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Master Degree in Industry 4.0

Ind4.0 (610455-EPP-1-MY-EPPKA2-CBHE-JP)

AGRICULTURE

AUTOMOTIVE

MANUFACTURING

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DELIVERABLE OF ERASMUS+IND4.0 WP3

**D3.4 Setup of Equipment and
Establishment of "Industry 4.0 Labs"**



Master Degree in Industry 4.0
610455-EPP-1-2019-1-MY-EPPKA2-CBHE-JP

3.4 Setup of Equipment and Establishment of “Industry 4.0 Labs” in Partner Countries

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D3.4 Setup of Equipment and Establishment of “Industry 4.0 Labs” in Partner Countries

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ABSTRACT

This deliverable describes the allocated budget, technical specifications, procurement procedures and the final list of equipment acquired for the "Industry 4.0 Labs" of the MSc Industry 4.0 curriculum of Asian partner HEIs.

1.0 Scope

Work Package 3.4: Common framework report for the establishment of "Industry 4.0 Labs" in Partner Countries

This activity involved in one fully equipped Industry 4.0 lab in each of the Asian partner HEIs. There were three areas of deliverables expected from each of Asian HEIs geared towards enabling the online training for academic personnel summarised as follows:

1. First the budget and technical specifications of the labs with the list of equipment to be purchased were drafted by each Asian HEIs under the guidance of the EU HEIs and industrial partners so that labs are tailored to local contexts and facilities and within the budget allocation.
2. Asian Universities or HEIs then followed their own procurement procedure to purchase the equipment, in accordance with the project budget and EACEA procurement rules.
3. Thirdly, the Asian HEIs reported the actual list of equipment finally purchased by the HEIs

Each Lab was delivered with the corresponding Manual addressed to students and guiding them on how to make use of the infrastructure in coherence with curricula syllabi and material developed in Task 3.1 (Ind4.0 learning material). The acquired equipment were installed in these laboratories ready to be used for the delivery of the programme in WP4 and for research and networking purposes during and after the project.

This activity involved all Asian Universities allocated with the funds to provide the list of equipment, in accordance with the project budget and EACEA procurement rules. The list of equipment suggested by the approved project for the Industry 4.0 Lab consisted of the following.

Table 1: List of equipment recommended for Ind4.0 programmes

- High-end PCs/ Laptops
- Printer/Scanner
- Computer-Aided Design (CAD)
- Computer Aided Manufacturing (CAM)

- 3D printer
- Computer-aided engineering (CAE) simulation tools

As some of the equipment may already be available in the HEIs, the proposed equipment to be purchased in each HEI would address the lack or add value to their lab to support the MSc Ind 4.0 and the VET courses. The list of all equipment deemed required by each Asian Partner should be within the given allocated budget and to be evaluated as relevant provided with justification. The HEIs are also required to provide the official documents from the University management with assurance that the original equipment or software has been purchased and is accessible for the teaching of the programme. This report covers the following topics:

<u>Part</u>	<u>Items</u>
2.0	Budget and Specification of Asian HEIs' Ind 4.0 Lab
3.0	Procurement Procedure of Asian Universities
4.0	Actual Equipment Purchased by the HEIs
Appendix	Photos of Equipment Purchased.

2.0 Budget and Specification of Asian HEIs' Industry 4.0 Lab

Tables 2 describes the total allocated budget in Euro (€) for Equipment of Asian HEIs' Industry 4.0 Labs. The overall total budget for Asia HEIs was €169,238 distributed equally among 8 Asian HEIs.

Table 2 Allocated Budget (€) For Equipment of P01- UiTM Industry 4.0 Labs

HEIs	Name of Institution	Country	Budget Approved €	Estimate Purchases €
P01	Universiti Teknologi MARA (UiTM)	Malaysia	21,000	20,000
P02	Universiti Teknologi Malaysia (UTM)	Malaysia	21,155	20,920
P03	Universiti Kuala Lumpur (UniKL)	Malaysia	21,000	21,000
P04	University of Heng Samrin Thbongkhmum (UHST)	Cambodia	21,000	20,894
P05	National University of Battambang (NUBB)	Cambodia	22,080	21,004
P06	Mean Chey University (MCU)	Cambodia	21,003	20,983
P08	Syiah Kuala University (Unsyiah)	Indonesia	21,000	20,993
P09	Universitas Sumatera Utara (USU)	Indonesia	21,000	21,780
	Total Allocated		169,238	167,574

Table 3 - 11 provides the list of equipment to be purchased by all the Asian HEIs, their specifications, and justifications on why the equipment were needed.

Table 3 Equipment, Specifications, Quantity, Justifications and Estimated Price of PO1 - UiTM

Name of Institutions:Universiti Teknologi MARA (UiTM) Location of Ind 4.0 lab: UiTM				
Item No	Equipment description & Technical Specification	Quantity	Justification of Needs	Estimated Price (€)
1.	<p>High-end Laptops (Apple M1 Chip 2020 or equivalent)</p> <p>Apple M1 chip with 8-core CPU, 8-core GPU, and 16-core Neural Engine with 8GB unified memory or equivalent</p> <p>Retina display. 13.3-inch (diagonal) LED-backlit display with IPS technology; 2560x1600 native resolution at 227 pixels per inch with support for millions of colours or equivalent</p> <ul style="list-style-type: none"> - 512GB SSD storage - Magic Keyboard - Touch ID - Force Touch trackpad - Two Thunderbolt / USB 4 ports or equivalent <p>Comes with 90 days of free telephone support and get up to 3 years of additional hardware service options and expert technical support form Apple/ limited warranty and can be extended to three years warranty with AppleCare Protection Plan or equivalent</p>	5	As per allocation	RM32,500
2.	Desktop Computer	5	As per allocation	RM27,500

	<p>DELL OptiPlex 7080 PC (7080MT-I7708G-512-W10-WF) or equivalent</p> <p>Windows 10 Pro (64bit) English Intel® Core™ i7-10700 (8 Cores/16MB/16T/2.9GHz to 4.8GHz/65W) 8GB 2x8GB 2933MHz DDR4 Memory M.2 512GB PCIe NVMe Class 35 Solid State Drive Intel HD Graphics 8x DVD+/-RW 9.5mm Optical Disk Drive or equivalent</p> <p>Intel® Wi-Fi 6 AX201, Dual-band 2x2 802.11ax with MU- MIMO + Bluetooth 5.0 with Internal Antenna Warranty : 3Yr ProSupport and Next Business Day Onsite Service or equivalent</p> <p>DELL E2420H 23.8" LCD or equivalent</p>			
3.	<p>Printer/Scanner (HP color Laser jet Pro MFP M181FW or equivalent) 28ppm Print, Scan, Copy Automatic Duplex Ethernet Port or equivalent</p>	1	As per allocation	RM2,000
4.	<p>3D-Printer 1 Unit Industry 4.0 Lab- 3D Printer (Proteus Maker 3D printer (Medium) Or equivalent) -200mmX200mmX200mm Print Size -Technology : FDM(Fused Deposition Modelling) -Printing Speed : Up to 150mm/s XY Axis -Resolution : 5 microns -Z Axis Resolution : up to 50microns Print Head Layer -Resolution : 0.1mm - 0.4mm</p>		As per allocation	RM4,500

	<p>Or equivalent</p> <ul style="list-style-type: none"> -Interchangable Brass Nozzle : Diameter 0.2mm, -0.4mm or 0.6mm Build Plate : Auto Bed Leveling and -Real Time XY axis plane callibration -Material supported : PLA, Thermoplastic, ABS, PET, -PVA,HIPS and others -Filament diameter : 1.75mm <p>Support any brand of material Or equivalent</p> <ul style="list-style-type: none"> -Operation : File transfer : USB 2.0 -Operating Interface : Built-in SD Card -Reader Machine Language : G-Code -Supported File Format : STL/OBJ/PLY/G-Code -c/w White PLA 1kg 1.75mm, Blue PLA 1kg filament 1.75mm, Red -PLA 1kg filament 1.75mm, Yellow PLA 1kg filament 1.75mm, PETG filament 1kg, conductive filament black 0.5kg <p>Or equivalent</p> <p>1 Year Warranty</p>			
5.	<p>Software 1 Unit Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM) and Computer-Aided Engineering (CAE) simulation tools or Equivalent</p>		<p>The university has already subscribed to these softwares. In replacement, the robotic arm is included for conducting Agriculture/A quaculture Orientation Course.</p>	
6.	<p>Replacement</p>	1		RM18,570

	<ul style="list-style-type: none"> • Intel® Iris® X0 Graphics 			
2.	<p>Workstation</p> <ul style="list-style-type: none"> • HP Z2 Tower G4 Workstation • Windows 10 Pro 64 • Intel® Core™ i7-9700 (3.0 GHz base frequency, up to 4.7 GHz with Intel® Turbo Boost Technology, 12 MB cache, 8 cores) • 16 GB DDR4-2666 SDRAM (2 x 8 GB) • 256 GB SATA SSD • 1 TB 7200 rpm SATA • NVIDIA® Quadro® P620 (2 GB GDDR5 dedicated) • 27-inch monitor 	5		6000
3.	<p>HP Color LaserJet Pro MFP M182n</p> <ul style="list-style-type: none"> • Print, Copy, Scan • 256 MB DDR, 128 MB Flash • Duty cycle (monthly, letter) : Up to 30,000 pages 	1		420

4	Interactive Touch Screen TV/ Monitor 65" <ul style="list-style-type: none"> • Touch Panel (with multiple touch point) • USB capable • Built-in automatic WIFI hotspot • Support Windows • Wall mount/Mobile Floor Stand • Related Software 	1	Interactive touch screen displays have an inherent ability to bolster active learning for the students.	8000
5	Related Software	1	The industry-specific software related to IND4.0 will be installed on the computer to facilitate students learning activities.	1400
	Estimated Total Price			20,920

Table 5 Equipment, Specifications, Quantity, Justifications and Estimated Price of PO3 - UniKL

Name of Institutions: Universiti Kuala Lumpur (UniKL)				
Location of Ind 4.0 lab: UniKL				
Item No	Equipment description & Technical Specification	Quantity	Justification of Needs	Estimated Price (€)
1.	<p>Macbook Pro 13' Notebook</p> <p>1 (Color), 2 (Display) Retina display 13.3-inch (diagonal) LED-backlit display with IPS technology; 2560x1600 native resolution at 227 pixels per inch with support for millions of colors Supported scaled resolutions: 1680x1050 1440x900 1024x640 500 nits' brightness Wide</p> <p>1year warranty (default) for 13-inch MacBook Pro</p> <p>Operating Requirement: Line voltage: 100V to 240V AC Frequency: 50Hz to 60Hz Operating temperature: 10° to 35° C Storage temperature: -25° to 45° C Relative humidity: 0% to 90% non-condensing Operating altitude: tested up to 3,000 meters Maximum</p>	5	<p>1. One of the deliverables in this project is to setup and establish the industry 4.0 Labs in the partner countries. There is a list of equipment to be acquired where these are the precursor to the industry 4.0 lab establishment.</p> <p>2. The Industry4.0 lab is to act as foci for research and innovation in this area to ensure that Ind4.0 outputs remain sustainable within the local regional priorities' agenda in the academic perspective.</p> <p>3. The development and implementation of the Master Ind4.0 degree contents including the MOOCs and VLE which requires this equipment so that many functionalities within the project can be performed efficiently as well as to assist on smooth</p>	10,880.00

	<p>storage altitude: 4,500 meters Maximum shipping altitude: 10,500 metres</p> <p>Size and Weights Height: 1.56cm Width: 30.41cm Depth: 21.24cm Weight: 1.4kg (or the latest specification)</p> <p>Operating System macOS macOS is the most advanced desktop operating system in the world. macOS Big Sur introduces a bold new design and major updates to apps — taking macOS to a new level of power and beauty. (or the latest specified version)</p>		<p>accessibility of resources either internally within UniKL or externally with other partner members.</p> <p>4. The development of the contents and resources for the program which include codes, formulas, designs, audio/visual media, syllabi, program structures etc. using the VLE platform as well as design software facilitated by the high-end laptops.</p>	
2.	<p>DELL XPS Desktop</p> <ul style="list-style-type: none"> - 11th Gen Intel® Core™ i7-11700 processor (8-Core, 16M Cache, 2.5GHz to 4.9GHz) - NVIDIA® GeForce® RTX 3060 Ti™ 8GB GDDR6 - 16GB, 8Gx2, DDR4, 2933MHz - 512GB PCIe M.2 SSD +1TB SATA 7200 RPM HDD - Dell Wired Keyboard KB216 Black (English) - Dell Laser Wired Mouse - MS3220 Black - Dell24 Monitor – S2421HS - Killer™ Wi-Fi 6 AX1650i (2x2) 	5		8,260.00

	802.11ax Wireless and Bluetooth 5.1 - Tray load DVD Drive (Reads and Writes to DVD/CD) - System Power Cord (UK/Irish/MY/SG/Sri Lanka/Bangladesh/HK) - Regulatory label for 500w power supply - Intel® Core™ i7 non-vPro Processor Label - Wireless Killer1650i Driver - McAfee® LiveSafe™ 12 months Subscription - Cyberlink Media Suite Essentials DVD - Windows 10 Pro (64bit) English			
3.	3D Printer - General: FDM Technology - Specifications: Year 2020 or later Max. build volume: 250x250x400mm Max. print speed: 150 mm/s - Printing materials: Compatible materials - PLA/TPU/Wood/Carbon-fibre - Software: Recommended slicer: Cura OS: Windows, Mac, Linux File types: STL, OBJ, 3MF - Dimensions: ~ 495mm x 495mm x 650mm - Weight: 30kg - 3 year warranty – onsite	1		1,520.00
4.	HP LaserJet Pro M203dw - General: B&W Laser Printer	1		340.00

	- Power Consumption: 0.5 watts (sleep) 480 watts (active printing), 1.9 watts (ready) - Dimension & Weight: Dimensions (W x D X H): 370.5 mm x 624.4 mm x 359.5 mm Weight: 6.9 kg - 3 Years Limited Warranty (3 Year 3-5WD 1 -1 Exchange)			
	Estimated Total Price			€21,000.00

Table 6 Equipment, Specifications, Quantity, Justifications and Estimated Price of PO4 - UHST

Name of Institutions: University of Heng Samrin Thbongkhmum(UHST)				
Location of Ind 4.0 lab: UHST				
	Equipment description & Technical Specification	Quantity	Justification of Needs	Estimated Price(€)
1.	Dell OptiPlex 7070MT	5	Needed by UHST	4489.88
2.	Microsoft Surface Laptop	1		2263.99
3.	Lenovo Yoga S730-13IWL (13.3" None Touch)	4		5278.26
4.	Printer HP MFP-M227fdn (print, scan, and copy)	1		370.99
5.	Samsung Smart TV 65" TU7000 Crystal UHD 4k	1		1159.35
6.	3D Printer, Model: Ultimaker S3	1		6733.56
7.	LCD Projector, Sony VPL EX430 (ANSI:4200lm)	1		598.66
	Estimated Total Price			€20,894.60

Table 7: Equipment Specifications, Quantity, Justifications and Estimated Price of P05 - NUBB

Name of Institutions: National University of Battambang (NUBB)				
Location of Ind 4.0 lab:				
Item No	Equipment description & Technical Specification	Quantity	Justification of Needs	Estimated Price (€)
1.	<p>Photocopie Machine Canon Image RUNNER 2006N</p> <p>Function :Print,scan,Copy</p> <ul style="list-style-type: none"> • ADF Function :Yes. • Copy / Print Speed: Up to 20 ppm (A4), 10 ppm (A3). • Scan Speed (A4, 300dpi):1 sided (Black & White: 23 ppm, Colour: 12 ppm). • Multiple Copies / Prints:Up to 99 copies. • Copy / Print Resolution: Up to 600 x 600 dpi. • Scan Resolution:Black & White / Colour: 300 x 300dpi. • Reduction / Enlargement: Copy Ratio Zoom: 25% - 40 increments . • Paper Input Capacity: Cassette 1 (Standard): 250 sheets, 80gsm Multi Purpose Tray: 80 sheets, 80gsm Cassette 2 (Optional): 250 sheets, 80gsm. 	1	To support teaching and learning.	2,010
2.	LCD Projector	1	LCD projector will be used for	770

	<p>Sony VPL-DW241</p> <ul style="list-style-type: none"> • Display System : 3 LCD system • Size of effective display area : 0.59" (15 mm) x 3 , BrightEra , Aspect ratio: 16:10 • Number of pixels : 3,072,000 (1280 x 800 x 3) pixels • Zoom : Optical: Manual (Approx. x 1.3) • Focus : Manual • Throw ratio : 1.36:1 to 1.77:1 • Lamp mode: High / Standard / Low : 3000 H / 5000 H / 10000 H • Filter cleaning cycle : Max. 1000 H • Screen size : 30" to 300" (0.76 m to 7.62 m) • Lamp mode: High / Standard / Low : 3000 lm / 2200 lm / 1900 lm • Lamp mode: High / Standard / Low : 3000 lm / 2200 lm / 1900 lm • INPUT B : HDMI input connector: HDMI 19-pin, HDCP support, audio support • INPUT C*5 : HDMI input connector: HDMI 19-pin, HDCP support, audio support • VIDEO IN : Video input connector: Phono jack • OUTPUT : Audio output connector: Stereo mini jack • Speaker : 1 W x 1 (monaural) 		<p>teaching and learning for master programs in ind4.0 and mobile training program.</p>	
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	<ul style="list-style-type: none"> • Outside dimensions : W 325.1 x H 79.8 x D 230.5 mm (W 12 13/16 x H 3 5/32 x D 9 1/16 inches) (without protrusions) • Mass : 2.7 kg / 5.9 lb • Supplied accessories • AC 100 V to 120 V : RM-PJ8 Remote cable (1), Lens cap (1), Carrying case (1) <p>Replacement lamp : LMP-D214</p>			
3.	<p>Monitor Asus TUF Gaming XG32VQ Gaming Monitor – 31.5 inch Full</p> <ul style="list-style-type: none"> • Display Type: WLED-backlit LCD monitor / TFT active matrix. • Screen Display : LED 31.5" inch. • Panel Technology : Vertical Alignment (VA). • Screen Coating : Anti-Glare • Game Plus (modes) : Yes (Crosshair/Timer/FPS Counter/Display Alignment). • Game Visual : 7 Modes (Scenery/Racing/Cinema/RTS/RPG/FPS/ sRGB Modes/MOBA Mode). • Native Resolution : Full HD (1920 x 1080) 144Hz, adaptive-SYNC. • Anti-Screen Tearing : adaptive-SYNC (Free Sync™ technology supported). • Viewing Angle : Ultra wide 1780 Vertical/1780 Horizontal. • Response Time : 1ms (MPRT). • Brightness : 250cd/m2. • Aspect Ratio : 16:9. 	2	These extra monitors will be used for design in association with the desktop and laptops.	780

	<ul style="list-style-type: none"> • Contrast Ratio : 3000:1 (typical). • Color Support : 16.7 Million colors • Stereo Speakers : 2W x 2 Stereo RMS. • Connectivity : 1 x HDIM, 1x Audio Line. • Dimension : 709.7 x 507.1 x 213.7mm (WxDxH). • Weight : 7Kg. <p>Code : MOASUS-18</p>			
4.	<p>High-end Laptops</p> <p>LI-426 Microsoft Surface Laptop3</p> <ul style="list-style-type: none"> • Processor: 10th-Generation • Intel Core i7-1065G7 • RAM: 16GB • SSD512G • Win10Pro (PLA-00037) Color: Black 	1	We will use this Microsoft surface for admin and management tasks because Window operating system is more adaptable with Khmer font.	2,630
5.	<p>High-end Laptops</p> <p>Macbook Pro13.3"</p> <ul style="list-style-type: none"> • Z11B0014Y • Touch Bar & touch ID • CPU:M1 Chip 8 Core+8Core GPU • SSD :512GB PCIe • RAM : 16GB Unified • Screen 13.3" Retina true Tone • VGA: Chip M1 • Magic Keyboard 	3	We will use them for designing and programing.	4,935
6.	<p>Desktops</p> <p>Dell Inspiron MT 3881</p> <ul style="list-style-type: none"> • Processor : 10th Generation Intel Core i7-10700F (16M Cache, 2.90GHz up to 4.80GHz). • Memory: 16GB DDR4-2933MHz (Max. 32GB). • Storage : 512 SSD PCIe. • Optical Drive : Build-in DVD-RW Drive. 	1	This desktop will be used for designing digital contents of the lecture.	1,040

	<ul style="list-style-type: none"> • Graphic : NVIDIA® GeForce® GTX 1660 6GB GDDR6. • Connectivity : WiFi 802.11ac, Bluetooth, Gigabit Ethernet LAN. • Display Monitor : LED Dell 18.5" HD Widescreen (E1916HV). • Interface Port : 1 x HDMI, 1 x VGA, 1 x DisplayPort, 3 x USB 3.2, 4 x USB2.0, 1x line-out, 1x Type-C, SD Card. • Keyboard & Mouse : Dell USB keyboard & Optical Mouse. • Operation System : Windows 10 HLS. • Code : DEDEL-233 . 			
7	<p>Screen HIKVISION DS-D5A75RB/B</p> <ul style="list-style-type: none"> •4K display, and the resolution of the input signal is up to 3840× 2160. •20 px ultra fine writing, and 1 mm writing in diameter recognizable. •Built-in interactive whiteboard system allows sharing by scanning QR code. •Annotating on any interfaces supports 20 people writing at the same time. •Built-in Wi-Fi realizes wireless screen mirroring supporting 2/4-split screen without any cable connection. •Software and hardware video conferences realize tele-cooperation. 	2	These 2 screens will be equipped in the graduate school lecture rooms to serve teaching and learning activities. These screens will be used to build the smart classrooms, that can be used for multiple purposes (online lectures, workshop, seminar, VET etc) for the graduate students.	6,594
8	<p>Stand DS-D5ABL</p> <p>Mobile Bracket, suitable for DS-D5A65RB/B and DS-D5A75RB/B</p>	2	These stands are for supporting the screens above.	740

9	Screen Smart TV-Samsung 75 inches <ul style="list-style-type: none"> • Resolution 4K Ultra HD (3840 x 2160px) • LAN Port • HDMI port 3 ports • USB port 2 ports • VGA port Are not • Audio output port Built-in digital receiver DVB-T2C	1	This screen will be equipped in the small class room to serve teaching learning activities and video conference.	1,210
10	Stand for Samsung screen Mobile Bracket, Hikvision DS-D5ABL	1	This stand is for Samsung screen.	295
Estimated Total Price				€ 21,004.00

Table 8: Equipment Specifications, Quantity, Justifications and Estimated Price of PO6 - NMC

Name of Institutions: Mean Chey University (MCU)				
Location of Ind 4.0 lab: MCU				
Item No	Equipment description & Technical Specification	Quantity	Justification of Needs	Estimated Price (€)
1.	Dell OptiPlex 7090 Tower XCTO,10th Generation - Intel Core i7-10700 (8-Core, 16MB Cache, 2.9GHz to 4.8GHz, 65W) - Ram : 8GB (1x8GB) DDR4 - Memory,3.5 inch 1TB 7200rpm SATA Hard Disk Drive - Optical Disk Drive: 8x DVD+/-RW 9.5mm - Intel Integrated Graphics - Free : Dell USB Optical Mouse-MS116 , Dell Wired Keyboard KB216 and Mouse paid - LED Monitor Dell E2216H (21.5")	5	None (as allocated)	4,611.53
2.	ASUS UX425EA-KI440T 2G-PINE GREY(BEZEL) -Intel® Core™ i7-1165G7 Processor 2.8 GHz (12M Cache, up to 4.7 GHz, 4 cores) -RAM: 16GB DDR4 Onboard -Storage: SSD 512GB PCIE -Optical Drive: N/A -Graphic: Intel® Iris® Xe Graphics -Display : 14"FHD (1920 x 1080) anti-glare - Free : Bag , Mouse and Mouse paid	5	None (as allocated)	6,502.89

3.	<p>Printer HP MFP-M227fdw (Print , scan and copy)</p> <ul style="list-style-type: none"> -Print speed black: Fast print speed (30 ppm A4) -Normal: Up to 30 ppm, Black: As fast as 6.4 sec,Up to 30,000 pages -Print quality black (best): Up to 1200 x 1200 dpi -Duty cycle (monthly, A4): Up to 30,000 pages -Memory, standard: 256 MB/Processor speed: 800 MHz -Paper handling input: 250-sheet input tray, 10-sheet priority -Paper handling output: 150-sheet output tray -Media sizes supported: A4, A5, A6, B5 (JIS) -Weight: 9.3 kg 	1	None (as allocated)	374.02
4.	<p>SAMSUNG 75" TU7000 Crystal UHD 4K Smart TV (2020)</p> <ul style="list-style-type: none"> -Dynamic Crystal Color -Crystal Processor 4K -Motion Xcelerator -TV Stand 75 " 	1	TV is needed for training, meeting and workshops	1,317.58
5.	<p>Blue 24-inch iMac with Apple M1 chip. Apple M1 chip with 8-core CPU with 4 performance cores and 4 efficiency cores, 7-core GPU, and 16-core Neural Engine</p> <ul style="list-style-type: none"> - Ram : 16 GB unified memory - Storage : 256 GB SSD - Two Thunderbolt / USB 4 ports - Magic Mouse 	2	iMac PC will be used for teaching different operating systems to students.	4,352.26

	- Magic Keyboard - US English			
6.	<p>DS-D5A75RB/A Interactive Tablet 70-86" Inch All-In-One Smart Whiteboard + Smart TV for Education: (86 inch Interactive Whiteboard 10 points touch screen all-in-one monitor pc smart tv for education meeting school) Specifications - Diagonal Screen Size : 75". - Backlight: LED Backlight - 4K display, and the resolution of the input signal is up to 3840 × 2160. - 20px ultra fine writing, and 1 mm writing in diameter recognizable - Built-in Wi-Fi realizes wireless screen mirroring without any cable connection. - Built-in interactive whiteboard system allows annotating and sharing by scanning QR code. - Display looping out. - Various audio and video interfaces for device access. - Built-in network switch chip saves a network switch. - Built-in Android system supports kinds of applications. - Compatible with OPS/OPS-C devices, and built-in systems can</p>	1	75" interactive tablet is needed for training, meeting and workshops.	3,825.23

	seamlessly switch between each other. - Ultrathin aluminum profile frame design. - Hikvision DS-D5ABL Stand			
	Estimated Total Price			€20,983.51

Table 9: Equipment Specifications, Quantity, Justifications and Estimated Price of PO8 - Unsyiah

Name of Institutions: Syiah Kuala University (Unsyiah)				
Location of Ind 4.0 lab: Unsyiah				
Item No	Equipment description & Technical Specification	Quantity	Justification of Needs	Estimated Price (€)
1.	MacBook Air (13 inci, M1 2020) 8GB RAM, 512GB SSD, Space Grey	3	To be distributed over the three departments that will implement this project.	4.800,60
2.	MacBook Pro (13 inci, M1, 2020) 8GB RAM, 512GB SSD, Space Grey	1	To be distributed over the three departments that will implement this project.	1.863,40
3.	MATRICE 600 PRO	1	One of our focus area will be in agriculture and this equipment will support its related courses.	7.571,60
4.	Aqua Drone Power Dolphin Wizard	1	One of our focus area will be in agriculture where aquaculture is one of our emphasis and this equipment will support its related courses.	1.134,40
5.	PRUSA I3 MK3S+ MMU	1	For prototyping students' project.	1.657,70
6.	Dragino Outdoor LoRaWAN Gateway	1	To build a LoRa-base network that will be used as the basic infrastructure for	714,00

			various courses and laboratory.	
7.	Dragino LoRa IoT Starter Kit	5	To build a LoRa-base network that will be used as the basic infrastructure for various courses and laboratory.	1.555,00
8.	Raspberry Pi 4 Model B - RAM 4 GB v1.2	6	A testbed for demonstration and laboratory work that will support various courses.	615,60
9.	PYNQ Z2 Board Xilinx ZYNQ XC7Z020-1CLG400C	12	A testbed for demonstration and laboratory work that will support various courses.	1.081,20
	Estimated Total Price			€20.993,50

Table 10: Equipment Specifications, Quantity, Justifications and Estimated Price of PO9 - USU

Name of Institutions: Universitas Sumatera Utara (USU)				
Location of Ind 4.0 lab: USU				
Item No	Equipment description & Technical Specification	Quantity	Justification of Needs	Estimated Price (€)
1.	<p>UR-3 Collaborative Robot</p> <ul style="list-style-type: none"> • Power consumption: min 90W, typical 125W, max 250W • Payload: 3kg/6.6lbs • Reach: 500mm/19.7in • Degrees of freedom: 6 rotating joints <p>Programming: Polyscope graphical user interface on 12inch touchscreen with mounting.</p>	1	Collaborative Robot	20,760
2.	<p>OnRobot RG2 Collaborative Gripper</p> <ul style="list-style-type: none"> • Payload: 2kg 	1	Collaborative Robot	- (Included in the UR-3 Collabora

	<ul style="list-style-type: none"> • Gripping force: 3-40N (1N resolution) • Total stroke: 110mm (1mm resolution) • Stroke time: 950ms/200ms • Repetition accuracy: +0.1mm Product weight (bracket): 650g (100g)			tive Robot)
3.	3D Printer Inova 20E series <ul style="list-style-type: none"> • Type: 20E • Dimension: 570x510x600mm • Power consumption: 100 Watt • Layer resolution: 150micron – 600micron • Extruder: 1 • Bed Heater: Yes Input Voltage: 220v	1	3D Printer	1,020
	Estimated Total Price			€21,780

3.0 Procurement Procedure of Asian Universities in Accordance with Project Budget and EACEA Procurement Rules

This activity involved in all Asian Universities allocated with fund to provide each of their own procurement procedure foreseen to purchase the equipment, in accordance with project budget and EACEA procurement rules.

A workshop through google meet was conducted on the 17 December 2020 among Asian partners on documentation of procurement procedure of equipment based on each Asian universities.

The procedures of each partner institution are depicted in the process flow-chart diagrams as illustrated in the Figures 1 - 8.

PO1 – Universiti Teknologi MARA (UiTM)

Procedure of Acquisition of IT Equipment

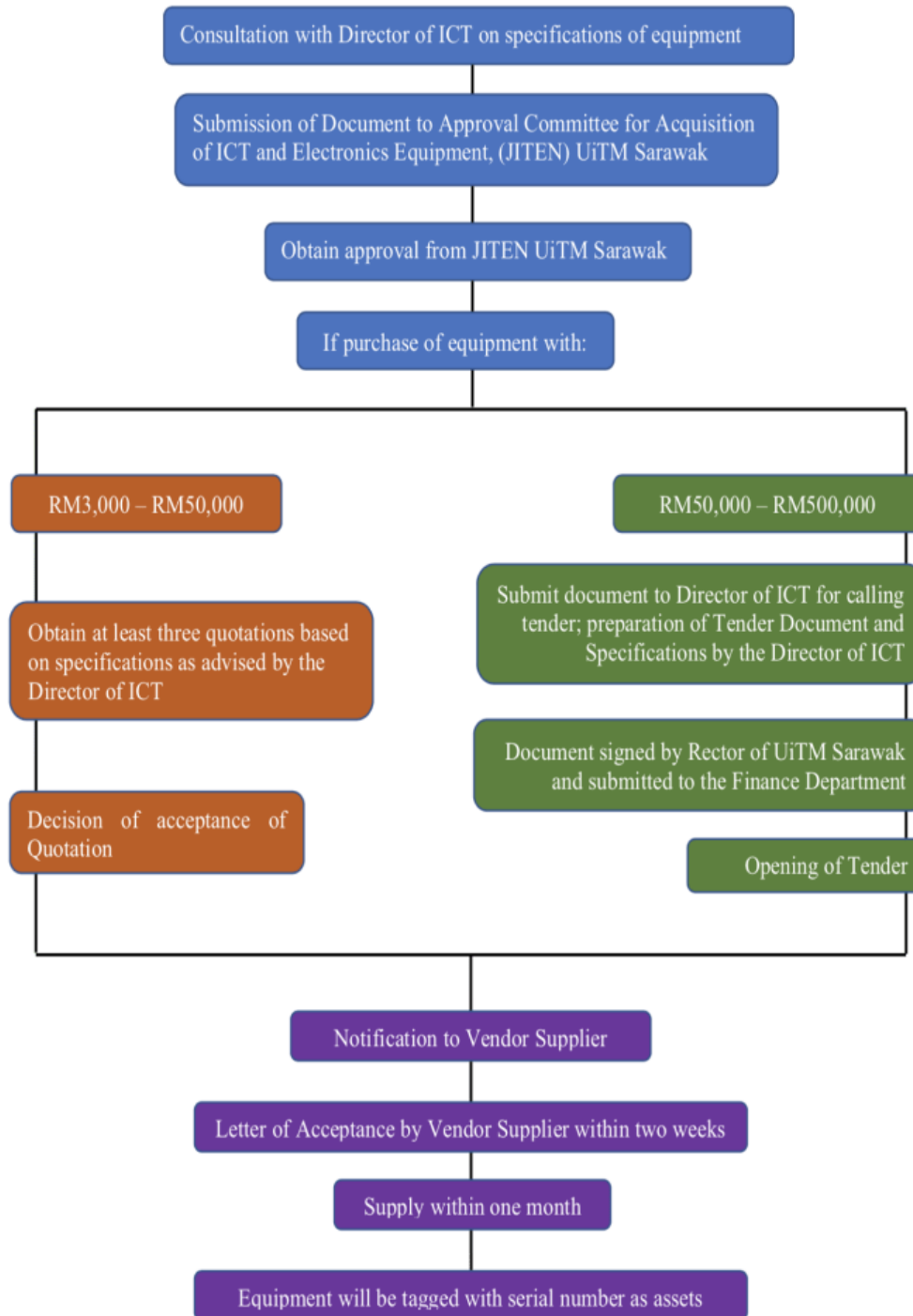


Figure 1: Procurement procedure of equipment of PO1 - UiTM

P02 – Universiti Teknologi Malaysia (UTM)

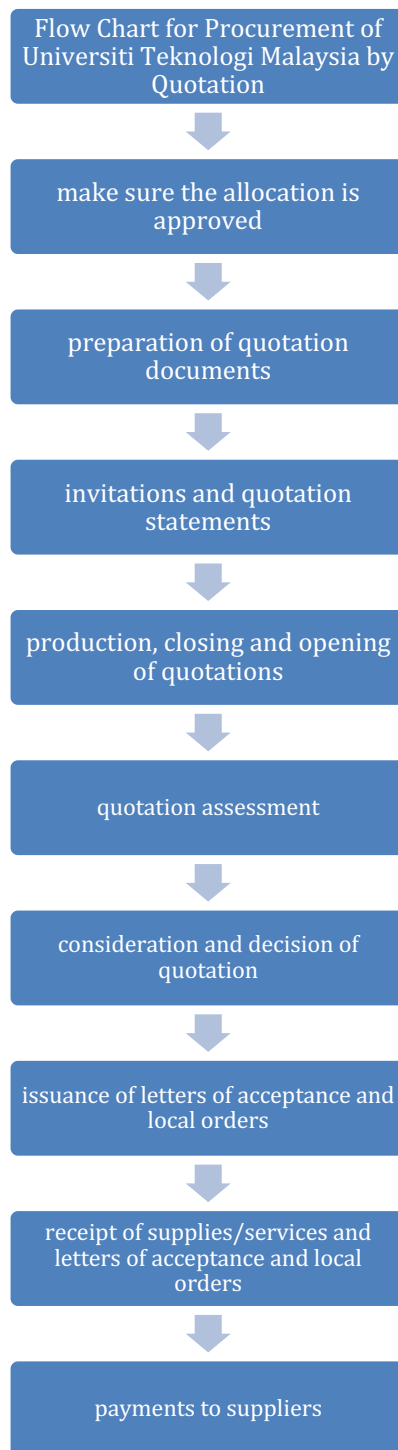


Figure 2: Procurement procedure of equipment of PO1 - UiTM

P03 – Universiti Kuala Lumpur (UniKL)

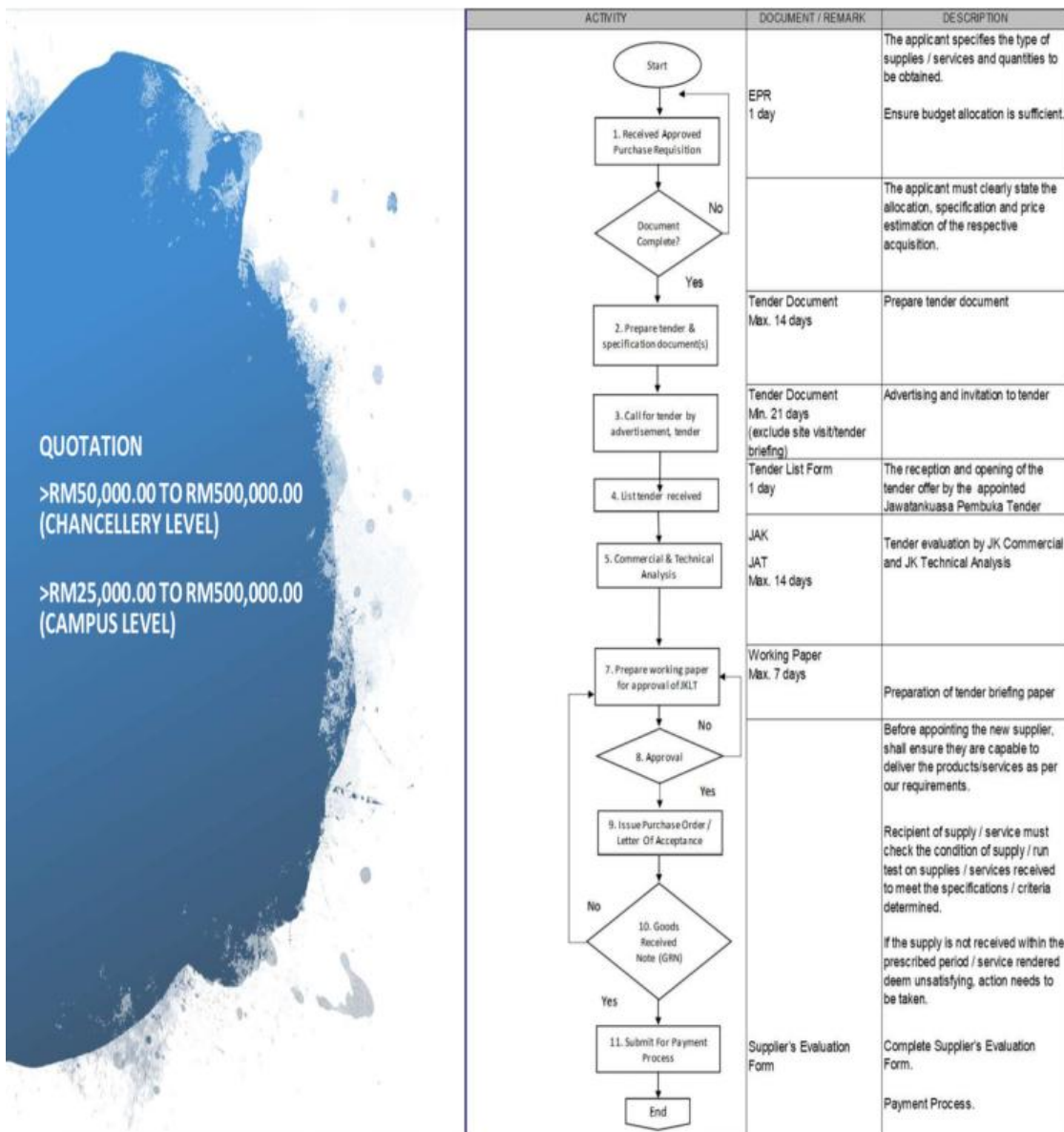


Figure 3: Procurement procedure of equipment of PO3 - UniKL

P04 – University of Heng Samrin Thbongkhmum, Cambodia

Procurement Thresholds for Cambodia Policy

The thresholds provided the different methods of procurement as given below will be applied, except where the RGC, represented by MEF, and the DP have agreed to different thresholds. In such cases, the thresholds specified in the specific project legal/financing agreements will be prevailed and applied.

Method	Threshold
International Competitive Bidding	All procurement above US\$300,000
Limited International Bidding	Only when specifically allowed under the Project's legal agreements or with a specific no objection from the DP and MEF on an exceptional basis
National Competitive Bidding	All procurement above US\$100,000 and up to US\$ 300,000
Shopping With Advertising	All procurement above US\$25,000 and up to US\$100,000
Shopping Without Advertising	All procurement above \$500 and up to US\$25,000
Petty Cash/Purchase order	All procurement US\$500 and below but subject to Petty Cash limits set out in the FMM
Direct Contracting	Only when specifically allowed under the Project's legal agreements or with a specific no objection by the DP and MEF on an exceptional basis.

Source: Procurement Manual, Kingdom of Cambodia, Update Version I, May 2012

Shopping Without Advertising Process for Ind4.0

Shopping method also known as canvassing or request of quotation will be applied. Shopping simply compares the price quotations, and then select the lowest one for award. A minimum of three known sources of supply are invited to submit their quotations by letter or facsimile. The minimum period allowed for firms to prepare their quotations shall be 7 days.

Activities	Description	Responsible
Preparation	Specification and Cost estimate	Project Staff
	Bidding Document Drafted	Project Staff
	Bidding Document Approved by PRC	UHST-PRC ¹
	Bidding Document Submitted to PO	Project Staff
	NOL Issued	Coordinator/PO
Evaluation	Specification Procurement Issued	Project Staff
	Bidding Period	Project Staff

	Bidding Closing Date	Project Staff
	Bid Opening Minute Distributed	UHST-PRC
	Evaluation Bids by PRC	UHST-PRC
	Evaluation sent to Coordinator	Project Staff
	NOL Issued	Coordinator/PO
Contract Formation	Notification of Award Issued	UHST-PRC
	Performance Security Received	UHST-PRC
	Contract Sign	UHST-PRC
	Equipment Received/Payable	UHST-PRC

Source: Procurement Manual, Kingdom of Cambodia, Update Version 1, May 2012

PROCEDURE OF ACQUISITION OF IT EQUIPMENT FOR IND4.0

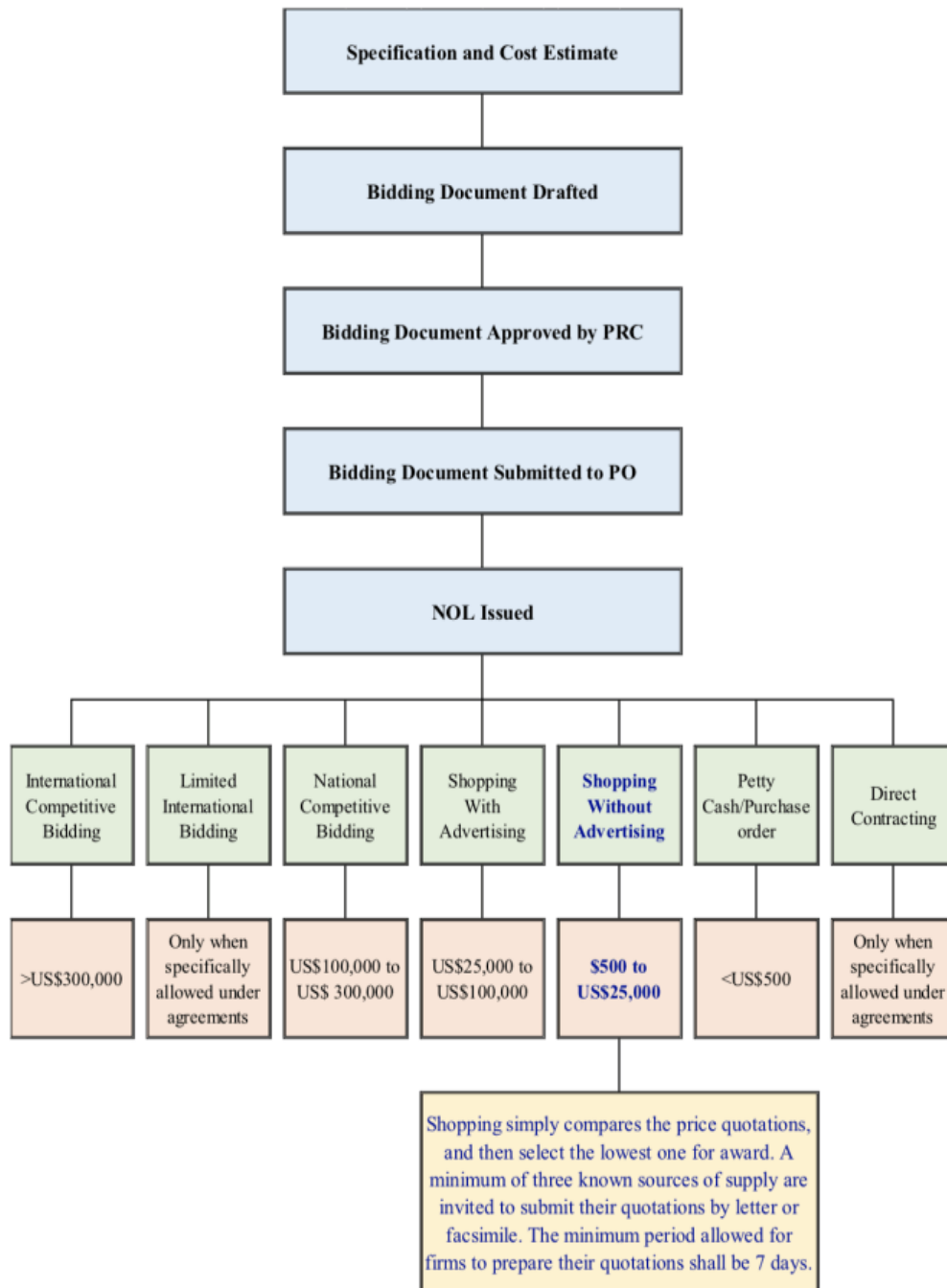


Figure 4: Procurement procedure of equipment of PO4 - UHST

P05 – National University of Battambang (NUBB)

PROCEDURE OF EQUIPMENT ACQUISITION

NUBB

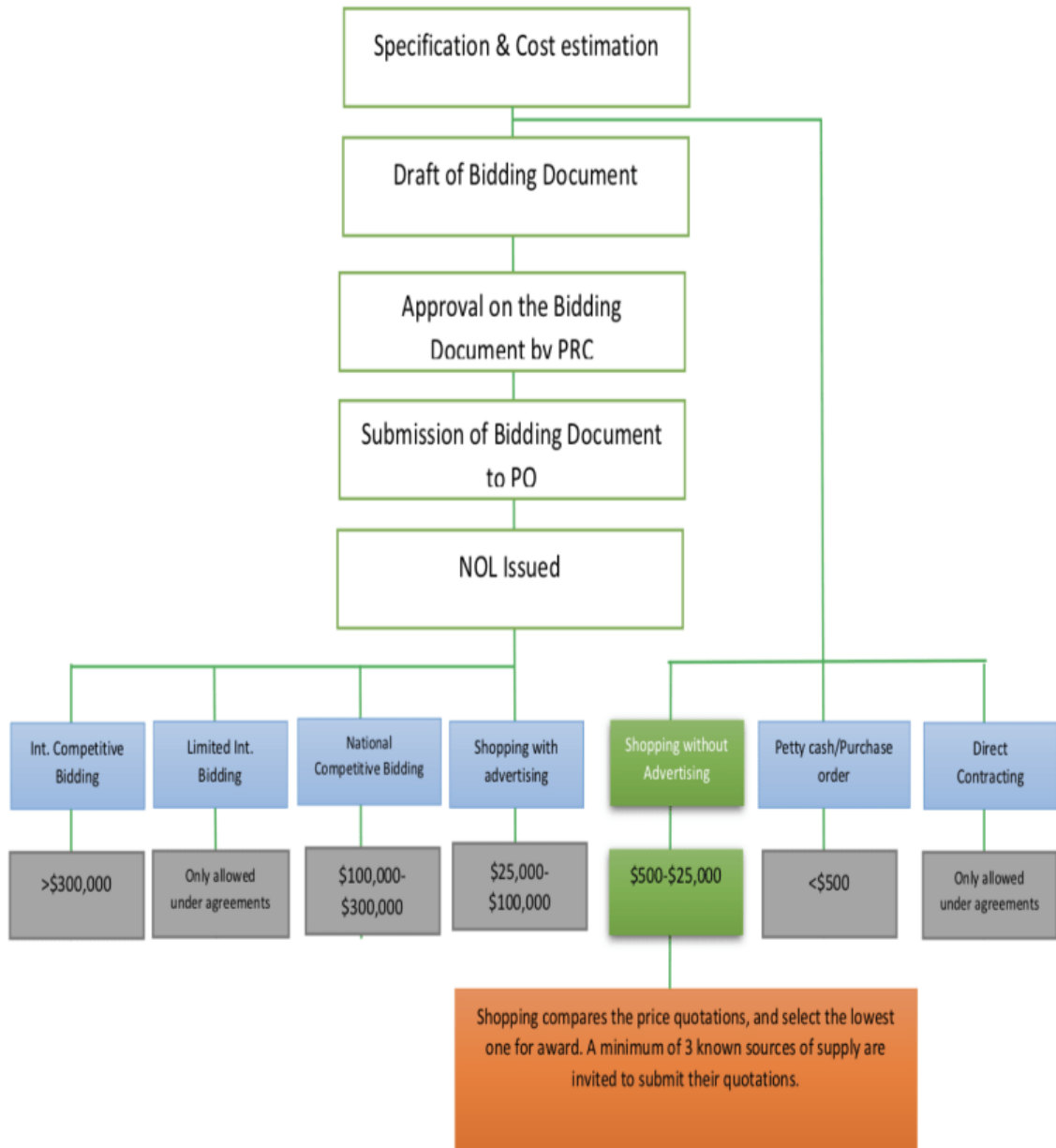


Figure 5: Procurement procedure of equipment of PO5 - NUBB

P06 – Mean Chey University (MCU)

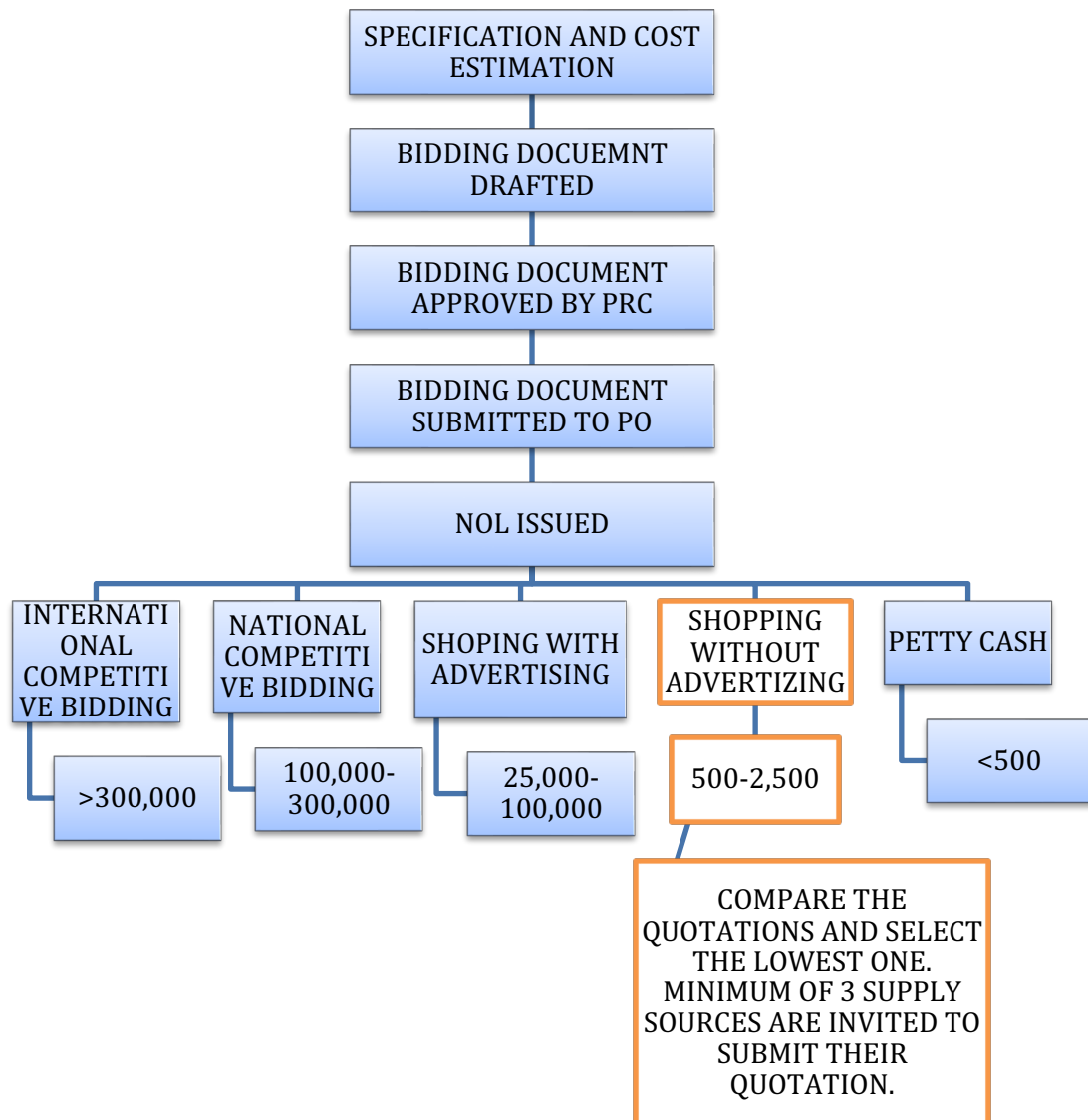


Figure 6: Procurement procedure of equipment of PO6 - MCU

P08 - Syiah Kuala University (Unsyiah)

PROCEDURE OF ACQUISITION OF IT EQUIPMENT - Universitas Syiah Kuala (USK)

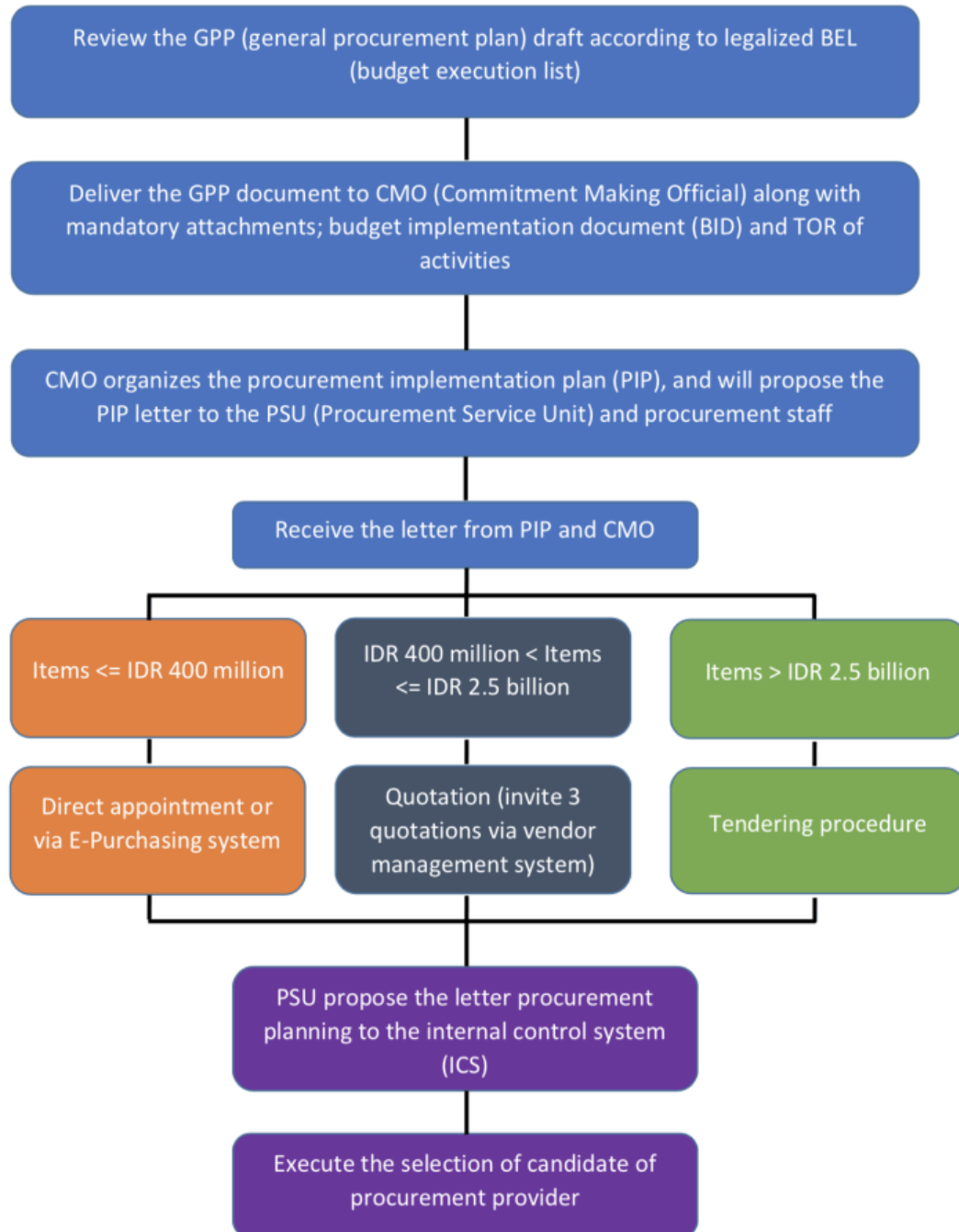


Figure 7: Procurement procedure of equipment of P08 - Unsyiah

P09 - Universitas Sumatera Utara (USU)

Procedure of Acquisition of IT Equipment - Universitas Sumatera Utara (USU)

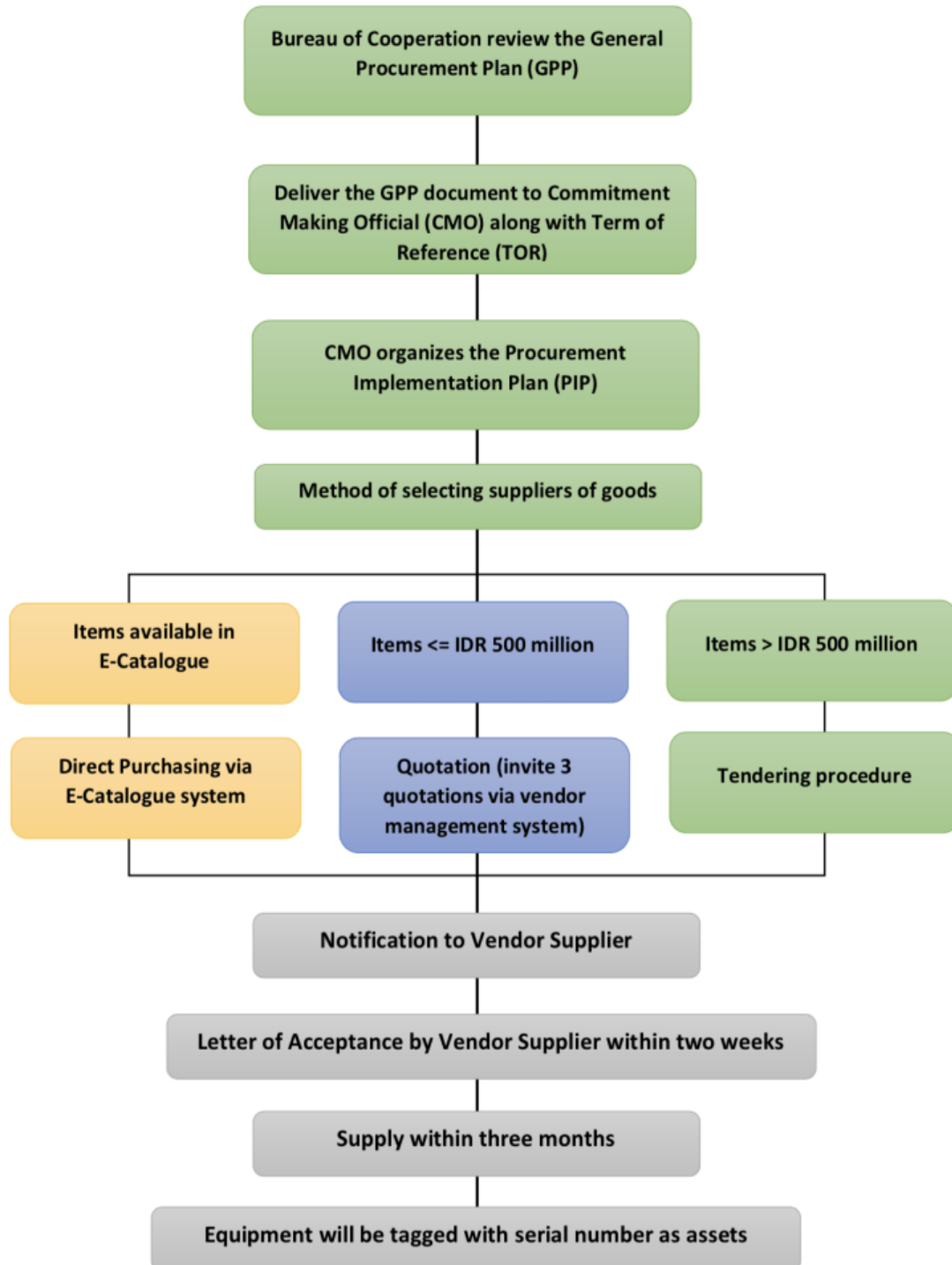


Figure 8: Procurement procedure of equipment of P09 - USU

4.0 Actual Purchases / List of Equipments Purchased By The HEIs

The part was prepared by Asian HEIs upon the actual purchased of Industry 4.0 LabEquipment using the allocated grant.

Table 11 shows the summary of the total budget used for the lab Ind 4.0 by Asian partners. Overall, the actual expenditure is at €169,341.56 which is close to the budgeted amount of €169,238.

Table 11: Summary of the total budget used for the lab Ind 4.0 by Asian partners

HEIs	Name of Institution	Country	Budget Approved €	Estimate Purchase €	Actual Purchase €
P01	UniversitiTeknologi MARA (UiTM)	Malaysia	21,000	20,000	20,999.85
P02	UniversitiTeknologi Malaysia (UTM)	Malaysia	21,155	20,920	21,510.97
P03	Universiti Kuala Lumpur (UniKL)	Malaysia	21,000	21,000	21,235.89
P04	University of Heng SamrinThbongkhmu m (UHST)	Cambodia	21,000	20,894	20,894.60
P05	National University of Battambang (NUBB)	Cambodia	22,080	21,004	20,943.24
P06	Mean Chey University (MCU)	Cambodia	21,003	20,983	20,983.51
P08	Syiah Kuala University (Unsyiah)	Indonesia	21,000	20,993	20,993.50
P09	Universitas Sumatera Utara (USU)	Indonesia	21,000	21,780	21,780.00
	Total		169,238	167,574	169,341.56

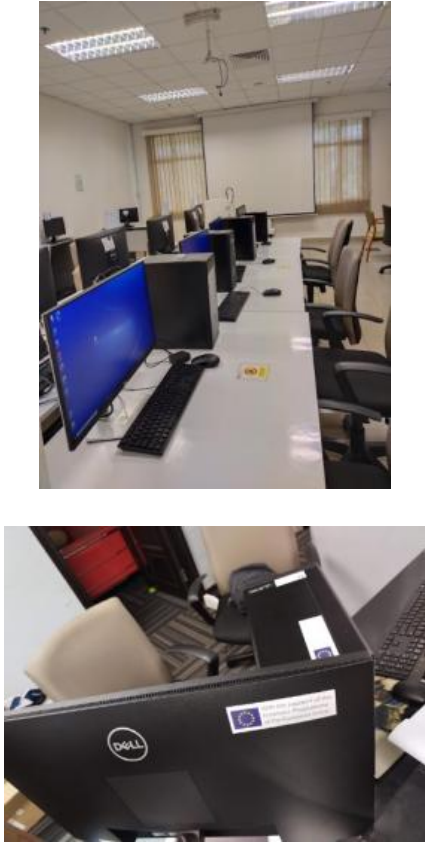

All purchases have been completed the before end of November 2022.

Table 12: Actual Equipment Ordering, Price, and Delivery Date of PO1 - UiTM

Name of Institution: Universiti Teknologi MARA (UiTM)							
No	Equipment & Model Ordered	Unit	Price per Item (RM)	Total price in local Currency (RM)	Total price in (€)	Date of Order	Date of Delivery
1.	<p>Laptops</p> <p>Apple M1 chip with 8-core CPU, 8-core GPU, and 16-core Neural Engine with 8GB unified memory</p> <p>-512GB SSD storage</p> <p>3 years warranty with AppleCare Protection Plan</p>	5	6450	32250	7087.99	21/8/21	6/9/21
2.	<p>HP color Laser jet Pro MFP M181FW</p> <p>28ppm</p> <p>Print, Scan, Copy</p> <p>Automatic Duplex</p> <p>Ethernet Port</p>	1	1899	1899	417.37	28/7/21	21/8/21
3.	<p>5 Dell Optiplex 7090 Tower Desktop Serial No.: 6564ZP3, 7564ZP3, 8564ZP3</p> <p>5 DELL S2421HN 23.8" FHD IPS LCD MONITOR (HDMI PORT)</p> <p>Serial No.: CN04WCJRWS60022 3BSJL, CN04WCJRWS60022 3BT0L, CN04WCJRWS60022 3BT3L</p>	5	6999	34995	7691.29	21/6/23	21/9/23

4.	Proteus maker 3D printer	1	5340	5340	1143.30	21/6/23	21/9/23
5.	Dobot Magician (Education) - Dobot arm, suction cup kit, grapper, 3D printing kit, Writing and drawing kit, Bluetooth module, laser & Game controller	1	7430	7430	1650.95	25/7/22	30/7/22
6.	* Material for 3D printer * BELKIN BSV804SA2M 8-socket surge + 2.4A USB protection 2M * Transcend 500GB ESD270C USB3.1 Type-C External SSD * RAZER OPUS X Wireless low latnecy Headset with anc technology mercury (RZ04-03760200-R3M1) * Apple USB-C digital AV multiport adapter * Apple magic mouse 2 MK2E3ZA/A * computer backpack			9887	2126.82	27/6/22	27/9/22
7.	Dobot Magician (Education) - Dobot Arm, Suction cup kit, grapper, 3D printing Kit, Writing and drawing kit, Bluetooth module, Laser & Game Controller	1	7430	7430	1590.77	9/9/22	9/9/22
7.	Meta Oculus Quest 2 Advanced All-In-One Virtual Reality Headset 1.00 2,049.00 2,049.00 (64GB/128GB/256GB) VR Headset -	1		2049	438.89	25/6/22	25/6/22

	Storage:256GB, Warranty:365 Days Warranty SN: 1WMVR4D3HC2102						
8.	Pico 4 all in one Vr Headset	1	2399	2399	513.63	10/11/22	10/11/22
	Total Purchases			93,850.00	20999.85		

1. UiTM	
Desktop	Laptop
	



Dobot Magician- Robotic Arm



Printer



Virtual Reality Headset



3D Printer- Proteus Maker 3D

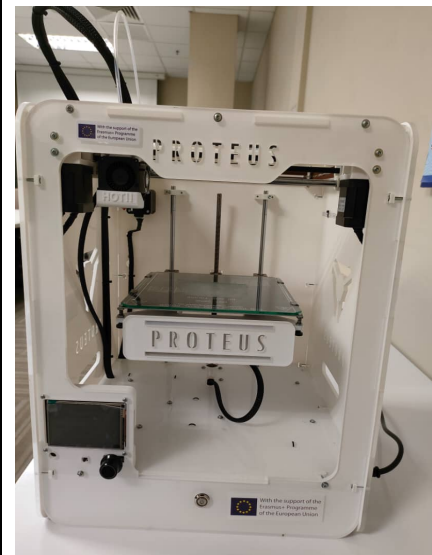




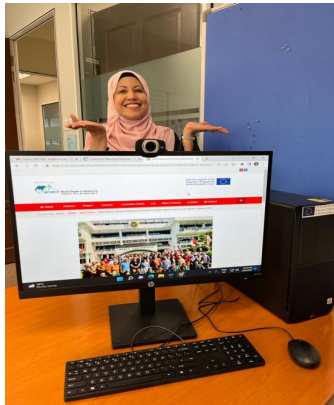
Table 13: Actual Equipment Ordering, Price, and Delivery Date of PO2 - UTM

Name of Institution: Universiti Teknologi Malaysia (UTM)							
No	Equipment & Model Ordered	Unit	Price per Item (RM)	Total price in local Currency (RM)	Total price in (€)	Date of Order	Date of Delivery
1.	Workstation HP Z2 Tower G5 Workstation Windows Professional 64 Intel Core i7-10700 processor	4	5990	23960	5031.6	8/11/21	30/12/21
2.	Laptop Surface Laptop 4, 71C-00018	4	5950	23800	4998.00	8/11/21	30/12/21

3.	Printer HP MFP M128	1	2040	2040	428.40	8/11/21	30/12/21
4.	Microsoft Surface Laptop 4 Edition AMD Ryzen-5 256 GB 16G	1	5000	5000	1050.00	27/10/22	31/10/22
5.	HP Z2 G9 Tower workstation Desktop PC	1	5800	5800	1218.00	27/10/22	31/10/22
6.	Nanlite Cn-Lumipad 25 Led Light Pad	1	1100	1100	231.00	16/10/22	17/1/23
7.	Samsung Smart Tv 65 Inch	3	4150	12450	2614.45	16/10/22	17/1/23
8.	KALOC Height Adjustable Multimedia Carts Tv Mounts For 50- 80inch - Ts190-Blk	3	1235	3705	778.03	16/10/22	17/1/23
9.	Yamaha 12" Passive Speaker Cbr12	1	3689	3689	774.67	16/10/22	17/1/23
10.	Power Amplifier - Behringer Km750 750-Watt 2-Channel	1	2890	2890	606.89	16/10/22	17/1/23
11.	Videowall Controller	1	4500	4500	944.98	16/10/22	17/1/23
12.	Auctopus Usb	1	7500	7500	1574.97	16/10/22	17/1/23
13.	Wireless Mic (2 Unit In 1 Set)	2	3000	6000	1259.98	16/10/22	17/1/23
	Total Purchases			102,434	21,510.97		

2. UTM

Dekstops



Laptops



Printer

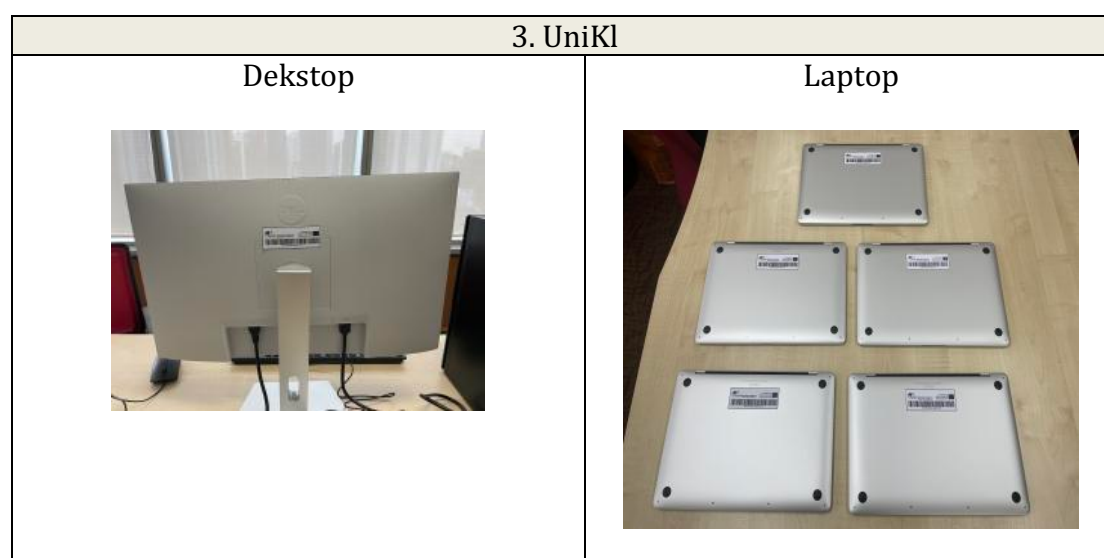


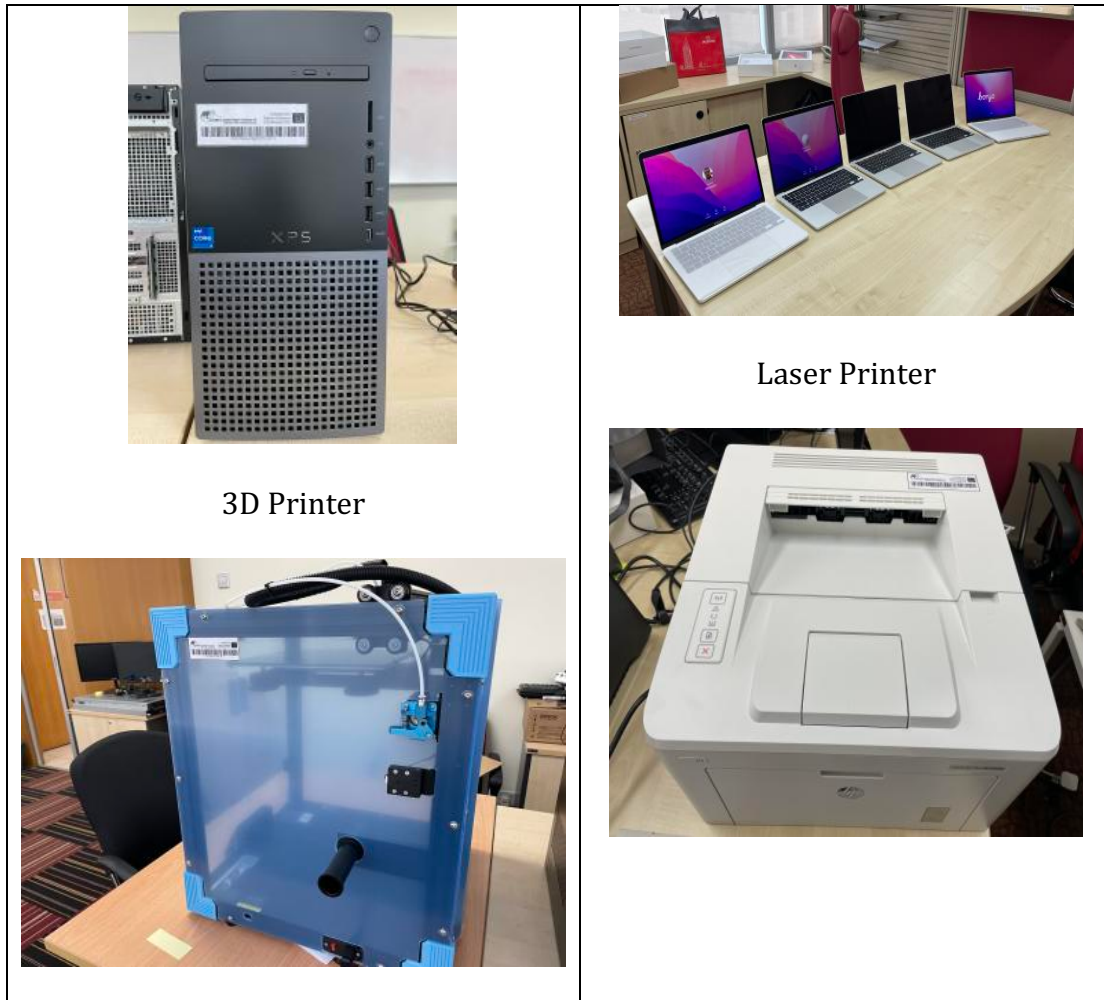
Smart TV



Table 14: Actual Equipment Ordering, Price, and Delivery Date of PO3 - UniKL

Name of Institutions: Universiti Kuala Lumpur (UniKL)							
No	Equipment & Model Ordered	Unit	Price per Item (RM)	Total price in local Currency (RM)	Total price in (€)	Date of Order	Date of Delivery
1.	Laptop Apple Macbook Pro 13"with Accessories: - USB-C Digital AV Multiport Adapter - USB-C Gigabit Ethernet Adapter - Magic Mouse	5	10,000	50,000	11,003.05	28/4/22	10/6/22
2.	High-end Desktop with LED Monitor (Dell XPS)	5	7,600	38,000	8362.32	28/4/22	10/6/22
3.	3D Printer	1	7,000	7,000	1540.42	28/4/22	10/6/22
4.	Printer (HP LaserJet Pro M203DW)	1	1500	1500	330.09	28/4/22	10/6/22
Total Purchases				96,500	21,235.89		





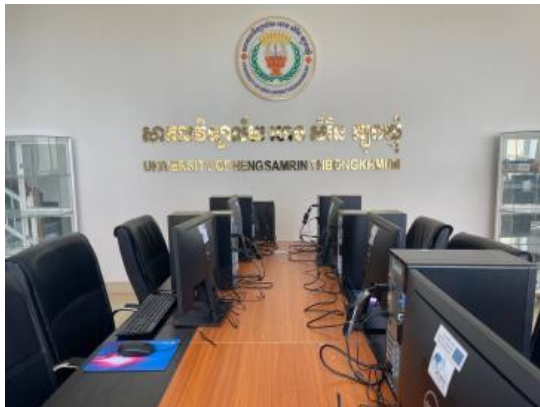



3D Printer

Laser Printer

Table 15: Actual Equipment Ordering, Price, and Delivery Date of PO4 – UHST

Name of Institutions: University of Heng Samrin Thbongkhmum (UHST)							
No	Equipment & Model Ordered	Unit	Price per Item (USD)	Total price in local Currency (USD)	Total price in (€)	Date of Order (agreement signed)	Date of Delivery
1.	Dell OptiPlex 7070MT	5	1,065	5,325	4489.88	10 June 2021	1 st July 2021
2.	Microsoft Surface Laptop	1	2,685	2,685	2263.99	10 June 2021	1 st July 2021
3.	Lenovo Yoga S730-13IWL (13.3" None Touch)	4	1,565	6,260	5278.26	10 June 2021	1 st July 2021
4.	Printer HP MFP-M227fdn (print, scan, and copy)	1	440	440	370.99	10 June 2021	1 st July 2021

5.	Samsung Smart TV 65" TU7000 Crystal UHD 4k	1	1,375	1,375	1159.35	10 June 2021	1st July 2021
6.	3D Printer, Model: Ultimaker S3	1	7,986	7,986	6733.56	10 June 2021	1st July 2021
7.	LCD Projector, Sony VPL EX430 (ANSI:4200lm)	1	710	710	598.66	10 June 2021	1st July 2021
Total Purchases				24,781	20,894.60		

4. UHST	
Dekstop	Laptop
 	 

Projector

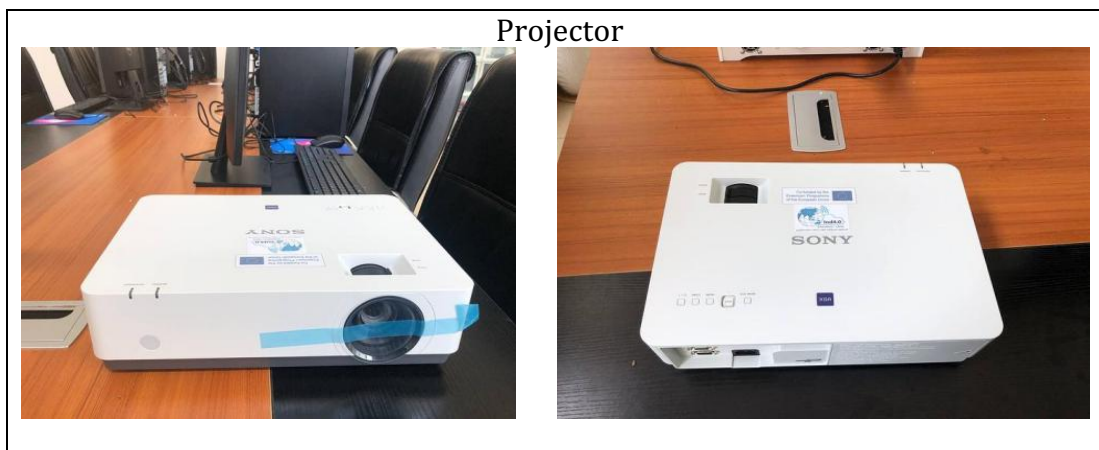


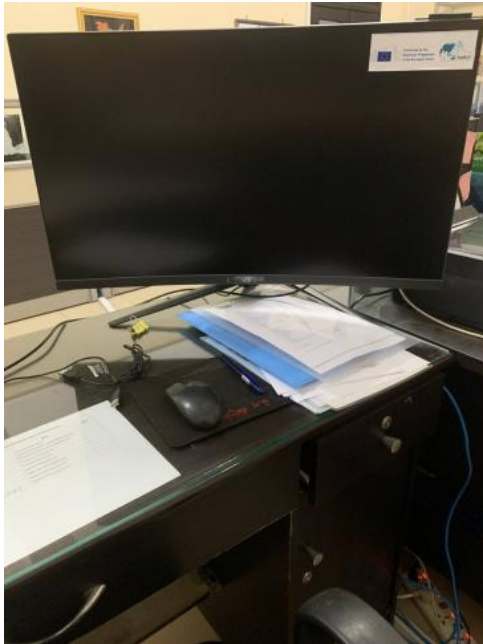
Table 16: Actual Equipment Ordering, Price, and Delivery Date of PO5 - NUBB

Name of Institutions: National University of Battambang (NUBB)							
No	Equipment & Model Ordered	Unit	Price per Item (\$)	Total price in local Currency (\$)	Total price in (€)	Date of Order	Date of Delivery
1.	Photocopy Machine Canon Image RUNNER 2006N	1	2,177	2,177	2,005.00	3 Aug 21	6 Aug 21
2.	LCD Projector Sony VPL-DW241	1	833	833	767.19	3 Aug 21	6 Aug 21
3.	Monitor Asus TUF Gaming XG32VQGaming Monitor - 31.5 inch Full	2	417	834	768.11	3 Aug 21	6 Aug 21
4.	High-end Laptops LI-426 Microsoft Surface Laptop3	1	2,856	2,856	2,630.38	3 Aug 21	6 Aug 21
5.	High-end Laptops Macbook Pro13.3"	3	1,785	5,355	4,931.96	3 Aug 21	6 Aug 21
6.	Desktops Dell Inspiron MT 3881	1	1,128	1,128	1,038.89	3 Aug 21	6 Aug 21
7.	Screen HIKVISION DS-D5A75RB/B	2	3,570	7,140	6,575.94	3 Aug 21	6 Aug 21
8.	Stand DS-D5ABL	2	393	786	723.91	3 Aug 21	6 Aug 21

9.	Screen Smart TV- Samsung75 VGA	1	1,309	1,309	1,205.6	3 Aug 21	6 Aug 21
10.	Stand for Samsung screen MobileBraket, Hikvision DS-D5ABL	1	322	322	296.56	3 Aug 21	6 Aug 21
	Total Purchases			22,740	20,943.54		

5. NUBB

Dekstop



Laptop



Printer



Monitor Asus

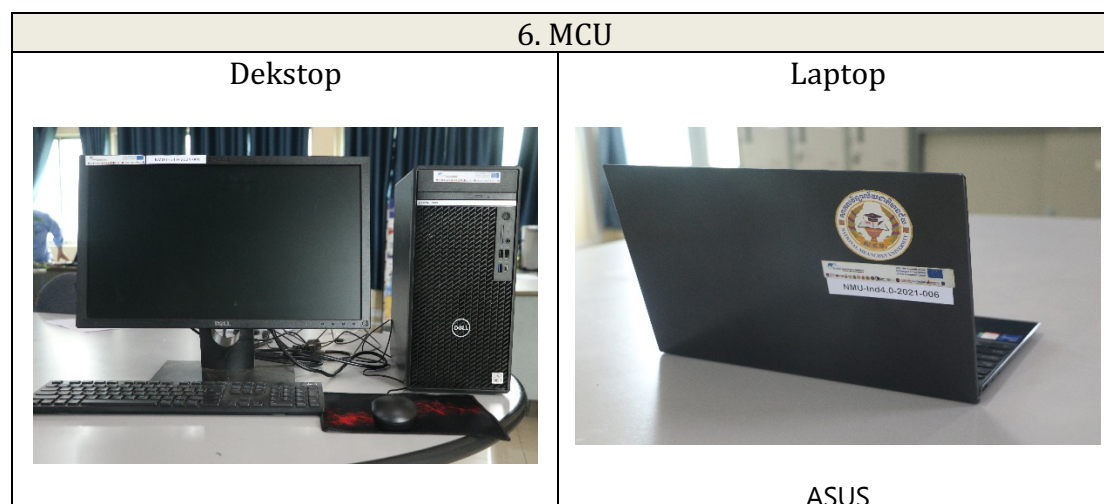


LCD Projector



Table 17: Actual Equipment Ordering, Price, and Delivery Date of PO6 - MCU

Name of Institutions: Mean Chey University (MCU)							
No	Equipment & Model Ordered	Unit	Price per Item (USD)	Total price (USD)	Total price in (€)	Date of Order	Date of Delivery
1.	Dell OptiPlex 7090 Tower XCTO,10th Generation	5	1,085	5,425	4,611.53	30 Oct 2021	05 Nov 2021
2.	ASUS UX425EA-KI440T 2G-PINE GREY(BEZEL)	5	1,530	7,650	6,502.89	30 Oct 2021	05 Nov 2021
3.	Printer HP MFP-M227fdw (Print, scan and copy)	1	440	440	374.02	30 Oct 2021	05 Nov 2021
4.	SAMSUNG 75" TU7000 Crystal UHD 4K Smart TV (2020)	1	1,550	1,550	1,317.58	30 Oct 2021	05 Nov 2021
5.	Blue 24-inch iMac with Apple M1 chip	2	2,560	5,120	4,352.26	30 Oct 2021	05 Nov 2021
6.	DS-D5A75RB/A Interactive Tablet 70-86" Inch All-In-One Smart Whiteboard + Smart TV for Education	1	4,500	4,500	3,825.23	30 Oct 2021	05 Nov 2021
Total Purchases				24,685.00	20,983.51		



Dell
(2021)
OptiPlex 7090 (DOM9KH3)



Dell
(2021)
OptiPlex 7090 (CFGS8G3)



Dell
(2021)
OptiPlex 7090 (20M9KH3)

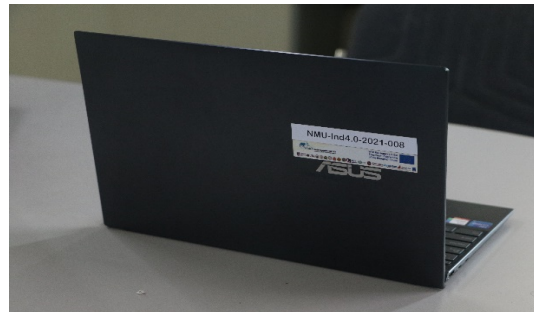


Dell
(2021)
OptiPlex 7090 (JZLGKH3)

(2021)
Zenbook (M8N0LP01R75833H)



ASUS
(2021)
Zenbook (M8N0LP01R764334)



ASUS
(2021)
Zenbook (M8N0LP01R75133C)



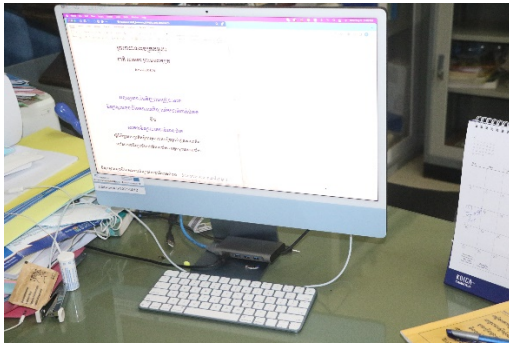
ASUS
(2021)
Zenbook (M8N0LP01R75433H)



Dell
(2021)
OptiPlex 7090 (61M9KH3)



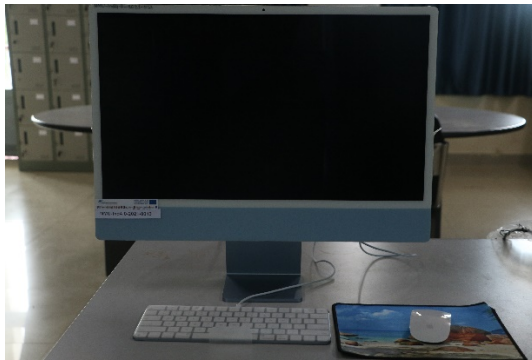
ASUS
(2021)
Zenbook (M8N0LP01R757335)



iMac
(2021)
Apple (CO2G908A125F)



SAMSUNG 75"
(2021)
OA1E3NJR100301H



iMac
(2021)
Apple (CO2G908B125F)

Smart Television

Printer Laser



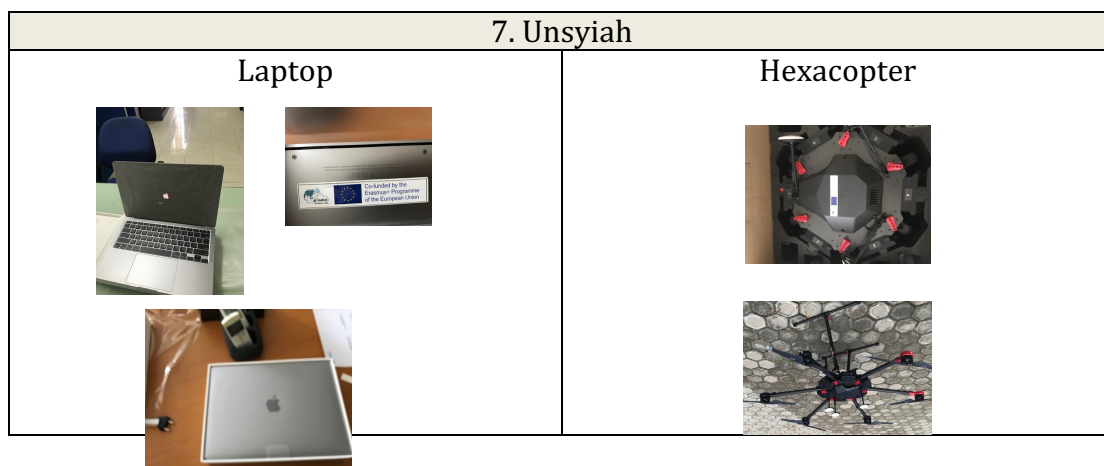
Smart TV86"
(2021)
HIKVISION (F59681686)



HP
(2021)
MFP-M227fdw (VNH4Y12018)

Table 18: Actual Equipment Ordering, Price, and Delivery Date of PO8 - Unsyiah

Name of Institutions: Syiah Kuala University (Unsyiah)							
No	Equipment & Model Ordered	Unit	Price per Item (Rp)	Total price in local Currency (Rp)	Total price in (€)	Date of Order	Date of Delivery
1.	MacBook Air (13 inci, M1 2020) 8GB RAM, 512GB SSD, Space Grey	3	26,450.00	79,350.00	4.800,60	08 November 2021	01 December 2021
2.	MacBook Pro (13 inci, M1, 2020) 8GB RAM, 512GB SSD, Space Grey	1	30,800.00	30,800.00	1.863,40	08 November 2021	01 December 2021
3.	MATRICE 600 PRO	1	125,150.00	125,150.00	7.571,60	08 November 2021	01 December 2021
4.	Aqua Drone Power Dolphin Wizard	1	18,750.00	18,750.00	1.134,40	08 November 2021	01 December 2021
5.	PRUSA I3 MK3S+ MMU	1	27,400.00	27,400.00	1.657,70	08 November 2021	01 December 2021
6.	Dragino Outdoor LoRaWAN Gateway	1	11,800.00	11,800.00	714,00	08 November 2021	01 December 2021
7.	Dragino LoRa IoT Starter Kit	5	5,140.00	25,700.00	1.555,00	08 November 2021	01 December 2021
8.	Raspberry Pi Model B - RAM 4 GB v1.2	46	1,695.00	10,170.00	615,60	08 November 2021	01 December 2021
9.	PYNQ Z2 Board Xilinx ZYNQ XC7Z020-1CLG400C	12	1,490.00	17,880.00	1.081,20	08 November 2021	01 December 2021
Total Purchases				347.000.00	20.993,50		








<p style="text-align: center;">Drone</p>  <p style="text-align: center;">LoRaWAN Gateway</p> 	<p style="text-align: center;">Multi Material Upgrade</p>  <p style="text-align: center;">LoRa IoT Starter Kit</p> 
<p style="text-align: center;">Raspberry Pi 4</p> 	

Table 19: Actual Equipment Ordering, Price, and Delivery Date of PO8 - USU

Name of Institutions: Universitas Sumatera Utara (USU)							
No	Equipment & Model Ordered	Unit	Price per Item (IDR)	Total price in local Currency (IDR)	Total price in (€)	Date of Order	Date of Delivery
1.	UR-3 Collaborative Robot	1	345,657,400	345,657,400	20,760		29 December 2021

2.	OnRobot RG2 Collaborative Gripper (Included in the UR-3 Collaborative Robot)	1	-	-	-	29 December 2021
3.	3D Printer Inova 20E series	1	17,342,600	17,342,600	1,020	29 December 2021
Total Purchases				363.000.000,00	21,780.00	

8. USU

Robot



3D Printer



