly believe that a sustainable business relation must develop over time. Therefore, we usually invite for quarterly business reviews to discuss both past and future, what we can do differently and what has been good.

3.4a.1 Supplier Continuous Improvement Activities

Robotics strives to continually perform better and expect the same from the suppliers. Quality management system must ensure improvements of process, based on evaluation of data and information. As there is always a risk, as an effect of uncertainty on an expected result, Robotics is interested to be informed about initiatives and results at the supplier’s side, in addition give feedback on effectiveness of supplier’s promotion of focus on enhanced customer satisfaction. Besides the

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After the workshop, "Letter 1" is officially sent to the supplier. The supplier then has 2 weeks to provide a Corrective Action Plan (CAP) that the supplier would like to implement, and Robotics can support the supplier in preparing the plan. The supplier then has 12 weeks to execute the plan and Robotics Monitors the progress during the next 8-12 weeks. If the supplier manages to reach the target and is sustainable, then the supplier can exit the Flop 10 process. If the supplier does not reach the targets "Letter 2" is issued and thereafter follows the same steps as after "Letter 1".

3.5.1 IMPACT OF FLOP10 LETTERS:

Flop 10 letter 1

Purpose: Generate focus and a corrective action plan (CAP) that brings supplier back to sustainable PPM, Speed of resolution and/or OTD levels.

Time period: 6 months to comply with set targets

Business impact: None

Flop10 letter 2

Flop10 letter 2 is sent to a Flop10 supplier that:

- Fail to provide CAP on time
- Provides CAP that will not take supplier back to sustainable PPM and OTD levels
- Corrective actions are not progressing or are ineffective
- Still have systematic risk to fall into Flop 10 again
- Failure to reach and sustain Letter 1 targets

Purpose: Give a clear message about the business impact of not improving/responding. Generate focus and a corrective action plan (CAP) that brings supplier back to sustainable PPM, speed of resolution and OTD levels.

Time period: 6 months to comply with set targets

Business impact: Robotics defines and activates plan for 20% target reduction of business with the supplier

Flop10 letter 3

Flop10 letter 3 is sent to a Flop10 supplier that:

- Fail to provide CAP on time
- Provides CAP that will not take supplier back to sustainable PPM and OTD levels
- Corrective actions are not progressing or are ineffective
- Still have systematic risk to fall into Flop 10 again
- Failure to reach and sustain Letter 2 targets

Purpose: Give a last chance to improve before full de-sourcing. Flop10 letter 3 is only given via a business meeting in Robotics HQ.

Time period: 6 months to comply with set targets

Business impact: Robotics defines a plan for removing all business with the supplier, including ongoing projects and mass production parts.

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NOTE: The FLOP10 process is driven by Robotics as a supplier development and continuous improvement activity which is to be led by the suppliers to improve performance with support from Robotics. It is possible that the supplier can be de-sourced through the process besides the reasons stated in section 3.4b.

3.6 WHY SAP ARIBA?

3.6.1 Where are we right now?

Systems

- Stand alone solutions w/o integration (e.g. ProSupply, SNCRP)
- Large number of interfaces between other systems or applications
- Outdated and non-state-of-the-art platforms
- Platforms to come to end-of life

Processes

- Non standardized and harmonized processes across businesses, countries and regions
- No end-to-end integration
- Various channels to interact with suppliers
- No house-keeping in transactional systems

People

- Additional workload due to inconsistent and/or incomplete data
- No clear defined roles/responsibilities
- Missing ownership of data/information

3.6.2 Where do we Want to go

The key objectives of where we want to go are:

1. State-Of-The-Art Procurement

- To replace ProSupply - Emptoris by mid of 2020
- End-to-end integration across all platforms along the chain (Ariba – MDG – SAP-ERP)
- Benefit from suppliers being on the Ariba Network
- To improve strategic sourcing processes (more convenient, more practical and simpler)
- To get rid of third-party partner suppliers (e.g. Achilles)

2. Transparent & Seamless Supplier Management

- To have a standardized process starting from onboarding to a structured transfer into transactional systems in place
- To make the overall supplier-master data process (data, quality, governance) a business process again
- To improve overall data quality and completeness
- To establish a central business team to manage supplier-data

3. Digitize & Accelerate Transactional Processes

- To collaborate in a more efficient and standardized manner
- To benefit from a various number of communication scenarios beside P.O. send and confirmation

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- To improve overall transparency within Supply-Chain
- To speed-up transactional P2P process based on clean, complete and high-quality master-data

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CHAPTER 4:

PRODUCT DEVELOPMENT

4.1 PRODUCT DEVELOPMENT PROCESS FRAMEWORK

For Robotics to stay competitive in the market, it requires continuous improvements to existing products and continuous development of new products. The global development process framework is based on Platform thinking and agility and supports development organized either in projects or in SAFe-trains or a combination.

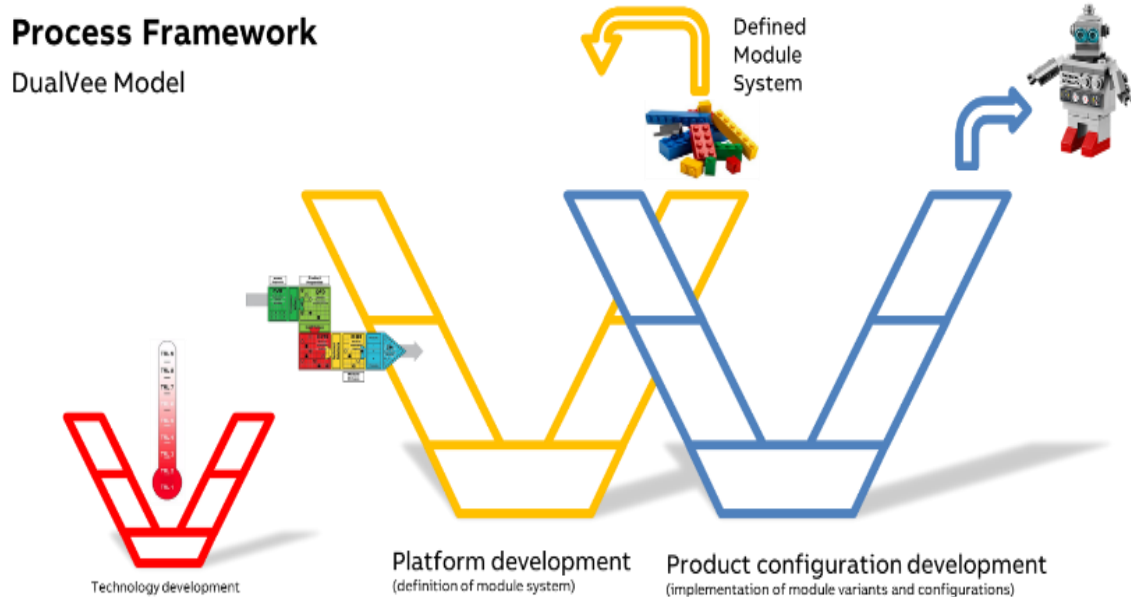
Our success is totally dependent on our ability to collaborate over the domain borders and cross-functionally with other functions and suppliers to successfully integrate our deliveries into one solution.

We organize our development in three major categories listed below:

- **Technology development:** Pre-studies to close knowledge gaps
- **Platform development:** Definition of module systems, modules and interfaces
- **Configuration development:** Implementation of module variants and product configurations

The **Platform** department has the long-term technology, platform and process ownership.

Program managers are the drivers of development projects and activities. There is one program for Product Improvement taking care of improvements of released products.



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4.1.1 Product Development

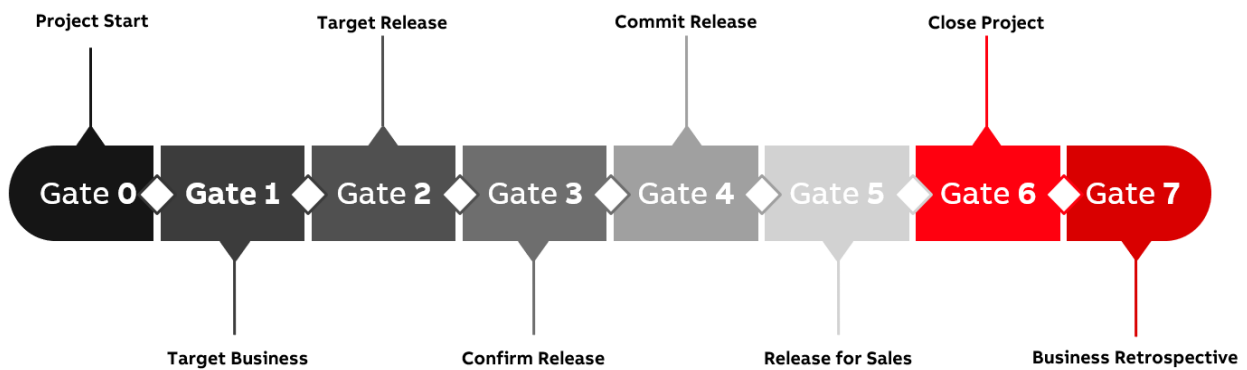
New products are built on defined platforms. The development of a robot system follows a V-model, but the work in various areas should be managed as agile as possible in increments and iterations.



4.2 GATE MODEL FOR PRODUCT DEVELOPMENT

The ABB Gate Model serves as the one common business decision model used by all technology and product development organizations across the company.

The Gate Model is an integral part of how product development is governed at Robotics. It contributes to a common language and shared understanding of development progress and status. Ultimately it aims to increase the ratio of successful projects, resulting in better products and reducing the time from idea to profit.



The gate model in one word per gate:

- G0 Why?
- G1 What?
- G2 How?
- G3 Confirm?
- G4 Launch?
- G5 Release?
- G6 Close?
- G7 Evaluate

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GATE 0: Initial business motivation in place, and all required organizational functions are ready to start.

- High level customer needs and expectations
- Adequate resources to start the project

GATE 1: Agreement on business motivation and intended offering, and all organizational functions are ready to start planning.

- ESI Possible Start
- Make or buy analysis performed
- Business and technology risks identified
- APQP Kick-off & Planning

GATE 2: Agreement on the targeted release (scope, cost and time), and all organizational functions are ready to start execution.

- APQP Milestone 2 Product Design and Development
- Initial design, drawings and specifications defined
- Confidence that the technical solution is achievable. Prototype Material Receiving & Testing.
- Targeted release has been agreed in terms of scope, cost, time and priorities
- Plans are realistic and achievable
- Activities to ensure technology ownership are initiated

GATE 3: Agreement on the confirmed release and all organizational functions are on track.

- Planned activities are on track for market introduction
- The technical solution is confirmed.
- APQP Milestone 3 Process Design and Realization initiated
- Adequate resources to complete

GATE 4: Business case and release are committed, and the organization is ready to start market introduction.

- Technology ownership has been secured
- Business and technology risks are acceptable and managed
- The technical solution is committed and there is confidence in the product quality
- APQP Milestone 4 Product & Process Validation performed (Audits, Initial Samples)

GATE 5: The organization is ready to release, manufacture, and start sales.

- The product is ready for release
- Service offering is ready for release
- APQP Milestone 5 Assessment of Serial Production executed

GATE 6: The project has been closed in a controlled way, all deliverables have been handed over to the organization and lessons learned have been captured.

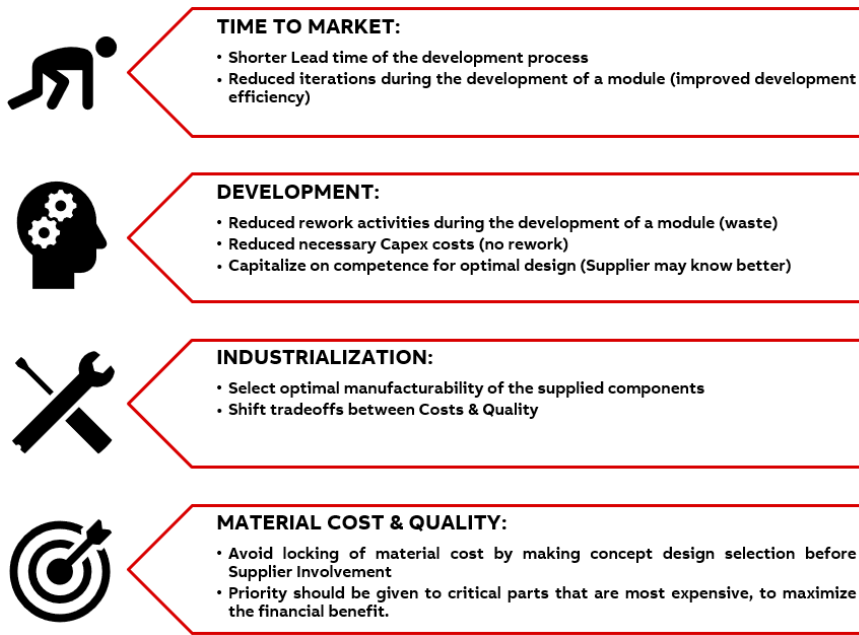
- All deliverables have been completed and handed over to the organization
- APQP Closure
- Initial customer feedback and lessons learned have been captured and acted on
- Sales, supply chain and manufacturing are fully operational

GATE 7: The business impact has been evaluated and selected improvements are being implemented.

- Customer feedback has been analyzed and selected improvements are being implemented
- Internal feedback and lessons learned have been analyzed and acted on

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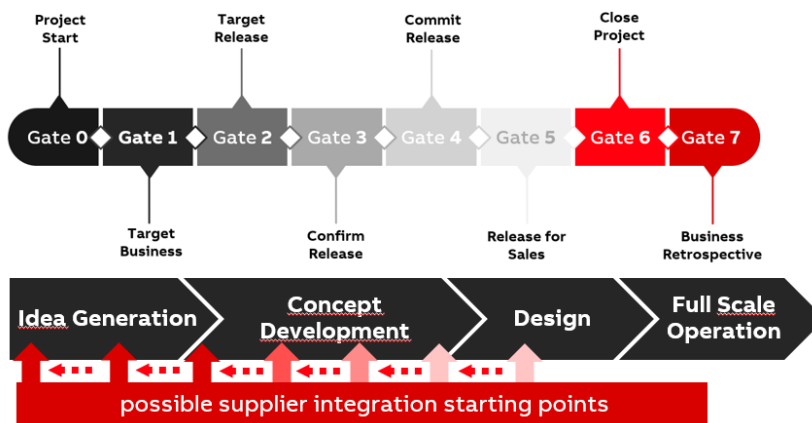
4.2.1 Why Gate Model for Product Development



4.3 EARLY SUPPLIER INVOLVEMENT (ESI)

Early Supplier Involvement (ESI) is a form of vertical collaboration between selected partners in which the manufacturer involves the supplier at an early stage of a project or a technology development activity. (Van Weele, 2010)

ESI can be embedded in the Product Development Process at different stages



Typical timeline of the ESI in New Product Development



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4.3.3 ESI process phases

1. Set up Project ESI Plan

Determine where ESI engagement is expected to bring highest value.

Assess, Prioritize & Select areas most critical in terms of technology, requirements, specifications and/or financial value

- Identify ESI areas & scope
- Set up ESI cross-functional teams
- Align on ESI targets
- Business case and financial targets
- Set up initial ESI engagement time plan.
- Identify IP areas to protect

2. ESI Preparation & Supplier Pre-Selection

Prepare information required for an efficient Supplier Involvement.

- Align on ESI Mode
- Prepare necessary ESI Information (Specifications, Timeline, Commercial targets)
- Set up ESI/Supplier evaluation Criteria/Method
- Pre-select suppliers that will join the ESI activities
- Define IP Control

3. ESI Kick off

Introduction & Start of Formal Exchange with suppliers.

Build Suppliers engagement to the ESI process

- Project scope, Targets, Timeline, Deliverables, Business potential Etc.
- ESI engagement plan: “Rules of the game” and “Suppliers incentives”
- Share of design info (functional requirement, drawings, visualizations etc.)

4. ESI Execution & Follow up

Continuous exchange & refinement of requirements & proposals.

- Collecting supplier ideas and business proposals
- Identification of Gaps & Supplier Feedback
- Quantification of financial benefit
- Update of Evaluation and of Evaluation Criteria/Model

5. Selection/Award

Supplier Selection/Award

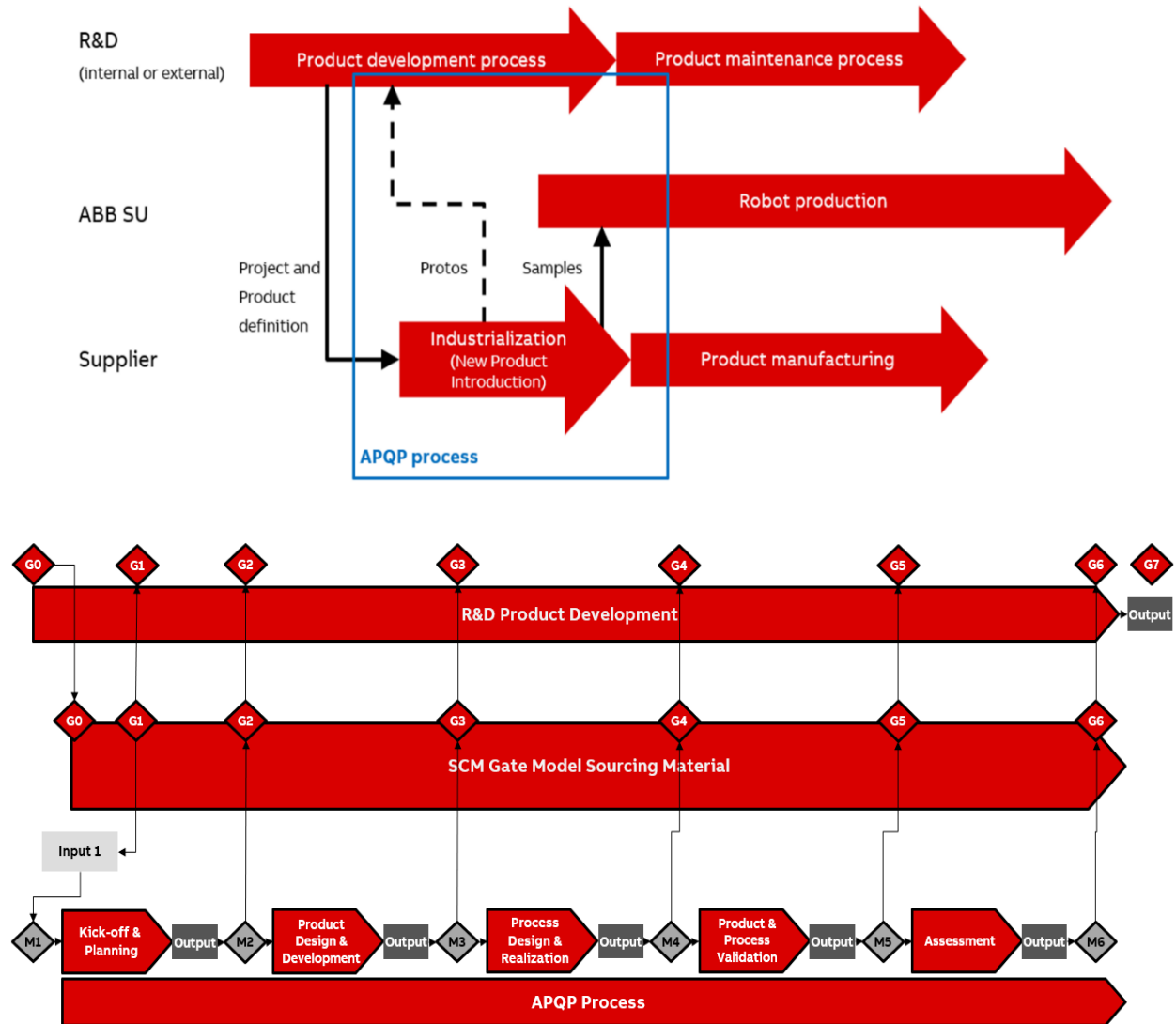
- Formalize final RFQ/ Business Proposal
- Finalize negotiation
- X-functional final evaluation of supplier proposals
- Implementation Plan
- Supplier Award and inform other Suppliers
- Lessons Learned

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4.4 APQP – ADVANCED PRODUCT QUALITY PLANNING

The new product development introduction requires a structured and well-defined process for Project Planning and Launching. Robotics considers all new product introductions and developments as projects. Hence to fulfill this requirement, Robotics adopted the APQP process as a standard for the projects.

APQP is a structured approach to product and process design. This framework is a standardized set of quality requirements that enable suppliers to design a product that satisfies the customer. It helps realize the risks and opportunities during the different stages of product development and the industrialization process by controlling the key activities to ensure process deliverables.



APQP objectives at the heart of the process is to identify quality needs, expectations, requirements and ensure customer satisfaction. Robotics implements Advanced Product Quality Planning to strive to:

- Develop a framework that allows for effective communications between the internal departments and external suppliers who will implement the plan.
- Reach a defined set of goals in a timely manner.
- Reduce risks associated with the launch of a new product by ensuring that there are few or no quality problems.

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4.4.1 Five (5) Milestones of APQP

Milestone 1: Kick off and Planning – No physical product available, only concept discussions.

When Robotics starts to plan the introduction of a new product or an overhaul of an existing one, preliminary planning takes priority, even before the discussions of product design or re-design. In this phase of the APQP, planning is directed at understanding Robotics needs and product expectations.

Planning activities include setting up the internal Robotics team and a team at the supplier, gathering data necessary to define Robotics expectations and developing product characteristics. The output of this phase includes a preliminary product design or specification, team responsibilities and quality goals.

Milestone 2: Product Design and Development – First prototypes

This phase focuses on completing the product design and ensuring that the physical parts are available as prototypes for testing. This is also where the product feasibility is assessed.

Resulting outcomes from this phase are:

1. Completed design/specification review
2. Defined material Specifications and equipment/tool requirements
3. Completed Design FMEA to assess failure possibilities
4. Established Control plans for the prototype creation
5. Prototype development & verification

Milestone 3: Process Design and Development – Final protos and R&D samples

The goal of this phase of the APQP is to design and develop the production process that will be used to produce the new or improved product. The process must be able to meet the product specifications and must be able to meet Robotics demands on quantity and quality efficiently.

Resulting outcomes of the Phase include:

1. ECOs and Engineering approvals
2. Completed Process Flow configuration
3. Completed Process Failure Mode & Effect Analysis
4. Operational control plans and instructions
5. Product finishing and packaging requirements.

Milestone 4: Product and Process Validation – Initial samples and Pre-series

This phase is where Robotics validates the manufacturing process and the final product at the supplier.

Steps in this phase include:

1. Making final adjustments to the process or product (if any).
2. Performing the process/product audit at the supplier.

Milestone 5: Assessment – Series production including ramp-up.

The phase focuses on the launch of the full-scale serial production with the focus on evaluating process effectiveness and improving the processes. The main aim is to reduce the process variations,

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identifying issues and initiating corrective actions to support continuous improvement, and ensuring that the Quality KPIs are met.

Outcomes from the phase are:

1. Assessing stability of the process with the increase in Robotics demands.
2. Reduced variations providing an improved manufacturing process.
3. Improved product quality delivered to the customer.

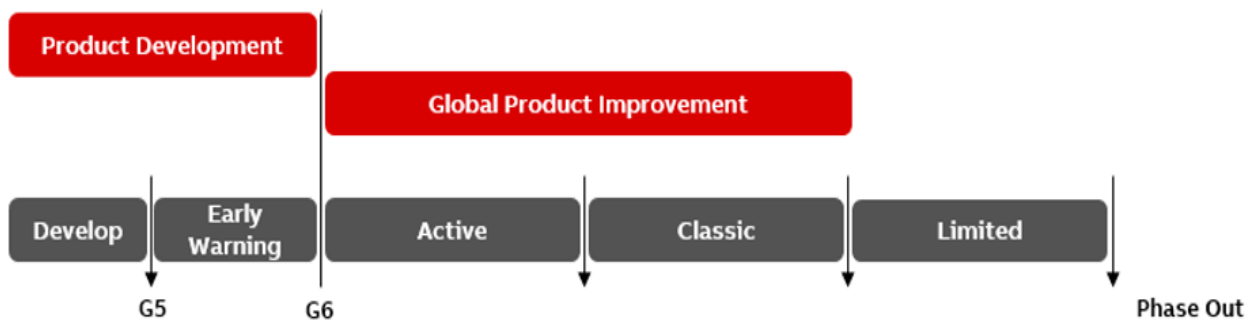
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CHAPTER 5: PRODUCT MANAGEMENT

5.1 PRODUCT IMPROVEMENT

When the robot product is released for sale, the product is considered as in Active phase. When serial production has ended, the product enters its Classic phase still retaining the full range of spare parts. When only limited support is technically and/or commercially feasible, the product enters the Limited phase. This phase continues until it is decided that we cannot support the product anymore at which point we declare the product Obsolete.

There is a program in R&D for Global Product Improvement taking care of all improvements of released products in active and classic phases. The Product Development projects must however take full responsibility for an early warning period before allowed to handover to Product Improvement at Gate 6.



5.2 TECHNICAL DOCUMENTATION

Documentation is an integral part of any business conducted between Robotics and its suppliers. All activities are based on valid documents, drawings and records. Many misunderstandings and unnecessary costs can be avoided if structured document and data control procedures are followed and only valid information is used. This applies to administrative and technical documents as well to material specification, technical drawings, manufacturing instructions, etc., used for production.

5.2.1 Document Control:

All Suppliers must have a formal document control and change procedures. The supplier shall always use the latest version of drawings, specifications and instructions. When receiving updated or revised documents, the supplier must secure the replacement according to instructions and archive or discard the older revisions.

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5.2.2 Document Modification Routine

The supplier must confirm document and product changes, which Robotics introduces as soon as possible. Confirmation is done by returning the signed Robotics Change Request document. The confirmation must contain all the information on how the product, processes, material, deliveries, quality and prices are affected by the modifications.

5.2.3 Access on Request

Robotics assumes the right to view the supplier's test reports and quality reports for products that have been delivered to Robotics.

Other documents shall be made available to Robotics and can order copies if required.

5.2.4 Norms and Regulations

The technical specification of a product will state whether the product must fulfill certain norms and/or regulations.

5.3 SUPPLIER CHANGE MANAGEMENT

Supplier Change Management process defines the requirement on the supplier to inform and receive approval from Robotics, if any changes in the product, internal manufacturing process or supply chain are to be made before the implementation of the change. The purpose is to ensure the quality levels are met and the changes do not cause delivery issues, with unapproved, untested modifications, that could impact the important properties of the parts or system to be delivered to Robotics.

The Change request form is to be filled out and sent to the responsible Category leader, SQE and / or other appointed contact personnel.

When the change request is received at Robotics, the SCM department decides the level of quality assurance activities need to validate the change based on the complexity and risk connected to the change. Proposed changes are divided into 3 different levels (A, B & C) following the below guidelines:

LEVEL A (Form, Fit, Function): Change that impacts the form, fit and/or function, characteristic parameters, quality, reliability of the material or system, requires a robotics system level confirmation. These changes can be but are not only limited to dimensions, raw material and visual appearance, but also valid when transferring a product to a new production line or site, changes in the process at the sub-supplier. In such a case, Robotics review is mandatory, and the supplier cannot execute this change until they are granted an approval through Robotics' ECO process.

LEVEL B (CLARIFICATION, CORRECTION): Change that can possibly or potentially influence the form, fit and/or function, characteristic parameters, quality, reliability of the material or system, requires a material level certification. The changes are generally additions, deletions, improvements or minor changes to physical features and requirements which does not impact the robot's functionality, such as change of tooling, machine or packaging on the subject material or system. For the application of such a change, Robotics review and approval is mandatory, and the supplier cannot execute the change without the approved CRF from Robotics.

LEVEL C (Long Lead Release Cycles): Change that has no influence on the form, fit and/or function, characteristic parameters, quality, reliability of the material or system but affects the configuration documentation only and delivery to Robotics. For example, change of logistics or stock,

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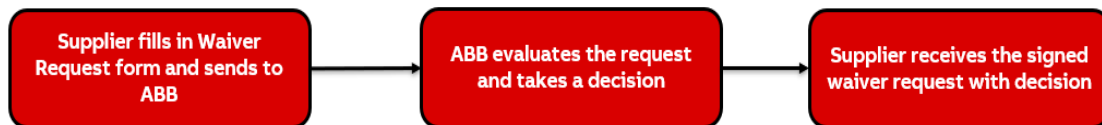
work instruction, critical manpower resource change and minor changes in production equipment. Formal notification of such a change to Robotics is necessary.

Robotics shall have the opportunity to visit its suppliers & their sub-suppliers at any time during the contract period, to audit the quality system or any manufacturing processes. Robotics also assumes the right to view test- & quality reports that apply to the parts supplied to Robotics.

NOTE: ALWAYS contact Robotics if there is any uncertainties or doubts whether a change needs to be reported or not.

5.3.1 Waiver Request

Waivers are sent out by the supplier to request Robotics to deliver parts that have a deviation from the specification during manufacturing or inspection of the parts. The request is valid either for a certain quantity or a certain time period. Once Robotics receives the Waiver, the request is analyzed by the Supplier Quality Engineers and based on the deviation analyze the risk, if it is only a visual defect or does the defect effect form fit or functionality. If the risk is high, then there are chances for the request to be rejected.



5.4 TRACEABILITY

Traceability is a strict requirement by Robotics towards all suppliers. Suppliers should be able to provide records of the product to review the product flow throughout the manufacturing and supply chain. This gives the supplier and robotics to quickly and effectively isolate, contain and quarantine any possible quality issues.

This includes the unique identification of the parts and materials to the incoming and outgoing performance requirements. The Suppliers should retain, maintain and control the manufacturing and quality related records for conformance and verification purposes for a minimum of 10 years. The major reason for losing traceability is temporary, non-functional or non-permanent markings or the lack of any marking system. And in such a case Robotics requests its supplier to establish a system.

5.5 INTELLECTUAL PROPERTY

In general, Robotics demands ownership of all proprietary products. These products comprise everything that has exclusively been developed for Robotics including special tools and fixtures. Further information regarding this subject will be stated in the contract.

5.5.1 Patent and other Rights

The copyrights to ideas, inventions, know-how as a result of Robotics' collaboration with a supplier shall fall to the originator. If the supplier is the originator, Robotics shall for a reasonable fee, be able to obtain a licence to utilise the idea.

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If any damages occur due to disputes in patent or trademark infringements the supplier shall compensate Robotics in full for this. In the event of infringement, the supplier shall, free of charge, ensure that the products are modified or replaced with another corresponding product.

5.6 WARRANTY

Warranties are stated in the contract and may depend on the product/item. Robotics' standard warranty period is normally 36 months. Further information about warranty can be found in the contract.

When returning a faulty part to Robotics, the customer wants: To rapidly find out why a fault has occurred and what Robotics is doing to ensure that the same fault does not occur again.

Therefore, the faulty part is returned to the supplier for Root Cause Analysis (RCA) and correction. If the part is still under the supplier warranty, the part is replaced or repaired to function and appear "as new".

Robotics should receive the action report from the supplier within ten (10) days from the date the supplier has received the faulty part.

5.7 TOOLS & FIXTURES

Tools and fixtures that a supplier requires for production for Robotics and that have been produced entirely for Robotics' needs, is regarded as property of Robotics. Accordingly, the tools may only be used for manufacturing products for Robotics' needs. The tools shall be handed over to Robotics if so requested.

The supplier shall carry out maintenance and reparations of fixtures and tools as long as they are in care of the supplier.

The supplier shall attempt to develop and improve the tools during the current contract period in order to improve production methods and the quality of the products.

Models, tools and equipment belonging to Robotics, but in the care of the supplier, shall be labelled "The property of ABB Technologies". If Robotics decides that tools shall be insured, Robotics will pay the insurance premium.

5.8 COMPLAINT MANAGEMENT – SUPPLIER QUALITY

The complaints registered towards a supplier could be related not only to the KPIs mentioned in chapter 3 but also problems occurring at Robotics' internal and external customers. They are non-conformances that result in a complaint/claim report from Robotics towards its suppliers and it is essential that the supplier acts with a sense of urgency for every received complaint, since robotics measures the speed of resolution (SOR) of every complaint.

The supplier shall act as follow:

- All investigations are to follow the 8D methodology described in the next section
- All communication regarding the case must be uploaded on ASCC (see section 6.2).
- All parts in stock at PDP, EDP, CS and other sites to be checked when a complaint is received (highly necessary)

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5.8.1 Eight Disciplines of Problem Solving (8D Methodology):

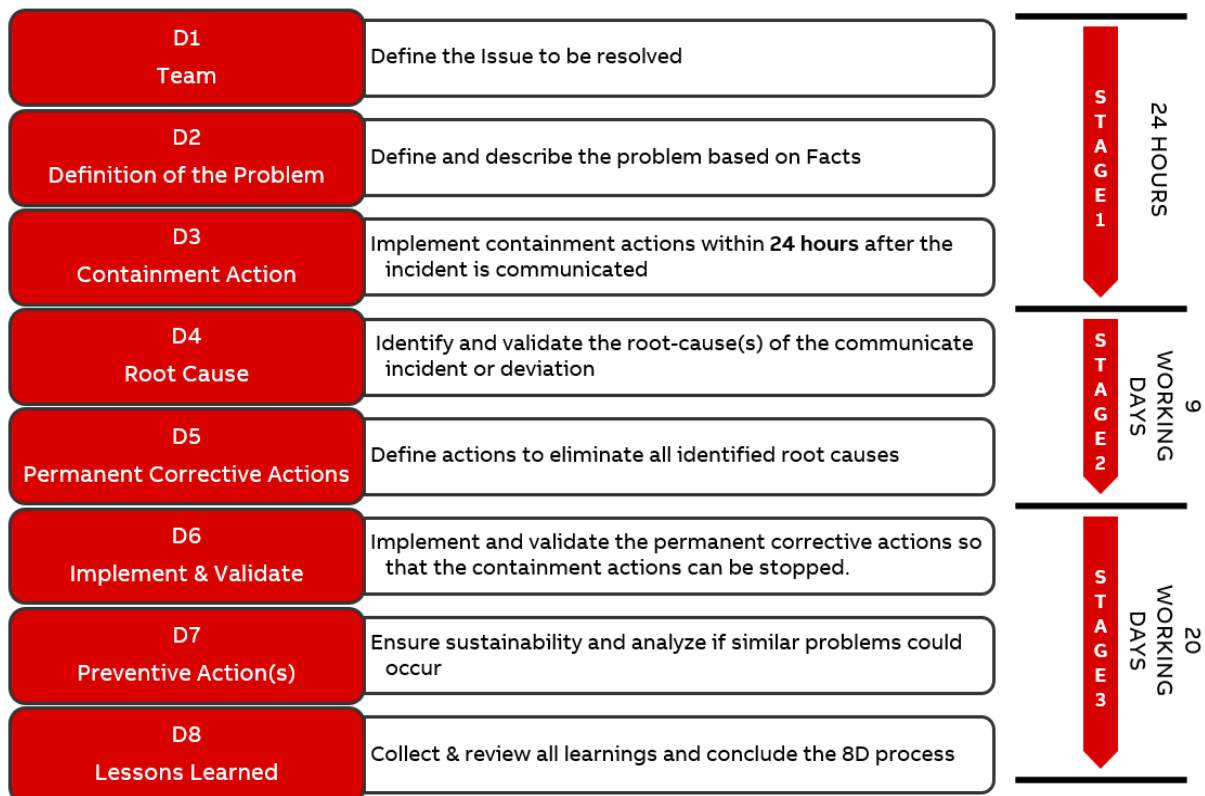
The Eight Disciplines of Problem-Solving methodology is a detailed, team-oriented approach designed to solve the critical problems in the quality of the product or production process, formulate a short-term fix and implement long-term solutions to prevent recurring problems that cause hindrance to the product or service at Robotics.

The 8D method is a popular tool in the manufacturing industry and its strength lies in it being structured and disciplined. It drives systematic change; help improve not only the problem at hand but also issues that may derive from a system failure.

Quite Important to note is the following points, whether it is for New Product Development Projects or claims from serial production:

1. RCA analysis is to be performed using the 8D methodology. Designated representative from the supplier side shall be trained for RCA and implementation of the 8D tool.
2. Supplier needs to arrange the closest site to provide proactive support for technical/quality related topics, even though the parts/material has been produced at a different site. The aim is to investigate/analyze the root cause within the shortest time period.
3. Supplier needs to nominate 1 representative to handle the internal coordination between different supplier sites and provide input on the progress to the Robotics contact person.
4. RCA analysis from the supplier should not be limited only to the parts in the warranty period, but Robotics could also request supplier to provide support or RCA analysis of parts out of warranty.
5. The quality of the RCA report should be guaranteed. If Robotics or its customers are not convinced / satisfied by the root causes and/or the improvement actions, then the RCA or 8D could be rejected.
6. The lead time for the RCA should be pre-defined. If the RCA report cannot be provided in the committed time frame an interim report with estimated ready date and preliminary analysis should be provided.

The 8 Ds of the Methodology are as below:



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Once Robotics informs its suppliers of a possible deviation, within the first 24 hours the supplier should be able to complete stages D1 to D3, i.e. create a team, provide a detailed description of the problem and define containment actions. Once the problem is contained, the parts are sent back to the supplier for investigations. The supplier has 9 working days from the date of receipt of material to complete its investigations, identify the root cause and come up with Permanent Corrective actions. The supplier should also aim to proactively investigate other processes or products where these actions can be implemented.

After the actions are defined the supplier has 20 working days to implement and validate the corrective actions and ensure that the corrective actions are sustainable. And the provide a final report to Robotics for their review.

5.8.2 Cost Regulation

Once the non-conformance has been confirmed as a defect from the supplier, Robotics defines means of regulating the cost of the defective parts which can be done in one of 2 ways:

- If the defective parts are returned to the supplier, Robotics issues a credit order and expects a credit from the supplier.
- If the quality defects easily can be repaired on site at Robotics and this is advantageous instead of returning the parts, this can be done by either:
 - The supplier, or
 - Robotics/external company at the supplier's expense. Repair/Re-work cost will be invoiced to the supplier.

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CHAPTER 6:

OPERATIONAL SUPPLY CHAIN

Operational Procurement deals with the procurement of goods and services to meet the daily production requirements. The chapter provides an insight as to the systems and working principles implemented by Robotics in meeting the customer demands.

6.1 FORECASTS

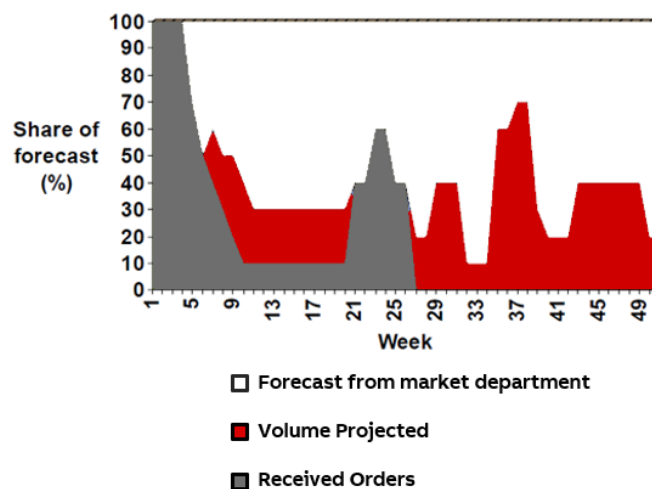
Forecasts are demands for production that are predicted for the future, based on the past and current requirements in the production to build the robots or subassemblies.

The reason for having forecasts in Robotics is to receive deliveries on time from the suppliers which is essential to avoid production disturbances and to fulfil Robotics' commitment towards its customers. This requires first class information to be able to create forecasts and production planning.

6.1.1 Planning – S&OP

The S&OP process of Robotics comprises of regular meetings conducted, with various purposes, at different levels of the organization. The regular S&OP-meeting is held every third week of the month, consequently a new forecast is presented every fourth week of the month.

Every month key persons from market and delivery processes attend the Regular S&OP meeting to merge sales forecasts from Robotics' sales units and partners with the production ability of Robotics. The result from the meeting is a production plan for one (1) year ahead.



Producing this analysis and forecast is a complex process to get the requirements for each part. The updated forecasts can be downloaded from ASCC each week in the month. The forecast shows Robotics' planned net requirement per part and should be used by the supplier to plan their activities,

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e.g. the purchase of materials, production planning and the build-up for buffer storage. The development of the forecast can be illustrated schematically as in the picture above.

The forecast will contain a mixture of received orders, large orders that has not yet been finally specified and a forecast volume not yet connected to orders. The forecast contains greater uncertainty the further ahead you look in the forecast due to the decreasing proportion of confirmed orders.

6.1.2 How to use the forecast

To maintain delivery times, it is important to interpret the forecast correctly. Usually the SOP plan indicates the weekly requirement within the time period, for up to 12 months. Besides the PPO forecasts (PPO = Planned Purchase Order), the forecast also shows the not delivered Pull Principle orders and not delivered POs (PO = Purchase Order). The SOP plan also shows the latest received deliveries.

The forecast can also show forecasts for passed calendar dates (backlog). This means that Robotics has not been able to produce as planned. Robotic aims to never be more than three (3) days behind the time schedule. There should always be a possibility to “deliver away” the backlog within four (4) weeks.

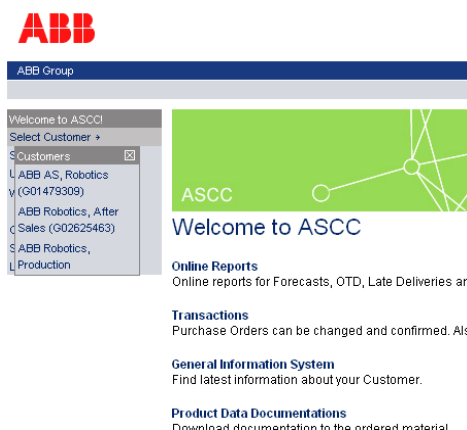
The supplier must contact Robotics immediately if they cannot deliver according to the forecast. The supplier must also directly contact Robotics if they experience difficulties interpreting the SOP-plan. This gives Robotics the opportunity of going through the SOP-plan together with the supplier and prevents disturbances to production.

6.2 ASCC

ASCC (<https://ascc.abb.com/>) is a Robotics developed supply chain solution which provides a collaborative commerce network between Robotics and its suppliers. The ASCC’s main focus is the procurement processes of direct materials for contracted suppliers, but its broad set of features supports various supply chain processes. Via ASCC is a self-service tool that the supplier has real-time access to selected, relevant ERP and non-ERP contents, such as:

- Daily / Weekly / Monthly / Annual – forecasts
- Orders based on Pull / Kanban / JIT Principle
- Statistics on the suppliers own OTD (On Time Delivery) and Quality performance (e.g. PPM) Quality reports to read and answer
- Confirmation of orders

Robotics encourages its suppliers to contact the relevant people for the ASCC user manual to know how to use each function in ASCC.



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6.3 ORDERS

Robotics has two (2) different scenarios when placing Purchase orders:

1. Order Placement based on Pull / Kanban / JIT Principles placed on a regular basis with a varying order quantity according to the true consumption. Delivered items are used in production the day after delivery.
2. Purchase orders based on committed delivery time and order quantity between Robotics and the supplier. The order quantity is based on Robotics forecast.

6.3.1 Order Placement based on Pull Principle

Pull / Kanban / JIT principle orders are based on the true consumption and can be downloaded from the ASCC every morning. It is mainly used for high turnover and high value materials.

The supplier produces towards stock in order to maintain several days buffer storage. Depending on the transportation time, the order is based on either actual demand (short transportation time) or forecast (long transportation time).

Benefits for the Supplier

- Possibility to even out production
- Minimize the influence on production from rush orders and large variations in demand from one week to another
- Thus, opportunities to balance and optimize production
- Optimal conditions for 100% OTD

Information transparency between Robotics and the Supplier

- Robotics' real demands displayed in ASCC
- Supplier's stock level and WIP reported in ASCC

6.3.2 Purchase Orders

Purchase Order (PO) for each part are sent to the supplier. If the supplier does not have the capacity to deliver the ordered quantity, he/she must notify Robotics immediately.

The supplier should acknowledge the order and returns the order-acknowledgement (OA) by email or ASCC within two (2) days. If there are any deviations in the PO compared with the quotation or the quotation negotiations, the supplier must point out this before the order-acknowledgement is sent.

Robotics may require a shorter delivery time which entail the supplier to do everything within its power to meet this request.

6.4 Buffer Management

The delivery of items shall be guaranteed by the supplier week by week through a constant buffer of each part. The buffer shall be of a size that enables delivery of the forecast quantities one week earlier than stated in the plan, i.e. five (5) days buffer. Deliveries shall take place so that the buffer is replenished according to the First In First Out (FIFO) principle.

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It is vital that the buffer always remains at or above the agreed amount of parts throughout the week. The buffer must not be consumed and then build up again. In practice this means that the supplier must reserve capacity according to the forecast and produce items for the buffer. The delivered quantity is taken from the buffer based on the Pull / Kanban / JIT Principle.

Robotics has a corresponding buffer through pre-production of customised robots equivalent to five (5) days deliveries. This buffer guarantees the entire production chain and significantly increases the possibility to maintain delivery times to Robotics' customer.

These buffers are a prerequisite to enable the Pull Principle routine. It provides the supplier with the needed short-term flexibility in volume. It is therefore important that the supplier report its buffer level each week.

6.4.1 VMI – Vendor Managed Inventory

Vendor Managed Inventory (VMI) is becoming one of the more important best practices between Robotics and its suppliers. It's good for smooth transaction towards forecasts, supplier delivery and raw material preparation. Both the vendors and Robotics both can benefit from running VMI mode.

Robotics encourages VMI implementation with suppliers and can provide a series of professional trainings for suppliers.

6.5 Delivery Terms

Regarding delivery terms, Robotics follows the INCOTERMS, if not stated otherwise in the contract.

6.5.1 Delivery Monitoring

Robotics orders of parts and products are constantly monitored in order to discover problems and delays at an early stage. Especially delays that can result in production disturbances in the robot assembly are of interest.

The supplier shall continuously verify current orders and download new orders on ASCC. The supplier may be asked to report the reason for the delay and what has been done to ensure future deliveries on time. See the corresponding routine for quality disturbances. It is important that the supplier quickly answers questions from Robotics concerning delivery status and be proactive in reporting any disturbances. A summary of all active orders to the supplier can be found in ASCC and is updated daily.

6.6 SHIPPING AND GOODS HANDLING

6.6.1 Principles

Deliveries to Robotics shall be packed and transported so that goods arrive undamaged and on time according to plan and defined routes and transportation means.

6.6.2 Packaging

Goods shall be packed so that they are not damaged when handling normally during transport to Robotics. European pool-pallets (EUR-pallets) with collars shall be used except when it is impractical

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to do so. All pallets and collars must be in an approved condition for transport as set out in Robotics packaging instructions. It is important that the packaging is easy to remove and not too bulky. The packaging shall be if possible manufactured from environmentally friendly materials and is preferred to have returnable packaging that can be returned for reuse.

6.6.3 Standard Packaging

Robotics normally accept the standard packaging that the supplier uses for products/items supplemented with external packaging. It is made clear during procurement whether specific packaging shall apply for certain items. Robotics' Packaging specification has pre-defined requirements based on the categories of products, for e.g.:

- ESD-protective packaging for electronics
- Corrosion protection
- Oiling
- Silica gel
- Sealing plugs
- Special boxes
- Molded foam

6.6.4 Special Packaging

If no standard packaging exists, the supplier shall together with Robotics determine how the item shall be packed. When a packaging method has been determined the item shall be packed, photographed and documented. The supplier and Robotics shall sign the documentation.

6.6.5 Goods Labelling

Goods labelling procedure is stated on the order the supplier receives from Robotics. Goods belonging to different orders shall be packed separately and labelled with Robotics' reference and part number. Robotics' part number shall be stated on each product packaging. Goods labelling shall consist of a pallet flag, which is attached to the EUR-pallet or its lower collar. Only one (1) part type may be packed on each pallet. Fire-, health and environmental hazardous goods shall be labelled in accordance with applicable laws and provisions.

6.6.6 Goods Handling Aid on ASCC

"Delivery notes" is a function on ASCC which enhance the goods handling control between the supplier and Robotics. The supplier can through this function print unique pallets labels with bar codes for each order.

The advantage with this function is that both the supplier and Robotics get a better overview of the orders to be delivered, orders ready for shipment, status on the transport and receipt on arrival at Robotics.

6.7 TRANSPORT

Shipments to Robotics are to be handled by forwarders chosen by Robotics. Normal procedure for new suppliers or in change of forwarder, Robotics issues a Routing order. This routing-order states that a named forwarder is nominated to handle shipments from the supplier to Robotics and

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includes contact information about the supplier and the forwarder. After issuing this document to both supplier and forwarder, both parties are obliged to establish contact with each other. Problems with shipments from the supplier to Robotics caused by forwarders shall always be reported to Robotics. This is made to Robotics' Freight manager or Robotics' contact person. The supplier must be able to order shipments through an internet-based booking site.

6.7.1 Waybill and Delivery Note (Packing List)

The Waybill is handed over to the goods recipient, who then signs this as an acknowledgement that the goods have been received. Delivery Notes shall follow the goods during transport and must not be sent via fax, e-mail or mail if not agreed otherwise. The Delivery Note shall be attached in a plastic pocket to the outside of the packaging. If the Delivery Note is placed inside the package, the package must be marked with: "CONTAINS DELIVERY NOTE"

A Delivery Note shall contain following information:

- Number of parts
- Parts description
- Part number
- Net Weight
- Gross weight
- Delivery date
- Robotics' reference (Purchase number and row)
- Delivery Note number

6.7.2 Transportation Insurance

All transports provided by Robotics have full insurance. For further information see contract.

6.7.3 Export Licenses and Restrictions

If the product has export restriction in the land of origin, the supplier must inform Robotics the ECCN number and any other export licenses.

The supplier shall, if requested and free of charge, produce goods certificates or other documents that confirm the origin of the product in accordance with applicable trade agreements.

6.8 GOODS RECEPTION

Pallets and packages are inspected during unloading, which is carried out by the truck driver. If Robotics discovers a damaged pallet while unloading, the goods are unpacked and examined. During unloading the number of packages is controlled as well as other information on the delivery notes included with the goods. If the information on the delivery note corresponds with reality, the reception manager signs the delivery note as an acknowledgment that the goods have been received. Undamaged pallets are unpacked, and the parts go directly to the stores located by the assembly lines.

Robotics' planning is based on parts being used for robot assembly during the day after arrival. The maximum storage time in the workshop depends on buffer stocks.

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6.9 INVOICING

As a minimum, the invoices sent to Robotics must contain the following information:

Header Level:

- Supplier name and address
- Buyer name and address
- Buyer VAT number
- Invoice date
- Invoice number
- Terms of payment (as stated in the contract)
- Invoice maturity date
- Terms of delivery (Incoterms)
- Delivery date
- Delivery note number
- Supplier's sales order number (if applicable)

Item Level; per item:

- ABB's purchase order number
- ABB's purchase order item number
- ABB's part number
- ABB's part number description (in English)
- Supplier part number (if applicable)
- Quantity
- Price per unit
- Total price
- Net weight per unit (kg)
- Statistical number for import (HS-code/customs tariff code)
- Country of origin

Invoice summary:

- Total invoice quantity
- Net invoice amount (excl. VAT)
- VAT amount (if applicable)
- Total invoice price

The invoice must also include:

- Currency
- Total amount of packages
- Total gross weight (kg)
- Total net weight (kg)
- Supplier registration number
- Supplier VAT registration number (if applicable)
- Bank information (name, account, IBAN number)

Invoices must be sent in duplicate, one original and one copy. The invoice may be made at the earliest on the date the goods leave the supplier's premises and the invoice shall be sent to the address stated in the purchase order.

Furthermore, a copy of the abovementioned payable invoice should also be included in the shipping/export documents, for customs purposes. Robotics does not want to have proforma or customs invoices for import customs clearance. However, if a payable invoice cannot be issued and sent together with the goods, a proforma or customs invoice will be acceptable.

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CHAPTER 7:

CUSTOMER SERVICE

7.1 SPARE PARTS

A spare part is much more than a replacement of the material which has broken down. It can be part of upgrading, re-building or refurbish packages and/or repair services towards our customers. It could also involve the service tools, software or documentation. The Spare parts must meet or exceed requirements stated in the technical specification of the original part.

Spare part orders from Robotics' customers are always directed towards Robotics Customer Service. The supplier must not deliver spare parts to anyone other than Robotics aftermarket partners, expressly specified by Robotics. Only in certain exceptional cases and according to special agreements, can the customer order spare parts directly from a supplier to robotics.

The most important aftermarket issues could be grouped in cornerstones which will be explained more in detail below.

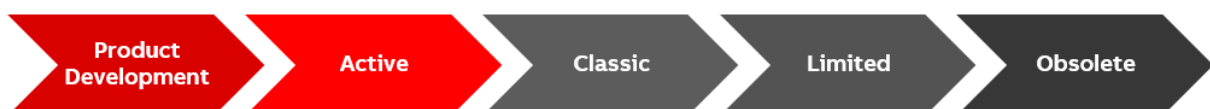
1. Lifelong Availability of Materials
2. Assured Deliveries
3. Fixed Pricing

Service SCM involvement through whole life cycle management (LCM)

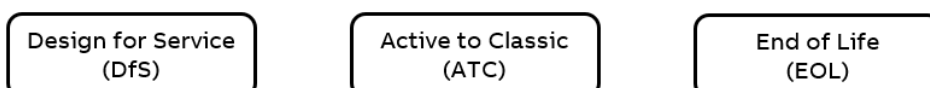
Time Frame:



LCM Phases:



Key external process for service SCM to LCM phase shifting:



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7.2 LIFELONG AVAILABILITY OF MATERIAL

Robotics guarantees its customers, availability of spare parts for at least eight (8) years after serial production of the robot type has ended. Expectations from robotics on the supplier is therefore to:

- Assure availability of spare parts for eight (8) years after serial production has ended.
- Thereafter, if possible, keep spare parts available another 5-10 years, due to the long life of the robot.
- If the supplier decides, after the eight (8) year period, to phase out the possibility of supplying a spare part, Robotics must be informed in due time before any actions are taken. This gives Robotics the chance to find alternate solutions for the spare part.
- If there is a reason to replace the part and supply a substitute part with the same function / performance this must first be approved by Robotics.
- End of Life handling: In case of End of life supplier must immediately inform Robotics, preferably at least 12 months ahead. In case Robotics prefers to purchase Material as LTB (last time buy), supplier shall purchase and keep such component in stock.
- Repair material: The Supplier must allow access to their sub-suppliers for components or manufacturing to allow Robotics or appointed partner(s) of Robotics to repair the products. In case of need supplier shall support with technical documentation, testing equipment etc. to Robotics or appointed partners.

The supplier should not scrap any tools, fixtures, models, or documentation after phase-out of production, without first contacting Robotics customer service. In case of major changes of the supplier's financial status, ownership, organization, then Robotics is granted full access to all tools and information required to supply the products, and the Supplier will support Robotics to resource or insource the supply of the Products.

7.3 ASSURED DELIVERIES

Robotics guarantees its customers delivery of majority of the spare parts within 24 hours anywhere in the world. Therefore, it is crucial that Robotics uses correct delivery times from the supplier when calculating the buffer storage. Short and stable delivery times are crucial to Customer satisfaction and their business requirements. The spare parts business has often high volatility in Consumption which demands production flexibility to keep up with lead times and delivery assurance.

Suppliers are required to use forwarders appointed by Robotics for the delivery of products, and to apply logistics methods specified by Robotics. To see more detailed information on delivery rules, see delivery guidelines instruction **3HA001351** for more information

Transportation documentation: When requested by Robotics, the Supplier must provide the logistics documentation needed to comply with Customs clearance requirements, all over the world. To check international requirements for export (embargo, etc.) refer to page 37.

Besides that, the supplier should be aware and follow the provided information below:

- Supplier shall use relevant packing method and material including the specified label according to Robotics Process instruction **3HA001124**.
- Robotics does not perform any incoming quality inspection of the products supplied for the aftersales market; therefore, the highest level of quality is a mandatory requirement.
- Traceability data – shall be stored by the supplier at least 10 years per individual spare part.
- Material that Robotics sent back to the suppliers because of any non-conformance and if within the warranty period, shall be replaced with new articles immediately.
- All changes to the product or documentation should follow the ECO process; same procedure as mentioned in the previous chapter.

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- The non-conformance of products, when reported by robotics should be followed up with an 8D report, as stated in the previous chapter.

7.4 FIXED PRICING

The trend on the market is that the customer requests spare part prices together with the robot RFQ (Request for Quotation). Several customers ask for a fixed price on the entire service package during 5-10 years of service. It gives the customer the opportunity to assess the TCO (total cost of ownership) for their robot investment during the entire lifecycle, i.e. LCC (Life Cycle Cost) already in the RFQ process.

Robotics' expectation on the supplier:

- Assurance of a competitive price and price development even after serial production has ceased.
- Price needs to be based on agreed open book price model.

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