Agenda

- ICT Technical Background.
- Knowledge Economy Model.
- Developing ICT Professionals & Curricula.
What Does IT Stand For?

Information and Technology:

1. Information: TEXT, AUDIO, VIDEO.
2. Technology: COMPUTERS, LAPTOPS, NOTEBOOKS, SMARTPHONES, PDAs.
HOW DATA IS TRANSMITTED?

- Exchange of Data Between Two or More Machines.
  - Wired Connections: CABLES, FIBEROPTICS.
    - Medium: COPPER, GLASS.
  - Wireless Connections: SATELLITES, ANTENNAS.
    - Medium: AIR.
HOW DO MACHINES TALK WITH EACH OTHER?

- Machines Must Speak the same Understandable Language by Others.
- Messages and Data are BROADCASTED Over a Medium.
- Information is Transmitted and Exchanged Between Computers Using Communication Protocols.

- The Open Systems Interconnection (OSI) Model: STANDARD
  1. **Application**: DATA PROCESSING, WEB-BROWSER.
  2. **Presentation**: DATA REPRESENTATION, **ENCRYPTION**.
  3. **Session**: INTERHOST COMMUNICATION.
  4. **Transport**: END-TO-END CONNECTIONS, RELIABILITY.
  5. **Network**: LOGICAL ADDRESSING (IP).
  6. **Data Link**: PHYSICAL ADDRESSING (MAC).
  7. **Physical**: MEDIUM, SIGNAL.
INFORMATION, TECHNOLOGY, AND COMMUNICATION NETWORKS ARE USED?

Information and Communications Technology (ICT).

Are Transmitted Data and Communication Networks Secure?

To a Certain Point ‘YES’ Depending on:

- Type of Networks:
  1. PRIVATE NETWORKS (INTRANET).
  2. PUBLIC NETWORK (INTERNET).

- Transmitted Data is Encrypted or NOT:
  1. COMPLEXITY OF ENCRYPTION ALGORITHMS.
  2. ENCRYPTION/DECRYPTION KEYS.
HOW DATA/MESSAGES ARE SECURELY EXCHANGED OVER THE INTERNET?

INTERNET is a Public Network.

Data Sent From a Source (Machine m) to Destination (Machine n):
- Travels From one Node or Router (Machine i) to the Next (Machine i+1).
- Follows an ‘Optimized Routing Path’ Until it Reaches Destination (Machine n).
- Random Machine (Machine p) can Read Transmitted Data.
- How Personal and Sensitive Data are Secured?
  1. Encrypting Sent Data.
  2. Decrypting Received Data.

EX: INTERNET Banking - CIPHER STRENGTH OF 128-BIT.

SOURCE: Client in Fiji

DESTINATION: Server in Japan

SOMEBWHERE in the World

INTERNET
KNOWLEDGE ECONOMY

EFFICIENT USE OF EXISTING KNOWLEDGE

EDUCATION

INNOVATION

ICT INFRASTRUCTURE

Collaboration, Support, and Commitment from Academic and Research Institutions, Government, and Industry.

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SPECIALISTS ARE NEEDED TO DESIGN, MANAGE, AND SUPPORT ICT INFRASTRUCTURE?

- Demand for ICT graduates by:
  - IT Industry.
  - Telecommunications Sector.
- Universities are Responding by Using:
  - Real Market Data Analysis.
  - Locale and Regional Demand.
  - Students Career Perceptions.
- Universities Need to Develop Specialized ICT Degree Programmes:
  - Bachelor (B) in:
    - Software Engineering (SE).
    - Electronic Engineering (EE).
    - Information System (IS).
    - Communications Engineering (ComE).
    - Computer Science (CS).
    - Computer Engineering (CE).

Professional Accreditation of ICT degrees by international professional bodies:

1. Institute of Electrical and Electronics Engineers (IEEE).
2. Association for Computing Machinery (ACM).
WHAT ICT DEGREE PROGRAMME TO OFFER?

- Physical & Data Link Layers of the OSI Model:
  - Processing Hardware.
  - Pipelining Architectures.
  - ISDN/ADSL Technologies.
  - Mobile/Wireless Communication Techniques.

- Electronic Engineering, Communications Engineering & Computer Engineering Cover the First Two OSI Layers.
  - Specialized Laboratories are Required.
  - Specialized Academic Staff Members are Required.
  - Industry-University Partnerships are Essential.

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WHAT ICT DEGREE PROGRAMME TO OFFER?

- **Network & Transport** Layers of the OSI Model:
  - TCP/IP Protocol.
  - Network Management.
  - VoD Communication Protocol.
  - VoIP Services.

- **Computer Science, Communications Engineering & Computer Engineering** are Necessary.
  - CISCO Certification is Necessary.
  - Specialized Laboratories are Needed.
  - Specialized Academic Staff Members are Required.
  - Industry-University Partnerships are Essential.
WHAT ICT DEGREE PROGRAMME TO OFFER?

- **Session & Presentation** Layers of the OSI Model:
  - Network Security.
  - Encryption Algorithms.
  - Distributed Processing Environment.
  - Grid/Cloud Computing.

- **Computer Science, Communications Engineering, Software Engineering, & Information System** Degree Programmes are Essential.
  - Advanced Programming Techniques and Environments are Required.
  - Specialized Academic Staff Members are Required.
  - Industry-University Partnerships are Essential.

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WHAT ICT DEGREE PROGRAMME TO OFFER?

- Application Layer of the OSI Model:
  - Networked Applications.
  - Mobile Applications.
  - Wireless Applications.
  - E-government Applications.
  - E-commerce Applications.
  - E-learning Applications.

- Represents Great Opportunity for Fiji Graduates.

- Computer Science, Communications Engineering, Software Engineering, & Information System Degree Programmes Graduates are Needed.
  - Certification of Software Developers is Required.
  - **Incubate** Software Development Start-up Companies.
  - Certification of Software Houses.

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ICT DEGREE PROGRAMMES GRADUATE EXIT REQUIREMENTS?

- **Management Skills:**
  - Economics.
  - Accounting.
  - Business Planning.
  - Ethical Practices.
  - Engineering Law.

- **Communications Skills:**
  - Oral/Written.
  - Technical Presentations.
  - Technical Reports.

- **Project Management Skills:**
  - Design and Development.
  - Implementation and Verification.
  - Team Building.

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THANK YOU!