International Centre for Organisational Management

MBA AND DIPLOMA IN TELECOMMUNICATIONS MANAGEMENT

INTRODUCTION

Our world is dominated by the information and communication revolution, by rapid technological innovation, globalisation and by financial market uncertainty. The organisations of the future see these changes as opportunities not threats. They will mould the changes to achieve global competitive advantage.

The engine of this worldwide revolution is fuelled by two areas of convergence:

- Ø First, telecommunications and information technology have formed a single discipline.
- Ø Second, the telecoms, television, computing, publishing and information services industries are merging.

A new telecoms industry is taking shape.

The communications industry is at the centre of this global revolution. Companies have evolved from state-owned monopolies to customer-centred, market driven, enterprises in regulated but competitive global markets where partnerships and the emergence of new companies is the norm. New skills and knowledge have to be acquired and a culture of innovation, responsiveness and continuous learning has to be created to general business value. Engineers and other specialists have to take on management and leadership responsibilities.

The MBA and Diplomas programmes were designed by ICOM's faculty to address these issues. It was concerned with developing management and technical skills within a strategic awareness of the business context of the communications industry. It was piloted in Singapore Telecoms and PT Telkom Indonesia, where 20 senior managers did a two-year part-time, action learning MBA programme. The technical part of the programme was taught by former senior managers from British Telecoms who had become professors in University College London and by faculty of the International Telecommunications Unit (ITU). Faculty from the National University of Singapore and representatives of the Regulators were also involved. The management process was led by the ICOM faculty programme director and faculty from Bradford University Management Centre. This programme was further developed as a Cambridge University (UCLES) Diploma in Telecommunications Management for P.T. Telkom, Indonesia.

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CONTENT OF WORKSHOPS

Workshop 1 - Globalisation of Telecommunications

The traditional correspondent cartel for global communications is now breaking down and a small number of major global alliances are emerging as significant competitors for this market. This session will examine the drivers and players together with the various forms of partnership.

International telecommunications

- Correspondent trading, refile etc.
- International networks.
- Global telecommunications market.
- Sector pressures and structural changes.
- Global bandwidth market.
- Bandwidth brokering.

Global competition

- Players and target markets.
- Opportunities and competitive strategies.
- Entry, build and breakout strategies.
- Customer access.
- Network plans and economics.
- Organic and inorganic strategies.
- Target markets.

Partnerships

- Types of partnership and relationship.
- Identifying partners, natural allies.
- Value chain aspects.
- Branding implications.
- Stakeholder implications, shareholder expectations.
- Success and failure modes.

Strategic Options

- New players vs. Incumbent.
- Competition.
- Service mix.
- Deployment strategies

Workshop 2 - Telecommunication Systems

The pace of technological development continues to increase and is resulting in fundamental changes to the telecommunications industry. The impact of a disruptive technology on an existing market can be extremely painful for dominant operators. An appreciation of the application of technological developments to modern telecommunications systems is therefore essential to the understanding of the industry.

Transmission

- PCM principles.
- FDM systems.
- PDH systems.
- SDH systems.
- Optical fibre systems, WDM principles.
- Microwave radio systems.
- Satellite systems.
- ISDN.

Switching

- Principles of switching systems.
- Principles of digital switching, basic architecture, space and time switching, call processing, modularity.
- Line [loop] interface, BORTSCH functions.
- Stored programme control.
- Message and packet switching principles.
- Intelligent network platform and standards.

Signalling

- Signalling requirements [access and core].
- Channel associated signalling.
- Common channel signalling.
- ITU-SS7, protocols, relationship to ISO model.
- Access signalling.
- Private network signalling.

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Workshop 3 - Communications Networks

The network is an important internal revenue driver since it's capability determines the service portfolio, it's costs influence tariffs, it's performance influences quality of service and it's local loop provides a connection to customers. The network also consumes a major proportion of operating costs and generates much of the need for capital. This module builds on the systems module by providing an understanding of how the elements are interconnected to provide a cost-effective network.

Public Switched Telephone Network

- Layered architecture.
- Control structure.
- Teletraffic theory: traffic intensity, traffic characteristics, blocking, Grade of Service, measurement of traffic.
- Traffic routeing, routing strategies [AAR, ARR and DAR].
- Design and dimensioning of switched network.
- Network synchronisation.
- Signalling networks.

Access Network [Local Loop]

- Structure of local loop.
- Dimensioning of network.

Numbering and Addressing

- International plan, national plans and their expansion, linked numbering schemes.
- Number portability, personal numbering.
- Data numbering schemes, IP addressing.
- Interworking of numbering schemes.

Data Networks

- Connection-oriented and connectionless working.
- Layering and the OSI model.
- X.25, Frame Relay, SMDS and IP networks.
- Protocols.

Transmission Bearer Network

- Structure and architecture.
- Plesiochronous, synchronous and WDM networks.
- Relationship to switched networks.
- Dimensioning.

Network Performance

- Performance parameters.
- Relationship to quality of service.

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Workshop 4 - Telecommunications Operations and Project Management

Efficient and effective operations are key to profit growth and good customer service. This module deals with modern operational processes and their enhancement by the use of computer support systems. Also covered is the increasingly important topic of customer service and satisfaction.

Field Operations

- Process management and re-engineering.
- Provision of service.
- Maintenance.
- Computer assisted work management.
- Jeopardy management.
- Relationship to quality of service.
- Field productivity.
- Organisation - front office, back office, field force.

Network Management

- System architecture, TMN standards.
- Processes and workstrings.
- Functional areas.
- Traffic management.
- Computer support systems.

Customer Service

- Quality of service and relationship to network performance.
- Service surround.
- Customer satisfaction measures, tail management.
- Service management.
- Call centres - Inbound, outbound, dimensioning, organisation and staffing.
- Computer support systems.
- Productivity vs cost.

Network Planning

- Growth planning [core and access, switched and transmission networks].
- Economic design periods.
- Works planning and execution.
- Equipment procurement and supply chain management.
- Computer support systems.

Project Management

- Methodology - critical path techniques.
- Risk appraisal and management.
- Financial control.
- Project appraisal.
- Telecommunication applications.

Workshop 5 - Broadband Networks

The emerging information society will demand high quality multimedia and e-commerce services that cannot be satisfied by traditional [64 kbit/s] public switched telephone networks. Ever-higher bit rates will need to be delivered to customer equipment and this module deals with the various techniques to achieve this.

Broadband Switching Systems

- Connection modes, Connectionless, Connection oriented.
- Protocols.
- Tunnelling.
- Virtual Paths etc.
- Transport evolution.
- IP., ATM.
- Frame relay.
- SMDS.
- ATM/IP options.
- Quality of service.
- Routeing, flow control and policing.
- Switched optical networks.

Broadband Transmission Systems

- SDH.
- DWDM.

Access evolution

- xDSL.
- PON.
- HFC.
- WILL.
- Access economics.

Control evolution

- Middleware
- APIs/Parlay.
- Active networks.
- Network intelligence.

Internet

- Structure.
- Traffic characteristics.
- PSTN problems.
- Internet Streaming.
- PoPs/Virtual PoPs.
- Bypass routes.
- VoIP.

Evolution

- Architecture.
- Options.
- Interworking.

Core broadband economics

LANs, MANs and WANs

Workshop 6 – Mobility

Probably the most rapidly moving and important field of telecommunications as demonstrated by the phenomenal uptake of mobile services by all sectors of the community. This module not only aims to give a thorough grounding of the principles of all forms of mobile communications, but also deals with the evolution to third generation systems and the rich portfolio of service opportunities that it will facilitate.

Propagation Fundamentals

Cellular concepts

- Network architecture and system operation.
- Signalling.
- Planning.
- Cell splitting for growth.
- Analogue and digital systems, GSM, SMS.
- Access techniques - FDMA, TDMA and CDMA.

Spectrum management

- Spectrum allocation.
- Auctions.

Technology evolution

- WAP.
- HSCSD.
- EDGE.
- GPRS.
- UMTS.
- CAMEL.

Satellite systems

- LEO and MEO.

Paging Systems

- POSAG, ERMES and FLEX.

Private Mobile Radio Systems

- TETRA and DAWS.

Service evolution

- Services.
- Pricing options.
- Disruptive pricing.
- Value chain and players.
- Market analysis.
- Channels to market.

Fixed Mobile

- DECT.
- Wireless PABX and LAN.
- Personal numbering and contactability management.
- Fixed/mobile integration.
- Fixed mobile interconnect.
- Interconnect pricing.
- Fixed/mobile convergence.

Terminal evolution

- PDAs.
- Multi-band.
- Multimedia.

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Workshop 7 - Service and Deployment Economics

Communication services are the life-blood of telecommunications operators and, in a competitive environment there are pressures to market an ever expanding and balanced portfolio of services that are well managed to give customer satisfaction and profit. This model provides a comprehensive understanding of the process of bringing new services to market, from recognising market opportunities through constructing a plausible and persuasive business case to development and launch.

Market analysis

- Opportunities.
- Requirements capture.
- Proposition.
- Marketing Mix.
- Forecasting.

Service engineering options

- Interpretation of requirements.
- Service types.
- Service engineering.
- Service description.
- Service architecture.
- Buy vs in-house development.
- Solution design, disruptive and stabilising technologies, technology trends, Moore's Law and Medcalf's Law.
- Development methodology, software development, waterfall model, testing.
- Scalability.
- Customer interface.
- Product launch process.
- Deployment and network enhancement options.

Network Performance

- Customer satisfaction vs solution performance.
- Preservation of network integrity, feature interaction.

Product Management

- Product/services lifecycles.
- Boston matrix and directional policy matrix.
- Portfolio management.
- Translation from customer requirements to service definition, technical specification and service engineering.
- Product/service launch process.
- Product/service management.
- Product/service withdrawal.
- Service solutions.
- Pricing.
- Profitability of products/services.
- Investment management.
- Capex and Currex.
- R&D.
- Equipment supplier strategy and management.

Infrastructure Economics

- Network optimisation, optimisation parameters.
- Network sector cost structure.
- Scale economies.
- Fixed variable and marginal costs.
- Modularisation aspects.
- Capital and current account drivers.
- Cost forecasting and trending.

Business Cases

- Business case drivers and risks.
- Types of business case [services, technology, new ventures].
- Structure of business case.
- Business case process.
- Authorising levels.
- Authorising process.
- Investment appraisal.
- DCF techniques.
- Risk and sensitivity analysis.
- Critical success factors.
- Dynamics of service adoption.
- Cost evaluation.
- Budgeting.

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Workshop 8 – Infocoms

The information era has now arrived as demonstrated by the explosive growth of the Internet and its use to deliver e-services. However, the stage of evolution is still embryonic but rapidly developing. The impact on telecommunication operators will be profound, ranging from the emergence of new and powerful competitors to additional revenue opportunities. This module will provide a broad grounding of the current situation and will explore likely future developments.

Market

- Market sectors and services.

e-Commerce

- Principles of e-Commerce.
- Technology requirements.
- Players.
- e-companies.
- Portals and vortals.
- Competition analysis.
- Web marketing.
- Security.
- Parameters - authentication, access control, data confidentiality, integrity, non-repudiation.
- Encryption.
- Secure payment systems.
- Quality of service issues.
- Commercial model.
- Value chain and positioning of actors.
- Partnerships.
- Standards.
- Regulation issues.
- Architecture models [e.g. DAVIC, enterprise model etc. ETSI EII reference model, distributed systems model].

Cyberspace

- Community networks.
- Community of interest networks [COINs]
- Home networks.
- Personal virtual networks.
- Content retrieval/data mining.
- Networked workplace.

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