Understanding Industry 4.0 and Readiness Assessment Training
(Innovation Center for Industry 4.0)

Project Governance:

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Senior Users – Dr Ibrahim Alshunaifi, Ahmed Alghamdi, Shatha Sunbou (Innovation Center for Industry 4.0).
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Project Manager – Magdalena Riley (Industry 4 Institute).

The objective of the training was to enable a group of professionals to perform an assessment of the manufacturing maturity of Saudi Arabian companies through:

a) Building a common understanding of Industry 4.0.
b) The competency development of an Assessor.
c) Providing on-the-job-support through a digital platform and with reference material.

The project's key performance indicators included:

• Course content (including eLearning assets) which could be assessed from a learning platform.
• Face-to-face material (in a printable format).
• The online assessor was available.
• One unit of trainees had completed the training.
• Qualified Innovation Center for Industry 4.0 trainers to deliver to the future units.

The planned deliverables:

• The Industry 4.0 Assessment course with bespoke development and face-to-face training of one unit.
• Access to ‘Understanding Industry 4.0’ eLearning course.
• Digital tools to help Assessors including the VR visualisation tool and the online assessor portal.
The project’s achievements:

Industry 4 Institute designed and delivered a blended learning course on time and within the agreed budget.

The course covered the key concepts, terminology and transformation criteria for Industry 4.0.

The course was delivered to two separate groups; between the 17th and 18th of March 2019 (twenty-three participants) and the 1st and 2nd of May 2019 (twenty-eight participants).

The average score of the participants' course evaluation was ‘4.4 out of 5’:

“Great presenters, demonstrated great knowledge of Industry 4.0 in general.”

The ‘Understanding Industry 4.0’ eLearning course was designed in collaboration with the Innovation Center for Industry 4.0 who have produced a variety of digital learning assets which cover topics including ‘The Rise of Industry 4.0’, ‘Opportunities for the Kingdom of Saudi Arabia’, ‘The Impact of Industry 4.0 on Business’, ‘Production and the Workforce’, ‘Capability Centers’ and ‘Advanced Manufacturing’.

The face-to-face course hosted fifty participants. The learning portal is available to the trainees on the learning portal [here](#).

The Readiness Assessment Training

Industry 4 Institute (with SIMERA South Africa) designed a bespoke face-to-face Readiness Assessment course which was delivered to one unit consisting of twenty-eight trainees on the 5th of May 2019.

The training consisted of two parts – theoretical and practical.

The practical element simulated the assessment of an actual manufacturing business. This was delivered at the KACST's Solar Panel factory. Trainees performed a mock assessment to experience the process and to test their understanding of the assessment dimensions.
The participants’ average score for the course was ‘4 out of 5’:

“Thank you so much, I took good advantage of the training.”

“It’s a new field for me that I’m experiencing so the whole training was useful.”

“I’m fully satisfied as it is a new opportunity for the future. Need to arrange more sessions like this.”

“Thank you for the very informative course. I learned a lot from you; and looking forward for future courses!”

“Thank you, a lot, I appreciate what you have done.”

The Assessor Portal was created to provide Assessors and SMEs with necessary information and documentation to assist in the Readiness Assessment process.

The aim for the website was to grow and to expand together with the progression of Industry 4.0’s transformation journey.

The following sections have been published so far:

• Assessment Process
• Assessment Resources and Learning

The Virtual Reality Visualisation Tool will show the smart factory model, depicting all sixteen dimensions of the Industry 4.0 model of manufacturing.

Assessors will be able to walk through a smart factory in Virtual Reality to experience the futuristic functions and characteristics. The visualisation will allow users to be transformed to the future to discover the experience of the realities of their businesses after the successful adoption of the Industry 4.0 model.

The Virtual Reality Tool is available to the Innovation Center for Industry 4.0 employees and visitors.

Train the Trainer

Upon feedback from the client, the deliverable was descoped thus not achieved.

Lessons learnt

Industry 4 Institute believes the project was delivered in time and according to the budget (and the client’s satisfaction) due to the following factors:

• Client involvement

Industry 4 Institute worked very closely alongside the client during the course design and in the organisation of the training sessions. The client provided clear instructions, guidance and support to Industry 4.0 and the project’s team. This close collaboration led to training which addressed the specific needs of course participants and the wider stakeholder community.
• **Collaboration with SIMERA SA**

Industry 4 Institute worked with SIMERA’s subject matter experts to create the content for the Readiness Assessment and the ‘Understanding Industry 4.0’ courses. The assessment training was modelled on the 140RA, SIMERA’s own assessment tool. The collaboration of training specialists and the advanced manufacturing specialists proved successful as the participant feedback (regarding the course content) was very positive.

In addition, both partners were able to leverage their own experience of working with KASCT and local educational institutions, which allowed Industry 4 Institute to place the generic knowledge of Industry 4.0 in the local context.

• **Understanding the wider stakeholder group**

The project was part of the country’s strategic initiative of establishing Industry 4.0 capabilities in the Kingdom of Saudi Arabia. It was led by NIDLP and supported by a complex network of different government organisations. It was vital that the project satisfy learning objectives and fulfil the expectations of these various institutions. From the very start of the project, the client guided Industry 4 Institute and provided us with the advice on how to manage their varied expectations.

• **Skills practice in a real manufacturing environment**

During the latter part of the Readiness Assessment course, trainees had visited the KACST Solar Panel Factory. This provided them with the opportunity to practice their assessment skills by observing manufacturing processes, interviewing the factory’s key management team and performing assessments on the real, operational business.

Professional skills cannot be developed in isolation and classroom participation can only lead to knowledge acquisition and theoretical understanding. The skills required for new jobs need to be developed in context which allows trainees to apply their learning in practice; to make mistakes and to learn from them.

Having delivered two iterations of the training for KACST staff, Industry 4 Institute has identified some improvements and opportunities:

• **Arabic version**

Participants suggested that the learners would benefit from an Arabic version of the online course and face-to-face delivery. If such a request arises, Industry 4 Institute is prepared to produce an Arabic version of the courses.
• **Scale up**
  The investment in the design and the production of the course can be leveraged to allow
  the training to be scaled up. It is ready to be delivered to a wider audience as a regular or
  periodic training course. The training content has been tested and adjusted to further
  enhance the learning outcomes.

• **Engagement of the manufacturing facilities**
  Industry 4.0 training needs to incorporate knowledge application and practical exercises
  in the real work environment. Therefore, Industry 4 Institute recommended engaging real
  manufacturing facilities such as Innovation Center for Industry 4.0 to play an active part
  in such training.