

## IS 4400 – Management of Technology

### Lesson 03 – Managing Technological Components

Faculty of IT, University of Moratuwa

### Process and Product Technology

- Product technology
  - Technology embedded within products/services
- Process technology
  - Used to create and deliver products and services

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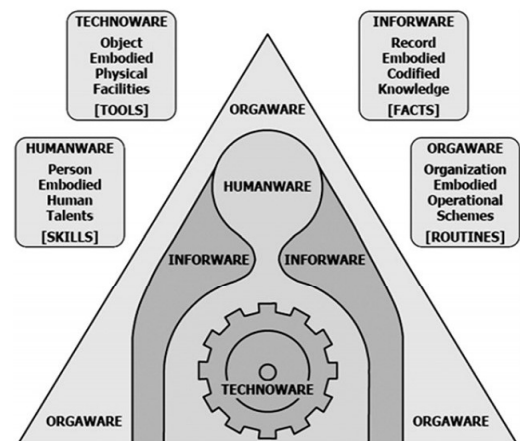
### Components of Process Technology

- Consist of commonly available embodiment forms of technology for conversion of inputs to marketable outputs
  - Technoware: object-embodied/physical facilities
  - Humanware: human- embodied/human abilities
  - Inforware: information-embodied/documented facts
  - Orgaware: institution-embodied/organizational framework

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### Interacting components of Technology



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### Technoware

- Object-embodied technology, called physical facilities or technoware
- Technoware carries out necessary "transformations" based on set of "decisions" to generate desired output

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### Humanware

- Personal embodied skills such as craftsmanship, knowledge, expertise, creativity needed to realize potential of technoware
- Humanware consists of,
  - Contact Humanware - skills of operators
  - Support humanware - skills of maintenance crew
    - Skills to develop software to operate machines, repair machines, control production, QA
- Changes through process of progressive learning of new things

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## Orgaware

- Organization-embodied technology
- Effective organizational support needed to make best use of technoware and humanware
- Exemplified by operational technologies such as methods, techniques, linkages, practices
- Coordinate all productive activities of enterprise for achieving purposeful results

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## Inforware

- Refers to record embodied or documented facts
  - i.e. facts and formulae, design parameters, specifications, manuals, theories, blue prints, etc.
- Enables quicker learning and savings in time and resources



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## IS 4400 – Management of Technology

### Lesson 04 – Technological Capabilities

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## Technological Capabilities - Introduction

- Technological capabilities leverage competition
- Availability of four technological components is a necessity, but not sufficient for competition
  - Technology components does not generate power for competition



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## Technological Capability: Classification 1

- Internal capabilities
  - Organizational ability to effectively use these assets
- Strategic capabilities
  - Understanding of opportunities and companies own capabilities need to be matched together
- External capabilities (Networking)
  - Accessing other business partners who have useful complementary assets and capabilities

Source : Erik Arnold, Ben Thuriaux (1997), Developing Firms' Technological Capabilities

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## Technological Capability – Classification 2

- Operative Capability
- Innovative Capability
- Transactional Capability
- Supportive Capability



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## Operative Capability

- Continuation ability to effectively transform inputs into outputs in accordance with business strategy of firm
  - Using available plant and machinery
  - Plan and control production process
  - Troubleshooting and good predictive, preventive and emergency maintenance
  - Usage of information and control

## Innovative Capability

- Enable them to define and develop competences to create competitive advantage
  - Types of innovation
    - Product, process, position, paradigm innovation
  - Incremental innovation: Refine and extend established designs and components
  - Radical innovation: New set of core components, usually new specific phenomena

## Transactional Capability

- Ability of firm to effectively plan and engage in technological transactions
  - Justify and specify technologies to be bought and sold
  - Suitable sellers and buyers of technology and assessing strategic recourse and technological match
  - Suitable mechanism for buying and selling, negotiating effective terms

## Supportive Capability

- Organizations often establish organizational routines to maximize efficiency of their business operations and achieve reliable outcomes
- Supports to form unique set of organizational routines

## Technological Components and Capabilities - Interrelationship

