


EBU5608 Product Development and Management


Topic 4 – Innovation

1




Agenda

- What is innovation?
- Types of innovation
- Models of innovation
- What makes an innovative company?




EBU56082

2



Innovation


- Innovative **ideas** = products, or not ...
 - this module is all about identifying innovative ideas that may be turned into products
- Most large companies contain **R&D** divisions
 - Companies like Tencent, Microsoft, Apple, Tesla, Sony etc.
- There is constant research into the next potential product to increase **turnover** and **profit**



EBU5608

3

3





Basic principles of innovation

- Innovation appears to have its origin in Latin „Innovare“ –
 - meaning to **renew**, to **make new** or to **alter**, new way of doing things
- Innovation characteristics:
 - Process from idea generation to commercialization
 - The adoption of change,
 - Radical change in traditional ways vs. incremental change,
 - New device or something new to society

EBU5608


4

4




Innovation?

- Quick questions to think about:
 - 1) What do you understand by the term '**innovation**'?
 - “the creation and application of new knowledge to improve the world” [1].
 - Innovation is where an idea becomes reality.
 - Innovation turns great ideas into value, prosperity, productivity and wellbeing.
 - It is the mechanism by which we adapt to new opportunities and challenges [1].
 - Innovation is the practical application of new inventions into marketable products and services.




EBU5608

5



Queen Mary
University of London




Invention?

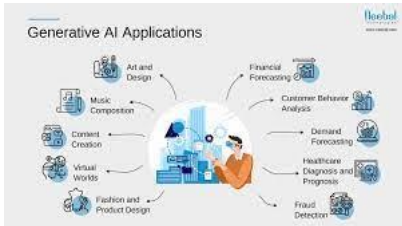
2)

What do you understand by the term '**invention**'?
Invention – creation of something new/new idea or the formulation of new ideas for products or processes

3)


Give one example of '**invention**'.








EBU5608

6



Invention and Innovation - what is the difference?



3) Is there a difference?

Differing opinions


Innovation = theoretical conception + technical invention + **commercial exploitation**

- OR
 - An **invention** can still become an **innovation** even if it is **unsuccessful**, provided it made it to the marketplace
 - e.g. Sinclair C5 car


EBU5608

7

7



Sinclair C5 Electric Vehicle – Invention or Innovation?




[2]

EBU5608

8

8



Sinclair C5 Electric Vehicle – Invention or Innovation?

- This was invention from the early 80’s.
- This was an electric vehicle aimed at saving money, cutting pollution, easy to drive.
- Designed by Clive Sinclair - owner the electronics company Sinclair Spectrum.
- The concept was very good as was the technology of the product, but there was no market for it, as it was considered unsafe and much too geeky!
- It was marketed as an alternative to cars and bicycles but ended up appealing to neither group of owners.
- It was available in shops with several months delay; particular, in winter, thus not ideal time for an open-topped vehicle.

EBU5608

9

9




Innovation and Product Development

- An innovation is successful implementation of a **new** or significantly **improved product** (good or service), or **process**, a **new marketing method**, or a **new organisational method** in business practices, workplace organisation or external relations.
- A creative process in which **two or more existing things are combined** in some novel way to produce unique new thing.
- Innovation is the management of all the activities involved in the process of idea generation, technology development, manufacturing and marketing of a new (or improved) product or manufacturing process or equipment.

EBU5608

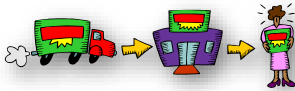


10

10



Innovation


- Innovations can fall into two main categories:
 - **Product** (or service) innovation
 - **Process** Innovation
- There are also other categories that can be seen in the table on the next slides



EBU5608

11

11




Types of innovation

Product Innovation	The development of a new or improved product
Process innovation	The development of a new manufacturing process
Organisational innovation	A new venture division, a new internal communication system, introduction of a new accounting procedure
Management innovation	TQM (Total Quality Management) systems. BPR (business process re-engineering)
Production innovation	Quality circles, just-in-time (JIT) manufacturing system, new production planning software
Commercial/marketing innovation	New financing arrangements, new sales approach e.g. direct marketing, e-commerce
Service innovation	Telephone financial services or on-line services e.g. customer support

EBU5608

12

12



Product Innovation

- In most cases we think of innovation relating to **actual products**
 - New technologies
 - Leading edge products
 - Gadgets, etc
- **Advantages** of launching new or improved products on to the market include [2]:
 - Increased market share
 - Public relations – e.g. news coverage
 - Enhanced reputation as an innovative company
 - Opportunity to build early customer loyalty
 - Added value
 - Higher prices and profitability
 - Competitive advantage

However, creation of some innovative products can instigate **other innovations**

EBU560813

13






Innovation (cont.)

- **Product** innovation can lead to **process, management** and/or **organisational** innovation
- The **digital camera** replacing film cameras, eg:
 - **Changes** had to take place in manufacturing, marketing, sales and repair functions
 - **Business focus** shifted to digital cameras for the consumer market
 - **Marketing staff** were required for promotion and education of customers (and distributors)
 - **Production** of the cameras is different – new processes, equipment and human skills
 - **Complementary goods** are different (i.e. memory cards instead of film)


EBU560814

14



Process Innovation


- Has to do with finding more **efficient** and **effective** ways of
 - Producing** existing products
 - Delivering** existing products
 - Can also include producing or delivering **new** products were appropriate
- Advantages** are
 - Reduced **costs**
 - Improved **quality**
 - More responsive **customer service**
 - Greater **flexibility**
- Disadvantages**
 - Loss of **jobs** – especially if work is outsourced
 - Need for **re-training** of workers



EBU5608

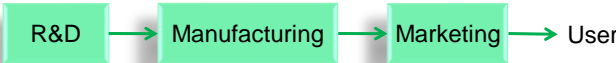
15

15




Models of innovation - what is the source?

- Serendipity**
 - Innovation luck? 'Eureka!'
- Linear models (3 models)
 - Technology push**



```
graph LR; RND[R&D] --> Mfg[Manufacturing]; Mfg --> Mkt[Marketing]; Mkt --> User[User];
```

 - Scientists make unexpected discoveries
 - Technologists apply them to develop product ideas
 - Engineers and Designers turn them into prototypes for testing
 - Manufacturing devise ways of producing the products efficiently
 - Marketing and sales will promote the product to the potential customer




[3]

EBU5608

16


16



Models of innovation

- market pull

- Linear Models – 2. **Market pull**



```
graph LR; Marketing[Marketing] --> RnD[R&D]; RnD --> Manufacturing[Manufacturing]; Manufacturing --> User[User];
```


- Identified in 1970's,
- Studies showed that market was influential in the innovation process,
- This is a more customer driven model and is used by the majority of industries today,
- Market Research supports this model,
- Customer requirements are then conveyed to R&D for design and engineering and then manufacturing for production.

[5]

EBU5608

17

17



Models of innovation


- university & industry liaison

- Linear Models – 3. **Universities & industry liaison**

Creation of **new knowledge**, dominated by universities and large science-based organisations

Technology development, dominated by organisations

Consumers express their **needs and wants** through the consumption of products




```
graph LR; A([Science & Technology base]) --> B([Technological developments]); B --> C([Needs of the market]);
```

[5]

EBU5608

18

18

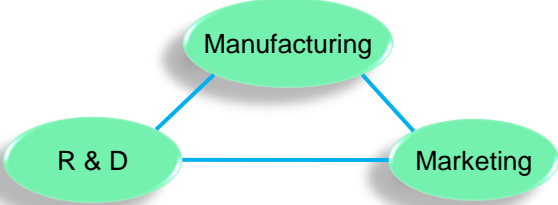


Queen Mary
University of London

Models of innovation

- simultaneous coupling

- **Simultaneous coupling**




```
graph TD; RD([R & D]) --- Mfg([Manufacturing]); Mfg --- Mkt([Marketing]); Mkt --- RD;
```

- Identified in the 1980's,
- Within this model, the moment of innovation is unknown (unlike the linear models),
- The groups work together simultaneously and create innovation.

EBU5608

19

19

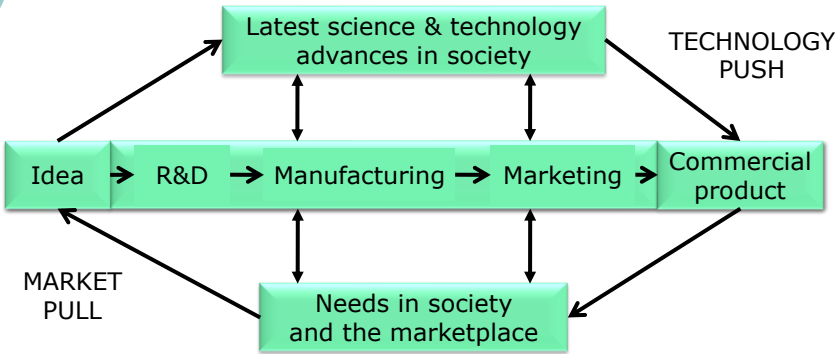


Queen Mary
University of London

Models of innovation

- interactive

- **Interactive**
 - Innovations occur due to work in universities, industry and from market demand




```
graph LR; Idea --> RD --> Mfg --> Mkt --> CP[Commercial product]; LSTA[Latest science & technology advances in society] --> RD; LSTA --> Mkt; LSTA --> CP; NS[Needs in society and the marketplace] --> RD; NS --> Mkt; NS --> CP; LSTA --> NS; CP --> LSTA; CP --> NS;
```

EBU5608

20

20



Models of innovation


- interactive (cont.)


- This model takes **simultaneous** coupling one step further
- No explicit **starting** point
- Identified in 1980's/1990's by Rothwell and Zegveld
 - They believed that society had an influence on innovation and vice versa [10]
- The diagram represents the links between the **organisation** and its internal and external linkages with the **marketplace** and **science** base
- Organisations which can **successfully** manage this process will be the most **successful innovators**
- This diagram allows for **feedback** through the different stages of the development of innovations.

EBU5608

21

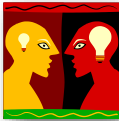
21





What makes a company innovative?


- We have discussed types of innovation and sources of innovation
- Now we move on to what makes a company innovative
- Think of some **examples**
 - What companies have been very successful with an innovative product?
- One answer could be that it is a company that has
 - incorporated an interactive model of innovation and
 - can be characterised by the features on the following slides



EBU5608

22

22




What makes a company innovative?

Organisational requirement	Characterised by
Growth orientation	A commitment to long-term growth rather than short-term profit
Vigilance	The ability of the organisation to be aware of its threats and opportunities
Commitment to technology	The willingness to invest in the long-term development of technology
Acceptance of risks	The willingness to include risky opportunities in a balanced portfolio
Cross-functional cooperation	Mutual respect among individuals and a willingness to work together across functions
Receptivity	The ability to be aware of, to identify and to take effective advantage of externally developed technology
'slack'	An ability to manage the innovation dilemma and provide room for creativity
Adaptability	A readiness to accept change
Diverse range of skills	A combination of specialisation and diversity of knowledge and skills

EBU5608


23

23



What makes a company innovative - investment

- Growth orientation
 - Not all companies' priority is for growth
 - Often family run companies want to stay the same size, thus remaining manageable without external intervention
 - Innovative companies are those that wish to grow their business
 - This is a long-term process, and investment is required
 - Companies show this R&D investment in their company reports
 - E.g. Amazon, Microsoft, Siemens, Tencent, others?



EBU5608

24

24



What makes a company innovative - vigilance


- It is vital to be aware of what markets and competitors are doing
- **SWOT** analysis is an important tool
- Identifying **threats, opportunities** etc.
- Often carried out by **marketing** team, but should be encouraged in **all departments** at all levels
- **R&D** team University liaison
- Many companies have specific teams to **monitor** competition and opportunities



EBU5608

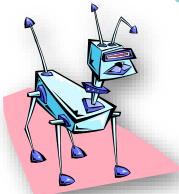
25

25



What makes a company innovative - commitment to technology

- **Long-term** commitment is needed, and appropriate resources must be financed
- There is not always an immediate return on **investment**
- Some companies **moved away** from this during the IT/Telecoms recession
- **Creativity** is only seen in a climate of commitment to innovation
 - Need to employ and retain innovative **staff**



EBU5608

26

26



Queen Mary
University of London

What makes a company innovative - acceptance of risks


- Not all investment in innovation will be realised in **turnover** or **profit**
- Not all inventions will become **innovations**
- **Risk assessment** strategies and balanced product portfolios are crucial to success
- The business **strategy** must consider risk and commitment



EBU5608

27


27



Queen Mary
University of London

What makes a company innovative - cross-functional cooperation


- Reduction/removal of inter-departmental **conflict**
- The biggest conflict is often between **marketing** and **R&D** functions
 - Opinions differ over business **objectives** and the ability to commit to firm **dates**
 - The marketing function does not always understand what is involved **technically** to create product



EBU5608


28

28



What makes a company innovative - receptivity

- The ability to accept technologies from **outside** of the company and use them to create new innovations
- It is very difficult to create everything 'in-house'
- Strength to identify areas of **focus**
- **Joint activities** allow knowledge sharing
 - e.g. IBM, Microsoft joint activity to create mutually beneficial technology, including web services and creating industry standards



EBU5608


29

29



What makes a company innovative - slack


- Allowing individuals time to **think** and investigate new technologies etc.
- Some **flexibility** on milestones
- **Encouragement** for group discussions, attending conferences etc.



EBU5608


30

30



What makes a company innovative - adaptability


- Ability for companies to **adapt** as required
- Innovative products can lead to **changes** in process etc.
- Need to encourage a **climate** that accepts change
- Can be easier in **smaller companies** with less processes.
 - From its origins in explosives, DuPont added other businesses like lacquers and synthetic rubber before inventing the first polyesters, nylon, Teflon, and the first phenothiazine insecticide.



EBU5608

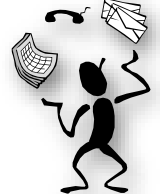
31

31



What makes a company innovative - diverse range of skills



- Ensuring that a company has a **work force** with a diverse range of skills
- Important to have employees with the appropriate **industry knowledge**
- Good **management** knowledge and experience
- Strong overall team with the correct **mix** of skills and experience
- Innovation ecosystems rely on a wide range of skills, such as technicians, engineers, discovery scientists, technologists, entrepreneurs, and investors.



EBU5608

32

32




Summary

- What is innovation?
- Types of innovation
- Models of innovation
- What makes a company innovative?

EBU5608


33

33



Reading


- Department for Business, Energy & Industrial Strategy (2021), UK Innovation Strategy-Leading the future by creating it, *Innovation Today – Learning from the pandemic to create the world’s best innovation ecosystem*, pp.11, 17-20.
- Deborah. L. Roberts, Roger Palmer and Mathew Hughes (2021), *Innovating the product innovation process to enable co- creation*, RADMA and John Wiley & Sons Ltd.



EBU5608


36

36



Further Reading


- o <https://youtu.be/3T-NBDGovno> (a video about innovation)
- o <https://www.uspto.gov/kids/videos.html> (short videos about new inventions here, like 3D printing, driverless cars, etc.)



EBU5608


37

37



References

- [1] UK Innovation Strategy Leading the future by creating it, Department for Business, Energy & Industrail Strategy, July 2021, page 11
- [2] https://en.wikipedia.org/wiki/Sinclair_C5
- [3] UK Innovation Strategy Leading the future by creating it, Department for Business, Energy & Industrail Strategy, July 2021, page 17



EBU5608

38

38