SECTION 6 (15.00 - 15.45):
Integrated Product Development
The whole product is more than the sum of its parts!

6th Section - Learning objectives
To be able to:
1. Describe the difference between Sequential and Integrated Product Development (IPD)
2. Identify the important stakeholders involved in the development of a product
3. Name the 3 key disciplines in IPD
4. Analyse a simple product in terms of the three main disciplines of IPD

EXERCISE 1a
Using as few of the numbers as possible:
\[ 6 \ 7 \ 4 \ 1 \ 6 \ 4 \ 8 \]
Using these functions: +, -, \times, \div, (, )
Make or get as close as you can to: __________=____

Exercise 1b
Integrated development
Using as few numbers as possible, what can the product developers do with the following:
\[ 6 \ 7 \ 4 \ 1 \ 6 \ 4 \ 8 \]
Marketing wants: [ ] __________ = ___
Stylists want: [ ] __________ = ___
Manufacturers want: [ ] __________ = ___

Does this really apply to product development
• Constraints imposed by design decisions cause compromise for other stakeholders
• Product development is greatly complex
• Nobody knows how a product is developed
Even a simple product like a pencil!
EXERCISE 2: List the stakeholder activities involved in the development of a Pharma product.

Some important stakeholder activities in the development of the iPhone:
- Engineering
- User / Operators
- Shipping / Distribution
- Sales / Retailing
- Purchasing
- Quality control
- Assembly
- Disposal
- Manufacturing
- Suppliers

The three Key disciplines of Integrated Product Development (IPD)

"Integrated Product Development is:

an idealised model of development where the business case of a product is built from the perspectives of all stakeholders"
Exercise 3b: What are the associated Pharma Individual types... 

2 Products with the same task...

Analyse the sample in terms of the key disciplines of IPD

Market
- High end, premium, brand differentiation
- Functional mid range, better perception

Product
- Relative complex, several parts, better quality, more cases, easier to direct
- Simple easy to use and cheap, more messy, more difficult to use

Production
- Difficult manufacture, assembly & customisation
- Very simple 1 piece moulding

Which product is better?

Extreme cases...

The IPD model
The link between Product and Market

Customer relationship modelling

Case study 1

The initial project brief:

“To design quick release security screws for small paintings.”

Clive Stevens (Managing Director) of Euronova.

Defining a market

• In the UK last year there were 42 thefts from Museums and Galleries from about 2,700 organisations.

• In probability terms this works out at a 1:60 chance of a theft from a single organisation per year.

• The pattern of crime has migrated from night-time and fraud, to snatches during open hours. 64% of thefts were from displays during the day.

Whose market?

The link between Product and Production
Supply chain modelling

Market
Product
Production

What are DFX methods?

DFX: Design For X
- where 'X' is an important aspect related to the product lifecycle,
- and 'Design For' means to design the product in order to improve

Important DFXs:
DFE – Design for the Environment
DFM – Design for Manufacturability
DFA – Design for Assembly
DFS – Design for Serviceability
DFC – Design for Changeover
DFD – Design for Disassembly
DFQ – Design for Quality (QFD method)

Think about service in advance...
Headlamp bulb replacement example

Boeing Helicopter
(formerly McDonnell Douglas Helicopter Systems)

Apache Longbow Helicopter
Redesign

Estimated savings
$1.3 billion over life of program

One aircraft per month now - increasing to five per month by 1999
Anti-Flair Bracket Assembly for the Boeing Longbow Apache Helicopter

Before

- 5 sheet metal parts
- 19 rivets
- 20 tools needed
- 32 hours manufacturing

After

- 1 high-speed machined part
- 2 hours manufacturing
- 10% less weight
- Tooling cost virtually eliminated

Source: Alfredo Herrera, 1998 International DFMA forum, Newport, RI

Apache Longbow Helicopter Redesign

<table>
<thead>
<tr>
<th>Design</th>
<th>Original</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>Sheet metal angles and extruded stiffeners</td>
<td>High-speed machined parts</td>
</tr>
<tr>
<td>Parts</td>
<td>Attached with rivets</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>3 kg</td>
<td>2.74 kg</td>
</tr>
<tr>
<td>Fabrication</td>
<td>305 hr</td>
<td>20 hr</td>
</tr>
<tr>
<td>Manufacturing &amp; assembly</td>
<td>697 hr</td>
<td>181 hr</td>
</tr>
<tr>
<td>Cost</td>
<td>$58,000</td>
<td>$15,000</td>
</tr>
</tbody>
</table>

New design - more rigid, more stable, easier alignment, reduced installation and inspection time

DFS improvements...

Refrigerator Service Time Comparison

<table>
<thead>
<tr>
<th>Service Task</th>
<th>Original</th>
<th>Redesign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Days</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summary

Purposes: The model will help you to understand IPD

User: The model can be used as a checklist to identify the relative position of a project and any phases that may have been left out

Limitations: The model will not tell you what to do next or which phases are most important to consider

But mainly... it helps you to think in an IPD style

Meeting the learning objectives?

To be able to:
1. Describe the difference between Sequential and Integrated Product Development (IPD)
2. Identify the important stakeholders involved in the development of a product
3. Name the 3 key disciplines in IPD
4. Analyse a simple product in terms of the three main disciplines of IPD

Final round-up:

Topics covered:
Managing Innovation
The Product Development Process
Integrated Product Development

Any Questions?
Mission Statement:

“To appreciate the considerations of project management in a real organisation where results are not just about creating new knowledge but turning it into profitable products.”

Final Thought