

Self Assessment Tool – Technology and Innovation Readiness and Maturity

Callaghan Innovation has designed a framework for NZ Manufacturers to quickly assess their business in both technology and innovation.

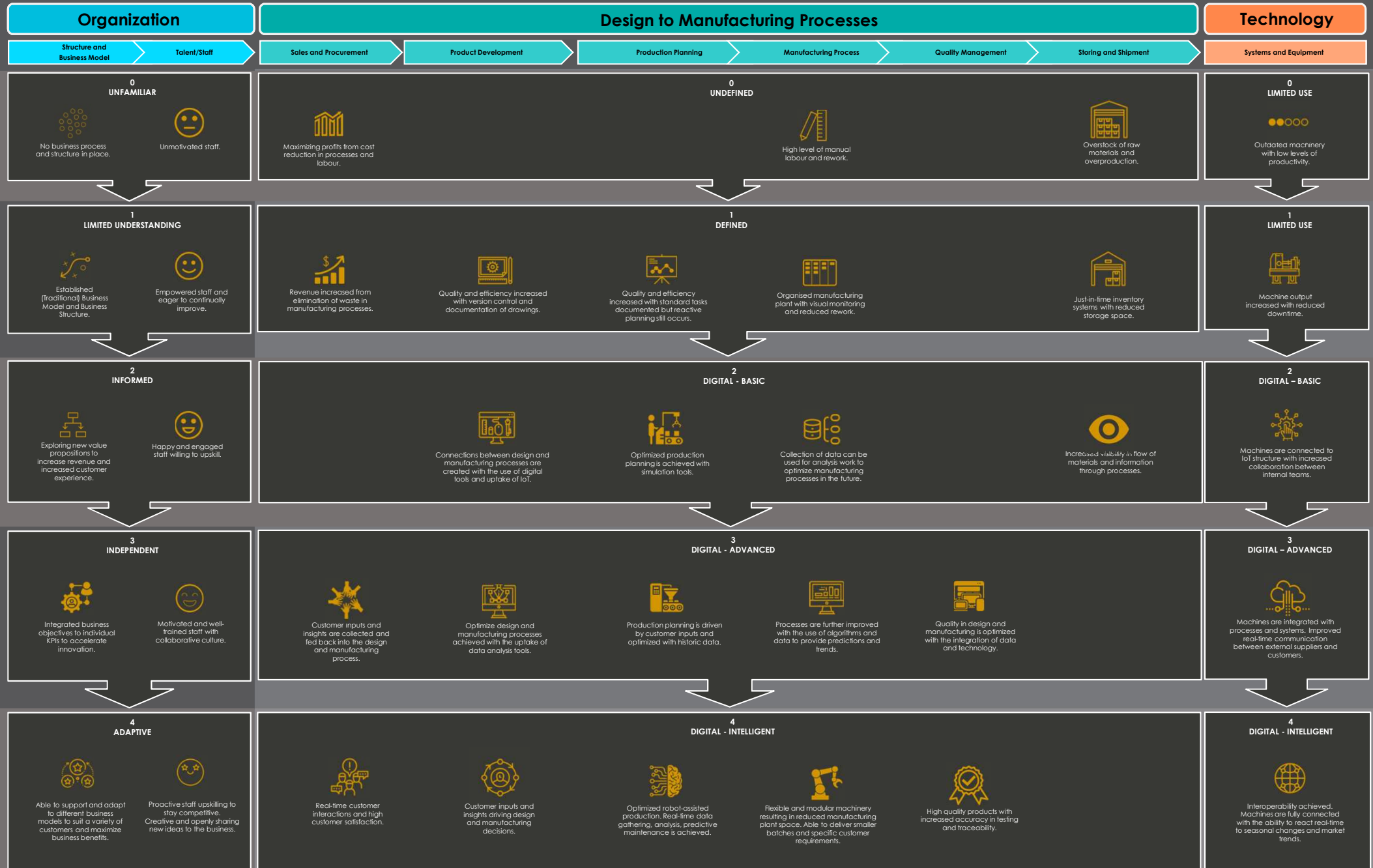
INSTRUCTIONS:

There are two pages to this assessment tool.





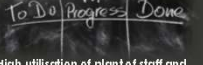























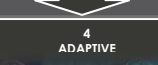







The first page outlines the business benefits and value-add as you go down the page, moving from one stage to the next.

The second page provides clarification and further detail under each of the focus areas.

For further guidance on "HOW TO" get to the next stage, please speak to your Callaghan Innovation Primary Relationship Manager or contact industry4hub@callaghaninnovation.govt.nz for more information.



Self Assessment Tool - Technology and Innovation Readiness and Maturity

Organization		Design to Manufacturing Processes						Technology
Structure and Business Model	Talent/Staff	Sales and Procurement	Product Development	Production Planning	Manufacturing Process	Quality Management	Storing and Shipment	Systems and Equipment
<p>0 UNFAMILIAR</p> <ul style="list-style-type: none"> No incentives and metrics in place. No gateway process. No digital strategy. No innovation strategy. Traditional business model. 	<p>0 UNFAMILIAR</p> <ul style="list-style-type: none"> Not aware of recent trends and technology. No formal training/ upskill programme. 	<p>0 UNDEFINED</p> <ul style="list-style-type: none"> No standardised sales strategy. No data exchange between business units, all human interaction. No customer insights. Procurement requests are ad hoc. 	<p>0 UNDEFINED</p> <ul style="list-style-type: none"> Parts are over engineered and designed separately. Not designed for manufacturing and not customer centric. No drawings are documented and no version control. Unstructured, long prototype process. 	<p>0 UNDEFINED</p> <ul style="list-style-type: none"> No order scheduling. Low productivity in staff and machines. No data collection from process. No standardised flow of materials. Physical set up of manufacturing plant is cluttered. 	<p>0 UNDEFINED</p> <ul style="list-style-type: none"> No standardised use of manual tools and machines. No control of batches/order. High level of waste. High level of downtime. No data collection from machines and process. 	<p>0 UNDEFINED</p> <ul style="list-style-type: none"> No instructions or standardised processes. No definition of quality. High level of rework. High level of returns/warranties. No data collection from defective parts and/or returned goods. 	<p>0 UNDEFINED</p> <ul style="list-style-type: none"> Overflow of inventory and finished products. Mixture of old and new stock. Mixture of finished goods and raw materials. No tracking available. 	<p>0 LIMITED USE</p> <ul style="list-style-type: none"> No use of digital programs and systems. Decentralised/silo-ed data infrastructure. Equipment and machinery produces fixed product range and large batch sizes. No interoperability.
<p>1 LIMITED UNDERSTANDING</p>  <ul style="list-style-type: none"> Incentives and metrics in place to drive productivity. Structured Gateway process. No digital strategy. No innovation strategy. Traditional business model. 	<p>1 LIMITED UNDERSTANDING</p>  <ul style="list-style-type: none"> Aware of recent trends and technology. Formal training/ upskill programme for continuous learning. 	<p>1 DEFINED</p>  <ul style="list-style-type: none"> Standardised sales strategy. No data exchange between systems, all human interaction. No customer insights. Procurement requests are standardised. 	<p>1 DEFINED</p>  <ul style="list-style-type: none"> Parts are optimised in designed and part count. Parts are designed for manufacturing and are customer centric. Drawings are documented on paper with version control. Structured, but long prototype process. 	<p>1 DEFINED</p>  <ul style="list-style-type: none"> High utilisation of plant of staff and machines. High level of productivity in staff and machines. Limited data collection from process. Low level of downtime. Standardised flow of materials. Physical set up of manufacturing plant is lean. 	<p>1 DEFINED</p>  <ul style="list-style-type: none"> Standardised process with written procedures. Minimum part travel. Low level of waste. Low level of downtime. Limited data collection from machines and process for continuous improvement. 	<p>1 DEFINED</p>  <ul style="list-style-type: none"> Standardised process and written procedures. Defined measure of quality. Low level of rework. Low level of returns/warranties. Limited data collection from quality test data. 	<p>1 DEFINED</p>  <ul style="list-style-type: none"> Near DIFOT. Reduced storage and clutter. Low tracking and traceability in internal systems and processes. 	<p>1 DEFINED</p>  <ul style="list-style-type: none"> Limited use of digital programs and systems. Independent/isolated data infrastructure. Equipment and machinery produces fixed product range and large batch sizes. No interoperability.
<p>2 INFORMED</p>  <ul style="list-style-type: none"> Incentives and metrics in place to drive productivity and continuous improvement. Structured Gateway process. Digital strategy in place. Innovation strategy in place. Exploring different business models. 	<p>2 INFORMED</p>  <ul style="list-style-type: none"> Actively seeking recent trends and technology. Formal training/ upskill programme integrated with organization objectives and skills required. 	<p>2 DIGITAL - BASIC</p>  <ul style="list-style-type: none"> Standardised sales strategy. Low data exchange between systems, and high human interaction. Low customer insights and data stored. Procurement requests are influenced by rule based inputs/existing trends. 	<p>2 DIGITAL - BASIC</p>  <ul style="list-style-type: none"> Parts are further optimized in design and part count. Parts are designed together with digital simulation of functionality: tolerances and interfaces of two or more products. Parts are designed for manufacturing and are customer centric. Drawings are documented digitally with version control. Structured and reduced learning cycle in prototyping process. 	<p>2 DIGITAL - BASIC</p>  <ul style="list-style-type: none"> Optimized Resource Planning e.g. MRP. Optimized Requirements Planning e.g. ERP. Data is collected and stored. Output flow and production line is modelled for optimisation. Physical set up of manufacturing plant is optimized. 	<p>2 DIGITAL - BASIC</p>  <ul style="list-style-type: none"> Standardised process with digital procedures. Low level of waste. Low level of downtime. All data is collected and stored from machines and process for continuous improvement. 	<p>2 DIGITAL - BASIC</p>  <ul style="list-style-type: none"> Standardised process with digital procedures. Low level of rework. Low level of returns/warranties. Limited data collected from customer insights/ feedback, and quality tests. Introduce the use of digital data/ designs to check against physical parts. 	<p>2 DIGITAL - BASIC</p>  <ul style="list-style-type: none"> DIFOT. High visibility of tracking and traceability in internal systems and processes. 	<p>2 DIGITAL - BASIC</p>  <ul style="list-style-type: none"> High use of digital programs and system. Low integration of systems and data infrastructure. Equipment and machinery produces fixed product range and large batch sizes. Introduce visualisation of data. Low connectivity and data transfer (analogue).
<p>3 INDEPENDENT</p>  <ul style="list-style-type: none"> Incentives and metrics integrated with business strategies. Structured Gateway process. Integrated Digital strategy. Integrated innovation strategy. Open and collaborative culture. Exploring different business models. 	<p>3 INDEPENDENT</p>  <ul style="list-style-type: none"> Actively seeking recent trends and technology. Formal training/ upskill programme integrated with organization objectives and driven by staff. 	<p>3 DIGITAL - ADVANCED</p>  <ul style="list-style-type: none"> Standardised sales strategy. High data exchange between systems, with low human interaction. Customer insights are analysed and transferred to the design and manufacturing team. Procurement requests are semi-automated. 	<p>3 DIGITAL - ADVANCED</p>  <ul style="list-style-type: none"> Drawings are documented digitally, have version control and connected to the design and manufacturing systems. Parts are optimized in design, part count and drawings are updated instantly. Parts are optimized for manufacturing and are customer centric. Rapid learning cycle and rapid prototyping (e.g. 3D printing) in place. 	<p>3 DIGITAL - ADVANCED</p>  <ul style="list-style-type: none"> Use of algorithms to provide insights to staff members to optimize output. Use of algorithms/ rule based input to forecast/ predict demand. Physical set up of manufacturing plant is semi-flexible. 	<p>3 DIGITAL - ADVANCED</p>  <ul style="list-style-type: none"> Semi-integrated system and machines. Uptake of automation to remove repetitive tasks from staff around monitoring and quality control. Staff is working on value-added tasks. Use of algorithms/ rules based inputs to predict equipment failures. 	<p>3 DIGITAL - ADVANCED</p>  <ul style="list-style-type: none"> Use of data for continuous improvements to process. Minimum rework. Close to no returns/warranties. Introduce the use of Digital Twin and AR/VR to optimize maintenance, training and visibility of processes. High level of accuracy in checking for quality. 	<p>3 DIGITAL - ADVANCED</p>  <ul style="list-style-type: none"> DIFOT. High visibility of tracking and traceability in internal systems and processes. Use of algorithms/ rules based inputs to optimize flow. Introduce the use of AGVs. 	<p>3 DIGITAL - ADVANCED</p>  <ul style="list-style-type: none"> Full use of digital programs and systems. High integration of systems and data infrastructure. Standardised communication technologies and protocols. Equipment and machinery are semi-modular and semi-flexible to produce different product ranges and smaller batch sizes. High connectivity and data transfer.
<p>4 ADAPTIVE</p>  <ul style="list-style-type: none"> Incentives and metrics adapting to continuous ideas. Structured Gateway process. Open, adaptive and collaborative culture. Adaptive Digital strategy. Adaptive innovation strategy. Adaptive business models. 	<p>4 ADAPTIVE</p>  <ul style="list-style-type: none"> Proactively seeking recent trends and technology. Proactively creating formal training/ upskill programme for future skills and driven by needs from staff. 	<p>4 DIGITAL - INTELLIGENT</p>  <ul style="list-style-type: none"> Flexible sales strategy to suit different customer needs. Data-driven systems, with minimum human interaction. Customer insights are data driven and provides recommendations to the design and manufacturing teams. Procurement requests are fully-automated. 	<p>4 DIGITAL - INTELLIGENT</p>  <ul style="list-style-type: none"> Updates in one system is autonomously updated across the systems. Data-driven/AI to provide recommendation for designers e.g. reduce material/weight and part counts, and also choice of materials. Rapid learning cycle and rapid prototyping in place. 	<p>4 DIGITAL - INTELLIGENT</p>  <ul style="list-style-type: none"> Data-driven/AI to predict customer orders and optimize production schedule. Data-integration of demand and supply chain. Ability to adapt to change in schedules and optimize orders. Physical set up of manufacturing plant is flexible and machines are modular. 	<p>4 DIGITAL - INTELLIGENT</p>  <ul style="list-style-type: none"> Data-driven/AI to learn from failures and optimize machine output. Flexible and modular production lines. Optimized robots/human interaction. Batch size of 1 is achievable. 	<p>4 DIGITAL - INTELLIGENT</p>  <ul style="list-style-type: none"> Data driven and continuous improvements. Failure of 1. Flexible quality levels to what customer needs. Human oversight monitoring. Optimized use of autonomous AGVs and human interaction. 	<p>4 DIGITAL - INTELLIGENT</p>  <ul style="list-style-type: none"> DIFOT. High visibility of in-house and external supply chain flow. Good visualisation of data and use of AI to provide instant improvements to systems. Optimized use of autonomous AGVs and human interaction. 	<p>4 DIGITAL - INTELLIGENT</p>  <ul style="list-style-type: none"> Data driven systems and processes to diagnose problems and identify opportunities for improvement e.g. Machine learning in predicting equipment failure, changes in demand. Fully integrated systems and data infrastructure. Open, inclusive and transparent communications network to work closer with internal and external partners. Fully connected and data transfer.