

تمكين
Tamkeen

Manufacturing Sector

Skills Report 2024

مهارات البحرين
Skills Bahrain

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
INTRODUCTION AND PURPOSE	5
Purpose	5
Intended Audience	5
Methodology	6
SECTOR OVERVIEW	7
Kingdom of Bahrain’s Manufacturing Subsectors and Industries	8
Employers in Bahrain’s Manufacturing Sector	9
The Manufacturing Sector in Numbers	10
Trends shaping Bahrain’s Manufacturing Sector	11
WORKFORCE	13
Demographics of Bahrain’s Manufacturing Sector	14
Career opportunities in Bahrain’s Manufacturing Sector	16
Career Spotlight: Digital Transformation Specialist – Digitalization Engineer	22
Career Spotlight: Quality Assurance & Quality Control (QA & QC) Officer	23
Career Spotlight: Material Engineers	24
Career Spotlight: Research & Development Scientist	25
PREPARING A FUTURE-READY MANUFACTURING WORKFORCE	26
Core Skills Framework	27
Key Skills for a Dynamic Workforce	29
Key Technical Skills for an Agile Workforce	30
TRAINING PROGRAMS AND INITIATIVES	31
Degree Programs	31
Diplomas and Vocational Training Programs	32
Tamkeen: Employment Programs	33
Tamkeen: Career Development Programs	33
KEY TAKEAWAYS	34
ACKNOWLEDGEMENTS	36
GLOSSARY OF TERMS	37

Content Disclaimer

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Executive Summary

Kingdom of Bahrain's Manufacturing sector is a dynamic and diverse component of the national economy that is currently undergoing substantial transformation. This transformation is driven by advancements in technology, a growing emphasis on sustainable manufacturing practices, and evolving market demands.

The sector holds significant importance within Bahrain's economic landscape, standing as the second-largest non-oil sector and contributing 14.1% to the national real GDP in 2022. It also serves as a major employer, with a diverse workforce of nearly 55,000 professionals as of the end of 2022. The Manufacturing workforce comprises a mix of local and international talent, encompassing a wide range of roles, including entry-level Operators and Technicians, Engineers, Quality Control and Quality Assurance Experts, Health and Safety professionals, and Research and Development Scientists.

Legacy industries like aluminum and related downstream activities, steel, petrochemicals, refined petroleum, chemicals, and plastics industries have long been pillars of Bahrain's industrial output, providing substantial employment opportunities to the Bahraini workforce. As the sector embraces advanced technologies, adopts smart manufacturing processes, and expands from its traditional roots and into other industries like food and beverage, pharmaceuticals, and micro-electronics as outlined in Bahrain's Industrial Sector Strategy 2022-2026, skills development becomes paramount. This focus on skills development is crucial in facilitating a smooth transition towards a well-equipped, future-ready workforce that can adapt to these evolving trends.

Today, Bahrain's education and training landscape provides varied paths for individuals to enter, transition into and advance in the Manufacturing sector through an array of degrees, diplomas, and vocational training programs. These programs cover Engineering disciplines and related fields, technology, supply chain management and specialized certifications in quality, and health and safety, among

others. However, to ensure the workforce stays competitive and meets future demands of employers, there needs to be stronger ongoing alignment and collaboration between universities, training institutions and employers.

Employers in the Manufacturing sector signaled a strong need for both core and technical skills development within the workforce. Core skills like communication, critical thinking, and digital literacy are particularly important to employers as these contribute to effective and efficient workplaces, while enhancing opportunities for employee career growth into senior management positions. Whereas for technical skills, there is a growing demand for certified Quality Managers, Health and Safety professionals, and Specialized Engineers in fields like automation, digitalization, environment, and metallurgy. Bridging these skill gaps is essential to ensuring a ready workforce.

Bahrain's Manufacturing sector is actively preparing for the future by strategically positioning itself to tackle forthcoming challenges and capitalize on emerging opportunities. The sector is making a deliberate effort to incorporate advanced technologies, adopt sustainable practices, and foster innovation. These initiatives demonstrate the sector's commitment to building resilience and competitiveness. The success of this endeavor relies heavily on having a workforce that is adaptable and equipped with skills that align with industry demands.

To achieve this goal, it is imperative to establish a strategic alignment between educational and training institutions, and the requirements of employers within the Manufacturing industry. This alignment will help bridge skill gaps and cultivate a culture of continuous learning. By prioritizing these efforts, Bahrain can ensure the sustained growth and dynamism of its Manufacturing sector.

Introduction & Purpose

Purpose

This report serves as a resource for individuals, organizations, and professionals intending to or currently operating in the Manufacturing sector. Its primary aim is to provide a clear understanding of both the current and future skills landscape within the sector, reflecting the views and insights from industry representatives alongside comprehensive secondary research. The report identifies emerging

trends, highlights the evolving nature of jobs and career opportunities in the sector, and outlines key skills required to enhance the workforce's alignment with industry needs. Additionally, it provides an overview of the various educational pathways and training programs available to embark on or advance a career within the Manufacturing sector.

Intended Audience

Individuals
Provides insights into sector trends, jobs, and skills in demand, as well as relevant trainings and programs, aiding in informed career planning.



Employers
Provides insights into sector trends, current and emerging skills landscape, and relevant trainings to guide workforce planning.

**Academia &
Training Providers**
Provides insights to support curriculum and training program development in alignment with industry needs.

Methodology

Research Methodology

The research methodology for the Manufacturing Sector Skills Report followed a robust and systematic approach with several key research activities, starting with an international benchmarking exercise to identify best practices in sector skills report development. This initial step, in addition to guidelines from the International Labour Organization (ILO), informed the design of the engagement methodology outlined in the following section.

Extensive desktop research established an understanding of the current landscape within Bahrain's Manufacturing sector, and a review of Government strategies – including the Economic Recovery Plan, the Industrial Sector Strategy, and the National Energy Strategy – ensured alignment of findings with national strategic priorities. Economic and labor market data were sourced from official Governmental sources.

Engagements with sector representatives (see 'Engagement Methodology') provided the core insights into the sector's specific dynamics and requirements embedded throughout the report. The findings from these research activities have been consolidated into the Sector Skills Report, which serves as a valuable resource for individuals, employers, academic institutions, and training providers.

Engagement Methodology

To gather critical insights, a Sector Working Group was formed, serving as a collaborative platform for engagement and knowledge exchange. The Sector Working Group aimed to uncover trends, opportunities, and challenges within the Manufacturing sector, and to identify the skills gaps in the workforce.

This group included a diverse array of stakeholders and experts from both local and international contexts, encompassing representatives from small and medium-sized enterprises (SMEs) and large companies, as well as higher education, vocational and training institutions. This wide-ranging representation ensured a holistic view of the sector's needs and dynamics.

Over a period of 10 weeks, from September to November 2023, the Sector Working Group conducted a series of workshops with the active participation of almost 20 representatives from more than 8 industries within the Manufacturing sector, including Metals, Chemicals, Plastics, Rubber, Food and Beverage, and Furniture. These collaborative sessions were crucial in validating job demands and career pathways in the Manufacturing sector, drawing on the collective insights of the Sector Working Group members.

The contributions of the Sector Working Group were instrumental in the development of a skills framework tailored to the sector's requirements and context in Bahrain. The insights and findings from the Sector Working Group's engagement have been thoroughly integrated into this report.

Sector Overview



The Manufacturing sector is one of Bahrain's key priority sectors and a strategically important contributor to the country's economic landscape. It is the second-largest non-oil sector, accounting for 14.1% of national real GDP in 2022 with a total output of BHD 1.9 billion. The sector is a key driver of economic diversification in the country, and a significant employer to a diverse workforce of 54,953 professionals, representing 9.7% of total private sector employment as of the end of 2022.

Regulatory oversight of the Manufacturing sector primarily rests with the Ministry of Industry and Commerce (MOIC), as it is responsible for industrial licensing, policy making and development. The Supreme Council for Environment (SCE) regulates environmental licenses in its efforts to set and govern the Kingdom's environmental and sustainability strategies. Additionally, all engineers and engineering offices must be licensed by the Council for Regulating the Practice of Engineering Professions (CRPEP) to operate in Bahrain.

Kingdom of Bahrain's Manufacturing Sub-sectors and Industries

The Manufacturing sector comprises of heavy and light industries, with metals, petrochemicals, chemicals, nonmetallic minerals, and food and beverage production collectively constituting more than 70% of the total manufacturing activity as of 2022.

Figure 1: Manufacturing subsectors and industries



Employers in Bahrain's Manufacturing Sector

Reflecting the Kingdom's strategic vision for diversified industrial growth, the Manufacturing sector comprises a wide range of companies, including large companies in established heavy industries, as well as SMEs and international manufacturers in emerging industries.

Pivotal to Bahrain's Manufacturing landscape are legacy industries, such as Oil, Gas, and Aluminum, which have long anchored the country's industrial output across prominent downstream clusters, including Refined Petroleum products, Petrochemicals, and a variety of aluminum products such as extrusions, rods, and wires. These industries played a vital role in bolstering Bahrain's economy, and companies such as Aluminium Bahrain (Alba), Gulf Aluminium Rolling Mill (GARMCO), Gulf Fiberglass & Plastic Factory (GFPPF), and Gulf Petrochemical Industries Company (GPIC) continue to foster quality employment for Bahrainis.

Other heavy industries feature strongly in the country's Manufacturing sector landscape, capitalizing on the historical surge in construction underpinning the urban development of Bahrain and other regional cities across the GCC. Companies operating in this domain include Chemicals, Plastics, Steel, and Construction and Building Materials manufacturers, such as BASF, BFG International, Hempel Paints, CPIC Abahsain Fiberglass, Bahrain Steel, Sulb, and Awal Ready Mix Concrete. Additionally, a host of Machinery and Equipment Repair and Installation providers continue to support industrial

parts maintenance, engineering, and industrial repair services, such as Ramsis Engineering, Fives Services Gulf, Bahrain Workshop Company, Fabtech, Airmech, MTQ Oilfield Services, Bridge Industrial Services, and Relay Engineering.

This landscape has expanded with the emergence of light industries supported by the Kingdom's investment in industrial zones and robust logistics infrastructure, which has attracted both local and international investors. This synergy is transforming Bahrain into a growing hub for Food and Beverage and Fast Moving Consumer Goods (FMCG) manufacturers and distributors such as Mondelez, Arla Foods, FOOSCO, Awal Dairy, Reckitt Benckiser and Olayan Kimberly Clark.

In addition to Downstream Aluminum, Petrochemicals and Food Processing, industries such as Pharmaceuticals, Renewable Energy Equipment, and Micro-Electronics are central to the Government's strategic focus to diversify Bahrain's Manufacturing sector landscape as outlined in Bahrain's Industrial Sector Strategy 2022-2026. With a vision to increase industrial exports, grow the sector's GDP contribution, and strengthen local SMEs, the Manufacturing sector is poised for high-quality employment opportunities.

Meanwhile, initiatives targeting Industry 4.0 and other technological advancements, as well as investments into industrial infrastructure, aim to drive productivity and growth in Bahrain's Manufacturing sector in the coming years and ensure it is well-positioned to capitalize on emerging opportunities and trends shaping the global and regional industries.

The Manufacturing Sector in Numbers

GDP Contribution



14.1%

In **2022**, the Manufacturing sector contributed **14.1%** to Bahrain's real GDP

BHD 1.9 Billion

Total real output in **2022**

Employment



54,953

By year-end **2022**, the Manufacturing workforce stood at almost **55,000** employees, constituting **9.7%** of total private sector employment

2%

In **2022**, employment in the sector **grew 2% YoY**, while experiencing a soft decline over the past years potentially reflective of trends such as automation and modernization

Foreign Direct Investment



BHD 2.3 Billion

In **2022**, the Manufacturing sector attracted **BHD 2.3 Billion** of foreign direct investments (FDI) into the Kingdom, which was the second-highest **17%** of all sectors during the year

Trends shaping Bahrain's Manufacturing Sector

The Manufacturing sector is undergoing a significant transformation following the emergence of several trends that are shaping the future of the industry and workforce dynamics. These trends are driven by technological advancements in pursuit of increased efficiency and productivity, a growing commitment to environmental sustainability, and a shift towards more localized and flexible production methods.

Industry 4.0 and Related Technologies

Advancements in technology have led to increased automation and the implementation of Industry 4.0 principles, thus transforming traditional plants and manufacturing processes. The integration of advanced technologies into the manufacturing process, such as the Internet of Things (IoT), Artificial Intelligence (AI), and Robotics has led to the development of highly automated and connected smart factories, resulting in increased productivity, reduced costs, and improved quality. The adoption of Augmented Reality (AR) and other virtual reality simulations in training are also redefining the ways in which skills are acquired and developed.

In Bahrain's Manufacturing sector, Industry 4.0 adoption is advancing with initiatives like iFactories which is led by the Ministry of Industry and Commerce. Launched in August 2023 and in partnership with Tamkeen, the iFactories initiative aims to incentivize and support 300 factories on their journeys to assess their readiness and invest in factory automation and other Industry 4.0 technologies. Furthermore, digital transformations can already be seen across key industries, such as aluminum, petroleum refining and petrochemicals. Leading companies in these industries are developing digital twins, integrating real-time monitoring solutions, and using cloud computing technology to process large amounts of data and identify areas for performance optimization.

As the adoption of Industry 4.0 technologies and the move towards digitalization in Bahrain's Manufacturing sector accelerate, opportunities will open for professionals who are skilled in advanced technologies and Big Data analytics. The workforce will need to develop the relevant skillsets to use these technologies effectively and adapt to the industry's technological revolution, leading to enhanced efficiency, productivity, and innovation.

Environmental Sustainability and Decarbonization

Sustainability is becoming a core trend across all industries in the Manufacturing sector, with companies focusing on reducing their environmental footprint and adopting greener practices within factories and plant operations. Environmental regulatory pressures and growing consumer demand for sustainable products, are driving business model transformations and increased investments into sustainable manufacturing practices, such as manufacturing-efficient processes, waste reduction, and the use of renewable energy sources.

Bahrain's environmental sustainability policies and commitment to achieving Net-Zero emissions by 2060 – as outlined in the National Energy Strategy – call on a cross-sectoral and collaborative effort between Government and industry, including Manufacturing and Energy. This includes initiatives to diversify Bahrain's power mix to include renewable energy sources, as well as the adoption of sustainable practices and green technologies by local manufacturers to optimize water and energy demand and reduce carbon emissions.

The shift towards sustainable practices requires a strong understanding of environmental regulations and compliance with sustainability standards and certifications, and is creating career opportunities for Bahrainis to specialize in environmental management and green technology implementation.

Localization, Regionalization and Flexible Production Strategies

Amidst a hyper-connected and globalized world, the COVID-19 pandemic exposed the vulnerabilities and risks associated with relying heavily on single-source supply chains and the lack of manufacturers to adapt to such disruptions. To enhance preparedness for future disruptions and reduce dependence on international supply chains, manufacturers are reevaluating their strategies and transitioning towards localized, regionalized, and flexible production methods. This means manufacturing companies are moving their production facilities closer to their target markets and customers. This shift is expected to strengthen Bahrain's manufacturing resilience, competitiveness, and create growth prospects for local and regional suppliers.

Bahrain's Manufacturing sector has seen significant investments and expansions in recent years from international manufacturers like Mondelez (US), Armacell (Germany), iCOOL (China), and Aerolam Middle East (India). By establishing their production

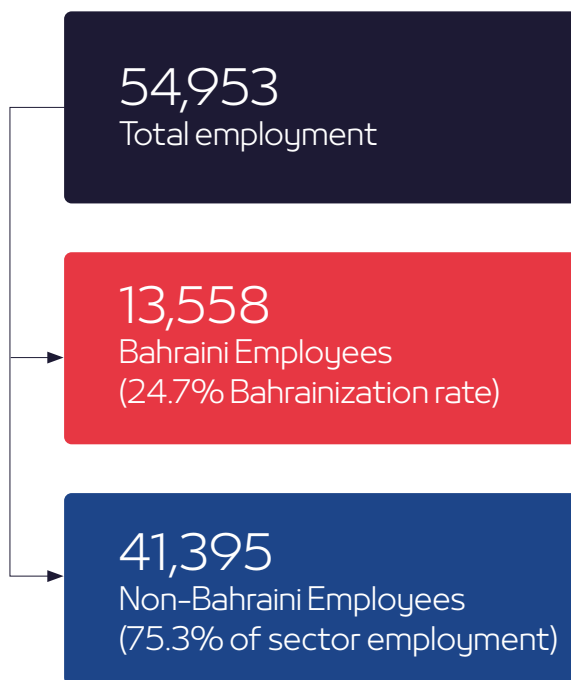
facilities in Bahrain, these companies are able to be closer to their customers in the GCC and Middle East and be able to serve them better. Other manufacturers have expedited localization by acquiring existing businesses that have local experience and production capabilities. For example, in 2023, US-based Aptar Closures acquired majority stake in Bahrain-based Gulf Closures to accelerate its strategy in the region by tapping into Gulf Closure's local manufacturing capabilities, workforce and regional distribution network.

The expansion of manufacturing facilities in Bahrain indicates that the demand for skilled workers will be across several functions, including production, maintenance, quality control, and supply chain management. Additionally, the implementation of flexible production strategies often entails the use of advanced manufacturing equipment and data-driven decision-making. As a result, skilled production technicians and professionals who possess the ability to analyze and interpret data for informed production decisions are anticipated to play an increasingly important role in the composition of the manufacturing workforce.



Workforce

Figure 2: Manufacturing workforce composition, by nationality (2022)



Bahrain's Manufacturing sector presents a dynamic labor landscape with a diverse workforce of 54,953 professionals as of the end of 2022. While Bahraini nationals make up around 25% of the manufacturing workforce, there is a growing focus to increase Bahrainization in the sector. Bahrain's Industrial Sector Strategy (2022-2026) aims to enhance job prospects for Bahrainis in this priority sector, especially across skilled roles that range from technical to managerial.

Meanwhile, the substantial portion of the workforce constituted by non-Bahrainis mostly fills low-skilled, labor-intensive roles. These jobs have been an essential foundation for the sector's operations, however it is these manual jobs that will be most affected by the inevitable impact of automation and digitalization.

The shift towards Industry 4.0 adoption and technological transformations in the Manufacturing sector is anticipated to change the nature and composition of the manufacturing workforce. While some jobs will be obsolete, there is strong potential for skills development and career growth within the new, high-skilled jobs that Industry 4.0 is expected to create in the coming years.

Demographics of Bahrain's Manufacturing Sector

From 2018 to 2022, Bahrain's Manufacturing sector witnessed subtle yet telling trends in its Bahraini workforce composition. Overall, the number of Bahraini nationals in the sector saw a slight decrease of around 2.5%, compared to non-Bahraini workers, whose numbers declined by more than 22% during the same period. This shift suggests a potential refocusing on Bahraini workforce utilization amid Government efforts towards nationalization and the promotion of local talent in key priority sectors. Additionally, the sector's move towards more advanced technology adoption and automation is expected to displace certain jobs, and therefore the overall decline is in line with observed trends in the global manufacturing workforce.

When segregated by gender, the number of Bahraini males in the manufacturing workforce remained relatively stable between 2018 and 2022, with a marginal decrease of just under 0.7%. In contrast, Bahraini females have experienced a more pronounced reduction of approximately 9.9% in the same period. This trend suggests that while the sector maintains a steady appeal for Bahraini males, there may be underlying factors influencing the participation of Bahraini females. According to industry representatives from the Manufacturing Sector Working Group, some underlying factors may include the lack of interest in the nature of manufacturing jobs, a perceived lack of career progression opportunities for females in the sector, or stronger preferences to work in other, more attractive sectors.

For employers and other stakeholders operating in the Manufacturing sector, it is important to understand these trends and examine the factors that may be at play in further detail. This can guide the development of targeted initiatives to encourage Bahrainis, especially Bahraini females, to explore career opportunities across the wide spectrum of functions and specializations in the sector and ensure a balanced and inclusive manufacturing workforce.



Figure 3: Manufacturing sector employment evolution, by nationality (2018 – 2022)

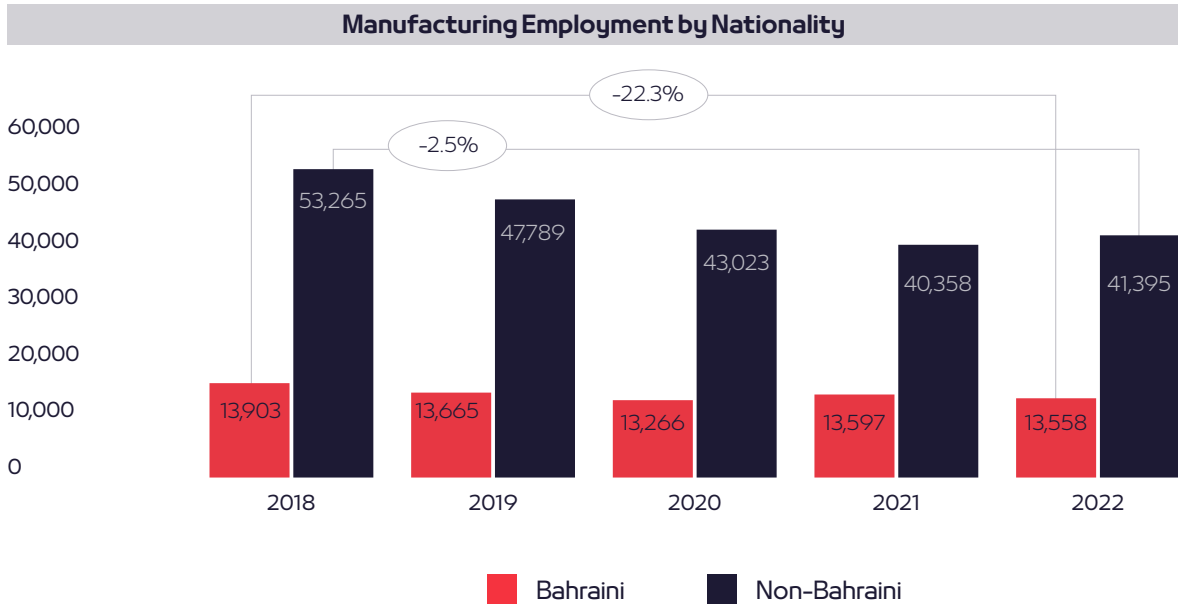
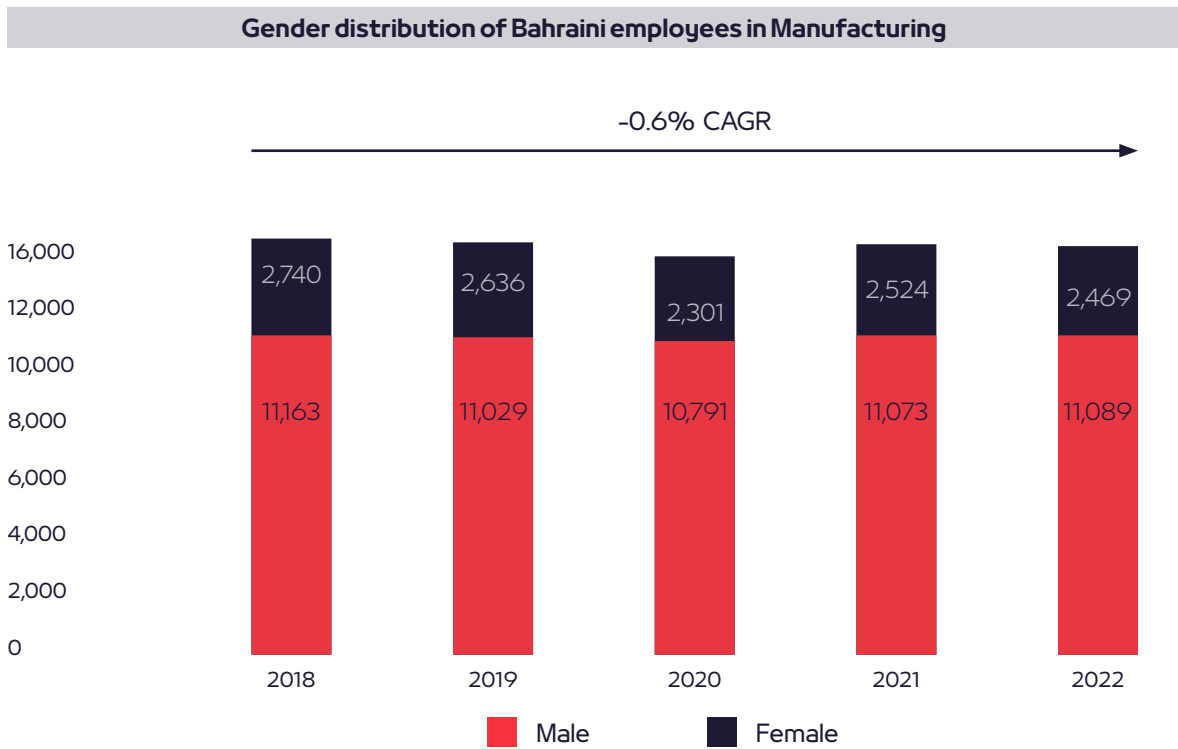


Figure 4: Manufacturing sector Bahraini employment evolution, by gender (2018 – 2022)



Source: Social Insurance Organization (SIO)

Career Opportunities in Bahrain's Manufacturing Sector

A career in the Manufacturing sector can provide a dynamic and rewarding experience across a broad range of jobs and positions, catering to individuals with different educational and professional backgrounds. These jobs primarily relate to the processes involved in the transformation of raw materials into finished products and can be found within many industries such as aluminum, petrochemicals, chemicals, food and beverages, and textiles production.

In collaboration with the Sector Working Group, six job families were defined that capture the most critical roles that currently exist in Bahrain's Manufacturing sector and identify opportunities for career growth and progression (see supplementary document "Manufacturing Career Pathway Map").

The Production (or Operations) job family makes up the majority of the key roles in the sector. These are the typical occupations that come to mind when thinking of the manufacturing workforce. Production teams are directly involved in assembling, processing and making new products within plants and factories, working with materials like metals, chemicals, and wood and often operating machines and other equipment. Entry-level employees like Plant Operators and Machine Operators can grow in their careers towards more senior roles. For example, the role can climb the career levels to a Production Supervisor where they will lead a team of Operators, and can grow all the way to the Head of Plant Operations position where they will be responsible for all production, maintenance and engineering processes. Meanwhile, the Maintenance Technicians, Process Technicians, and Electricians make sure that all machinery, equipment and electrical components

are properly set up, regularly tested and routinely maintained. Higher-skilled Engineers across various disciplines, such as Chemical, Mechanical, Electrical, and Electronic Engineers, are also essential to drive efficiency in manufacturing operations, including designing and improving production processes, systems and products, as well as optimizing the production floor in the facility.

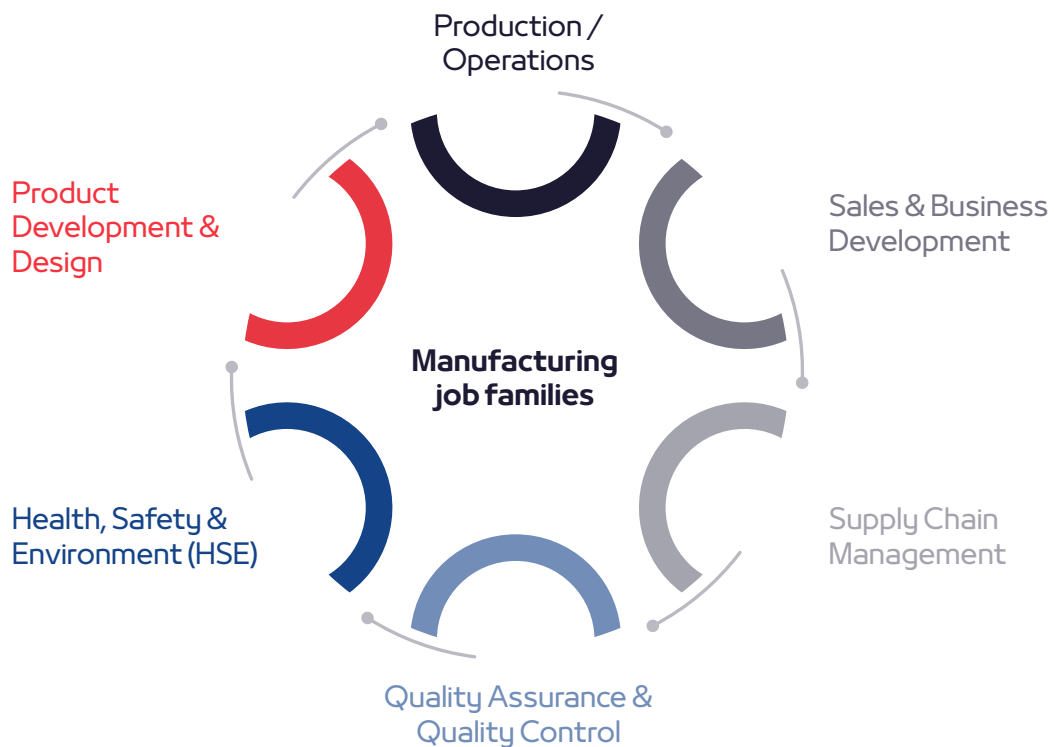


Other job families provide alternate career options for individuals seeking roles beyond the production floor. Sales and Business Development roles, such as Sales Coordinators, Key Account Managers and Business Development Managers, are out there promoting the company’s products, identifying prospective customers, nurturing existing customer relationships, and driving the company’s growth. Supply Chain Management roles, such as Purchasing Officers and Warehousing and Distribution Managers handle material procurement and oversee the movement of raw materials and products from source to end-customer. Quality Management positions like Quality Assurance Officers and Quality Managers maintain product quality standards. Professionals in the Health, Safety and Environment (HSE) roles, such as HSE Inspectors and HSE Specialists focus on maintaining safety and ensuring

compliance to HSE policies and procedures, including monitoring, responding to, and reporting on incidents. Product Development and Design positions include Product Engineers, Researchers, and Scientist, and they are involved in the prototyping and testing of new products and processes, as well as improving existing ones.

The broad spectrum of career opportunities and job roles in the Manufacturing sector apply to a wide range of skills and educational backgrounds, offering multiple entry points for graduates, job seekers and other individuals interested in developing their career in Manufacturing.

Figure 5: Manufacturing job families



Source: Manufacturing Sector Working Group

According to the views of the Manufacturing Sector Working Group, the current employment landscape in Bahrain's Manufacturing sector is characterized by a demand to fill roles that blend technical skills with operational expertise. Trained individuals are in high demand for positions across Production, such as Plant Operators, Machine Operators, and Maintenance Technicians. These roles offer a practical entry route into the sector for individuals coming from technical and vocational education.

While Operators and Technicians are generally in higher demand compared to Engineers and make up a larger segment of an employer's employee base, the Sector Working Group identified a current demand for specialized Engineering capabilities. For example, specialist positions in Materials (or, Metallurgy), Mechatronics, Electrical, and Automation Engineering seem to be challenging to fill, however these roles could offer rewarding career opportunities in the current environment as manufacturing processes are modernizing and becoming more sophisticated.

The sector is also in need of professionals to serve in Techno-Commercial roles, Supply Chain operations, Health Safety and Environment (HSE), and Quality Assurance and Quality Control. Supply Chain professionals are critical for managing logistics and ensuring efficient production flow. Electrical Engineers and sector-specific technicians are needed for their technical skills in electrical systems and specialized control areas. Automation Engineers and Food Production Supervisors play pivotal roles in enhancing productivity and overseeing food manufacturing processes. Quality Control was particularly emphasized, with demand for Quality Inspectors in food production and processing activities. Similarly, Quality Control specialists are in demand within other industries given prior experience and knowledge of that particular industry.

Looking ahead to the next 3-5 years, it is the view of the Manufacturing Sector Working Group that the sector will see a shift in job demand towards roles that align with emerging technologies and sustainability trends. Mechatronic Engineers and Artificial Intelligence specialists will be increasingly sought after as the industry embraces automation

and AI-driven solutions. Fire Engineers with a specialization in HSE and Sustainability Specialists will be crucial in ensuring safety and environmental compliance.

Engineering expertise will continue to be required within the Production/Operations job family, however with a renewed focus on specializations such as Automation, Digitalization and Reliability Engineering. This anticipated demand suggests the importance of developing a manufacturing workforce that is well-versed in technology. The Sector Working Group also expects more roles in Artificial Intelligence and Machine Learning, 3D Modeling, and Robotics to emerge. However, the readiness of the current workforce to adapt to these emerging fields remains a challenge that requires strategic educational and training initiatives.

Furthermore, Bahrain's commitment to renewable energy and Net-Zero goals has encouraged the emergence of job roles like Sustainability and Waste Management experts, while increasing the demand for HSE Specialists and Metallurgy Engineers, for example. As the sector evolves, these roles will be vital in steering Bahrain towards a sustainable and efficient manufacturing future, marking a shift from traditional manufacturing roles to those aligned with environmental and technological advancements.

For those considering a career in Bahrain's Manufacturing sector, these roles offer a window into the future of industry, each integral to the sector's success and each a pathway to potential career growth. This landscape presents a nuanced narrative, one where opportunities for growth and innovation exist alongside challenges in skills development and adaptation to new paradigms. The sector's alignment with Bahrain's broader economic vision suggests a future that is resilient and competitive, yet one that will demand a concerted effort to overcome the hurdles of transition and training.

Figure 6: Jobs anticipated by the Sector Working Group to be in demand

Note: The job roles listed below are not ranked in terms of demand within the sector.

Job in demand	Job overview
 <p>AI and Machine Learning Experts</p>	<p>AI and Machine Learning Experts (including AI / ML Developers and Experts) develop algorithms and machine learning solutions to optimize production lines, predict maintenance needs, and enhance product quality, often collaborating with Data Scientists and Engineers. AI / ML Experts are at the forefront of technological advancement, turning data into actionable insights that drive smarter manufacturing processes.</p>
 <p>Automation and Robotics Engineers</p>	<p>Automation and Robotics Engineers (including Mechatronics specialists) are the driving force behind the sector's transition to Industry 4.0. They design, implement, and maintain automated systems and robotic technologies, transforming manufacturing processes and plants into modern, high-efficiency environments.</p>
 <p>Cybersecurity Specialists</p>	<p>Cybersecurity Specialists are responsible for safeguarding industrial control systems and sensitive production data to prevent disruptions caused by cyber attacks, which can lead to significant production downtime. By securing networks and systems, they ensure continuous, efficient, and safe manufacturing operations, collaborating with IT and production teams to fortify the digital backbone of manufacturing plants.</p>
 <p>Big Data Analysts</p>	<p>Big Data Analysts are instrumental in driving efficiency and innovation in the Manufacturing sector. They analyze large sets of production data, manage inventory through predictive analytics, and optimize supply chains. Their insights enable Plant Managers to make data-driven decisions, directly impacting production efficiency and reducing operational costs.</p>
 <p>Digital Transformation Specialists</p>	<p>Digital Transformation Specialists (includes Digitalization Engineers and Industry 4.0 Experts) lead the integration of technologies like Internet of Things (IoT), AI and Cloud Computing, effectively transforming manufacturing processes into smarter, connected operations. The role also involves driving cultural change within the company, ensuring that all levels of the organization embrace and adapt to digital advancements.</p>
 <p>Electrical and Electronics Engineers</p>	<p>Electrical and Electronics Engineers design and maintain the electrical systems that power manufacturing plants, ensuring machinery runs effectively and safely. Their work directly impacts production uptime and the introduction of new technologies on the manufacturing floor.</p>

Job in demand**Job overview****Health, Safety & Environment (HSE) Specialists**

HSE Specialists (including HSE officers, fire engineers, and ESG specialists) play a key role in ensuring compliance with health, safety, and environmental regulations. They develop and enforce safety protocols and environmental strategies, conduct risk assessments, and provide guidance to prevent accidents and injuries. HSE Specialists also develop strategies for hazard mitigation, and advocate for practices that protect employees and reduce the environmental impact of manufacturing activities.

**Materials Engineers**

Materials Engineers (also known as Metallurgy Engineers) design and optimize materials for various applications, specializing in selecting and testing materials used in manufacturing, directly influencing the quality and durability of the products. Their work interfaces closely with the Production/Operations and Product Development and Design teams to innovate and improve on manufacturing techniques.

**Quality Assurance and Quality Control (QA & QC) Experts**

QA & QC Experts (including Chemists, Scientists, Quality Inspectors, and Dairy Production Quality Controllers) oversee manufacturing processes to ensure products meet quality standards and customer expectations. The role involves overseeing every stage of production, from raw material sourcing to final product testing, and working closely with Production/Operations teams to implement quality protocols.

**Research & Development Scientists**

R&D Scientists (including R&D Innovators, and Product Development Scientists) lead product innovation, meaning they lead projects to develop new materials, products, and manufacturing methods. They often collaborate within cross-functional teams with engineering, production and sales teams, turning scientific discoveries into practical manufacturing solutions.

**Sustainability and Waste Management Experts**

Sustainability and Waste Management Experts (includes recycling manager, waste reduction leader, and sustainability managers) develop strategies for sustainable manufacturing practices, focusing on waste reduction, recycling and sustainable resource use. The roles involves collaborating across departments to integrate sustainability in every aspect of production.



Career Spotlight

Career Spotlight:

DIGITAL TRANSFORMATION SPECIALIST – DIGITALIZATION ENGINEER

Role Overview

Digitalization Engineers are vital to transforming traditional manufacturing processes into smart, interconnected systems through the integration of digital solutions to enhance efficiency and productivity in manufacturing. They develop digital strategies, oversee the integration of digital technologies into manufacturing processes, and ensure optimal utilization.

The role entails continuous learning in rapidly evolving technology fields, fostering intellectual and professional growth. The increasing demand for digitalization expertise in manufacturing ensures job security, competitive compensation, and opportunities for global collaboration. It is a gratifying career choice for individuals with a passion for technology and its application in the manufacturing industry.

Career Pathway and Progression

A background in Engineering (Electrical, Mechanical, or Computer Science) or a related field is essential to pursue a Digitalization Engineer position. Key skills include proficiency in digital technologies, IoT, programming, and a strong understanding of manufacturing processes. While manufacturing experience is beneficial, it's not always necessary. Employers value candidates with strong analytical, problem-solving, adaptability, and communication skills, as well as a collaborative mindset.

Digitalization Engineers have opportunities for professional growth and specialization. Beginning as a junior engineer, one can progress to positions such as senior digitalization engineer, project manager, or technology consultant. Specialization options encompass areas such as IoT, AI, or data analytics. Advanced roles may involve assuming responsibilities as a Chief Digital Officer (CDO) or Technology Strategy Director. Furthermore, opportunities exist for venturing into consultancy, education, or research within the realm of digital technology, particularly as it pertains to the field of manufacturing.

Career Spotlight:

QUALITY ASSURANCE & QUALITY CONTROL (QA & QC) OFFICER

Role Overview

Quality Assurance and Quality Control Experts ensure impeccable standards through rigorous inspections and protocols. With meticulous attention to detail, they exceed customer expectations by delivering exceptional products. Through creative problem-solving and engagement with evolving technologies, they strive to exceed quality expectations. Collaboration with cross-functional teams is a crucial aspect of their role, enabling them to bring fresh perspectives to the table and serve as catalysts for transformative advancements in the Manufacturing sector.

Career Pathway and Progression

Engineering professionals are highly sought after for roles in Quality Assurance and Quality Control. They typically obtain a Bachelor's degree in Industrial Engineering or Quality Management. However, due to their diverse background, professionals with other engineering educational backgrounds and experience would be good candidates for a career in Quality Assurance & Quality Control.

Specialized training and certifications in quality management is essential, and practical experience in the field gained through internships or entry-level positions are highly sought after. Alternatively, Engineers and QA/QC specialists from other industries such as Energy (oil and gas industry) can transition into this role within the Manufacturing sector.

Career progression is well-defined and promising. The typical path leads from the Officer level up to a QA/QC Manager, and eventually to becoming the Head of Quality. Each step in this career ladder brings broader responsibilities, including overseeing larger teams, strategic planning, and higher-level management of quality systems. The progression marks an expansion of influence and responsibilities to ensure excellence in quality.

Career Spotlight: Materials Engineers

Role Overview

Materials Engineers (or the more specialized Metallurgy Engineers) ensure optimal performance and structural integrity of materials components in manufacturing (including metals, the primary focus area for Metallurgy Engineers). They craft alloys, fine-tune heat treatments, and apply advanced metallurgical techniques to meet diverse industry demands. As stewards of material excellence, they exceed industry standards, contributing to the reliability and longevity of essential products.

Metallurgy Engineers play a vital role in shaping the materials that drive the manufacturing industry, experiencing continuous growth and fulfillment. Through problem-solving and advanced metallurgical processes, they contribute to the industry's commitment to delivering durable materials.

Career Pathway and Progression

A career as a Materials Engineer (or Metallurgy Engineer) involves a structured path of education, experience, and specialized skill development. One will require a Bachelor's degree in Materials Engineering, Metallurgical Engineering or a related field, gaining a strong foundation in the principles of the discipline.

Targeted training and certifications in areas such as material characterization, heat treatment, and advanced alloy development can enhance the degree background. Skill refinement in metallurgical analysis and quality control can be gained through practical experience in the form of internships or entry-level positions.

Moreover, Materials Engineers are not confined to the Manufacturing sector. They also play a significant role in the Energy sector, which offers diverse career paths and opportunities for upskilling through specialization, trainings, and the pursuit of further education.

Career Spotlight: Research & Development Scientist

Role Overview

Research and Development (R&D) Scientists conduct complex technical studies, experiments, and evaluations to enhance manufacturing processes and products. The role involves collaborating with interdisciplinary teams, including Engineers, Technicians and Quality Control personnel, in addition to leading innovation, implementing quality control measures, and staying informed about industry trends to develop and integrate new technologies into manufacturing.

The Scientists analyze data and interpret results to improve manufacturing processes and efficiency. They conduct experiments and research to develop new products and procedures. R&D Scientists also develop and implement quality control measures to ensure product consistency and compliance with industry standards.

Research and Development Scientists must stay current with industry regulations, guidelines and best practices, and identify market needs and trends to inform product development strategies.

Career Pathway and Progression

Becoming a Research and Development Scientist begins either directly in the R&D department or as an Engineer with expertise in a specific field. From there, hands-on experimentation, applied research, and ongoing professional development play a key role in refining their skillset. Proficiency in data analysis, laboratory management, and materials qualification are also important.

R&D scientists have diverse career trajectories, including vertical progression within R&D, lateral shifts to research roles, or transitions to Quality Assurance and Quality Control functions. These paths highlight the flexibility and broad scope for career development within the Manufacturing sector.

Preparing A Future-Ready Manufacturing Workforce

In today's ever-changing job market, a shift in mindset is crucial for professionals to succeed amidst industry transformations. The traditional focus on tenure and job titles is being replaced by a skill-centric approach. To navigate the complexities and opportunities presented by digitalization, sustainability, and renewable energy, individuals must prioritize continual skill development and adaptability. Embracing this mindset ensures relevance and competitiveness in the evolving landscape.

Recognizing this need, Tamkeen, in collaboration with Sector Working Group, have developed National Occupational Standards and Career Pathway Maps specifically for the Manufacturing sector. These resources are instrumental in illustrating the various career trajectories available within the industry, both vertically and laterally. They provide a clear framework for understanding the skills and competencies required at different stages and in different roles, offering guidance for those aiming to advance or pivot within the sector. This approach empowers employees to make informed decisions about their career paths and professional development, focusing on acquiring and refining the skills that are most valued and needed in the modern Manufacturing landscape. By utilizing these standards and maps, Bahrain's Manufacturing sector workforce can better align their personal career goals with the sector's evolving needs, ensuring a robust, skilled, and adaptable talent pool.

As the sector undergoes profound transformations – from the adoption of Industry 4.0 technologies to the national commitments towards sustainability and decarbonization – the demand for a skilled workforce adept in these new paradigms is paramount. For Bahrain, with its commitment to sustainable energy and a diversified economy, nurturing a workforce with the right skill set is a strategic imperative for success.

Skills can be classified as either core or technical skills, both of which play a crucial role in shaping an individual's competency, and contributing to the overall success of projects, teams, and organizations in the sector. Core skills, also known as generic or soft skills, are the basic skills which are required to function in both life and work. Technical skills can be defined as the abilities, knowledge, or expertise required to perform specific, job-related tasks. They are usually developed through on-the-job experience and structured training or learning programs.



Core Skills Framework

Tamkeen has developed and pioneered a national core skills framework as part of the country's wider skills taxonomy. The framework has been aligned and developed against a comprehensive list of international benchmarks and best practice whilst reflecting the specific needs and aspirations of Bahrain as a progressive country.

Core skills underpin and promote the development of learning and study skills and provide the foundation for the skills required to carry out specific job roles and functions. They are usually gained through life and work experience or through structured learning or training programs. Core skills are essential for any job or profession and provide a strong basis for lifelong learning and for building the technical skills required to support specific job roles.

The Core Skills Framework is structured around three key pillars: Social Intelligence, Self-Management, and Analytical Skills, each playing a vital role in shaping a proficient and adaptive workforce. Under each of the key pillars, four core skills are defined forming a complete framework of twelve core skills.

Core Skills Framework



SOCIAL INTELLIGENCE

The ability to be self-aware, inclusive, communicative and form relationships with others with empathy, compassion and assertiveness

Building Inclusivity

The ability to create an environment and manage relationships across diverse groups in a range of different contexts by seeking to establish common ground regardless of race, ethnicity, religion, gender, age, ability, education, or socio-economic status.

Communication

The ability to listen effectively and understand, articulate thoughts and ideas effectively, exchange information, employ negotiation skills and use oral, written and non-verbal skills across a range of different environments.

Empathy

The ability to demonstrate emotional intelligence by demonstrating awareness of the feelings and emotions of others and being able to act accordingly within that context.

Collaboration and Teamwork

The ability to work collectively and effectively with one or more people in order to achieve a common goal, bringing together a range of experience and skills based on exchanging ideas, sharing experience and developing creative solutions.



SELF MANAGEMENT

The ability to manage behaviors, thoughts and emotions in a conscious and productive way

Adaptability

The ability to easily adapt to new situations and changing circumstances in life and work and change actions as required.

Initiative

The ability to think independently, identify opportunities, think innovatively and take action when necessary and without direction.

Planning and Organizing

The ability to plan and organize tasks in order to fulfill requirements within a given time.

Literacy

The ability to understand and have the confidence and skills to work with language to identify, interpret, create and communicate effectively in written and oral formats.



ANALYTICAL SKILLS

The ability to collect, organize, visualize and assimilate data using a range of tools and skills

Digital Literacy

The ability to find, evaluate, analyze, use, share and create content using digital devices, use software applications and troubleshoot common problems.

Critical Thinking

The ability to analyze, interpret, evaluate, infer, explain, synthesize and self-reflect in the context of making reasoned judgements based on a logical sequence of independent thought.

Problem Solving

The ability to identify and assess issues and problems and make use of available resources to evaluate and generate potential solutions in personal, social and work contexts.

Numeracy

The ability to understand and have the confidence and skills to work with numbers using numerical skills to process, interpret and communicate information to help understand, predict and solve problems.

Key Skills for a Dynamic Workforce

As the Manufacturing sector undergoes rapid change, success relies on the acquisition of essential core and technical skills. These skills also highlight the gaps prevalent in the sector. The gap represents the disparity between the skills currently available in the workforce and those required to meet the needs of the manufacturing industry, presenting both a challenge and an opportunity in navigating the manufacturing landscape and adapting its operations and workforce to these innovative technologies. In an industry increasingly influenced by technological advancements, environmental considerations, and global market trends, the need for a workforce equipped with a blend of core and technical skills is crucial.

Core Skills to Enable Your Success in the Sector

In addition to providing a foundation for continuous learning and development, core skills play a crucial role in achieving success in a rapidly evolving workplace. Core skills foster resilience, innovation, and the ability to navigate diverse challenges across different contexts. As professionals progress in their careers, the emphasis on core skills intensifies, and the cultivation and development of core skills moves to the forefront. The Manufacturing Sector Working Group has identified five core skills that are most required across the sector.

<p>Communication</p>	<p>Strong communication skills are essential for ensuring clear understanding and coordination within a manufacturing setting, where precise instructions and feedback are crucial. Effective communication, encompassing both oral and written forms, is a key area for development, especially at Operator and Technician levels. Enhancing these skills will facilitate clearer interactions between various levels of staff and supervisors, improving overall operational efficiency.</p>
<p>Critical Thinking</p>	<p>Critical thinking contributes to innovative solutions and efficient handling of complex manufacturing challenges, benefiting both operational and management processes. The ability to apply critical thinking at various levels within the manufacturing workforce is an area for enhancement. This skill is vital for effective problem-solving and decision-making, both critical for progression into higher career levels such as executive management.</p>
<p>Digital Literacy</p>	<p>Digital literacy enables workers to navigate and optimize advanced technologies, fostering precision, efficiency, and adaptability in the production environment. As manufacturing increasingly integrates new systems, tools and advanced machinery, developing digital literacy is important.</p>
<p>Initiative</p>	<p>Initiative empowers independent thinking and innovation, creating a proactive environment. It enables decisive actions without explicit direction, promoting continuous improvement and adaptability. Fostering a culture where taking initiative is encouraged can be beneficial. This involves being proactive and taking ownership of responsibilities.</p>
<p>Planning and Organizing</p>	<p>Planning and organizing is essential for efficiently meeting requirements within designated timeframes. This capability ensures streamlined operations, optimal resource utilization, and adherence to production schedules. In a sector where precision and timeliness are paramount, strengthening skills in planning and organizing, particularly among new entrants to the workforce, can lead to better project execution and task management.</p>

Key Technical Skills for an Agile Workforce

Building on the insights from the earlier sections of this report, it is evident that specific technical skills are in demand within the Manufacturing sector. These skills reflect the current operational needs and anticipate future sector requirements. A deeper understanding of these key areas can guide professionals in aligning their expertise with the sector's evolving landscape.

In Bahrain's Manufacturing sector the demand for these skills is critical for the sector's growth and alignment with national manufacturing strategies. Professionals possessing these technical skills are well-positioned to make substantial contributions to the industry's evolution and support Bahrain's overarching manufacturing objectives.



Computer-Aided Design (CAD) and 3D Modeling

Proficiency in CAD tools is in high demand in Bahrain's Manufacturing sector, especially for draftsmen. It enables precise design and modeling, optimizing planning and implementation processes for efficient production workflows. While AutoCAD is a popular tool, the demand for skills in SOLIDWORKS 3D CAD is increasing with limited number of Bahrainis with these skills and proficiency in the market.



Data Analysis and Big Data Management:

In the age of digital transformation, the ability to analyze and manage large datasets is invaluable. It facilitates a methodical review of production data, fostering efficiency, optimizing production, and contributing to advancements in manufacturing processes.



Graphic Design

Expertise in industrial graphic design is highly valued, particularly in manufacturing. This skill involves creating visually effective and functional designs, contributing to enhanced communication and aesthetics in industrial settings.



Machine Operation

Demonstrated competence in operating machinery, including skills with tools like milling machines, lathes, and blender machines, ensures the precision and efficiency of production processes. This competence plays a pivotal role in the overall effectiveness of manufacturing operations.



Occupational Health and Safety

The Manufacturing sector places a heavy emphasis on compliance with safety standards, and HSE-certified specialists (NEBOSH Level 3, IOSH) are in increasingly high demand due to their pivotal role in safeguarding personnel and maintaining a secure working environment.



Project Management

Certifications like CAPM (Certified Associate in Project Management) or PMP (Project Management Professional) are highly sought-out by employers in the sector. These certifications validate the ability to systematically plan, execute, and oversee projects, ensuring efficient resource utilization and timely delivery.



Quality Assurance & Quality Control

Workers certified and skilled in QA & QC, such as holders of Six Sigma Green Belt, are in high demand by manufacturing companies in Bahrain. Critical across industries, QA & QC specialists play a key role in handling materials and conducting tests to ensure compliance to quality standards.

Training Programs and Initiatives

The education and training landscape in Bahrain provides a comprehensive foundation for addressing many of the Manufacturing sector's immediate requirements through a wide range of undergraduate, postgraduate, diploma, and vocational training programs. These programs offer individuals various pathways to embark on, transition into, or grow within diverse and rewarding fields in the sector.

However, there should be stronger alignment and ongoing engagement between the education and training institutions, and employers within the industry to evaluate and expand the education and training offerings. This proactive approach will be key to ensure the workforce remains competitive and prepared to meet the sector's future demand as manufacturers embrace smart manufacturing practices and prioritize environmental sustainability.

Individuals and employers may also benefit from the myriad of programs and initiatives offered by Tamkeen. Tamkeen is dedicated to enhancing the skills and competencies of both individuals and businesses, aiming to address the changing demands of the global market. Tamkeen offers a range of programs that help bridge skill gaps and foster a culture of continuous learning and adaptation. It offers this support through a range of programs relevant to the Manufacturing sector that contributes to individual career growth and supports the overall competitiveness and sustainability of the Bahraini economy.

Degree Programs

For those looking to delve into the Manufacturing sector through higher education, the presence of Mechanical, Electrical, Electronic, Chemical, and Industrial Engineering programs at multiple institutions lays a solid career foundation for future Engineers. Individuals may choose to specialize at postgraduate levels through a variety of degrees in Environmental Chemistry, Sustainable Development, Renewable Energy Engineering and Sustainable Energy Systems Engineering, which could facilitate a progression into roles in Materials Engineering (or Metallurgy Engineering) and Sustainability and Waste Management.

With the Manufacturing sector's push towards Industry 4.0, undergraduate and postgraduate programs in Artificial Intelligence, Machine Learning, Internet of Things (IoT), Cybersecurity, and Data Science are particularly relevant and provide the necessary technical grounding. These programs are crucial for developing the skills necessary to analyze and secure large sets of industrial data and optimize manufacturing processes as plants and factories modernize.

Diplomas and Vocational Training Programs

Beyond degrees, diplomas and vocational training programs offer a streamlined, industry-relevant education for those eager to enter the Manufacturing sector with a practical and focused skillset. This path is an excellent starting point that could offer a quicker transition into the workforce with a strong foundation in the chosen field. It also allows flexibility, as individuals are able to respond to changes in the sector by acquiring new competencies as needed.

Engineering diplomas offered through a multitude of vocational training institutions cover disciplines such as Electrical, Mechanical, Electromechanical, and Chemical Engineering and provide the technical foundation required for various manufacturing roles including Maintenance Technicians and Operators. In line with the forward direction of the sector, vocational trainings and diplomas in Cybersecurity, Artificial Intelligence and Cloud Computing are also available in Bahrain.

For diploma holders, Top-Up Programs provide an opportunity to further elevate an individual's educational standing. These programs allow individuals to convert their existing diplomas into full Engineering degrees including Mechanical, Electrical and Chemical Engineering. Top-Up programs benefit individuals with accumulated work experience that would like to progress into higher-level positions or more specialized roles.

Moreover, the availability of diplomas and certificates in health and safety, accredited and awarded by National Examination Board in Occupational Safety and Health (NEBOSH) and Highfield Awarding Body for Compliance (HABC), directly supports the upskilling of professionals for HSE roles, including HSE Officers and HSE Specialists. This is particularly significant given the industry's emphasis on upholding and maintaining safe and sustainable environments.

Vocational training institutes also offer a range of programs culminating in leading globally-recognized certifications, such as PECB's ISO and Six Sigma Green Belt certifications. These programs are directly tailored to fill gaps in Quality Assurance and Quality Control expertise, which are vital for maintaining high standards in the manufacturing process.

Other specialized trainings available in Bahrain support individuals and employers in addressing technical skills gaps in engineering design, such as SolidWorks and AutoCAD courses for draftsmen and R&D scientists, as well as project management through courses teaching towards the achievement of CAPM and PMP certifications.

Tamkeen: Employment Programs

National Employment Program	Provides employers with wage subsidy support to hire Bahraini Civil Engineers and Architects with less than two years of registered work experience in the Social Insurance Organization (SIO) or those registered with the Ministry of Labour (MOL). They are eligible to receive wage subsidy support of 40% for 5 years, subject to the approved cap amount.
On The Job Training	Bahraini jobseekers and recent graduates can take advantage of on-the-job training opportunities. Participants will have the chance to enhance their existing skills and acquire new practical skills, with a monthly stipend paid by Tamkeen to the trainees.
Apprenticeship Programs Support	Bahrainis participating in this program can attain in-demand skills through a blend of class-room based training and practical work experience with a technical institute. Employers can take advantage of this opportunity as Tamkeen fully subsidizes the training and also cover half of the participant's wage over a three-year period.

Tamkeen: Career Development

Wage Increment Program	The program provides support for wage increments to both existing and new employees within an enterprise with the goal of promoting Bahrainization and encouraging higher salaries for locals. Tamkeen offers wage support for a period of up to two years as a part of this initiative.
Professional Certification	Through this program, Bahraini individuals are empowered to enhance their skills and improve their competitiveness in the evolving Manufacturing sector. They are given the opportunity to obtain accredited professional certifications at a subsidized rate. Tamkeen offers comprehensive support for the training program expenses, which includes covering exam fees, membership fees, and study materials.
Leadership Employment Program	The program aims to enhance the progress of careers for Bahraini individuals by offering wage support to employers who are interested in hiring Bahrainis for mid-level and executive positions within the private sector. Employers have the opportunity to receive subsidies for up to 50% of the salaries of Bahraini employees, as long as they fall within the prescribed limit, for a duration of two years.
Train and Place	Bahraini job seekers are able to receive professional training, allowing them to enter the job market with a strong professional background.
Enterprise Training Program	Tamkeen provides support to employers in the Manufacturing sector by partially or wholly covering training costs associated with formal trainings such as professional certifications, vocational, and technical training, enabling them to enhance the skills and development of their workforce. This support aims to improve their competencies, capabilities, and ensure their global competitiveness in the industry.
Global-Ready Talent	The program supports overseas placement and work opportunities for Bahrainis to help them gain valuable work experience, and enhance their skills. Tamkeen may offer part of an employee's monthly wage during the placement period, as well as part of the travel costs. This initiative helps Bahrainis accelerate their career development through exposure to an international work environment.
Aspire	Aspire aims to support national talent currently employed in jobs that do not match their academic qualifications by providing training programs to support career progression and promotion. This initiative can also be coupled with the Wage Increment Program, thus benefitting employers and employees.

Key Takeaways

- ▶ **Prioritizing the adoption and development of core skills is essential for cultivating a skilled and adaptable workforce, ensuring individual growth and organizational success.**

Prioritizing the adoption of the core skills framework and actively fostering the development of these competencies is imperative for both employees and manufacturing companies. This strategic emphasis enhances the versatility of the workforce and fortifies resilience in the face of industry changes. By investing in core skills like critical thinking, initiative, and communication, companies lay the groundwork for sustained success and growth of their employee base across career levels.

Universities and vocational training institutions should embrace core skills development within existing programs, while employers can emphasize core skills within their onboarding and induction sessions for new hires. In particular, oral and written communication are essential for Operators and Technicians to be effective at their job, while development of critical thinking skills is essential for employees to unlock promotions into senior management positions.

Systematically cultivating these skills contributes to a more agile and future-ready workforce, capable of navigating the complexities of the modern professional landscape. This proactive approach is vital for maintaining a competitive edge and ensuring long-term viability in a rapidly-evolving sector.

- ▶ **Stronger alignment and collaboration between education and training providers and employers in the manufacturing sector is crucial to ensure an industry-ready workforce.**

Educational institutions and training providers must strive to continuously update and align their curriculum with the latest industry trends and demands, namely through industry consultations and other regular communication with leading employers in the Manufacturing sector. Collaborations with industry partners can help in designing programs that are directly relevant to the sector's needs. This includes expanding offerings in engineering disciplines anticipated to be in-demand, like Automation, Digitalization, and Robotics Engineering, as well as advanced technological fields, such as Industry 4.0 technologies.

Meanwhile, employers in the Manufacturing sector should engage more strategically with education and training providers in Bahrain to communicate the latest trends and developments in their industries, and the impact these changes have on their workforce needs. Employers may leverage the education and training institutions to tailor and customize training programs to equip their existing employee base with particular skills, for example developing a graduate training program for new hires. Companies can also come together with universities to lead industry-academia projects to bridge gaps between theoretical learning and practical applications in various industries. For example, R&D efforts at company level can be augmented with research at universities to drive innovation

Key Takeaways

in materials, products and processes for the benefit of the wider Manufacturing sector.

Establishing platforms that facilitate collaboration and knowledge sharing among the various stakeholders is essential to ensure a harmonious balance of labor supply with industry demand and overall growth of the Manufacturing sector.

▶ **Specialized certifications and training play a vital role in advancing and developing employees within the Manufacturing sector.**

Individuals working in the Manufacturing sector should consider augmenting their degrees and diplomas with specialized certifications as part of their continuous learning journeys and to access opportunities for career growth and advancement. In a competitive job market, additional certifications in areas like health and safety (NEBOSH), quality control and assurance (ISO standards, Six Sigma) and project management (CAPM, PMP) can distinguish employees and enhance their career moves into diverse roles that are in high demand by the industry.

In the dynamic Manufacturing sector, individuals can leverage Tamkeen's Professional Certification Program to register and study towards acquiring highly sought-after certifications.

▶ **Engineers are best positioned to explore career advancement in a variety of non-engineering roles and positions that cater to their unique skills, expertise and interests.**

Due to their unique skillset and expertise, Engineers are well-suited to take on roles in various non-engineering functions within the Manufacturing sector, including Sales and Business Development, Quality Assurance and Quality Control, and Product Development and R&D.

Engineers' technical acumen allows for seamless transitions into areas such as sales and business development, where they can effectively channel their technical knowledge and expertise to acquire customers and drive company sales and growth. Additionally, engineers can build on their trained experience to acquire ISO or Six Sigma Green Belt certifications and transition into Quality Control and Quality Assurance roles, ensuring the precision and reliability of manufacturing processes. Moreover, Engineers' scientific academic backgrounds and problem solving skills would make them valuable assets in roles related to product development, and research and development (R&D), driving innovation in materials, products and manufacturing processes to benefit the wider sector.

This diverse range of opportunities presents a promising and dynamic alternative career path for Engineers seeking to make significant contributions to the ever-evolving Manufacturing sector landscape.

Acknowledgements

We would like to thank the following organizations and partners for their support and contributions in the development and validation of the Manufacturing sector skills report:

- Ahmed Sharif Furniture Factory
- Al Manartain Company And Ali Alsheab Group
- Aleastur Middle East
- Aluminium Bahrain
- Arla Foods
- Armacell Middle East Company
- Awal Dairy Company
- Awal Gulf Manufacturing Co.
- Awal Ready Mix Concrete
- Bahrain Polytechnic
- Gulf Aluminium Rolling Mill
- Havelock One Interiors
- JBF Bahrain
- Midal Cables Company
- Mondelez Bahrain Biscuits
- Nasser Vocational Training Center
- Racing Force Group
- Ramsis Engineering Co.
- University of Bahrain
- Westpoint Home Bahrain
- Wires International Co.

Glossary of Terms

Term	Definition
Core Skills	The combination of essential skills required to be fully prepared for life and work in a global economy
Digitalization	The use of digital technologies, digitized information and data to change business operations and introduce efficiencies and opportunities
Emerging Jobs	A job/occupation that currently has small numbers but is expected to grow in the future
Job	A paid position of employment held by an individual
Job Family	A group of jobs/positions that involve work in the same functional occupation and share related core knowledge and background requirements. The job family structure is based on function rather than organizational structure
Job Role	A specific set of responsibilities and duties assigned to an employee within an organization
Sector Skills Report	A concise report which outlines an overview of an industry sector by identifying trends, presenting macro-economic data, outlining current and future job roles and associated skills gaps and making recommendations for the future
Skills Framework	Provides information such as key sector information, occupations and job roles, and the required existing and emerging skills to fulfill roles within that sector
Skills Gap	The difference between the identified skills (core and technical) that an employer expects their employees to have and the actual skills that employees possess
Skills Mismatch	An overarching term which can be used to describe various instances of imbalance in skills e.g. skill shortage which is where the demand for a particular type of skills exceeds the supply of the workforce with these skills; skill surplus which is where the supply of the workforce with a particular type of skills exceeds demand in the job market; over-skilling occurs where the workforce has more skills than required to perform a job adequately; under-skilling occurs where the workforce has less skills than required to perform a job adequately
Stakeholder Engagement	The process by which an organization involves others who may be affected by the decisions it makes or can influence the impact and implementation of its decisions
Technical Skills	The specialized knowledge and expertise required to perform specific tasks and use specific tools and programs associated with a particular job role