Australian Government

MEM29012 Access and use a digital twin for operational purposes

Release: 1

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Modification History

Release 1. New unit.

Application

This unit defines the skills and knowledge required to effectively access and use a digital twin for operational purposes in a manufacturing, engineering or related industry workplace. The unit covers the different uses and benefits of digital twins as virtual representations of physical objects and/or processes, the communication between digital twins and real objects and processes, and the interaction of digital twins with other Industry 4.0 related technologies. The unit does not cover the design and coding of digital twins.

The unit applies to individuals responsible for using digital twins with other manufacturing and industry 4.0 systems and processes.

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. Determine digital twin access requirements	1.1 Follow standard operating procedures and comply with work health and safety (WHS) requirements at all times 1.2 Check purpose, scope and information requirements for digital twin task 1.3 Confirm digital twin access as the most appropriate method for required task 1.4 Check status of connections to and from digital twin and physical objects or processes 1.5 Identify and review cyber security access protocols for the digital

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	twin
2. Undertake digital twin tasks	2.1 Access digital twin dashboard and select correct layer or test mode 2.2 Interrogate digital twin to obtain required current, historical or predictive data 2.3 Assess relevance and integrity of digital twin data according to workplace procedures 2.4 Assess implications of digital twin data for matching physical object or process 2.5 Use digital twin to initiate action in the matching physical object or process where required 2.6 Recommend adjustments to physical object or process according to workplace procedures
3. Assist in digital twin improvements	3.1 Document connections to and from the digital twin to physical object and process sensors, PLCs and network gateways 3.2 Assess suitability of sensors and sensor placement for digital twin 3.3 Document, maintain and update operating and response instructions for SCADA system 3.4 Provide support to others in the use of SCADA system according to workplace 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.

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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 • networked and cloud connected supervisory control and data acquisition systems (SCADA) • networked and cloud connected enterprise resource planning (erp) systems • 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
Connections to and from a digital twin to a physical object or process include one or more of the following:	• sensors • programmable logic controllers (PLCs) • edge devices • wired, WiFi and cloud networks and gateways
SCADA system components include one or more of:	• supervisory computers • remote terminal units • programmable logic controllers (PLCs) • communication including networking infrastructure • human–machine interfaces
Digital twin tasks include one or more of:	• testing design of physical objects and/or processes • gathering data on physical object or process current, historical performance or predicted performance under current conditions • condition monitoring • simulation and scenario modelling

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