

Terms of Reference

Conducting Technical Training on Industry Certifications for Government Officials

1.0 BACKGROUND

The Information and Communication Technology Agency of Sri Lanka (ICTA) is the apex body in implementing the Government ICT policy and making recommendations for policies required for ICT based development in Sri Lanka aligning with the national development agenda. As part of the above agenda, ICTA is in the process of formulation and driving national level initiatives towards developing and empowering all sectors through the intervention of digital technologies. In this regard, Information and Communication Technology (ICT) for Government sector has been considered as one of the key development areas to be addressed.

In order to drive these initiatives the competencies of government officials in field of ICT needs be uplifted and the vision of the human resource capacity building initiative at ICTA is to facilitate this requirement through constant provision of training in areas identified through requirement gathering of these government officials. Conducting technical training on industry certifications for government officials is also a result of such an assessment of need. Through trainings such as these the aim is to bridge the gap that prevents the rapid expansion and implementation of digital government policies.

2.0 AIM AND OBJECTIVES OF THE ASSIGNMENT

The aim of this assignment is to procure a training provider for planning, developing, delivering and conducting the following preparation training programmes related to System Administration. The project should planned and delivered in 6 months.

The participants should obtain the required level of knowledge, skills and competencies specified. System Administration Training is planned to train 100 participants from Local Government Authorities.

Specific Objectives of this assignment are to,

- The objective of this training program is to uplift the ICT technical knowledge and skills of government officers who are responsible for maintaining a multi-user computer system including Local Area Network (LAN) and Information Systems
- Developing, organizing, and delivering system administration training program for 100 government officials as stated guidelines in the Annexure 1

3.0 SCOPE OF THE SERVICE

3.1 List of Activities -System Administration Training

- 3.1.1 Training provider shall plan and develop training programme to train 100 officers in Local Authorities.
- 3.1.2 Training programme should cover minimum course content and guidelines given in the Annex 01,
- 3.1.3 The training shall be conducted as minimum (4) batches
- 3.1.4 Training should be delivered not less than **Forty (40) hours** per participant.
- 3.1.5 The training period per batch would be consecutive 4-5 days.
- 3.1.6 The training should be interactive
- 3.1.7 The learner should follow Adult learning techniques for teachings
- 3.1.8 Develop training plan according to the modules provided in the course structure (minimum lessons to be covered),
- 3.1.9 Employ qualified lecturers(resource persons) to deliver lectures and required practical sessions ,
- 3.1.10 Develop, implement performance evaluation and Monitoring & Evaluation methodology for access the effectiveness of the training program.
- 3.1.11 Training provider is not expected to furnish cost for providing examinations for final industry certifications.
- 3.1.12 Training program is required to be delivered within Colombo city limits.
- 3.1.13 Provide a venue, laboratory facilities and arrange necessary infrastructure facilities for conducting the training program,
- 3.1.14 Training provider should select a suitable venue with facilities described in Table 1 - Infrastructure Facilities .

Table 1 : Infrastructure Facilities – per batch

Item	Description/Configurations	No of Units Required
Venue	Colombo city limits	N/A
Air Conditioned Computer Laboratory facilities	- Computers/ laptops (core i3 processor, 4GB RAM) - A lab will equipped with following (per	Item

	batch) - Minimum 25 computers - UPS 25 - Uninterrupted power supplies (UPS) for each computer - Uninterrupted Internet facility – minimum speed of 04Mbps (dedicated) - White board and writing materials - Any other relevant items to conduct the training	
Multimedia projector with screen	- Multimedia projector 5000 ANSI Lumens - 11’x 9’ projector screen - necessary caballing	01
Other facilities required for the training which are specified in the Annexure 1, Table ‘M1-Hardware’		Item

3.1.15 Conduct mock exam and provide a participatory certificate (110 Nos)

3.1.16 Training provider should provide necessary workshop materials mentioned as in Table 2 - Workshop materials.

Table 2: Workshop materials

Item	Description	No of Units Required
Training materials *1*2	- Developing content according to the modules described in the course structure (Annex 1) - Content should be in English Medium - Training materials should be printed according to following specifications. Cover : Art Board 260GSM 4 Colour Page size : A4 Art paper 100GSM Black and White	110
Certificates *1 (participatory)	- Size : A4 size - Art Board - Four colour printing (one side)	110

*1 Relevant texts and logos will be provided by ICTA. Layout should be designed by the vendor. However, prior approval for above should be sought before final production. Ownership of training materials shall be transferred to ICTA.

*2 If standard printed materials are available the vendor should facilitate to obtain such materials other than lecture notes.

3.1.17 Provide refreshments at training sessions, in morning and evening minimum with 2 snacks and Tea/Coffee

3.1.18 Schedule the exam for all and award the participatory certificate accordingly the exam and attendance.

3.2 Monitoring and Evaluation (M&E)

- 3.2.1 Collect baseline evaluation data from all the trainees and assess their knowledge, skills, attitudes and practices on technical domain.
- 3.2.2 All baseline data collection tools shall be prepared in consultation with ICTA.
- 3.2.3 Monitor training programs and sessions based on data providing a comprehensive monitoring report including progress being made, issues faced, etc. ICTA expects the training provider to work closely with M&E team of ICTA in gathering data generated through project activities.
- 3.2.4 Upon completion of each modules, conduct evaluation and grade trainees based on their skill levels.
- 3.2.5 Certificate to participants should be printed and given according to their performance at the evaluation.
- 3.2.6 Training provider shall provide ICTA with a complete evaluation report of each batch of trainees at the end of the course outlining activities conducted, achievement of results, identifying lessons learned and recommendations. ICTA expects training provider to include a trainee feedback analysis with a comparison of baseline data in to the final evaluation report.

3.3 Reports

- 3.3.1 Training provider shall submit an inception report which contains planned activities related to the assignment. This includes following but not limited to, training plan, allocation of resources and M&E training approach and methodology.
- 3.3.2 Training provider shall submit training reports on participant's attendance and feedback.
- 3.3.3 Training provider shall submit training completion report at the end of each batch providing evaluation of training performance and achievement of course objectives. Report should also include detailed information on participants, attendance, exam results, summary of feedbacks and training provider's suggestions/ comments for future training programs.

4 STRUCTURE OF THE TRAINING PROGRAM

4.1 System Administration Training

Training provider should conduct training as per the requirements mentioned below.

- 4.1.1 Training provider is expected to develop a training programme to cover the course contents specified in the Annexure 01.
- 4.2.1 Training should be delivered in following modules and should not be less than Forty (40) hours per participant.
- 4.3.1 Training provider is expected to complete four modules with theory and practical work with necessary tools giving preference for learning by doing as described in Annexure 01. Training provider is also encouraged to include any other value additions.
- 4.4.1 The training manual developed should cover the training content described in Annexure 01 and make this available to all individual participants as take the home material in English language.
- 4.5.1 Training to government officials should be provided at the training provider's facility with the necessary infrastructure, including Internet connectivity (if necessary) for each personal computer.
- 4.6.1 Trainers should be capable of delivering the course content in Sinhala, Tamil or English based on the language capabilities and preference of the trainees in each batch.
- 4.7.1 ICTA expects System Administration training to improve efficiency and effectiveness of using ICT applications and infrastructure whereby government employees would be able to maintain their own networks, computers hardware and software in their respective organizations. The training program is expected to train up to a maximum of 100 government officers.
- 4.8.1 Training providers should maintain a participant to instructor ratio of 5: 1 for the System Administration Skills Training with one main trainer (lecturer) per class.
- 4.9.1 Training provider shall appoint qualified and experience resource persons to conduct the training (resource persons required qualifications and experience are listed in Table 3).
- 4.10.1 Conduct exam for System Administration Training to evaluate the training objectives
- 4.11.1 Provide a participatory certificate (100) with minimum 80% attendance upon the exam.

5 RESOURCE PERSON QUALIFICATIONS

Team Composition and Qualification Requirements for the Resource Person

5.1. Minimum Qualification of the resource person

Table 3 : Minimum qualifications of the resource person

	Minimum Academic Qualification	Experience
Team leader	Degree from a recognized university	Minimum 3 years' experience in handling ICT training projects
Trainer – (1) [System Administration Training]	Industry Recognized Certification on ICT System Administration (A+, CCNA, Linux + etc.)	Minimum 3 years' experience in ICT technical training
Instructors (1) [Phase II - System Administration Training]	Recognized certification on ICT System Administration	Minimum 1-year experience in ICT technical training
Technical Assistant (1)	Recognized certification on computer Hardware	Minimum 1-year experience in computer hardware and troubleshooting

Note 1: Training providers should maintain a participant to instructor ratio of 5: 1 for the System Administration Skills Training with one main trainer (lecturer) per class.

Note 2: Training provider must provide adequate technical staff to ensure smooth functionality and to handle technical issues.

Note 3: Demonstrate ability to deliver training for a batch of minimum 20 participants

6 TIME SCHEDULE AND DELIVERABLES

6.1 Service Provider's Reporting Requirements and Deliverables

Milestone	Task	Timeline	Deliverable
1	Submission of Inception report and work plan Finalized training material for System Administration training programme, Finalized training plan, including class schedules, resources, M&E systems.	Commencement Date + 2 week	Inception Report including work plan Finalized training material for System Administration training programme, Finalized training plan, including class schedules, resources, feedback forms M&E systems.
2	Completion of minimum 25 students (batch 1) on System Administration Training	Commencement Date + 5 weeks	Up to minimum of 25 participants trained , award of participatory certificate for 25 trainees and Submission of Training Completion report , feedback analysis of the completed batch and M&E Report
3	Completion of minimum 25 students (batch 2) on System Administration Training	Commencement Date + 7 weeks	Up to minimum of 25 participants trained , award of participatory certificate for 25 trainees and Submission of Training Completion report, feedback analysis of the completed batch and M&E Report
4	Completion of minimum 25 students (batch 3) on System Administration Training	Commencement Date + 9 weeks	Up to minimum of 25 participants trained , award of participatory certificate for 25 trainees and Submission of Training Completion report, feedback analysis of the completed batch and M&E Report
5	Completion of minimum 25 students (batch 4) on System Administration Training	Commencement Date + 11 weeks	Up to minimum of 25 participants trained , award of participatory certificate for 25 trainees and Submission of Training Completion report, feedback analysis of the completed batch and M&E Report
6	Final Report	Commencement Date + 13 weeks	Submission of Final report including all aspects of the training requirements specified in the Terms of Reference , M & E report of the project , report on feedback analysis of the students

* All the above deliverables should be delivered in a manner acceptable to the review committee appointed by ICTA.

7 PAYMENT SCHEDULE

7.1 Service Provider's Reporting Requirements and Deliverables

Milestone	Task	Timeline	Deliverable	Payment Schedule
1	Submission of Inception report and work plan Finalized training material for System Administration training programme, Finalized training plan, including class schedules, resources, M&E systems.	Commencement Date + 2 week	Inception Report including work plan Finalized training material for System Administration training programme, Finalized training plan, including class schedules, resources, feedback forms M&E systems.	10% of the contract
2	Completion of minimum 25 students (batch 1) on System Administration Training	Commencement Date + 5 weeks	Up to minimum of 25 participants trained , award of participatory certificate for 25 trainees and Submission of Training Completion report , feedback analysis of the completed batch and M&E Report	20% of the contract
3	Completion of minimum 25 students (batch 2) on System Administration Training	Commencement Date + 7 weeks	Up to minimum of 25 participants trained , award of participatory certificate for 25 trainees and Submission of Training Completion report, feedback analysis of the completed batch and M&E Report	20% of the contract
4	Completion of minimum 25 students (batch 3) on System Administration Training	Commencement Date + 9 weeks	Up to minimum of 25 participants trained , award of participatory certificate for 25 trainees and Submission of Training Completion report, feedback analysis of the completed batch and M&E Report	20% of the contract
5	Completion of minimum 25 students (batch 4) on System Administration Training	Commencement Date + 11 weeks	Up to minimum of 25 participants trained , award of participatory certificate for 25 trainees and Submission of Training Completion report, feedback analysis of the completed batch and M&E Report	20% of the contract
6	Final Report	Commencement Date + 13 weeks	Submission of Final report including all aspects of the training requirements specified in the Terms of Reference , M & E report of the project , report on feedback analysis of the students	10% of the contract

8 CLIENT'S INPUTS

List of participants and their contact details.

Relevant texts, logos and content/guidelines which are required for course materials and certificates.

9 PROCEDURE FOR REVIEWING OUTPUTS

All outputs will be reviewed by a committee appointed by ICTA.

Annex 01 :

Course Structure : System Administration Training

Training Methodology

Training provider is expected to develop a training programme to cover the course contents specified below. Training should be delivered in following modules and should not be less than **Forty (40) hours** per participant. Training provider is expected to complete four modules with theory and practical work with necessary tools giving preference for learning by doing as described below. Training provider is also encouraged to include any other value additions. The training manual developed should cover the training content described below and make this available to all individual participants as take the home material in the English language. Training to government officials should be provided at the training provider’s facility with the necessary infrastructure, including Internet connectivity (if necessary) for each personal computer. Trainers should be capable of delivering the course content in Sinhala, Tamil or English based on the language capabilities and preference of the trainees in each batch.

ICTA expects System Administration training to improve efficiency and effectiveness of using ICT applications and infrastructure whereby government employees would be able to maintain their own networks, computers hardware and software in their respective organizations. The training program is expected to train up to a maximum of 100 government officers.

Module 1 – Hardware

The Hardware module requires the participant to know and recognize the basic physical set-up of personal computers and Servers as well as their functions:

Table – M1-Hardware

PC HARDWARE	
Category	Topics
Introduction to Personal Computer	Basic Components, Types of Computers
Motherboards	Function, Types, and differences
BIOS	Features, Upgrading
Microprocessors	Features, Types, Slots and Sockets
Memory	RAM, ROM, and Cache
Buses	Structure and Bandwidth, Types of buses
System Resources	I/O Port Addresses, IRQs, DMAs ,APIC , Managing
Interfaces	Parallel ATA, Serial ATA, FireWire, Infrared, Bluetooth, Memory Card, RAID Controller
Mass storage	Principles, Other Magnetic Medias

Video Display	Monitor, Graphics Adapter, Graphics Library
Printers	Types, Installing, and Managing
Network Hardware	Basic components, Network equipment, Network storage(NAS), Wi-Fi, Types, and Function, Connection Ports
Power Supply	Types and Functions, ESD, UPS
Installation of new hardware	Install and Replace Hardware
Diagnosing and Troubleshooting	Hardware Problems, <i>Giving Practical exercises</i>
Trends	Upcoming technologies and equipment
SERVER HARDWARE	
Category	Topics
Introduction to Servers	Basic Components, Types of Servers
Motherboards	Function, Types, and differences
BIOS	Features, Upgrading
Microprocessors	Features, Types, Slots and Sockets
Memory	RAM, ROM, and Cache
Buses	Structure and Bandwidth, Types of buses
System Resources	I/O Port Addresses, IRQs, DMAs ,APIC , Managing
Interfaces	Parallel ATA, SCSI, Serial ATA, FireWire, Infrared, Bluetooth, Memory Card, RAID Controller
Mass storage	principles, Tapes, SAN
Network Hardware	Basic components, Network equipment, Network storage(NAS), Types and Function, Connection Ports
Power Supply	Types and Functions, ESD, UPS
Installation of new hardware	Install and Replace Hardware
Diagnosing and Troubleshooting	Hardware Problems, with <i>practical exercises</i>
Trends	Upcoming technologies and equipment

Module 2 – Operating System

This module requires the participant to be familiar with the procedure of installing and updating the most common operating systems and applications especially CentOS, the server operating system which is being used by the LGN. The participant should be able to repair software problems that may occur and to help and perform network management functions. Also, he/she should know and handle the system tools, which are included in most operating systems and diagnose any problems at a PC system or a Network system, in order to repair the software problems.

PC	
Category	Topics
Operating System Fundamentals	Basic function
Install Operating System	Installation process, Dual O/S (Windows/Linux)
Operating System Organization	Boot Process
Using, configure and upgrade the	Operating system Interface, Configure the

operating system	Environment, Configuration files, Upgrading,
Disk management	File Management, File Systems , Disk Cache
Disk maintenance	Optimize disk performance
Memory	Memory Management
Install new Hardware	Hardware Installation, Plug and Play
Install new Application Software	Software installation
External Communication	Internet connection, Network, Internet browser, Mail Software,
Checking performance and monitoring events	Performance, Events
Diagnosing and Troubleshooting	<i>With practical exercises</i>

SERVER	
Category	Topics
Operating System Fundamentals	Basic function
Install Operating System	Installation process, Windows/ CentOS
Operating System Organization	Boot Process
Using, configure and upgrade the operating system	Operating system Interface, Configure the Environment, Configuration files, Upgrading,
Disk management	File Management, File Systems, Disk Cache, RAID
Disk maintenance	Optimize disk performance
Memory	Memory Management
Install new Hardware	Hardware Installation, Plug, and Play
Install new Application Software	Software installation
External Communication	Internet connection, Network, Internet browser, Mail Software,
Manage users and groups accounts	Add and remove users and groups, Set Properties,
Create and manage shared resources and account permissions	Create shared resources, Remove shared resources, Logical Network Drives, Manage account permissions
Manage Network Printers	Installing and managing printers,
Backups	Types of backups
Utilities	Administrative Tools, Disk administration utility, Network utilities,
Installing software	Install network operating system, Install and remove applications
Installation and Configuration	Installation and Configuration of an NIC, Network Protocol,
Sharing Internet Services	Installing Services
Checking performance and monitoring events	Performance, Events
Diagnosing and Troubleshooting	<i>With practical exercises</i>

Module 3 – Local Area Network and Network Services

This module requires the participant to be familiar with the procedure of installing, using and managing a local area network starting with the servers. He/ She should be able to add and remove users and shared resources. The participant should be able to repair the network problems.

Category	Topics
Network Fundamentals	OSI Model, Topologies, Types of Networks (LAN, MAN, and WAN), Protocols
LAN standards	Ethernet, FDDI, Wi-Fi
Internet connections	Modem Communication, ISDN communication, DSL communication, Sharing Internet Connections, IP Addressing, Subnetting
Configuration and Upgrading	Configuration, Upgrading
Diagnosing and Troubleshooting	Diagnose and resolve problems
Network Components	Hubs, Switches, Routers, Wireless Routers, Wireless Access Point and Controller
Network Management	Network Management tools and protocols

Module 4 – ICT Security

This module requires the participant to be familiar with the various ways of protecting data both in a single PC and in an LAN with an internet connection. More specifically the participant should be able to protect the company data from loss, virus attack and hacking. Also, he/she should be able to know and handle the most common utilities and programs designed for this purposes. Upon completion of this module, he/she should aware about ICT Laws in Sri Lanka.

Category	Topics
Basic concepts	6. Definition of Information 7. Information in an organizational context 8. Objectives of Information Security 9. Value of Cyber-crime trade 10. Information Security Management 11. Confidentiality, Integrity, Availability 12. Security Architecture (Operating Systems) 13. Identification, Authentication, Authorization, and Accounting
Risk Management	<ul style="list-style-type: none"> • Importance of Risk Management in IS • Vulnerabilities, Threats, Threat Agents, Risk, Security Controls • Risk Management Methodologies and Standards <ol style="list-style-type: none"> 1.) Risk Identification – in very brief 2.) Risk Assessment – in very brief 3.) Risk Treatment – in very brief 4.) Risk Acceptance – in very brief

<p>Threats and attacks</p>	<ol style="list-style-type: none"> 1. Attack vectors 2. Attacker profiles and Motives 3. Hackers (white hat, black hat) 4. Crackers 5. Reverse Engineers 6. Threats to confidentiality: <ol style="list-style-type: none"> 6.1 Unauthorized disclosure 6.2 Unauthorized Access 7. Threats to Integrity <ol style="list-style-type: none"> 7.1 Lack of validation <p>Intentional and Unintentional modification of data</p> <ol style="list-style-type: none"> 8. Threats to Availability <ol style="list-style-type: none"> 8.1 Denial of Service Attacks 8.2 Natural causes 8.3 Unintentional and intentional man-made causes 9. Common Threat realization techniques: <ul style="list-style-type: none"> ○ Malware ○ Virus, Worms, Spyware, Bots, Trojans, Rootkits, Keyloggers ○ Social Engineering ○ Phishing, Pharming, Phaxing, Masquerading ○ Exploiting Design and implementation flaws (in brief) ○ Buffer overflow ○ Cross-site scripting ○ Privilege escalation ○ Session hijacking ○ Man in the middle attacks ○ Replay attacks 10. Physical <ol style="list-style-type: none"> 10.1 Theft, destruction of assets 10.2 Insertion of interception devices (wiretaps, optical fiber taps, EM detectors) 10.3 Sniffers 10.4 Snooping
<p>Administrative Controls</p>	<ol style="list-style-type: none"> 11. IS Policies <ul style="list-style-type: none"> ○ Introduction ○ Business Continuity Management ○ Information Systems Acceptable use ○ The internet and E-mail security ○ Incident Management ○ Acquisition, development and maintenance of Hardware and software ○ Logical Access control ○ (Access Control Models: MAC, DAC, RBAC) ○ Single Sign-On (SSO) <p>Procedures, Standards, Guidelines, Plans, Schemes, Templates, Laws, Roles, and Responsibilities, Segregation</p>

Technical Controls	Firewalls (Network and host based), IDS/IPS (Network-based, Host-based), Access Control Lists, Proxy, VLAN, VPN, Cryptography (Encryption algorithms, Symmetric vs. Asymmetric, Public Key Infrastructure, Digital Signatures, Digital certificates, Hashing algorithms, message digests, integrity checking), OTP Tokens (two factor authentication), Password Management, Antivirus (issues: zero-day attacks, signature update, selection criteria), Phishing filters
Physical Controls	Biometric detectors, CCTV, Siting and equipment protection, physical registers
Computer Security Incident Management	Incident Identification, Incident response process, Audit trails (log management), Lessons learned, Computer Emergency Response Team (CERT), capturing and storing malware samples.
Special Security Activities	Vulnerability Assessment and Penetration Testing and tools, Security assessment vs. security audit, Training and Awareness, Managed Security Services (Security Operations Centers), Honeypots, Malware analysis (behavioral analysis vs. static analysis)
Social, Ethical and Legal Aspects of Computer Security	Basic concepts, IPR, protecting personal information, Computer Crimes Act no. 24 of 2007, e-transactions act no. 19, Payment Devices Frauds Act

Module 5

This module requires the participant to be conversant in relation to the Lanka Government Network (LGN). Content should include the following:

- One day Site visit an Agreed LGN site
- Introduction to Lanka Government Network
- LGN Site study
- Group Discussion and a Report
- One day Revision on completed modules, new techniques, and trends

Certification

- Upon successful completion of each module from module 1 to module 4, participants should be assessed by the training provider.
- After successful completion of all five modules participants to be given a competency-based certificate for the course followed.