SECTION 5 (14.00 - 14.45):
The Product Development Process

What are the stages of product development?

5th Section - Learning objectives

To be able to:
1. List the benefits of a formalised product development process.
2. Explain what is meant by a stage-gate process.
3. Determine which development process models are most suitable.
4. Formulate a complete process model for your project.

The benefits of a well formed process

- **Quality Assurance**: provides checkpoint for the process
- **Coordination**: exchange of information
- **Planning**: milestones, completion of planning schedule
- **Management**: process to benchmark ongoing process
- **Improvement**: careful documentation of organisation development process used to identify areas of improvement

Why formalise a Product Development Process?

What do Process Models consider?

<table>
<thead>
<tr>
<th>Process Models consider</th>
<th>Description</th>
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<tbody>
<tr>
<td>Many alternative product concepts</td>
<td>Increase specification of product</td>
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<tr>
<td>Information processing</td>
<td>Input and processing of information</td>
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<tr>
<td>Risk Management: Various risks</td>
<td>Assess and reduce risks</td>
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<td></td>
<td>Confidence in product functions and that well received in market</td>
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Product Development Process Models

What is a stage-gate process?

Product Development Process

Decision Gates in Drug Development

Product Development Process at a Project Level

Drug Discovery and Development Process
The activities below are not always linear in fashion. The activities may overlap in terms of time and iteration (repetition) is often necessary due to new information or results.

Concept Development

Drug Discovery Process

1) Selection and validation of target areas for drug research - how and why a certain drug mechanism or target is chosen and validated?
2) Drug synthesis and drug characterisation
3) Pharmacology: drug screening of potential development candidates, efficacy evaluation and preclinical safety
4) Drug formulation, analysis and stability for entry into man
5) Costs assessment - is there sufficient market potential and profit to justify drug development?
6) Toxicology of a drug including acute/subacute/chronic toxicology, teratology, mutagenicity, carcinogenicity

Drug Development Process

Well regulated, often reason for failure, can be outsourced

Costs Committed Product Life Cycle

Majority of design costs committed during early stages

Source: DG Cooper, Winning at New Products

Adapting the Product Development Process

Technology-Push Products
- A firm begins with a new technology, then finds an appropriate market
  - the post-it note
  - Gore-Tex Rainwear
- Planning phase involves matching the technology to the market
- Technology fixed for concept stage

Platform Products
- A firm assumes that the new product will be built around an established technological sub-system
  - Consumer electronics, computers, printers
  - PT Cruiser – Dodge Neon
  - Concept phase, assumes a proven platform

Process-Intensive Products
- Characteristics of the product are highly constrained by the production process.
  - Both the product and the process must be developed together from the very start, or an existing production process must be identified first
  - Frito-Lay snack foods, chemicals, semiconductors, computer memory

Customised Products
- New products are slight variations of existing configurations
  - Examples include:
    - Switches
    - Motors
    - Batteries
    - Containers
Case Study. AMF Bowling

**Product**
- Bowling equipment, includes pin spotters, ball returns, scoring equipment
- Market-pull enterprise seeks out technology required

**Competitive advantage**
- Strong marketing
- Brand recognition
- Large installed base of equipment: no single technology

**AMF Products**
- Assembled use traditional manufacturing methods: moulding, casting, machining, manufacturing
- Non-customised products
- Development work: create new models rather than customise existing products

Adapting Generic Product Development Process

<table>
<thead>
<tr>
<th>Process Type</th>
<th>Description</th>
<th>Distinct Features</th>
<th>Examples</th>
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<tbody>
<tr>
<td>High-Risk Products</td>
<td>Technical or market uncertainties create high risk of failure</td>
<td>Risks are identified and tracked throughout the process, and problematic activities take place as early as possible.</td>
<td>Pharmaceuticals, space systems.</td>
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<tr>
<td>Quick-Build Products</td>
<td>Rapidly developing market opportunities allow design-build-test cycles.</td>
<td>Detailed design and testing phases are repeated a number of times until the product is assembled in function and operation.</td>
<td>Software, cellular phones, automobiles.</td>
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<tr>
<td>Complex Systems</td>
<td>System must be decomposed into several subsystems and many components.</td>
<td>Subsystems and components are developed by many teams working in parallel, followed by system integration and validation.</td>
<td>Airplanes, jet engines, automobiles.</td>
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Summary

Product development process:
- May differ from generic process (generic applies to market – pull)
- Depends on type of product and industry
- Is affected by global product development which is increasingly common/necessary

Meeting the learning objectives?
To be able to:
1. List the benefits of a formalised product development process.
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Exercises (in pairs)

1) What do you think would be a suitable adaptation to the standard linear stage-gate process for your type(s) of project (slide 28, 29)?
2) Create an outline process model for your development project. Include stages (what are the activities and outputs) and gates (what will be selected)
3) Write 3 questions that you will ask of your project company in add more detail to your process model.