



Australian Government

MEM29011 Develop a business case for Industry 4.0 implementation in a workplace

Release: 1

MEM29011 Develop a business case for Industry 4.0 implementation in a workplace

Modification History

Release 1. New unit.

Application

This unit defines the skills and knowledge required to develop a business case for implementing modern automated and digitally connected systems in an individual work site or small and medium enterprise (SME). The digital systems are usually referred to by the colloquial term as Industry 4.0, which for convenience is the term used in this unit. However, this term should not be regarded as prescriptive and the unit applies to all technologies that contribute to creating a workplace featuring cyber-physical, automated, and networked digital industrial systems.

The unit applies to individuals in manufacturing, engineering and related enterprises who individually or as part of a team are assessing the merits of implementing Industry 4.0 systems and technologies and who need to better understand the benefit and risk factors associated with introducing Industry 4.0 systems and technologies into their workplace. The unit does not cover final decision-making on Industry 4.0 implementation, developing a business case for Industry 4.0 implementation in large multi-site enterprises or business cases requiring complex financial analyses of costs and investment returns for Industry 4.0 expenditure.

The unit scope includes understanding the relationship between traditional manufacturing, engineering and services operations, lean systems, automation, digital data generation and processing, networking and cloud systems. The unit also requires an individual to apply knowledge of Industry 4.0 to business case development, participation in strategies and measures to improve nominated KPIs and the maintaining of currency with Industry 4.0 technologies.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Nil

Competency Field

Applied technologies

Elements and Performance Criteria

Elements	Performance Criteria
----------	----------------------

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Analyse current state of digital operations	1.1 Review current state of automation 1.2 Analyse current state of networking 1.3 Review current state of data collection, storage and analysis 1.4 Identify advantages, wastes, and risks of current operations and confirm with stakeholders
2. Analyse scope for Industry 4.0 implementation to improve operations	2.1 Gather information required to assess benefits and risks of increased automation, networking and data collection, storage and analysis 2.2 Perform initial assessment of Industry 4.0 systems and technologies relevant to the workplace and prioritise in terms of potential benefits and risks 2.3 Select and justify Industry 4.0 systems for more detailed investigation
3. Evaluate selected Industry 4.0 technologies	3.1 Assess cost of implementation for each selected technology 3.2 Assess benefits of each selected technology and estimate financial return where feasible 3.3 Finalise selection of Industry 4.0 technologies to include in business case
4. Assess risks for selected Industry 4.0 technologies	4.1 Assess risk factors that lead to cost over-runs 4.2 Assess risk factors effecting disruption to suppliers and customers 4.3 Assess cyber security risk 4.4 Suggest strategies to mitigate and minimise risks
5. Prepare business case for Industry 4.0 workplace implementation	5.1 Draft business case that provides evidence-based information about opportunities and risks and test with relevant experts before finalisation 5.2 Finalise business case and present for approval according to enterprise procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Industry 4.0 related systems include one or more of the following:

- industrial internet of things (IIoT) devices
- collaborative robots
- networked and cloud connected traditional robots and other industrial automation
- software that supports the introduction and maintenance of Industry 4.0 systems including:
 - networked and cloud connected supervisory control and data acquisition systems (SCADA)
 - networked and cloud connected enterprise resource planning (ERP) systems
 - other manufacturing and monitoring software that gathers and communicates data through networks and cloud connections
- networked and cloud connected CAD and CAM systems
- digital twins
- augmented and virtual reality systems
- networked and cloud connected CNC and additive manufacturing machines
- networked and cloud connected data storage and processing facilities
- networked and cloud connected edge devices
- other networked and cloud connected digital devices and systems relevant to the workplace

Methods of gathering information for the business case include one or more of:

- interviews
- surveys
- run sheets, SCADA reports,
- quality reports
- financial reports
- gemba walks
- maintenance reports

Unit Mapping Information

No equivalent unit

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM29011 Develop a business case for Industry 4.0 implementation in a workplace

Modification History

Release 1. New unit.

Performance Evidence

There must be evidence the candidate has demonstrated the ability to:

- review at least two real or simulated workplace operations and assess advantages, waste and risks for the current state of:
 - automation
 - local and cloud networking
 - data collection, storage and analysis
- gather relevant data to assess the benefits of and prioritise Industry 4.0 technologies for at least two workplaces
- prepare a business case for implementation of relevant Industry 4.0 technologies in a workplace covering relevant costs, parameters and benefits.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- classification of waste according to the definition used in lean systems i.e. activities or functions that do not create value for customers (muda)
- classes of waste:
 - waste that does not create value but is unavoidable
 - waste that does not add value and can be eliminated
- typical economic advantages and business case objectives for Industry 4.0 implementation including:
 - increased revenue through increased production
 - increased productivity, including:
 - less waste, rejects and rework
 - reduced costs
 - accelerated time to market
 - improved quality of products or processes
 - improved business agility
 - improved cyber security
 - improved workplace health and safety (WHS)
- cost factors for implementation of Industry 4.0 technologies including:

- direct equipment, material and software costs
- productivity loss costs including:
 - disruption cost
 - contingency costs
- training costs
- insurance, legal and other administrative costs
- decommissioning and disposal costs for redundant systems
- key parameters for an Industry 4.0 business case including:
 - description of current and proposed technologies, networking and data collection, storage and processing strategies
 - proposed scope of implementation (e.g. products, processes, locations)
 - implementation objectives expressed in terms of customer benefit
 - relationship to overall organisation objectives
 - operating KPIs for each proposed technology
 - benefit/cost analysis for each proposed Industry 4.0 system
 - implementation strategy, KPIs and timeline
 - risk management strategy
 - continuous improvement strategy
 - legacy systems transition strategy
 - approval process.
 -

Assessment Conditions

- Assessors must:
 - have vocational competency in developing a business case for Industry 4.0 implementation in a workplace at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015* or its replacement and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible, assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- There must be access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
-

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>