



# Building Skills 4.0 through University and Enterprise Collaboration

# SHYFTE 4.0

# **WP4: Dissemination & Exploitation**

# D4.5: Awareness dissemination and acceptance of emerging skills 4.0

# vs:3.0.0

Deliverable Lead and Editor: Yu XI, CDU and Haiqing Zhang, CUIT

**Contributing Partners: ALL** 

Date: 2022-07

Dissemination: Public

Status: < Draft | Consortium Approved | EU Approved>

This document identifies dissemination activities to encourage the creation of similar initiatives in universities and outreach to businesses. Project Ref: 598649-EPP-1-2018-1-FR-EPPKA2-CBHE-JP Grant Agreement: 2018 - 3316 / 001 - 001



Co-funded by the Erasmus+ Programme of the European Union





# **Document Status**

Deliverable Lead	Yu Xi, CDU; Andreia Artífice, UNL
Internal Reviewer 1	Salinee Santiteerakul, CMU
Internal Reviewer 2	Matteo Savinno, UNS
Туре	Deliverable
Work Package	WP4: Dissemination & Exploitation
ID	D4.5:
Due Date	2020-07
Delivery Date	2022-07
Status	< Draft - Consortium Approved - EU Approved>

#### **Status**

This deliverable is subject to final acceptance by the EACEA.

### **Further Information**

http://www.shyfte.eu/

#### Disclaimer

The views represented in this document only reflect the views of the authors and not the views of the European Union. The European Union is not liable for any use that may be made of the information contained in this document.

Furthermore, the information is provided "as is" and no guarantee or warranty is given that the information is fit for any particular purpose. The user of the information uses it at its sole risk and liability.





# **Project Partners:**

# – UNIVERSITÉ — LUMIÈRE — LYON 2









DIVISA NON ST















# **Table of Contents**

1. E	Executive Summary	
2. In	troduction	6
3. TI	he mechanism to accept emerging skills4.0	7
3.1	Scientific Development Team	7
3.2	The approach to gather emerging skills4.0	11
3.3	The approach to accept emerging skills4.0	11
4. A	wareness dissemination of emerging skills4.0	12
4.1	Regular meeting among different partners	12
4.2	Workshops and seminars with industry	12
4.3	Shyfte in the Media	12
4.4	Academic and industry training	13
5. A	cceptance of emerging skills4.0	31
5.1	Domain 1: Industrial Engineering and Management	31
5.2	Domain 2: Software Engineering and Big data Analysis	62
5.3	Domain 3: Wireless Networks Analysis	75
Dom	ain 4: Artificial Intelligence	95
6. C	onclusions	98
7. Fi	uture plan	99







This deliverable presents the results of the Shyfte project according to the defined "Adopted Strategic Plan for Dissemination and Outreach". Specifically, the document reports on Shyfte's establishment of a viable mechanism for awareness and acceptance of the new 4.0 skills, both within universities and with companies.

For this, the Shyfte project has participated in numerous seminars and workshops with industry, international conferences, academic seminars.... Shyfte has developed the emerging 4.0 skills in four areas of competence by proposing new modules that will be offered in the centers of learning excellence.







The purpose of this document is to report the mechanism of SHYTE to accept emerging skills4.0 in Shyfte project, the seminars and workshops with industry, the participation of academic from other universities in the training of the trainers, participation of frontier technology international conference and the modules of emerging skills4.0 in each Learning Centre.





# 3. The mechanism to accept emerging skills4.0

Following the development of industry 4.0, new technology, application emerged. Following the trend of industry requirement is a big challenge for Shyfte. In order to accept emerging skills4.0 and ensure the Shyfte can meet the requirement of the industry 4.0, a workable mechanism was built. Firstly, a scientific development team (SDT) which response for the education schedule of Shyfte was defined. Secondly, under the guidance of SDM, different approaches to gather emerging skills4.0 was made. Thirdly, an approach to accept emerging skills4.0 was made to ensure Shyfte can put the emerging skills4.0 into the education plan and implemented in each Learning Centre.

### 3.1 Scientific Development Team

Shyfte team has been working in collaboration to produce scientific knowledge, joining goals and responsibility. The complementarity of goals allows to align project activities. Shyfte team is composed by teachers, researchers, and SMEs of EU and Asia Shyfte partners. The SDT have regular workshop to discuss and check the education plan, ensure each partner can aware the emerging skills4.0 and implement in their excellent centre.

University Lumiere Lyon (ULL)	
Team Member	Mr Yacine Ouzrout
Position	Professor
Role	Coordinator
Team Member	Mrs Aicha Sekhari
Position	Assoc. Professor
Role	Project Member
Team Member	Mrs Chantal Cherifi
Position	Assoc. Professor
Role	Project Member
Team Member	Mrs Néjib Moalla
Position	Professor
Role	Project Member

Universidade Nova de Lisboa (UNL)	
Team Member	Mr Ricardo Gonçalves
Position	Professor
Role	Project Responsible
Team Member	Mr João Sarraipa





•**	
Position	Local Coordinator
Role	Project Member
Team Member	Mrs Andreia Artífice
Position	Researcher
Role	Technical Manager, has been contributing to the following tasks T1.3, T2.5, T3.2, T4.3.

ognitus	
Team Member	Mr Rafiqul Haque
Position	СТО
Role	Local Coordinator

Chiang Mai University (TH)	
Team Member	Mr Apichat Soadang
Position	Ass. Professor
Role	Local Coordinator
Team Member	Mrs Salinee Santiteerakul
Position	Lecturer
Role	Project Member
Team Member	Mr Sakagasem Ramingwong
Position	Assoc. Professor
Role	Project Member
Team Member	Mrs Korrakot yaibuathet Tippayawong
Position	Assist. Professor
Role	Project Member

KASETSART UNIVERSITY (TH)	
Team Member	Mr Apichat Soadang
Position	Ass. Professor
Role	Local Coordinator
Team Member	Mrs Salinee Santiteerakul
Position	Lecturer
Role	Project Member





6 <sup>7.</sup>	
Team Member	Mr Sakagasem Ramingwong
Position	Assoc. Professor
Role	Project Member
Team Member	Mrs Korrakot yaibuathet Tippayawong
Team Member Position	Mrs Korrakot yaibuathet Tippayawong Assist. Professor

CHENGDU UNIVERSITY (CN)	
Team Member	Mr Xi Yu
Position	Professor
Role	Local Coordinator
Team Member	Mrs Chang Liu
Position	Professor
Role	Project Member
Team Member	Mr Jing Fu
Position	Assoc. Professor
Role	Project Member
Team Member	Mr Lei Mou
Position	Lecturer
Role	Project Member

CHENGDU UNVERSITY OF INFORMATION TECHNOLOGY (CN)	
Team Member	Mrs Haiqing Zhang
Position	Assoc. Professor
Role	Local Coordinator
Team Member	Mr Dan Tang
Position	Professor
Role	Project Member

UNIVERSITY PUTRA MALAYSIA (MY)	
Team Member	Mrs Nor Kamariah Noordin
Position	Professor
Role	Local Coordinator





•	
Team Member	Mrs Aduwati Sali
Position	Professor
Role	Project Member
Team Member	Mr Borhanuddin Mohd Ali
Position	Professor
Role	Project Member
Team Member	Mrs Syamsiah Mashohor
Position	Assoc. Professor
Role	Project Member
Team Member	Mr Fazirulhisyam Hashim
Position	Assoc. Professor

University Teknologi Malaysia (MY)	
Team Member	Mrs Sharifah Syed-Yusof
Position	Professor
Role	Local Coordinator
Team Member	Mrs Norjulia Mohamad Nordin
Position	Senior Lecturer
Role	Project Member
Team Member	Mrs Naziha Ahmand Azli
Position	Assoc. Professor
Role	Project Member
Team Member	Nurul Muazzah Abdul Latiff
Position	Assoc. Professor
Role	Project Member
Team Member	Mrs Aida Ali
Position	Senior Lecturer
Role	Project Member
Team Member	Mr Usman Ullah Sheikh
Position	Senior Lecturer
Role	Project Member





### 3.2 The approach to gather emerging skills4.0

In order to gather emerging skills4.0, following approaches was suggested by SDT of Shyfte.

#### Regular meeting among different partners

These meeting will support each partner in Shyfte share their experience in their work. Since Asia and European have different development and requirement in skills4.0, these meeting can help partners know more about each other and learn from each other.

#### Workshops and seminars with industry

Shyfte workshops and seminars with industry provide a direct way for Shyfte members to discuss with industry and gather their new requirements in their application.

#### Academic and industry training

Shyfte encourage team members join academic and industry training in order to help them gather new technologies through training.

### 3.3 The approach to accept emerging skills4.0

After aware the emerging skills4.0 in industry, Shyfte organised formal and informal meetings among partners to discuss the emerging skills4.0 and revise the education plan. Specialist from university and industry are involved in the education plan, their feedback will be considered. Shyfte members will discuss and find a concrete way to implement the education plan in each excellent centre to make sure the trainers and students can learn the emerging skills4.0.





# 4. Awareness dissemination of emerging skills4.0

Many activities were conducted following the mechanism which can help Shyfte aware the emerging skills4.0. Regular meeting among different partners, workshops and seminars with industry, academic and industry training were already conducted. Some details information are detailed in the Deliverables D4.4, the new evidence will be reported in related sub-section.

### 4.1 Regular meeting among different partners

The main KPI's related to the meetings are:

- Formal meetings (face-to-face): 10 Plenary and/or PMB meeting
- Informal meetings (virtual): 44 Plenary and/or PMB meeting

The detail information can be seen in **Deliverable D4.4 section 3**.

### 4.2 Workshops and seminars with industry

The main KPI's related to the meetings are:

- Industrial workshops (face-to-face & virtual): 10 industrial & academics workshops
- Visits to companies: 4 visits (in Chengdu, Chiang Mai, Kuala Lumpur)
- Seminars (face-to-face & virtual): 5 dissemination seminars
- International Conferences (face-to-face & virtual): 20 papers presented in int. conferences
- Special session (face-to-face): 1 special session in an international conference
- Keynote Speaker (face-to-face): 1 keynote speaker invited

The detail information can be seen in **Deliverable D4.4 section 5**, they are summarized on the project website in the section "Dissemination/Shyfte in the media": <u>http://shyfte.eu/index.php/shyfte-in-media/</u>

### 4.3 Shyfte in the Media

To raise awareness and make the objectives of the Shyfte project known to the largest number of people, a certain number of articles in newspapers (online), communications on the websites of the different partners, videos posted on the Youtubes channels of the partners...

These different communications are summarized on the project website in the section "Dissemination/Shyfte in the media": <u>http://shyfte.eu/index.php/shyfte-in-media/</u>



# 4.4 Academic and industry training

The detail of the Training of the Trainers sessions (number of trainees, universities, contents...) is described in the **Deliverables D2.1 to D2.4** (Pilots description)

Academic and industry training	
Training Title	National information-Technology Training
Audience from Shyfte	CDU
Context	Artificial Engineer training
Date	18/01/2021-23/01/2021
Location	Chengdu, China
Certification from the training	<section-header><text><text><text><text><text></text></text></text></text></text></section-header>
Benefits for Shyfte	The project members in CDU and from other universities learned new technology in AI

Academic and industry training		
Training Title	National information-Technology Training	
Audience from	CDU	
Shyfte		
Context	Python data analysis Engineer training	
Date	18/01/2021-23/01/2021	
Location	Chengdu, China	





Certification	
from the training	Seleficities   Result   Resu
Benefits for Shyfte	The project members in CDU and from other universities learned new technology in data analysis by using Python.

Academic and industry training	
Training Title	Advanced research class of Computing and Python practical training courses for national universities and colleges
Audience from Shyfte	CDU
Context	Python practical training
Date	04/06/2021-06/06/2021
Location	Nanjing, China
Certification from the training	して <sup>2</sup> つの <b>     拾 止し 証 本</b> 不 曦 于2021年6月4日-6日, 参加了在南京举办的"全国高校大学计 郭和Python实训课程高级研修班",本次研修班为48学时。 通过本次学习, 该学员掌握并具备了大学计算和Python实训课程的教 学方法及授课能力, 完成全部学时并顺利结业。 亚羽骝髻: JSJJY-CS-0215205
Benefits for Shyfte	The project members in CDU learned new teaching method to lecture Python.





	Academic and industry training
Training Title	Skill Development for Industry 4.0: An Innovation Perspective
Audience from Shvfte	KU
Context	How to have an innovative vision for industry 4.0
Date	06/05/2022 14:00h-15h30 (Thailand)
Location	Bangkok, Thailand
Certification from the training	<complex-block></complex-block>
Benefits for Shyfte	The project members in KU learned how to have innovative thinking and vision under Industry 4.0





Academic and industry training	
Training Title	Renewable Energy for Wireless Network
Audience from	UPM
Shyfte	
Context	Improve wireless spectrum utilization
Date	12/04/2022 14:30h-17:00h (Malaysia)
Location	Serdang, Malaysia
Certification from the training	<complex-block>  Shifting of branching of branch</complex-block>
Benefits for Shvfte	The project members in UPM learned what is Renewable Energy for Wireless Networks

Academic and industry training		
Training Title	Green Energy Wireless Network	
Audience from	UPM	
Shyfte		
Context	Improve the resource and energy efficiency of the wireless network	
Date	13/04/2022 14:30h-17:00h (Malaysia)	
Location	Serdang, Malaysia	





Certification	Wireless Network & Analytic Domain
from the training	SHYFTE: TRAINING OF TRAINERS ABR 2022
	(link https://tinyuti.com/4y2t9x8) ⊠ liewjt@upm.edu.my ● http://shyfte.eu/
Benefits for Shyfte	The project members in UPM learned increasing both spectrum and energy efficiency

Academic and industry training		
Training Title	Skills for the Industry of the future	
Audience from	Participants from Shyfte	
Shyfte	4 companies (two from EU and two from Asia)	
Context	The needs in skills and competences within the framework of the	
	digitalization of their process	
Date	03/03/2022 08:00h (Portugal) / 09:00h (France, Italy) / 16:00h	
	(Malaysia/China) / 15:00h (Thailand)	
Location	Online meeting	
Certification	Making our world more productive	
from the training	CHYFTE 4.0 Industrial Workshop Joymangul Jensen Selwyn Research and study engineer Remote 03/03/2022 2 15 2 10 10 10 10 10 10 10 10 10 10 10 10 10	





	Challenges & needs for companies Vectolabs Technologies Sdn Bhd Imported from Cyberjoya VECTOLADS Technologies Sdn Bhd Imported from Cyberjoya VECTOLADS Technologies Sdn Bhd Imported from Cyberjoya
Benefits for Shyfte	Participants are able to know the skills and trends required for the future development of the industry 4.0

Academic and industry training	
Training Title	AI for Coputer vision
Audience from	UTM
Shyfte	
Context	Applications of AI in Computer Vision
Date	08/02/2022 14:30h-17:00h (Malaysia)
Location	Johor Bahru, Malaysia
Certification from the training	TRAINING OF TRAINERS (PART II)       Co-Anded by the Decaded of the Consendence in the Consendence in the Decaded of
	3       27 February 2022 Sunday 2.30 pm - 5.00 pm       Image: Convolutional Network Assoc. Prof. V. Dr. Kumeresan A/I A. Drapplasingam School of Electrical Engineering, UTM         4       28 February 2022 Ponday 2.00 pm - 5.00 pm       Image: Convolutional Network Assoc. Prof. V. Dr. Kumeresan A/I A. Drapplasingam         4       28 February 2022 Ponday 2.00 pm - 5.00 pm       Image: Convolutional Network Advance Hachine Learning for Big Data School of Computing, UTM         6       UTTM       Image: Convolutional Network School of Computing, UTM
Benefits for Shyfte	The project members in UTM learned main algorithms and applications of AI in computer vision

Academic and industry training	
Training Title	Supervised and Unsupervised learning
Audience from	UTM
Shyfte	





Context	Supervised and unsupervised learning concepts
Date	15/02/2022 14:30h-17:00h (Malaysia)
Location	Johor Bahru, Malaysia
Certification from the training	<ul> <li>FRAINING OF TRAINING OF TRAINING</li></ul>
Benefits for Shyfte	The project members in UTM learned main AI algorithms and applications of supervised and unsupervised learning

Academic and industry training	
Training Title	Convolutional Neural Networks
Audience from	UTM
Shyfte	
Context	The concept and application of convolutional neural network
Date	27/02/2022 14:30h-17:00h (Malaysia)
Location	Johor Bahru, Malaysia
Certification from the training	TRAINING OF TRAINERS (PARTII)       Image: Compare of the compare of th
Benefits for Shyfte	The project members in UTM learned basic concepts and most typical applications of convolutional neural networks

#### Academic and industry training





Training Title	Advance Machine Learning for Big Data
Audience from	UTM
Shyfte	
Context	Application of Machine Learning in Big Data
Date	28/02/2022 14:30h-17:00h (Malaysia)
Location	Johor Bahru, Malaysia
Certification	Childred to the The Control Children Ch
from the training	
	(PART II) Artificial Intelligence
	1 Stebrusry 2022 Liveday 2.30 pm - 5.00 pm MYTO
	Stote of Electrical Equivering, UN4
	A 30 pim - 5.00 pim (NYT) D, Asia All D, Asia All School of Computing, UTM
	3 27 February 2022 Sonday (HYT) S.00 pm (HYT) S.00 pm
	4 Advance Machine Learning 1.30 pm · 5.00 pm (HYT) Advance Machine Learning For IB g Data School of Computing, UIM
Benefits for	The project members in UTM learned advanced algorithms for machine
Shyfte	learning in big data applications

Academic and industry training	
Training Title	Role of Data for Future Organization
Audience from Shyfte	KU
Context	Acquire the suitable data for the organization
Date	19/01/2022, 26/01/2022 13:00h-16:00h (Thailand)
Location	Bangkok, Thailand
Certification from the training	<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>
Benefits for Shyfte	The project members in KU learned how to acquire the right quality of data





Academic and industry training	
Training Title	Digital Communication
Audience from	KU
Shyfte	
Context	Data visualization with the art of graphic design
Date	09/01/2022, 16/01/2022 13:00h-16:00h (Thailand)
Location	Bangkok, Thailand
Certification	SHYFTE 4.0
from the training	Role of Date for Exture Oceanization
	GESSION 4 Wednesday, January W&2/6, (am.4pm (Thatiand Strandard Time)
	Asstance of Alexagement Execution Educational Associations and Association and
	SESSION 5 Digital Communication Wednesday, February Rikk, Inn. 4pm (Theiland Standard Time)
	DRANKSARA THICKNON Company of Monogenerative Cambridge Cambridge C
Benefits for	The project members in KU learned how to instruct the trainees about
Shyfte	digital communication

Academic and industry training	
Training Title	Green Energy Wireless Network (Part II)
Audience from	UPM
Shyfte	
Context	Improve the resource and energy efficiency of the wireless network
Date	05/01/2022 14:30h-17:00 (Malaysia)
Location	Serdang, Malaysia







Academic and industry training		
Training Title	Data Acquisition and Analysis (Hands-on)	
Audience from Shyfte	UPM	
Context	Collection and processing of relevant data	
Date	11/01/2022 14:30h-17:00 (Malaysia)	
Location	Serdang, Malaysia	







Academic and industry training	
Training Title	Renewable Energy for Wireless Network
Audience from	UPM
Shyfte	
Context	Improve wireless spectrum utilization
Date	12/01/2022 14:30h-17:00 (Malaysia)
Location	Serdang, Malaysia





•**	
Certification from the training	SHIFTE 4.0 Characteristic Status of Characteri
	Mohd Ali Data Acquisition and Analysis (Honds-on) 11 January 2022, Wed, 13:30-17:00 MY Dr. Liew Jiun Terng and Dr. Wir Lugman Saleh
	Prof. Ir. Dr. Aduwati Sali
	Syuhada Yazid Putate teet Putate teet Put
Benefits for Shyfte	The project members in UPM learned what is Renewable Energy for Wireless Networks

Academic and industry training		
Training Title	New Product Development (Part II)	
Audience from Shyfte	KU	
Context	New product design and development under Industry 4.0	
Date	27/08/2021 (Thailand)	
Location	Bangkok, Thailand	





•**	
Certification	ToT Part 1 - Session 3: New Product Development (1)-20210820 0654-1
from the training	US LOUR LAR DANK US LOUR LAR DANK LOUR LAR DA
Benefits for Shyfte	The project members in KU learned how to design and development the new product

Academic and industry training	
Training Title	Introduction to Cybersecurity
Audience from Shyfte	UPM
Context	The importance and development trend of Cybersecurity
Date	28/07/2021 14:30h-17:00h (Malaysia)
Location	Serdang, Malaysia
Certification from the training	Structure 4.00   Struc
Benefits for Shyfte	The project members in UPM learned basic concepts of cybersecurity





Academic and industry training	
Training Title	Introduction to Energy Management
Audience from	UPM
Shyfte	
Context	energy management concept
Date	29/07/2021 14:30h-17:00h (Malaysia)
Location	Serdang, Malaysia
Certification from the training	SWIFE 42:   Barry State at state at watawa   2 July 2021 wata 2 Jugus 2021   Assoc: Frof. Dr. Fazirulhisyam   Fazirulhisyam   Hashim   Contractions 1: Energy   Barry State at a Jugus 2021   Prof. Dr. Fazirulhisyam   Barry State at a Jugus 2021 wata 2 Jugus 2021   Prof. Dr. Fazirulhisyam   Barry State at a Jugus 2021, watawa   Prof. Dr. Fazirulhisyam   Barry State at a Jugus 2021, watawa   Prof. Dr. Fazirulhisyam   Barry State at a Jugus 2021, watawa   Prof. Dr. Fazirulhisyam   Barry State at a Jugus 2021, watawa   Prof. Dr. Fazirulhisyam   Barry State at a Jugus 2021, watawa   Prof. Dr. Hashim   Barry State at a Jugus 2021, watawa   Prof. Dr. Hashim   Barry State at a Jugus 2021, watawa   Prof. Dr. Hashim   Barry State at a Jugus 2021, watawa   Prof. Dr. Hashim   Barry State at a Jugus 2021, watawa   Prof. Dr. Hashim   Barry State at a Jugus 2021, Watawa   Words Aradige   Barry State at a Jugus 2021, Watawa   Barry State at a Jugus 2021, Watawa <p< td=""></p<>
Benefits for	The project members in UPM learned basic concepts of energy
Shyfte	management and improving energy management efficiency

Academic and industry training		
Training Title	Data acquisition and Analysis (Part 1)	
Audience from	UPM	
Shyfte		
Context	Basic theory of data acquisition and analysis	
Date	30/07/2021 14:30h-17:00h (Malaysia)	
Location	Serdang, Malaysia	





•	
Certification from the training	SHYFTE 4.0 Building skills 4.0 through Undersyna de Enterprise 28 July 2021 until 2 August 2021
	Assoc. Prof. Dr. Fazirulhisyam Hashim
	Introduction to Energy Monogement 29 July 2021, Thur, 14:30 – 17:00 MYT
	Prof. Dr. Mohd. Fadlee A. Rasid 30 July 2021, Fri, 14:30 – 17:00 MYT
	Data Governance and Monogement 2 Aug 2021, Mon, 14:30 – 17:00 MYT
Benefits for Shyfte	The project members in UPM learned basic methods of data collection and analysis

Academic and industry training	
Training Title	Data Governance and Management
Audience from	UPM
Shyfte	
Context	Data governance framework and key methodologies
Date	02/08/2021 14:30h-17:00h (Malaysia)
Location	Serdang, Malaysia
Certification from the training	SUME Case   A lady 2221 unit 2 August 221     A sacc:   Prof. Dr.   Paired   Base   Dr. drodgement     Prof. Dr.   Base   Prof. Dr.   Base   Prof. Dr.   Base   Congement     Prof. Dr.   Base   Prof. Dr.   Base   Congement   Prof. Dr.   Base   Dr.   Base   Dr.   Base   Dr.   Base   Dr.   Base   Dr.   Base   Dr.   Congement   Dr.   Base   Dr.   Base   Dr.   Base   Dr.   Congement   Dr.   Base   Dr.   Base   Dr.   Congement   Dr.    Base   Dr.    Base   Dr.    Base   Dr.    Base   Dr.   Base   Dr.   Base   Dr.    Bas
Benefits for	The project members in UPM learned trends, technology architectures and
Shyfte	tools in data governance and management





Academic and industry training			
Training Title	The first UTM Training of Trainers (ToT) sessions		
Audience from	UTM		
Shyfte			
Context	The application of artificial intelligence and computer vision	on in industry	
Date	25/07/2021-27/07/2021 14:30h-17:00h (Malaysia)		
Location	Johor Bahru, Malaysia		
Certification	Cisco Rober Medirique @ Medirique	(Infer ) O Connected +	
from the training	Epsilon Burdink Yued	1550al Insilgenos 418 PM university Thaland	
	An order of the second se	PM 421 PM	
		even Stotlig and the AI .7 Marces Stotling are released match at some point may spanny principal Have this can the understation, as can play in	
	Hangel	125 PM PM	
	Restaurate Experience Restaurate Control of the Second Se	122 FM Instants to invest in this Values, with the attendant AIRE PM	
	aida Fahad UTM Low Jun Yi Mariam Shahoud mariff mar		
	Enur dut nessaja tura		
	👔 Mute 🔹 🖸 Stop videe 🕤 🖄 Stare 🛞 Recording 🗐 Breakent reasions 💿 \cdots 📀	<b>A</b> D	
Benefits for Shyfte	The project members in UPM learned basic knowledge of artificial intelligence and typical applications in industry		

Academic and industry training	
Training Title	Intro to Industry 4.0: Background & Environments
Audience from Shyfte	CMU
Context	Industry 4.0 status
Date	20/07/2021 10:00h-12:00h 13:00h-15:00 (Thailand)
Location	Chiang Mai, Thailand
Certification from the training	Image: Note of the sector of
Benefits for Shyfte	The project members in CMU learned current status and future trends of Industry 4.0





Academic and industry training	
Training Title	Human Resource Management for Industry 4.0
Audience from	KU
Shyfte	
Context	New strategic approaches for human resource management
Date	16/07/2021 14:00h-17:00h (Thailand)
Location	Bangkok, Thailand
Certification	
from the training	
Benefits for	The project members in KU learned a strategic approach for employee
Shyfte	qualification
Other Relevant	
Information	

Academic and industry training		
Training Title	Principle and Application of BigData Technology	
Audience from	CDU	
Snylle		
Context	Basic concepts and application scenarios of big data	
Date	12/07/2021 14:00h-17:00h (China)	
Location	Chengdu, China	
Certification	Concurr Trialway Onemas Registre         -         <	
from the training		
Benefits for Shyfte	The project members in CDU learned application scenarios and future development trends of big data	





Academic and industry training	
Training Title	Business Intelligence
Audience from	KU
Context	Help companies make better use of data to improve decision-making quality
Date	12/07/2021 (Thailand)
Location	Bangkok, Thailand
Certification from the training	
Benefits for Shyfte	The project members in KU learned how to obtain information and knowledge from a large amount of business data.





# 5. Acceptance of emerging skills4.0

Based on the emerging skills4.0 gathered from industry and academic researchers, the learning material of each module was proposed. To ensure the quality of the learning material, specialist from industry or academic were invited to review the learning material. Finally, learning materials that incorporate emerging skills4.0 have been developed.

### 5.1 Domain 1: Industrial Engineering and Management

Shyfte 4	4.0 - Learning Material Review Form
Reviewer's Name	Assoc. Prof. Dr. Wichai Chattinnawat
Position	Associate Professor
Organization (University/Company)	Chiang Mai University
Date Review Completed	18-Jun-21
Shyfte Domain	Industrial Engineering
Module Title	Introduction to IR4.0
Skill Set	Smart Production Management, Agile Manufacturing System, Quality System 4.0, Intelligence Quantitative Analysis
Skill Level	Beginner
Module Outcomes	Participants are able to : Explain the concept of Industry4.0 Realize how to implement this concept to targeted industry.
Target group	Bachelor student, Master students, SME employees
Delivery method	Lecture, case study, team working
Module description	Introduction to Industry 4.0 begins with a discussion of the industrial revolution, Industry4.0's context, and its environment. The challenges of implementing the I4.0 concept and technology, particularly for small and medium-sized enterprises, are introduced in terms of organization management, information technology, production and operation, and human resource. The implementation framework for SMEs 4.0 is explained through case studies. Industry 4.0 transforms business operations into intelligent factories and digital supply chains. The differences between data warehouse and big data are elucidated. The evolution of big data and the type of big data utilized in Industry 4.0 are explained. CPS is a system in which cyber and physical systems are tightly integrated across all scales





and levels, as opposed to cyber simply being applied to physical. The CPS shifts from a physical to a "Computing as parts" (commodity-based) mentality. The generation of sensors is then described with examples of how to implement various sensors in an Industry 4.0 setting. This module provides an overview of the maturity assessment model as well as preliminary research findings. The data was gathered in Thailand and three additional European countries. Assessment and Maturity Stage Models for Evaluating the Implementation of Industry 4.0 were investigated and presented.

#### **1. INSTRUCTIONAL DESIGN ELEMENTS** Score Note For the score, use a scale of 1 to 4: 1. 2 Very Poor, 2. Poor, 3. Good and 4. Very **Elements** 1 3 4 Good A. Trainer manual with: 1. Planning forms and checklists Х 2. Needs Х assessment materials 3. Guidance on delivery method and Х learning principles 4. Summary of key Х objectives/learning B. Structured module/manual with: 1. Agenda Х 2. Topics Х description 3. Measurable Х domain objectives 4. The outcomes Х are defined 5. Delivery method Х 6. Active learning Х exercises/equipment use 7. Teaching material appropriate to Х stated objectives 8. Additional

Х

resource and reference

materials





*						
Subtotal	43					
2. CONTENT						
	Score				Note	
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good	
1. Relevance of content to the domain				x		
2. Accuracy of content to the domain				x		
3. Completeness of content to the domain			x			
4. Relevance of content to the Meta Skills				x		
5. Relevance of content to the Hard Skills				x		
Subtotal	19					
Total Score	62					

#### **3. SUMMARY RECOMMENDATIONS**

If the video links are accessible to the public, you should include the link in the material so that trainees can rewatch it. The instructional material has been improved by including a link to a video on it.





Shyfte 4.0 - Learning Material Review Form									
Reviewer's Name	Assist. Prof. Dr. Warisa Wisittipanich								
Position	Associate Professor								
Organization (University/Company)	Chiang Mai University								
Date Review Completed	July 27, 2021								
Shyfte Domain	Industrial Engineering								
Module Title	Cloud ERP								
Skill Set	Smart Production Management, Agile Manufacturing System, Quality System 4.0, Intelligence Quantitative Analysis								
Skill Level	Beginner								
Meta Skills									
Module Outcomes	Participants are able to: design the ERP system for manufacturing								
Target group	Bachelor student, Master students, SME personnels								
Teaching material	Lecture, case study, team working								
Delivery method									
Module description	This module provides an understanding of Enterprise Systems Architecture (also known as Enterprise Resource Planning Systems, or ERPs). Using a case study and simulation game, an ERP concept is introduced. After defining these systems, the advantages of cloud-based enterprise resource planning (ERP) are outlined. Students would be exposed to the various positions and occupations associated with the use and deployment of cloud ERPs. This module offers case studies and data sets for purchase and procurement, production planning, order management, and warehouse management in cloud ERP software implementation. Students will be able to apply cloud ERP to real-world business issues.								
1. INSTRUCTIONAL DESIGN ELEMENTS									
	Score	Note							





Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good	
A. Trainer manual with:						
1. Planning forms and checklists				x		
2. Needs			x			
3. Guidance on						
delivery method and learning principles				х		
4. Summary of key				x		
B. Structured module/ma	inual wi	th:	<u> </u>	<u> </u>		
1. Agenda				x		
2. Topics				X		
description 3. Measurable				X		
domain objectives			Х			
4. The outcomes are defined				х		
5. Delivery method			х			
6. Active learning exercises/equipment use			х			
7. Teaching material appropriate to stated objectives				х		
8. Additional resource and reference materials				x		
Subtotal	44					
2. CONTENT						
	Score				Note	
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good	
1. Relevance of content to the domain				x		
2. Accuracy of				v		
3. Completeness				^		
of content to the domain			Х			





27 C					
4. Relevance of content to the Meta Skills				х	
5. Relevance of content to the Hard Skills			Х		
Subtotal	18				
Total Score		62	2		
3. SUMMARY RECOMMENDATIONS					
The content of course co better understanding of t world case studies are in	omprehe he ben ncluded	ensive efits of in the	are ir f clouc curric	nforma d-base culum.	tive. However, students will have a much d enterprise resource planning if some real-



Reviewer's Name	Assoc. Prof. Dr. Komgrit Leksakul
Position	Associate Professor
Organization (University/Compan y)	Chiang Mai University
Date Review Completed	November 14, 2021
Shyfte Domain	Industrial Engineering
Module Title	Integrated simulation and optimization

Shyfte 4.0 - Learning Material Review Form




Skill Set	Smart Production Management, Agile Manufacturing System, Quality System 4.0, Intelligence Quantitative Analysis							
Skill Level	Expert							
Meta Skills								
Module Outcomes	Participants are able to :							
Target group		Ba	achelor	studer	it, Master students, SME personnels			
Teaching material			L	ecture	, case study, team working			
Delivery method								
Module description	The first section introduces modeling, optimization, and simulation as they pertain to the analysis and study of manufacturing systems for decision support. The introduction of optimization models and algorithms provides a framework for considering many issues that arise in manufacturing systems. A case study demonstrates the advantages of simulation and optimization. This module offers a data set and simulation software in order to conduct a practical analysis. The second step is to introduce students to a wide range of applications for these methods and models and to integrate this content with their introduction to operations management.							
1. INSTRUCTIONAL D	ESIGN	ELEM	ENTS					
	Score Note							
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good			
A. Trainer manual with:								
1. Planning forms and checklists				x				
2. Needs			x					
3. Guidance on			~					
delivery method and learning principles				x				
4. Summary of				x				
B. Structured module/n	nanual w	vith:	I					
1. Agenda				Х				





•			
2. Topics			
description		X	
3. Measurable			
domain objectives		Х	
4. The outcomes			
are defined		X	
5. Delivery			
method		X	
6. Active learning			
exercises/equipment			
use		Х	
7. Teaching			
material appropriate to			
stated objectives		X	
8. Additional			
resource and reference			
materials		X	
Subtotal			
Jubiolai	4	5	

		Sco	ore		Note			
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good			
1. Relevance of content to the domain				х				
2. Accuracy of content to the domain				х				
3. Completeness of content to the domain				x				
4. Relevance of content to the Meta Skills				x				
5. Relevance of content to the Hard Skills			х					
Subtotal		19	9					
Total Score	Total Score 64							
3. SUMMARY RECOMMENDATIONS								





Shyft	e 4.0 - Learning Material Review Form
Reviewer's Name	Assist. Prof. Dr. Uttapol Smutkupt
Position	Assistant Professor
Organization (University/Comp any)	Chiang Mai University
Date Review Completed	December 6, 2021
Shyfte Domain	Industrial Engineering
Module Title	Data collecting system
Skill Set	Smart Production Management, Agile Manufacturing System, Quality System 4.0, Intelligence Quantitative Analysis
Skill Level	Beginner
Meta Skills	
Module Outcomes	Participants are able to : design the data collecting system for manufacturing
Target group	Bachelor student, Master students, SME personnels
Teaching material	Lecture, case study, team working
Delivery method	





Module description Variability affects product quality and yield in manufacturing environments. This module will teach students why analysis of manufacturing processes is crucial for diagnosing and correcting operational defects to improve outcomes and reduce costs. Acquire an understanding of the effective methods for collecting, preparing, and analyzing data, as well as the computational platforms that can be used to collect and process data over an extended period. Develop the skills necessary to participate as a member of an advanced analysis team and to provide valuable input on effective implementation. The clearly defined objectives and KPIs of data collecting in the production process is an important step that leads to the effective data collecting system design.

1. INSTRUCTIONAL DESIGN ELEMENTS							
		Sco	ore		Note		
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good		
A. Trainer manual with:							
1. Planning forms and checklists				х			
2. Needs assessment materials			x				
3. Guidance on delivery method and learning principles				x			
4. Summary of key objectives/learning				х			
B. Structured module	e/manual	with:					
1. Agenda				x			
2. Topics description				х			
3. Measurable domain objectives			х				
4. The outcomes are defined			x				
5. Delivery method				х			
6. Active learning exercises/equipment use			x				





Subtotal	44	1		
8. Additional resource and reference materials			Х	
7. Teaching material appropriate to stated objectives			Х	

		Sco	ore		Note	
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good	
1. Relevance of content to the domain				х		
2. Accuracy of content to the domain				х		
3. Completeness of content to the domain				x		
4. Relevance of content to the Meta Skills				X		
5. Relevance of content to the Hard Skills				x		
Subtotal		20	)			
Total Score		64	1			
3. SUMMARY RECOMMENDATIONS						



Shyft	e 4.0 - Learning Material Review Form
Reviewer's Name	Assist. Prof. Dr. Uttapol Smutkupt
Position	Assistant Professor
Organization (University/Comp any)	Chiang Mai University
Date Review Completed	December 13 2021
Shyfte Domain	Industrial Engineering
Module Title	Automatic data collecting system
Skill Set	Smart Production Management, Agile Manufacturing System, Quality System 4.0, Intelligence Quantitative Analysis
Skill Level	Intermediate
Meta Skills	
Module Outcomes	Participants are able to : design the automatic data collecting system for manufacturing
Target group	Bachelor student, Master students, SME personnels
Teaching material	Lecture, case study, team working
Delivery method	
Module description	A significant competitive advantage can be gained by properly collecting and utilizing the enormous amount of data that modern manufacturing processes generate. This information can help organizations improve operational efficiency. Gathering and capturing all of the necessary data during the operational process can be quite difficult. The information in this module covers the different types of data and recording devices, how to identify the data collection point, and some equipment for automating data collection from the manufacturing shop floor. With the aid of a data set and practical tools, students will learn how to design a data collection system. This equipment serves as the intermediary layer of communication between monitoring and analysis systems and machines. Through the practical assignment, students will learn how to gather data from the production process.





1. INSTRUCTIONAL DESIGN ELEMENTS							
		Sco	ore		Note		
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good		
A. Trainer manual wi	th:						
1. Planning forms and checklists				х			
assessment materials			х				
<ol> <li>Guidance on delivery method and learning principles</li> </ol>				x			
4. Summary of key objectives/learning				x			
B. Structured module	B. Structured module/manual with:						
1. Agenda				x			
2. Topics description				х			
3. Measurable domain objectives			х				
4. The outcomes are defined			x				
5. Delivery method				х			
6. Active learning exercises/equipment use			x				
7. Teaching material appropriate to stated objectives				x			
8. Additional resource and reference materials				х			
Subtotal		44	1				
2. CONTENT							
		Sco	ore		Note		





Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good	
1. Relevance of content to the domain				Х		
2. Accuracy of content to the domain				Х		
3. Completeness of content to the domain			x			
4. Relevance of content to the Meta Skills				x		
5. Relevance of content to the Hard Skills				Х		
Subtotal		19	)			
Total Score		63	3			
3. SUMMARY RECOMMENDATIONS						





Shyfte 4.	0 - Learning Material Review Form
Reviewer's Name	Assoc. Prof. Dr. Wimalin Laosiritaworn
Position	Associate Professor
Organization (University/Company)	Chiang Mai University
Date Review Completed	January 27, 2022
Shyfte Domain	Industrial Engineering
Module Title	Decision-making with Big Data
Skill Set	Smart Production Management, Agile Manufacturing System, Quality System 4.0, Intelligence Quantitative Analysis
Skill Level	Intermediate
Meta Skills	
Module Outcomes	Participants are able to : design the automatic data collecting system for manufacturing
Target group	Bachelor student, Master students, SME personnels
Teaching material	Lecture, case study, team working
Delivery method	
Module description	Numerous datasets can help solve significant problems and guide decision-making. However, these datasets are challenging to process and analyze due to their size, complexity, quality, and diversity. An introduction to data analytics is provided in this module. Data and its importance, Data and its relations, Data analytics, and the background required for Data analytics. The six phases of data preparation— discovery, preparation, model planning, model building, communication, and operationalization—are explained. Regression, decision trees, clustering, central tendency and standard deviation, and other data analysis tools and techniques are all explained in this module. In order to demonstrate how to use big data to lead successful business analytics initiatives and make fact-driven decisions includes the analysis, the case studies (CMU traffic management system, a water work enterprise, and a quarry enterprise) are shown in the final section.
	work enterprise, and a quarry enterprise) are shown in the final section.





	Score			Note				
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good			
A. Trainer manual with:								
1. Planning forms and checklists				х				
materials			Х					
3. Guidance on delivery method and learning principles				х				
4. Summary of key objectives/learning				x				
B. Structured module/manu	ual wit	h:	<u> </u>	1				
1. Agenda								
2. Topics description				X				
3. Measurable domain objectives				x				
4. The outcomes are defined				х				
5. Delivery method				х				
6. Active learning exercises/equipment use			х					
<ol> <li>Teaching material appropriate to stated objectives</li> </ol>				x				
8. Additional resource and reference materials				х				
Subtotal		4	6					
2. CONTENT								
	Score				Note			
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good			
1. Relevance of content to the domain				x				
2. Accuracy of								
3. Completeness of content to the domain				X				





•**		
4. Relevance of content to the Meta Skills		x
5. Relevance of content to the Hard Skills		x
Subtotal	20	
Total Score	66	
3. SUMMARY RECOMME	NDATIONS	

Shyfte 4.0 - Learning Material Review Form								
Reviewer's Name	Assoc. Prof. Dr. Yuraporn Sudharatna							
Position	Associate Professor							
Organization (University/Company)	Kasetsart University							
Date Review Completed	January 27, 2022							
Shyfte Domain	Business Management							
Module Title	Human Resource Management for Industry 4.0							





Skill Set	Digital talent management, Organizational transformation, Business revolution for industry 4.0
Skill Level	Beginner
Meta Skills	
Module Outcomes	Participants are able to : Identity each of the major HRM functions for Industry 4.0
Target group	Bachelor student, Master students, SME personnels
Teaching material	Lecture, case study, team working
Delivery method	
Module description	Human Resource Development for Industry 4.0 incorporates the process for acquiring human resource, developing human resource and organization, maintaining human resource and human resource transformation. Job analysis, personal planning and recruiting and employee testing and selection and interviewing candidates are the essential processes for acquiring human resource. Human resource development includes individual development, career development and organization development. Human resource training and development process indicates the steps for determining specific needs, determine specific objectives, select methods and delivery system, implement the program and evaluate the program. The performance management system is required for maintaining human resource. It composes of plan, follow, develop, estimate and reward. In addition, employee relationship management means the relationship between employer and employee both structural and non-structural forms. Finally, human resource 4.0 and human resource transformation is specified as the target to be achieved.

	Score				Note			
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good			
A. Trainer manual with:								
1. Planning forms and checklists				х				
2. Needs assessment materials			x					
3. Guidance on delivery method and learning principles				Х				





4. Summary of key objectives/learning				х				
B. Structured module/manual with:								
1. Agenda			х					
2. Topics description			х					
3. Measurable domain objectives			х					
4. The outcomes are defined			х					
5. Delivery method			x					
6. Active learning exercises/equipment use			х					
7. Teaching material appropriate to stated objectives				Х				
8. Additional resource and reference materials				х				
Subtotal	41							

		Sco	ore		Note	
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good	
1. Relevance of content to the domain				Х		
2. Accuracy of content to the domain				x		
3. Completeness of content to the domain				x		
4. Relevance of content to the Meta Skills				x		
5. Relevance of content to the Hard Skills				х		
Subtotal		2	0			
Total Score	61					
3. SUMMARY RECOMMENDATIONS						



The need of references at the end of presentation and the citation of some slides. The learning materials of module has incorporated all the required references and citation to the materials for reliability to the trainers and students.

	Shyfte 4.0 - Learning Material Review Form
SHYFTE	

Reviewer's Name	Dr. Papitchaya Wisankosol					
Position	Lecturer					
Organization (University/Company)	Assumption University					
Date Review Completed	January 21, 2022					
Shyfte Domain	Business Management					
Module Title	Digital Communication					
Skill Set	Digital talent management, Organizational transformation, Business revolution for industry 4.0					
Skill Level	Intermediate					
Meta Skills						
Module Outcomes	Participants are able to : Understand self-concept and its relationship to communication Recognize and describe appropriate strategies for self-disclosure and learn how to tell data stories with visualizations					





Target group	Bachelor student, Master students, SME personnels
Teaching material	Lecture, case study, team working
Delivery method	
Module description	Communication for industry 4.0 starts from functions of communication which are control, motivation, emotional expression and information. Direction of communication becomes downward, upward, horizontal and diagonal communication. Interpersonal communication composes of oral, written and nonverbal communication. Organizational communication includes formal and informal communication network. Sender, media and receiver are integrated in the communication process. The workplace needs to prepare the workforce for industry 4.0, specifically people, environment and tool. For people, workplace should focus on self-awareness, empathy, courage and resilience. Transparency and psychological safety are focal point for environment. In addition, several tools must be applied as assertive communication, recognition and appreciate listening.

		Sco	ore		Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good

## A. Trainer manual with:

	X			
	Λ			
		X		
		~		
	Х			
	X			
	Λ			
ual wit	h:			
		x		
	Х			
		Х		
		X		
	ual wit	X X X X X X X X X X X X X X X X X X X	X     X       X     X       X     X       X     X       Jal with:     X       X     X       X     X       X     X       X     X       X     X       X     X       X     X       X     X       X     X       X     X       X     X       X     X	x     x       x     x       x     x       x     x       x     x       x     x       x     x       x     x       x     x       x     x       x     x       x     x       x     x       x     x       x     x       x     x       x     x       x     x       x     x





	1 1		1	
5. Delivery method		x		
6. Active learning exercises/equipment use		x		
7. Teaching material appropriate to stated objectives	X			
8. Additional resource and reference materials	x			
Subtotal	30			

		Sco	ore		Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
1. Relevance of content to the domain				x	
2. Accuracy of content to the domain				x	
3. Completeness of content to the domain				x	
4. Relevance of content to the Meta Skills				x	
5. Relevance of content to the Hard Skills				x	
Subtotal	20				
Total Score	50				

#### **3. SUMMARY RECOMMENDATIONS**

Contents (on some slides) are too small The and overall contents are interesting. The learning materials of module is adjusted to use the bigger font size to become more appropriate.





Shyfte 4.	0 - Learning Material Review Form
Reviewer's Name	Dr.Ploy Sudon
Position	Lecturer
Organization (University/Company)	Mahidol University
Date Review Completed	July 13, 2021
Shyfte Domain	Business Management
Module Title	Business Intelligence
Skill Set	Digital talent management, Organizational transformation, Business revolution for industry 4.0
Skill Level	Expert
Meta Skills	
Module Outcomes	Participants are able to : Understand the importance and different levels of Business Intelligence for organizations Vave ability to have hands-on experience with "Power BI" to analyze data and use the insights to support decision-making
Target group	Bachelor student, Master students, SME personnels
Teaching material	Lecture, case study, team working
Delivery method	





Module description	Business Intelligence is emerging from advanced processing of high- quality data, information and knowledge, and analytical practices that support decision-making and performance measurement. BI incorporates with dashboards, data mining and reporting system. Several vendors are offered, particularly Power BI which is a business analytics service by Microsoft. It aims to provide interactive visualizations and business intelligence capabilities with an interface simple enough for end users to create their own reports and dashboards. Power BI composes of getting data / query editor (power query in excel), data model (relationship), DAX formular (power pivot in excel) and report (power view in excel). Power BI workshop is introduced as the ways of set up Power BI, import data from website and prepare data, save files, sign up and publish, transform data and edit format, Power BI application in mobile phone, create dashboard and create report on Power BI web, import data from excel, filter function and edit interaction, slicer function, sorting, number format and natural language query, refresh data by manual, data type conversion, calculation and measure, extraction and hierarchy and conditional format and DAX function.
--------------------	---

		Sco	ore		Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good

#### A. Trainer manual with:

					-
1. Planning forms and					
checklists				Х	
2. Needs assessment					
materials			Х		
3. Guidance on					
delivery method and					
learning principles				Х	
4. Summary of key					
objectives/learning				Х	
B. Structured module/manu	al wit	h:			
1. Agenda			Х		
2. Topics description				х	
3. Measurable					
domain objectives			X		
4. The outcomes are					
defined			Х		





5. Delivery method			х		
6. Active learning exercises/equipment use			Х		
7. Teaching material appropriate to stated objectives				х	
8. Additional resource and reference materials				х	
Subtotal	42				

		Sco	ore		Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
1. Relevance of content to the domain				x	
2. Accuracy of content to the domain			Х		
3. Completeness of content to the domain			Х		
4. Relevance of content to the Meta Skills				x	
5. Relevance of content to the Hard Skills			Х		
Subtotal	17				
Total Score	50				

#### **3. SUMMARY RECOMMENDATIONS**

The use of real data set or real-life example may be required to help the audiences to better understand on how BI can be used to support the business functions. The learning materials of module is adjusted to present more example of using BI in the company and how BI support the business functions.





Shyfte 4.0	) - Learning Material Review Form
Reviewer's Name	Dr.Ploy Sudon
Position	Lecturer
Organization (University/Company)	Mahidol University
Date Review Completed	December 20, 2021
Shyfte Domain	Business Management
Module Title	Role of Data for Future Organization
Skill Set	Digital talent management, Organizational transformation, Business revolution for industry 4.0
Skill Level	Intermediate
Meta Skills	
Module Outcomes	Participants are able to : Understand how to design the database to suit the requirements from customers Design a database and use basic SQL to improve many business processes
Target group	Bachelor student, Master students, SME personnels
Teaching material	Lecture, case study, team working
Delivery method	





Module description	Data represent any information, numbers, facts, and instructions which are helpful to understand an object or an entity that exists in a specified environment. Data can drive a company's decision and concerns regarding planning and marketing. ERP is one of the practices of consolidating and enterprise's planning manufacturing, sales and marketing efforts into one management system. ERP combines all databases across departments into a single database, automates the tasks involved in performing a business process and integrates all functions across a company to a single computer system that can serve all those functions' specific needs. A case study of Airways Hotel is shown as ERP systems is a business solution to integrate all hospitality functions from front office to payroll and create a centralized system of operations. The Entity–Relationship model (ER model) describes the structure of a database with diagram, known as Entity Relationship Diagram (ER Diagram). An ER model is a design or blueprint of a database that can later be implemented as a database. The main components of E-R model are entity set, attribute and relationship set. Finally, the example of normalization process is used to make a database table as efficient as possible.
--------------------	--

		Score			Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good

#### A. Trainer manual with:

1. Planning forms				
and checklists			Х	
2. Needs				
assessment materials		Х		
3. Guidance on				
delivery method and				
learning principles			Х	
4. Summary of key				
objectives/learning			Х	
B. Structured module/man	ual with	n:		
1. Agenda		Х		
2. Topics description			x	
3. Measurable				
domain objectives		Х		
4. The outcomes are				
defined		X		





5. Delivery method		х		
6. Active learning exercises/equipment use		х		
7. Teaching material appropriate to stated objectives		х		
8. Additional resource and reference materials			x	
Subtotal	4	1		

		Sco	ore		Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
1. Relevance of content to the domain				x	
2. Accuracy of content to the domain				х	
3. Completeness of content to the domain				х	
4. Relevance of content to the Meta Skills				х	
5. Relevance of content to the Hard Skills				х	
Subtotal	20				

**Total Score** 

61

## 3. SUMMARY RECOMMENDATIONS

To bring more real-life example (case study) of company using ERP and ERP handbook or manual may need to be provided. The learning materials of module is adjusted to present more case study of ERP application in the company and provide the practical manual.





Shyfte 4.0	0 - Learning Material Review Form
Reviewer's Name	Ajarn Norapatra Janpong
Position	Lecturer
Organization (University/Company)	Dhurakij Pundit University
Date Review Completed	August 7, 2021
Shyfte Domain	Business Management
Module Title	New Product Development
Skill Set	Digital talent management, Organizational transformation, Business revolution for industry 4.0
Skill Level	Expert
Meta Skills	
Module Outcomes	Participants are able to : Understand how to develop new product Design a database and use basic SQL to improve many business processes
Target group	Bachelor student, Master students, SME personnels
Teaching material	Lecture, case study, team working
Delivery method	





Module description	New product development begins with the exploration of the relationship between new product and sustainable growth strategies, the wide range of NPD ranging from packaging alterations to new technological research and a network model of NPD. The NPD processes include several stages; idea generation, idea screening, concept testing, business analysis, product development, test marketing, commercialization and monitoring and evaluation. The example of new product development on process of electric car is presented, and the workshop on NPD model with several templates including NPD process, concept development, new service development or service blueprints, business model canvas and new product development plan. The nature of creativity and innovation and their role in organization are introduced. The steps in the creative process are described and identify the four major types of innovation; creative people, creative processes, creative products and creative places. In addition, the nature of open and close innovation and the steps in open innovation process is described.
--------------------	--

		Sco	ore		Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
A. Trainer manual with:					
1. Planning forms and checklists				x	
2. Needs assessment materials			х		
3. Guidance on delivery method and learning principles				x	
4. Summary of key objectives/learning				х	
B. Structured module/man	ual wi	th:			
1. Agenda			x		
2. Topics description				x	
3. Measurable domain objectives			х		
4. The outcomes are defined				х	
5. Delivery method			x		





6. Active learning exercises/equipment use			х	
7. Teaching material appropriate to stated objectives		Х		
8. Additional resource and reference materials			x	
Subtotal	4:	3		

		Sco	ore		Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
1. Relevance of content to the domain				x	
2. Accuracy of content to the domain				x	
3. Completeness of content to the domain				x	
4. Relevance of content to the Meta Skills			х		
5. Relevance of content to the Hard Skills				x	
Subtotal		19	9		
Total Score	62				

#### **3. SUMMARY RECOMMENDATIONS**

1) Concerning the New Product Development (NPD) process, there are eight stages as clearly stated in the teaching materials followed by example (s)/ showcase (s) at the end of each stage. A few more examples/ showcases, running through stage 1 to 8, are strongly recommended as to holistically encourage better understanding of the topic.

(2) As regards to the "Creativity and Innovation & Open Innovation" topic, it seems that there isn't any clear-cut way of distinguishing 'Innovation' from 'Creativity', thus adding key differences as well as examples/ showcases can be absolutely useful.

(3) Some examples/ showcases of 'Open Innovation' can be of great envisioning for the trainers to apply with their workshop activities.

The learning materials of module is adjusted to present more example at the end of NPD stages to be better understanding. In addition, the additional content for key difference between innovation and creativity is identified with more examples.



# 5.2 Domain 2: Software Engineering and Big data Analysis-

Shyfte 4.0	- Learning Material Review Form
Reviewer's Name	Xun Sun
Position	Professor
Organization (University/Company)	East China Normal University/ Columbia University
Date Review Completed	23-Jun-21
Shyfte Domain	Software Engineering and Big data analysis
Module Title	Comprehensive Training of Artificial Intelligence
Skill Set	BigData tool kits, BigData Mining
Skill Level	Intermediate
Meta Skills	To be a senior Data Analyst of Bigdata
Module Outcomes	Students are able to analyze complex issues related to Supervised learning, Unsupervised learning,Semi-supervised learning, data reduction, and recommendation problems
Target group	Bachelor student, Master students, SME personnels
Teaching material	Lecture, case study, team working
Delivery method	
Module description	The module of "Comprehensive Training of Artificial intelligence" is a comprehensive frontier discipline, which is an important discipline to teach the professional knowledge of artificial intelligence and the related machine learning topic. On the basis of the fundamental ability of mathematics and programming, this module gives a comprehensive explanation of several branches of artificial intelligence in terms of supervised learning, unsupervised learning, semi-supervised learning, data dimensionality reduction, and recommended algorithms. By teaching artificial intelligence technology. It can also enhance





students' logical thinking ability and experimental practice ability. Moreover, it is a key module for students to master the principles, methods and technologies for computer vision, deep learning and also other major research fields.

## **1. INSTRUCTIONAL DESIGN ELEMENTS**

	Score				Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good

#### A. Trainer manual with:

1. Planning forms and					
checklists				Х	
2. Needs assessment			v		
materials			Х		
3. Guidance on					
delivery method and learning				Y	
4 Summary of key				Λ	
objectives/learning				Х	
		4 <b>b</b> -			
B. Structured module/manua	u wi	tn:			
1 Agenda					
1. Agenda				Х	
2. Topics description				v	
				X	
3. Measurable domain			x		
1 The outcomes are			Λ		
defined				Х	
5. Delivery method				Х	
6. Active learning					
exercises/equipment use			Х		
7. Teaching material					
appropriate to stated				V	
objectives				Х	
8. Additional resource				$\mathbf{v}$	
and reference materials				Λ	
Subtotal	45				





	Score				Note		
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good		
1. Relevance of content to the domain				х			
2. Accuracy of content to the domain				x			
3. Completeness of content to the domain			Х				
4. Relevance of content to the Meta Skills				х			
5. Relevance of content to the Hard Skills				х			
Subtotal	19						
Total Score		64					

## **3. SUMMARY RECOMMENDATIONS**

This training course offers fundamental knowledge for big data analytics, aiming at training students to understand essential theory and practice application with experiments. The course is comprehensive, which contains five chapters. The first three chapters discuss supervised, unsupervised and semi-supervised learning, which are the basis for AI. The fourth chapter discusses dimension reduction, which is important for handling big data. The last chapter discusses a practical topic, focused on using AI technology to recommend useful products for clients. In general, the design of the course is appropriate, which can meet the teaching objectives.

As the first theme of the series course "Software Engineering and Big data analysis", having relative more theoretical topics in this course is a very good idea. This will help students to get familiar with the ideas and theories, before starting more practical topics. In each chapter, theories are firstly introduced, then followed by examples and projects. This teaching method is thus suitable for the first theme of the series course. Maybe it would be better to have the course "Data mining" before this course, so that students can have a better understanding on data itself prior to working with AI technologies.

In terms of the design of each chapter, In the teaching plan each chapter has 4 hours' lecture time. However, chapter 3 and 5 are very long, which look hard to finish all contents within 4 hours. Given limited time, I would suggest to think about if the last chapter focused on a practical topic is really necessary for this course. There is also one minor suggestion for word documents presenting the experiments. Those documents are quite hard to read, because codes and texts use the same color and font. It is better to use different color to improve the legibility.

In conclusion, this course is well designed and materials are comprehensive. The teaching



-



L

method is appropriate, while the design of the chapters may need minor revision given limited time for each chapter. Based on my evaluation, this course will meet the teaching objectives.

Shyfte 4.0	- Learning Material Review Form
Reviewer's Name	Yuanping Xu
Position	Professor
Organization (University/Company)	Chengdu University of Information Technology
Date Review Completed	2020/11/15
Shyfte Domain	Software Engineering and Big data analysis
Module Title	Critical Thinking Oriented BigData
Skill Set	Decision Making Based BigData, Analyze BigData, Team Working
Skill Level	Imtermediate
Meta Skills	To be a senior data analyst of deep insight.
Module Outcomes	Students will be able to critically analyze and evaluate data quality, making rational decisions.
Target group	Bachelor student, Master student, SME personnels
Teaching material	Lecture, seminar, team working
Delivery method	Lecture/case study
Module description	Most current issues of big data focus on addressing the technical, managerial and social challenges, with little reference to critical thinking that could significantly aid to guarantee the quality of data and lead to rational decision-making. This module will make students build up consciousness of critical thinking and, through case studies and group-based activities, clearly understand the relationship of critical thinking and big data analytics, inspiring them to apply thinking skills to deal with the big data challenges.

## **1. INSTRUCTIONAL DESIGN ELEMENTS**





	Score		!	Note	
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
A. Trainer manual with:					
1. Planning forms and checklists			3		
2. Needs assessment materials			3		
3. Guidance on delivery method and learning principles			3		
<ol> <li>Summary of key objectives/learning</li> </ol>				4	
B. Structured module/manua	l wi	th:			
1. Agenda			3		
2. Topics description			3		
3. Measurable domain objectives			3		
4. The outcomes are defined			3		
5. Delivery method		2			
6. Active learning exercises/equipment use			3		
<ol> <li>Teaching material appropriate to stated objectives</li> </ol>			3		
8. Additional resource and reference materials		2			
Subtotal		3	5		
2. CONTENT					
	ç	Score		1	Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
1. Relevance of content to the domain			3		
2. Accuracy of content to the domain			3		
3. Completeness of content to the domain		2			





•		
4. Relevance of content to the Meta Skills	3	
5. Relevance of content to the Hard Skills	4	
Subtotal	15	
Total Score	50	

#### 3. SUMMARY RECOMMENDATIONS

Critical Thinking is a key tool in research methodology domain, and it can be gracefully applied in Bigdata based decision making improvements through ensuring the data quality. Thus, it's a wonderful teaching exploration. I wonder that this module has some improvements:

I Please enrich and detail the contents in PPT and other course materials to support the 12 teaching hours.

I The primary task of this module is to discuss and clarify how critical thinking contributes the Bigdata applications. Many abstract concepts and jargons for both critical thinking and Bigdata have been involved in the PPT slides, but the how to build the bridge between the two sides are largely ignored, so it is difficult for me to understand. Some case studies from SMEs may be benefit the understanding. Furthermore, personally, I am very interest on how SWOT strategy can be applied in critical thinking oriented Bigdata, but I can find any concrete information in the current course materials.

I Please further clarify the linkages between some teaching contents and the critical thinking to further justify that the teaching contents can support the module outcome, i.e., students will be able to critically analyze and evaluate data quality, making rational decisions. For instance, data visualization, business modeling and critical thinking? Please make the slides more logical to read and understanding.

I Some mistakes in PPT and other course materials, e.g. duplicated sentences on PPT pp.18.

# Shyfte 4.0 - Learning Material Review Form

7	
Reviewer's Name	YAO Min
Position	Principal 3D engineer
Organization (University/Company)	Teledyne e2v
Date Review Completed	Nov 16th, 2020
Shyfte Domain	Software Engineering and Big Data Analysis





Module Title		Data Mining Ideology and Technology					
Skill Set	Data mining ideology; ability to associate objects; exploring the laws of data; summarizing the value of mining						
Skill Level		Intermediate					
Meta Skills	To be	e a senior Algorithm and Data Analyst of Bigdata					
Module Outcomes	Students explore th ideal	are able to master the key technologies of data mining, e relationship and values of massive data. In addition, the ogy of different classic algorithms should be learned.					
Target group	Ba	chelor student; Master students; SME personnels					
Teaching material	Lecture, case study, team working						
Delivery method	Case study, hand in						
Module description	This module introduces the iedalogies and key technologies of Data Mining. By introduction of theoretical knowledge and the demonstration of classic algorithms, the related technologies of Data Mining will be demonstrated clearly. Three major parts are included in this module: the mining procedure and evaluation, objects association and fuzzy processing, supervised and unsupervised learning. Moreover, students are encouraged to conduct some related algorithms on python or matlab platform. Through systematic learning, students will master the ability of exploring the laws of data.						
1. INSTRUCTIONAL DESIG	N ELEMEN	TS					
	Score	Note					

#### A. Trainer manual with:

**Elements** 

1. Planning forms and					
checklists					
2. Needs assessment					
materials					
3. Guidance on delivery					
method and learning					
principles					
4. Summary of key					
objectives/learning					
B. Structured module/manual with:					
1. Agenda				$\checkmark$	

For the score, use a scale of 1 to 4: **1.** Very Poor, **2.** Poor, **3.** Good and **4.** Very Good

1

2 3

4





•			
2. Topics description			
3. Measurable domain			
objectives		$\mathcal{N}$	
4. The outcomes are			
defined			
5. Delivery method			
6. Active learning			
exercises/equipment use			
7. Teaching material			
appropriate to stated			
objectives			
8. Additional resource			
and reference materials			
Subtotal	48		

	Score			;	Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
1. Relevance of content to the domain					
2. Accuracy of content to the domain					
3. Completeness of content to the domain					
4. Relevance of content to the Meta Skills					
5. Relevance of content to the Hard Skills					
Subtotal	20				
Total Score	68				

#### 3. SUMMARY RECOMMENDATIONS

The course is designed for intermediate level students. Concepts are well presented. Examples and experimental cases are carefully selected, which makes this senior course easy to understand and to follow. Students shall be able to meet the course expectation at the end.





Shyfte 4.0	- Learning Material Review Form
Reviewer's Name	YAO Min
Position	Principal 3D engineer
Organization (University/Company)	Teledyne e2v
Date Review Completed	Nov 16th, 2020
Shyfte Domain	Software Engineering and Big Data Analysis
Module Title	Principle and Application of Big Data Technology
Skill Set	Big Data Tool Kits; Big Data Mining
Skill Level	Beginner
Meta Skills	To be a senior programmer of BigData
Module Outcomes	Students will design a bigdata system by using HDFS, HBase, and MapReduce
Target group	Bachelor student; Master students; SME personnels
Teaching material	Lecture, case study, team working
Delivery method	Case study, hand in
Module description	This module introduces the principle technology of BigBata. By using an online experiment platform, students will grasp the knowledge of HDFS, HBase, MapReduce by a series of experiments on class. Students should have Java programming skill and familiar with Unix operating system before this module.
<b>1. INSTRUCTIONAL DESIG</b>	N ELEMENTS

# D4.5 – Awareness dissemination and acceptance of emerging skills 4.0- Vs: 3.0.0 - Public





	Score			;	Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
A. Trainer manual with:					
1. Planning forms and checklists					
2. Needs assessment materials					
3. Guidance on delivery method and learning principles					
4. Summary of key objectives/learning					
B. Structured module/manua	l wi	th:			
1. Agenda					
2. Topics description					
3. Measurable domain objectives					
4. The outcomes are defined					
5. Delivery method					
6. Active learning exercises/equipment use					
7. Teaching material appropriate to stated objectives					
8. Additional resource and reference materials					
Subtotal		4	8		
2. CONTENT					
	\$	Sco	ore	9	Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
1. Relevance of content to the domain					
2. Accuracy of content to the domain					
3. Completeness of content to the domain					





•			
4. Relevance of content to the Meta Skills		٦	
5. Relevance of content to the Hard Skills		١	
Subtotal	2	0	
Total Score	7	0	

#### 3. SUMMARY RECOMMENDATIONS

The course is well designed and strunctured. It combines theoritical lectures with rich handson training and case studies. It is suitable to beginners to get basic understanding on the Big Data, and get familiar with the common analysis tool. I believe students shall archieve good knowledge level of Big Data analysis.

Reviewer's Name	Jiang Yu
Position	No.24 Block 1, Xuefu Road, Chengdu, China
Organization (University/Company)	Chengdu University of Information Technology
Date Review Completed	2020/11/15
Shyfte Domain	Software Engineering and Big Data Analysis
Module Title	Smart Decision Making with BigData
Skill Set	BigData tool kits, BigData Analysis




Skill Level	Expert
Meta Skills	To be a senior Data Analyst of Bigdata
Module Outcomes	Students master common data analysis methods and data visualization methods, and can use a reasonable decision-making model to complete smart decision-making
Target group	2nd year B.IE onward,1st year M.IE onward
Teaching material	Lecture, case study, team working
Delivery method	Lecture/case study
Module description	This module mainly introduces common data analysis knowledge and skills as well as intelligent decision-making based on data analysis. Through the learning of this module, students can master the process of data analysis, commonly used data analysis methods, data visualization methods and main decision-making models, so as to lay a good foundation for data analysis of smart decision-making based on big data.

## **1. INSTRUCTIONAL DESIGN ELEMENTS**

	•••	Score			Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good

#### A. Trainer manual with:

1. Planning forms and checklists	
2. Needs assessment materials	
3. Guidance on delivery method and learning principles	
4. Summary of key objectives/learning	
B. Structured module/manua	al with:
1. Agenda	
2. Topics description	
3. Measurable domain objectives	
4. The outcomes are defined	





	_		
6. Active learning		_	
exercises/equipment use			
7. Teaching material			
appropriate to stated			
objectives			
8. Additional resource			
and reference materials			
Subtotal			
SUDIOLAI		 	

	ę	Score			Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
1. Relevance of content to the domain					
2. Accuracy of content to the domain					
3. Completeness of content to the domain					
4. Relevance of content to the Meta Skills					
5. Relevance of content to the Hard Skills					
Subtotal	15				
Total Score		5	1		

#### 3. SUMMARY RECOMMENDATIONS

Nowadays, data processing and data analysis are becoming more and more important. Thus, it's a wonderful teaching exploration. I wonder that this module has some improvements: I1、Please enrich the contests in PPT. For example, in section S1, Designers can use a practical example to tell students why we should learn data analysis methods, which can improve the enthusiasm of students.

I 2、Data processing, data analysis and data visualization can be combined with mainstream Python or R language to introduce how they implement these processes.

13、PPT is not standard, Chinese and English mix and match.

I 4、Many methods for data processing and data analysis have been involved in the PPT slides, but the introduction of these theory is rather boring, so it is difficult for students to





l

understand. Case studies can run through the whole course content. In these cases, designers can introduce where and how to use the data processing methods, and where and how to use the data analysis methods.

## 5.3 Domain 3: Wireless Networks Analysis

Shyfte 4.0 - Learning Material Review Form									
Reviewer's Name	Assoc. Prof. Dr. Wichai Chattinnawat								
Position	Associate Professor								
Organization (University/Company)	Chiang Mai University								
Date Review Completed	June 18, 2021								
Shyfte Domain	Wireless Network Analytics								
Module Title	Introduction to IR 4.0								
Skill Set	Wireless Networks, Wireless Security, Wireless Propagation, IoT System, Energy Management								
Skill Level	Beginner								
Meta Skills									
Module Outcomes	Participants are able to : Explain the concept of Industry4.0 Realize how to implement this concept to targeted industry.								
Target group	Bachelor student, Master students, SME personnels								
Teaching material	Lecture, case study, team working								
Delivery method									





Module description	Introduction to Industry 4.0 concept application and case studies

## **1. INSTRUCTIONAL DESIGN ELEMENTS**

		Sco	ore		Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good

#### A. Trainer manual with:

1. Planning forms and checklists				x	
2. Needs assessment				<u></u>	
materials			Х		
3. Guidance on delivery method and learning principles				Х	
4. Summary of key objectives/learning				Х	
B. Structured module/manua	al wi	th:			
1. Agenda				Х	
2. Topics description				Х	
3. Measurable domain objectives			Х		
4. The outcomes are defined				Х	
5. Delivery method				Х	
<ol> <li>Active learning exercises/equipment use</li> </ol>			Х		
7. Teaching material appropriate to stated objectives			х		
8. Additional resource and reference materials			Х		
Subtotal		4	3		





		Sco	ore		Note				
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good				
1. Relevance of content to the domain				Х					
2. Accuracy of content to the domain				Х					
3. Completeness of content to the domain			Х						
4. Relevance of content to the Meta Skills				Х					
5. Relevance of content to the Hard Skills				Х					
Subtotal	19								

**Total Score** 

62

#### **3. SUMMARY RECOMMENDATIONS**

If the video links are accessible to the public, you should include the link in the material so that trainees can rewatch it.





Shyfte 4.0 - Learning Material Review Form										
Reviewer's Name	Assoc. Prof. Dr. Sharifah Mumtazah Syed Ahmad									
Position	Associate Professor									
Organization (University/Company)	Universiti Putra Malaysia									
Date Review Completed	23rd Feb 2021									
Shyfte Domain		Wireless Network Analytics								
Module Title		Introduction to Cybersecurity								
Skill Set	Wireless Networks, Wireless Security, Wireless Propagation, IoT System, Energy Management									
Skill Level	Beginner									
Meta Skills										
Module Outcomes	Participants are able to : 1. Understand the issues and challenges in cybersecurity 2. Analyse cybersecurity related problems 3. Identify the solution to cybersecurity related problems									
Target group	Bachelor student, Master students, SME personnels									
Teaching material	Lecture, case study, team working									
Delivery method										
Module description	This course covers the fundamental concept of cybersecurity. Participants will learn about importance of cybersecurity, its main issues and challenges, related law and regulations, and basic cryptography. This course also presents the defensive measures that can be taken by organization or individual to prevent attacks, and provides an overview of the malicious software types used in computer networks.									
1. INSTRUCTIONAL DESIG		8								
	Score	Note								





Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good					
A. Trainer manual with:										
1. Planning forms and checklists				Х						
2. Needs assessment materials			Х							
3. Guidance on delivery method and learning principles				Х						
4. Summary of key objectives/learning				Х						
B. Structured module/manua	al wi	th:								
1. Agenda				Х						
2. Topics description				х						
3. Measurable domain objectives			Х							
4. The outcomes are defined				Х						
5. Delivery method				Х						
6. Active learning exercises/equipment use			Х							
7. Teaching material appropriate to stated objectives				Х						
8. Additional resource and reference materials				Х						
Subtotal		4	5							

		Sco	ore		Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
1. Relevance of content to the domain				х	
2. Accuracy of content to the domain				Х	
3. Completeness of content to the domain			х		
4. Relevance of content to the Meta Skills				Х	





2				
5. Relevance of content to the Hard Skills			Х	
Subtotal	19	9		
Total Score	64	4		

#### 3. SUMMARY RECOMMENDATIONS

To rearrange the Cryptography topic under Countermeasures.

The reason why not to highlight cryptography as 1 main topic, we don't want the participants think that cyber security is only about cryptography.

To expose the trainee with the Cyber Security Domains. This will explain the areas in cyber security.

Can make a reference to 8 CISSP Domains :

- 1. Software Development security
- 2. Security Operations
- 3. Security Assessment and testing
- 4. Identity and Access Management
- 5. Communication and Network Security
- 6. Security Architecture and Engineering
- 7. Asset Security
- 8. Security and Risk Management

This can be included in Cybersecurity Fundamentals with brief explanation on each of the domains.

Overall, the outline looks good. All the best to the team.

Shyfte 4.0	- Learning Material Review Form
Reviewer's Name	Assoc. Prof. Dr. Zurina Mohd. Hanapi
Position	Associate Professor
Organization (University/Company)	Universiti Putra Malaysia
Date Review Completed	7th Dec 2020





Shyfte Domain	Wireless Network Analytics
Module Title	Introduction to Energy Management
Skill Set	Wireless Networks, Wireless Security, Wireless Propagation, IoT System, Energy Management
Skill Level	Beginner
Meta Skills	
Module Outcomes	Participants are able to : 1.Understand the concept and components of energy management and Energy Management System Standards (EnMS) for wireless network. 2.Manage the energy efficiency and lifecycle in IoT system 3.Design energy management framework for wireless network system.
Target group	Bachelor student, Master students, SME personnels
Teaching material	Lecture, case study, team working
Delivery method	
Module description	This module will cover the core concept of Energy Management System, Energy Management System Standards (EnMS), and energy efficiency in Engineering projects. Participants will also be exposed to the EnMS in a Project Life Cycle with actual case study

<b>1. INSTRUCTIONAL DESIGN ELEMEN</b>
---------------------------------------

		Sco	ore		Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
A. Trainer manual with:					
1. Planning forms and checklists				х	
2. Needs assessment materials			Х		
3. Guidance on delivery method and learning principles				x	





4. Summary of key objectives/learning				х	
B. Structured module/manua	al wi	th:			
1. Agenda				Х	
2. Topics description				х	
3. Measurable domain objectives			Х		
4. The outcomes are defined				Х	
5. Delivery method				х	
<ol> <li>Active learning exercises/equipment use</li> </ol>			Х		
7. Teaching material appropriate to stated objectives			X		
8. Additional resource and reference materials			Х		
Subtotal		4	3		

	Score				Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
1. Relevance of content to the domain				Х	
2. Accuracy of content to the domain				Х	
3. Completeness of content to the domain			х		
4. Relevance of content to the Meta Skills			х		
5. Relevance of content to the Hard Skills			х		
Subtotal		1	7		
Total Score		6	0		
3. SUMMARY RECOMMEN	IDA <sup>-</sup>	τιο	NS		





1.LO been scoped for wireless network and IoT. It would be better to highlight from the title and synopsis (especially). Or just make it general at the LO.

2.Why only on these 3 layers (PHY, Data link, Network)? Different applications on different OS might utilize different energy, as well as TCP or UDP or SCTP. So better make general, perhaps.

3.Based on the LO, where is EnMS IoT?

4.Where to relate with IoT?

5. The module is timely relevant to the wireless communication area.

6.The number of outcomes is adequate, and the statements are clear.

7.EnMS is highlighted well in both the synopsis and lecture content. My suggestion is to include the term 'standard or EnMS' in one of the outcomes. Regarding the IoT system, shouldn't it be part of the lecture content? Or it's part of the case study/evaluation? 8.The content can be delivered within the allocated time.

9. The assessment is suitable and adequate. It is presumed that energy management framework design is involved in the evaluation process.



# Shyfte 4.0 - Learning Material Review Form

Reviewer's Name	Siti Mariam Shafie @ Musa
Position	Lecturer
Organization (University/Company)	Universiti Putra Malaysia
Date Review Completed	19th Oct 2020
Shyfte Domain	Wireless Network Analytics
Module Title	Data Acquisition and Analysis
Skill Set	Wireless Networks, Wireless Security, Wireless Propagation, IoT System, Energy Management
Skill Level	Intermediate
Meta Skills	
Module Outcomes	Students are able to :





	<ul><li>1.Participants will be able to build a basic IoT data acquisition and perform data analysis</li><li>2.Participants will be able to understand the opportunities and challenges of IoT system</li></ul>
Target group	Bachelor student, Master students, SME personnels
Teaching material	Lecture, case study, team working
Delivery method	
Module description	This course will cover the IoT framework for data acquisition and analysis to solve the problem. Participants will be learning about IoT architecture, smart objects, IoT communication protocol, connecting smart objects to the network, and data and knowledge management. Advanced concepts such as distributed data analysis and LoRa configuration and hands-on will be covered toward the end of the course.

### **1. INSTRUCTIONAL DESIGN ELEMENTS**

		Sco	ore		Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor. <b>3.</b> Good and <b>4.</b> Very Good

#### A. Trainer manual with:

1. Planning forms and					
checklists				Х	
<ol><li>Needs assessment</li></ol>					
materials			Х		
3. Guidance on					
delivery method and learning					
principles				Х	
<ol><li>Summary of key</li></ol>					
objectives/learning				Х	
B. Structured module/manua	al wi	th:			
<b>B. Structured module/manua</b> 1. Agenda	al wi	th:		X	
<ul><li>B. Structured module/manual</li><li>1. Agenda</li><li>2. Topics description</li></ul>	al wi	th:		X X	
<ul> <li>B. Structured module/manual</li> <li>1. Agenda</li> <li>2. Topics description</li> <li>3. Measurable domain</li> </ul>	al wi	th:		x x	
<ul> <li>B. Structured module/manual</li> <li>1. Agenda</li> <li>2. Topics description</li> <li>3. Measurable domain objectives</li> </ul>	al wi	th:		x x x	
<ul> <li>B. Structured module/manual</li> <li>1. Agenda</li> <li>2. Topics description</li> <li>3. Measurable domain objectives</li> <li>4. The outcomes are</li> </ul>	al wi	th:		x x x	





Subtotal	4	7		
Subtotal	47			
8. Additional resource and reference materials			x	
7. Teaching material appropriate to stated objectives			Х	
6. Active learning exercises/equipment use			x	
5. Delivery method			x	

		Sco	ore		Note
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good
1. Relevance of content to the domain				Х	
2. Accuracy of content to the domain				Х	
3. Completeness of content to the domain				Х	
4. Relevance of content to the Meta Skills				Х	
5. Relevance of content to the Hard Skills				х	
Subtotal	20				
Total Score		67			

#### **3. SUMMARY RECOMMENDATIONS**

Minor revision needed on the wordings for learning outcomes.





SHYFTE	
4.0	
1	

# Shyfte 4.0 - Learning Material Review Form

7	
Reviewer's Name	Prof. Madya Dr. Nasri Sulaiman
Position	Associate Professor
Organization (University/Company)	Universiti Putra Malaysia
Date Review Completed	9th March 2021
Shyfte Domain	Wireless Network Analytics
Module Title	Renewable Energy for Wireless Network
Skill Set	Wireless Networks, Wireless Security, Wireless Propagation, IoT System, Energy Management
Skill Level	Intermediate
Meta Skills	
Module Outcomes	Participants are able to : 1.Understand the concept and components of renewable energy for wireless network. 2.Learn the latest techniques or technology for renewable and sustainable wireless network system. 3.Design renewable energy framework for wireless network system.
Target group	Bachelor student, Master students, SME personnels
Teaching material	Lecture, case study, team working
Delivery method	





Module description	This course will describe energy management topics related to Wireless Networks such as energy harvesting, wireless power transfer (WPT) and simultaneous wireless information and power transfer (SWIPT). Lectures and invited lectures will highlight topics in the current industry practices and a workshop on issues between spectral efficiency and energy efficiency will be covered.

1. INSTRUCTIONAL DESIGN ELEMENTS						
		Score			Note	
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good	
A. Trainer manual with:						
1. Planning forms and checklists				х		
2. Needs assessment materials			х			
3. Guidance on delivery method and learning principles				x		
4. Summary of key objectives/learning				х		
B. Structured module/manua	al wi	ith:				
1. Agenda				х		
2. Topics description				x		
3. Measurable domain objectives			х			
4. The outcomes are defined				х		
5. Delivery method			х			
6. Active learning exercises/equipment use				x		
7. Teaching material appropriate to stated objectives			х			
8. Additional resource and reference materials			x			





-		
Subtotal	43	

		Sc	ore		Note			
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good			
1. Relevance of content to the domain			х					
2. Accuracy of content to the domain				х				
3. Completeness of content to the domain			х					
4. Relevance of content to the Meta Skills				х				
5. Relevance of content to the Hard Skills			х					
Subtotal	17							
Total Score		60						

#### **3. SUMMARY RECOMMENDATIONS**

1.Describe the concept and components of renewable energy for wireless network.

2. Apply the latest techniques or technology for renewable and sustainable wireless network system.

3.Suggestions: To consider introducing the concept of green communication along with the content in the proposed course.

4.Suggestions: To consider introducing the concept of cycling wireless energy in Topic 4.





Shyfte 4.0	- Learning Material Review Form
Reviewer's Name	Prof. Dr. Syed Abdul Rahman Al-Haddad Syed Mohamed
Position	Professor
Organization (University/Company)	Universiti Putra Malaysia
Date Review Completed	24th Nov 2020
Shyfte Domain	Wireless Network Analytics
Module Title	Data Governance and Management
Skill Set	Wireless Networks, Wireless Security, Wireless Propagation, IoT System, Energy Management
Skill Level	Expert
Meta Skills	
Module Outcomes	Participants are able to : 1.Understand the issues and challenges in data governance and management in IoT system 2.Manage data and security issues in IoT system 3.Design data governance and management framework for IoT system.
Target group	Bachelor student, Master students, SME personnels
Teaching material	Lecture, case study, team working
Delivery method	
Module description	This course will cover the concept of data governance and management for IoT system. Participants will learn about the concept of data governance, its challenges in IoT system, data management to implement the data governance policies, security requirements, and the best practices. Advanced concepts such as value-based data governance and intelligent data governance will be covered toward the end of the course.





1. INSTRUCTIONAL DESIGN ELEMENTS								
	Score				Note			
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good			
A. Trainer manual with:								
1. Planning forms and checklists				х				
2. Needs assessment materials			х					
3. Guidance on delivery method and learning principles				х				
<ol> <li>Summary of key objectives/learning</li> </ol>				х				
B. Structured module/manua	al wi	th:						
1. Agenda				х				
2. Topics description				х				
3. Measurable domain objectives			х					
4. The outcomes are defined				х				
5. Delivery method			х					
<ol> <li>Active learning exercises/equipment use</li> </ol>			х					
<ol> <li>Teaching material appropriate to stated objectives</li> </ol>			x					
8. Additional resource and reference materials			х					
Subtotal		4	2	. <u> </u>				
2. CONTENT								
		Sc	ore		Note			
Elements	1	2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good			





1. Relevance of content to the domain			Х		
2. Accuracy of content to the domain				Х	
3. Completeness of content to the domain			Х		
4. Relevance of content to the Meta Skills				Х	
5. Relevance of content to the Hard Skills			Х		
Subtotal	17				
Total Score	59				

#### 3. SUMMARY RECOMMENDATIONS

1.In general this course focuses on "IoT Data Governance and Management". Therefore the course title is suggested to add "IoT"

2.Overall the course content is good which is has elements of data preparation/policies, data cycles, security, and data quality

3.No 1 add sub-content " Type of governance/management" either vertical, horizontal, etc. CEO, COO, CIO, IT Manager, IT Support. SMALL/BIG Company

4.No.4 add privacy and sub-content "Risk management".

Maybe, if it is not covered, for you to consider adding topic about the law and ethics with regards to data management etc into the module.





5a	
Shyfte 4.0	- Learning Material Review Form
Reviewer's Name	Prof. Dr. Mohd. Fadlee Abdul Rasid
Position	Professor
Organization (University/Company)	Universiti Putra Malaysia
Date Review Completed	12th March 2021
Shyfte Domain	Wireless Network Analytics
Module Title	Green Energy Wireless Networks
Skill Set	Wireless Networks, Wireless Security, Wireless Propagation, IoT System, Energy Management
Skill Level	Expert
Meta Skills	
Module Outcomes	Participants are able to : 1.explain the concept of energy management in general. 2.model energy usage based on data provided for sustainable business model. 3.apply appropriate techniques for energy optimisation based on the model identified.
Target group	Bachelor student, Master students, SME personnels
Teaching material	Lecture, case study, team working
Delivery method	
Module description	The greening of telecommunication has gained significant attention to improve energy efficiency and reduce the environmental impact. This module will focus on the sustainability in wireless networks, the importance of sustainable telecommunication and how SME business can be model for energy efficiency based on wireless energy usage. Last but not least, this module introduces some wireless energy optimisation techniques to be applied to the model





1. INSTRUCTIONAL DESIGN ELEMENTS												
	Score				Note							
Elements	1	1 2 3 4			For the score, use a scale of 1 to 4: <b>1.</b> Very Poor <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good							
A. Trainer manual with:												
1. Planning forms and checklists				х								
2. Needs assessment materials			х									
3. Guidance on delivery method and learning principles				x								
4. Summary of key objectives/learning				х								
B. Structured module/manua	al wi	ith:										
1. Agenda				x								
2. Topics description				x								
3. Measurable domain objectives			х									
4. The outcomes are defined				х								
5. Delivery method				х								
6. Active learning exercises/equipment use				х								
7. Teaching material appropriate to stated objectives				x								
8. Additional resource				x								
Subtotal		4	-6									
2. CONTENT	-											
	Score				Note							
Elements		2	3	4	For the score, use a scale of 1 to 4: <b>1.</b> Very Poor, <b>2.</b> Poor, <b>3.</b> Good and <b>4.</b> Very Good							
1. Relevance of content to the domain				х								
2. Accuracy of content to the domain X				х								





-					
3. Completeness of content to the domain				х	
4. Relevance of content to the Meta Skills				Х	
5. Relevance of content to the Hard Skills			x		
Subtotal		1	9		
Total Score	65				

#### 3. SUMMARY RECOMMENDATIONS

1. The use of RE sources and energy harvesting maybe considered for Green Networks.

- 2. Suggest updating references with more recent ones.
- 3. Probably can add a subtopic on communication act by MCMC in the syllabus. This is important specially to connect with SME business.
- 4. The lecture chapters look good and appropriate for students.
- 5. Reference no 4, probably can find the latest <5 years publication for latest technologies.
- 6. Should add 1 more textbooks on Optimisation in Reference.





## Domain 4: Artificial Intelligence

The review process for Domain 4 was evaluated by both internal and external assessors. Each module was reviewed by an Internal Reviewer and External Reviewer from the Industry. The selection of the assessors is based on the expert area and experience on the subject matter. The reviewers for the AI domain are listed in the following table.

No	Name	Reviewer	Modules Reviewed						
1	Dr. Shafaatunnur Hassan (IR1 - Internal Reviewer 1)	Internal	<ul> <li>Search Algorithm</li> <li>Al for Computer Vision</li> <li>Convolution Neural Network</li> <li>Advanced Machine Learning for Bi Data</li> <li>Metaheuristic Optimization</li> <li>Al for Industry</li> </ul>						
2	Assoc. Prof. Dr Hafis Izran (IR2 - Internal Reviewer 2)	Universiti Teknologi Malaysia	<ul> <li>Introduction to IR4.0</li> <li>Fundamental of AI</li> <li>Structure for Problem Solving</li> <li>Supervised and Unsupervised Learning</li> <li>Introduction to AI Application</li> <li>Reinforcement Learning</li> <li>Neural Network Computing</li> </ul>						
3	Ms Norzieyuswati Md Zenal (ER1 - External Reviewer 1)	External Intel Malaysia Senior Engineer	<ul> <li>Search Algorithm</li> <li>Al for Computer Vision</li> <li>Convolution Neural Network</li> <li>Advanced Machine Learning for Big Data</li> <li>Metaheuristic Optimization</li> <li>Al for Industry</li> </ul>						
4	. Dr. Abdul Aziz Abdul Rahman (ER2 - External Reviewer 2)	External Telekom Malaysia Research & Development (TMRND)	<ul> <li>Introduction to IR4.0</li> <li>Fundamental of AI</li> <li>Structure for Problem Solving</li> <li>Supervised and Unsupervised Learning</li> <li>Introduction to AI Application</li> <li>Reinforcement Learning Neural Network Computing</li> </ul>						

The module learning materials description are presented in Chapter 3 D2.4 report.

The review is conducted based on the assessment of module content and its relevance in meeting the modules outcomes and also to the professions related to the domain. Additionally, the exposure of software/hardware equipment is also assessed accordingly.

Detailed criteria reviewed on each module are as follows:

- A. Module content
- B. Relevance of the module content in meeting the module learning outcomes
- C. Relevance of the module content to professions related to AI
- D. Exposure on equipment (hardware and software)





The Likert scale is listed as below:

- 4 Excellent: Fully aligned to the AI domain
- 3 Good: Mostly aligned to the AI domain
- 2 Satisfactory: Somewhat aligned to the AI domain
- 1 Need improvement: Alignment to the AI domain is not clear

Table 5.4 below shows the review rating level for all training modules. All the review forms are available in Annex 1. From the tabulated findings, most all training modules score almost perfect rating scores on average and also on individual rating criteria. A few modules achieved lower scores but the rating averages are all close to 3 which tell that the modules content are mostly aligned to the Al domain and it is an indication of the emerging Skill4.0 acceptance. Nevertheless, amendments to the lower score criteria have been affected by the module developers before the actual training is carried out. The learning materials relevancy to the professional needs to be improved continuously through UTM Associate Partner (CAIRO UTM), Industry or SME engagement during the implementation training management review process in Shyfte Learning Centre. Improvement in software/hardware exposure is essential for effective training delivery. This comes in with proper resource management planning in the future.





		Criteria A			Criteria B			Criteria C				Criteria D				AVG		
	Training Modules	IR 1	IR 2	ER 1	ER 2	IR 1	IR 2	ER 1	ER 2	IR 1	IR 2	ER 1	ER 2	IR 1	IR 2	ER 1	ER 2	
1	Introduction to IR 4.0		3		4		4		4		4		4		4		4	3.9
2	Fundamental of Al		4		4		4		4		4		4		4		4	4.0
3	Structure for Problem Solving		4		4		4		4		4		4		3		4	3.9
4	Supervised and Unsupervised Learning		4		4		4		4		4		4		4		4	4.0
5	Introduction to AI Applications		4		4		4		4		4		4		3		4	3.9
6	Reinforcement Learning		4	4			4	4			4	4			4	4		4.0
7	Neural Network Computing		4	3			4	3			4	3			4	4		3.6
8	Search Algorithm	2		4		1		4		2		3		2		4		2.8
9	Al for Computer Vision	3		4		3		4		3		4		3		4		3.5
10	Convolution Neural Network	1		4		1		4		2		4		2		4		2.8
11	Advance Machine Learning for Big Data	3		3		2		2		3		2		3		4		2.8
12	Metaheuristic Optimization	2		4		1		4		2		4		2		4		2.9
13	AI for Industry	3			4	3			4	3			4	3			4	3.5

#### Table 5.4 : Review rating level for all training modules

\* IR1 - Internal Reviewer 1; IR2 - Internal Reviewer 2; ER1 - External Reviewer 1; ER2 - External Reviewer 2





## 6. Conclusions

We have built a mechanism which can work effectively to aware and accept the emerging skills4.0. By workshops and seminars with industry, Shyfte gathered new requirements of skills4.0. By join academic and industry training, Shyfte learned new technologies in industry.

By regular meeting among different partners, Shyfte discussed how to put the emerging skills4.0 into teaching materials.

Under the supervise of the scientific development team, the mechanism is workable and emerging skills4.0 in industry engineering and management, software engineering and big data analysis, wireless networks analysis, artificial intelligence have accepted by Shyfte and updated learning materials is implementing in the different Learning Centre now.





## 7. Future plan

In the future, Shyfte project will do the following works: In the future, Shyfte project will do the following works:

- 1. Teachers in each pilot will join academic and industry training. Different learning centres will share information of the online training to give project members' more opportunity to know and learn the emerging skills4.0.
- 2. Each pilot will hold regular meetings with industry to gather their requirements, on the base of these requirements, each learning centre can promote their teaching materials.
- 3. Each pilot will use questionnaire to gather the feedback of training from students and companies. The questionnaire will use union form which checked by Scientific Development Team. Based on the analysis result of the questionnaire, each learning centre can promote their teaching materials.
- 4. Considering the potential epidemic risks in future, pilots will prepare online training programme. Each pilot can provide online training based on the requirements gathered from universities, companies in different countries.





