



# Summaries modules 5 + 6

International Business Administration

Study Association Stress  
RAVELIJN BUILDING | RA1336



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## Stress

Stress is the study association for Business Administration (BA), International Business Administration (IBA) and Industrial Engineering and Management (IEM) of the University of Twente. Stress was founded on May 21st, 1974. Currently, Stress has over 2100 members and is the largest UT (study) association. Stress organizes various activities to support, expand and complement all of its studies. Stress has five principles, which will greatly enhance your time as a student: Study, Meet, Practice, Develop and International. Following these, several activities are organized by the roughly 120 active members, and are partially made possible thanks to the sponsorship and participation of various companies. Moreover, we have regular contact with other business and management study associations across the Netherlands.

## Education

As a study association, Stress represents its members towards the faculty. Therefore we have a Commissioner of Educational Affairs who, with help of the Education Committee, deals with everything concerning your education. From collecting summaries to handling complaints to organizing educational events. If you have any questions concerning your study, the teachers, the faculty or anything else, feel free to ask the Commissioner of Educational affairs!

### Education Committee

The committee consists of representatives of every cohort. The representative of the freshmen will be introduced during the first module. This committee is aimed at forming the bridge between teachers and students and therefore, improving the quality of the study. They keep the summary database on the Stress site up to date, organise study evenings and try to keep an eye out for the quality of our education. When there are complaints from the students concerning education, about one of the courses of one of our studies for example, they will be handled by this committee.

### Summaries

Next to handling complaints, we also collect and check summaries of all the courses you follow! So it does not matter if the course is in the first, fifth or eighth module, you can send your summary in and we will check if your summary will make a good addition to our collection. To hand in your summary, simply send the file to [ec@stress.utwente.nl](mailto:ec@stress.utwente.nl). The Education Committee will then check the summary and if it is found to be sufficient, you will be compensated for your efforts. If your summary is the first one of a course, you will receive €15. If it is the second one, €10, and for the third one you will get €5. If you think you have made a better summary than the ones online, you can also send yours in and earn €5,-. Our summary collection can be found at the bottom of the 'study' page on [www.stress.utwente.nl](http://www.stress.utwente.nl).

### Panel Meetings

The panel meetings are organised in every module to improve the education. Here, the teachers of the module together with some students discuss the module. The students are able to give their opinion about the module and what they would like to see improved. The teachers can also ask questions about the opinions of the students. This way teachers know what went right in a module and what went wrong so they can improve the module for next year. The panel meetings are for all the students which are taking the module. You can also join the feedback panel. This means that you join a group of student who attends the panel meeting each module and gives valuable feedback to the programme.

## Study sessions

For some courses, Stress organises study sessions. During these afternoons or evenings one or two student assistants of the course will be present. The study sessions are free to attend and coffee, tea and snacks are provided for you by Stress. If you think a study session will be valuable for a course you are following, please contact the Commissioner of Educational Affairs or the Education Committee. They will check if there is more demand for a study evening for this course and act accordingly.

## Complaints

If you have a complaint, you can submit it at the 'Study' page on [www.stress.utwente.nl](http://www.stress.utwente.nl) or talk to someone of the Education Committee. However, if you feel it is a really important complaint or you want to explain it personally, you can come to the Stress room and talk to the Commissioner of Educational Affairs or send an email. We will then contact the programme management team and discuss what actions can be taken. They value bundled complaints greatly because it tells them a lot more when multiple people have the same complaint, this is the most important reason to always voice your opinion.

## Ordering Books

For the first module, you can order your books during the Kick-In. For the following modules, you will have to order them by yourself. You can do this online, at our website. The only requirement to order the books is that you are a member of Stress.

To order books online you have to go to the 'Study' page on [www.stress.utwente.nl](http://www.stress.utwente.nl). On the left of the screen you find a header: 'BOOKSALE', and below the option: 'Order your books'; select this option. Next, you can use the dropdown menus to select your study and module. Once you have chosen the correct options, press 'To booklist'. After this, you can select all the books you would like to order, and then proceed to 'Checkout'. After paying, the books will be shipped to the address you enter.

For any questions about the books you need, the ordering of the books or anything else book-related, you can send an email to [books@stress.utwente.nl](mailto:books@stress.utwente.nl).

## Tutor platform

If you are having trouble studying for a course, we have the tutor platform to provide you with the right student for your struggles. We have a wide variety of students who have gone before you and who are willing to help you out for a small compensation. Send an email to [tutor@stress.utwente.nl](mailto:tutor@stress.utwente.nl) and mention your study, study-year, course you need help with, how many hours you need and any requirements you might have for the tutor. The payment of the tutor can be negotiated but keep in mind that students get paid €10 to €15 by the university when working as a teaching assistant, and you have to pay for it yourself.

The other way around, we are always looking for new tutors. If you are interested in joining our tutor pool let us know. We will add you to the WhatsApp group and you can reply to students asking for tutoring.

## HELP!

Often, students do not know where to go with any problems, either study-related or personal. Here you find some information about the most common places to find help.

## Study advisor

The study advisor is not only there to answer all your questions about your study, but also there to help you with any personal conditions or other issues that might affect you or your study progress. If you have any problem at all, go see your study advisor. Even if they are not the person who can help you, they can send you to someone who can. Every talk with the study advisor is confidential and she will always do her best to help you. You can make an appointment with the study advisor on [www.bms.planner.utwente.nl](http://www.bms.planner.utwente.nl). The study advisors for IBA are Lena Balci-Ay and Eline de Ruiter. The office of Lena is RA3248 and the office of Eline is RA3276. Their emails are [l.balci-ay@utwente.nl](mailto:l.balci-ay@utwente.nl) and [e.j.deruiter@utwente.nl](mailto:e.j.deruiter@utwente.nl).

## Red desk / Student Affairs Coaching & Counselling

If your study and personal life are all on track, this bit of information might not be really relevant for you. But if it is not the case, when your study is completely going the wrong way, or you find it hard to adapt to living away from your parents or you have a difficult situation back at home, the Student Affairs Coaching & Counselling, also called the 'Red Desk', is the place where they can help you. Every possible question about study or personal issues will be answered here, or you will be forwarded to a trained professional. The Red Desk can be contacted at [sacc@utwente.nl](mailto:sacc@utwente.nl) and is located in the Vrijhof (building 47), third floor, room 311.

## Become active at Stress!

Next to your study, you can become an active member of our association! Stress offers many different committees which have organisational tasks or supporting tasks. On our website, you can check out all the committees from Stress. To find out which committee suits you best, email the Commissioner of Internal Affairs at [internal@stress.utwente.nl](mailto:internal@stress.utwente.nl).

## Member Initiative

Have you always wanted to organize something big, but never had the resources? We appreciate initiatives from our members! So, if you have a clever idea for something within Stress or the committees, please contact us and we can see what is possible.

## More information about Stress

Do you want to know more about Stress? Or do you want to check out our website and social media? Make sure to scan the QR code:



## Module 5 overview: Strategy, Marketing & Economics

Module code: 202000561

! Disclaimer: always check what you need to study corresponds with the content of the summaries, courses can be changed which could cause changes in study material for your exams

Below you find information about which courses you have this module, and about the summaries for this module. If you made a summary for a course this module you can send them to [education@stress.utwente.nl](mailto:education@stress.utwente.nl) and depending on how many summaries we have for this course you will receive compensation for your work.

### Courses

- Strategy
- Marketing
- Economics
- SME project & Business Skills

### Summary 1

**Course:** Strategy\*

**Book:** Henry, A. E. (2018). *Understanding Strategic Management*. Oxford, United Kingdom: Oxford University Press.

**Chapters:** 1 - 8

**Year the summary was received:** 2019/2020

### Summary 2

**Course:** Marketing\*

**Book:** Fahy, J., & Jobber, D. (2015). *Foundations of Marketing*. New York, United States: McGraw-Hill Education.

**Chapters:** 1, 3, 5 - 11

**Year the summary was received:** 2023

### Summary 3

**Course:** Economics\*

**Book:** Lipsey, R., & Chrystal, A. (2020). *Economics*. Oxford, United Kingdom: Oxford University Press.

**Chapters:** 1, 2, 3, 4, 7, 8, 9

**Year the summary was received:** 2021

## Summary 1: Strategy

### Chapter 1: what is strategy

There is a general agreement that the purpose of strategy is to help organizations achieve a competitive advantage. The use of strategy exist already for many centuries it is originated out of military conflicts, but the use of it in management dates back about 40 years. The use of strategy is the primary way in which managers take account of a constantly changing environment. An effective strategy allows managers to use the organization's capabilities to exploit opportunities and limit threats in the environment.

Defining strategy, strategy can be defined in a number of different ways. Michael Porter believes strategy is about being different. A company must choose activities( design, manufacture, etc.) in which it can deliver a unique mix of value to the customer. Constantinos Markides argues that the essence of strategy is for an organization to select strategic position that it can claim as its own, a strategic position is represented by the following questions:

- Who should the company target as customer?
- What products should the company offer the targeted customers?
- How can the company do this efficiently?

In this way a company can choose a position and via this position achieve success.

Richard Rumelt, describes a good strategy as having an essential logical structure which he calls the kernel. The kernel of a strategy contains three elements:

- A diagnosis
- A guiding policy
- A coherent set of actions

Strategic analysis: is a useful starting point, it allows managers to evaluate how well the company is positioned to exploit opportunities and mitigate threats.

Strategic formulation: formulation of a strategy is a difficult process, of asking good questions and making choices

- Corporate strategy: deals with the fundamental question of what markets the company wants to compete in
- Business strategy: deals with how a company competes in the chosen markets

Strategy implementation: a good strategy only works if, it is communicated and coordinated throughout the organization effectively, effective implementation also requires to organization structure to be sufficiently flexible.

An organizations mission: seeks to answer why an organization exists.

Vision: often represents the desire of the founder in the future. In contrast with goals, a vision tends not to change over time. A vision must tap into the personal goals and values of the organization's employees if it is to be internalized by them.

Values: are important in guiding how an organization decides and implements its strategy

Theory of the business has four characteristics:

1. Assumptions concerning environment, mission and core competencies must fit reality
2. The assumption in all 3 areas have fit to each other
3. The theory must be known and understood throughout the company
4. The theory has to be continually tested

Business model: describes how the activities of a business fit together

There are 3 types of strategy(basic forms):

- Corporate strategy
- Business strategy
- Functional/operational strategy

## Chapter 2: evaluating the macro-environment

The external environment facing the organization consists of both a **macro-environment** and a competitive environment. The **competitive environment** consists of the industry and markets in which organizations compete, this is about Porter's five forces framework and is discussed in chapter 3. The macro-environment, in contrast is often referred to as general environment. This is because changes that occur here will have an effect that transcends firms and specific industries, this environment is about: political, social, technological, economic and the general environment. Changes in the competitive environment have the most impact on the organization

Organizations should always scan and monitor their macro-environment. As example, the typewriter industry, should have been aware of technological change and the rise of micro-technologies, resulting in personal computers etc.

Organizations use methods to look for signs in the macro-environment

- Scanning: due to the internet, scanning the environment has been far more cost-effective. Scanning is an opportunity for the organization to detect weak signals in the macro-environment before these have coalesces into a discernible pattern which might affect its competitive environment. Weak signals are minor changes in the external environment, that an organization's scanning barely registers. Because their impact has yet to be felt.

With scanning a cognitive bias may occur. This means that the organization may fail to identify these signals, or the organization may discern a pattern that is not there, but is based on the assumptions and mental models that managers carry in their heads.

- Monitoring: this can be seen as the activity that follows these initially disparate signals and tracks them as they grow into more clearly discernible patterns. It allows an organization to see how these macro-environment trends will impact on its competitive environment. Monitoring is the follow-up of scanning. But there is one way in which monitoring can monitor weak signals, for example when a big competitor shows interest in a particular social or technological change.
- Forecasting: the purpose of scanning and monitoring is to aid the organization in developing viable forecasts of future trends before they become an unmitigated threat. The objective is to



use this information to develop robust strategies that ensure a degree of competitive advantage. To accomplish this requires some understanding of the nature of uncertainty

Three main types of uncertainty:

1. Risks: this is where past performance of similar events allows us to estimate the probabilities of future outcomes
2. Structural uncertainties; this is where an event is unique enough not to offer evidence of such probabilities
3. Unknowable's: this is where we cannot even imagine the event

Most managers are capable of dealing with the type of uncertainty that appears in the form of **risk**. What is **unknowable** cannot, be forecast and therefore the organization must wait for the event to occur before it can react to it. This leaves **structural uncertainties** where no probable pattern of outcomes can be derived from previous experience. In such a situation, it is suggested scenario planning is a useful tool.

There are 6 tools of analysis(to help the decision-making process): scenario planning, PESTEL analysis, SWOT analysis, 5 forces framework, the industry life cycle and strategic groups.

- **Scenario planning:** is a disciplined method for imaging possible futures. The possible scenarios promote a discussion of possibilities beyond the most likely one and encourage the organization to consider 'what if' questions. Therefore a scenario can be seen as a challenging, plausible and internally consistent view of what the future might turn out to be.

How to build scenarios, this divides our knowledge into two areas: things we think we know, which is based on the past and continuity, for instance the fairly assumptions can be made about the direction of a country's demographic profile. And things we consider uncertain and unknowable, these elements include such things as future oil prices, interest rates and the outcome of political elections.

A process for building scenarios is:

1. Define the scope: this involves setting the time (via product life cycles or technological change) and the scope of analysis (this may include products, markets and geographical areas). Once time frame is set, the question becomes, what knowledge would the organization benefit most from in that timescale?
2. Identify the major stakeholders: stakeholders are individuals and groups who can affect and are affected by the organizations decisions.
3. Identify basic trends: which political, economical, technological, social and industry factors will have most impact on the issues identified in step 1, impact can be listed as positive, negative or uncertain.
4. Identify key uncertainties: which of the events with a uncertain outcome will most affect the issues the organization is concerned with? Keep the amount limited to keep the analyses simple.
5. Construct initial scenario themes: know all basic building block for scenarios are known, so scenarios can be made.

6. Check for consistency and plausibility: checking if the trends are compatible with the chosen time frame, otherwise remove. Do scenarios combos actually go together, otherwise remove (like full employment and zero inflation).
7. Develop learning scenarios: organize possible outcomes and trends around themes, at this stage the scenarios are useful for research.
8. Identify research needs: further research may be needed to understand uncertainties and trends more fully, so the organization needs to study changes in disruptive technology for instance.
9. Develop quantitative models:
10. Evolve towards decision scenarios: the ultimate aim of this is to move the organization towards scenarios that can be used to test its strategy formulation and help it generate new ideas, it may be wise to double check step 1-8.

If the scenarios are useful to the organization they might have the following characteristics:

- They address the concerns of individuals in the organization
- The scenarios are internally consistent
- They describe fundamentally different futures as opposed to being variation on a particular theme
- Each scenario describes an equilibrium state that can exist for a considerable period.
- **PEST(el) analysis:** a useful tool when scanning the macro-environment is PEST(el) analysis. This refers to political, economic, social, technological, (environmental, legal) factors. Both PEST and PESTEL can be used, with environment is meant the effect of our lifestyles on our environment, such as the use of fossil fuels and their impact on the climate change. In this respect, it can be captured within the social factor. The legal element can be subsumed within the political factor. But for this summary we will use PEST.

How will the PEST analysis aid the organization? This form of analysis is simply another tool to help the organization detect and monitor those weak signals in the hope recognizing changes taking place in the macro-environment. Interrelationships between the factors exist.

- **Political factors:** this factor deals with the effects of government policy. This includes items such as government stability, taxation policy and governmental regulation. Governmental stability is seldom a major issue in Western economies. However multinational corporations operate across international borders, whether there will be any sudden and detrimental legislative changes that might jeopardize the substantial investments they will have made.
- **Economic factors:** the changes in economic activity manifest themselves through changes in interest rates, disposable income, unemployment rates, retail price index (inflation), GDP and exchange rates. An economic indicator can never provide a complete picture, but rather provides a snapshot of the complex economic system, therefore it is very difficult to scan the macro-environment for signs of economic shift
- **Social factors:** include changes in demographics and culture. In many western economies, there exist a trend towards an ageing population. As example Johnson & Johnson added markings on their baby lotion as being kind and gentle to women's skin.
- **Technological factors:** some of the major disruptions are take place in the technological part of the macro-environment, think about online retailing.

An example of an interrelationship is: electric cars. It is a new technology, but there are also social implications, and political implications.

Limitations of the PEST analysis: in listing PEST factors, one must clearly exercise judgement to draw out the implications of each factor on the organization's industry. Furthermore the rate of change of these factors in the macro-environment and their increasing unpredictability may act to limit the use of this analysis.

- **SWOT analysis:** refers to strengths, weaknesses, opportunities and threats. Strength and weaknesses refer to the organization's internal environment over which the firm has control. Strengths are areas where the organization excels or has a competitive advantage. And weaknesses is the opposite. Opportunities and threats manifest themselves in the organizations external environment, over which it has less control. SWOT may be used in both the macro-environment and at the industry level.

### Chapter 3: industry analysis

this chapter we will also go further on the tools for analysis, with three of the 6 left open for further explanation: 5 forces framework, the industry life cycle and strategic groups.

- **Porter's Five Forces Framework:** this theory is based on an organization which is already operating in the industry. Although the framework is based on a organization already in the industry, it can be used to see if a organization should enter the industry. This will require it to adopt a distinctive positioning, to create a competitive advantage.  
The five forces framework is an analytical tool for assessing the competitive environment(the industry in which an organization competes). It enables the organization to determine the attractiveness or profit potential of a particular industry by examining the interaction of competitive forces. These five forces are:
  1. Threat of new entrants
  2. Bargaining power of buyers
  3. Bargaining power of suppliers
  4. Threat of substitute products or services
  5. Intensity of rivalry among firms in an industry

This difference between Porter and SWOT is that Porter is focused on the industry and SWOT is company-specific

We will now discuss the five forces separately

Threat of new entrants: the extent to which new competitors may decide to enter an industry and reduce the level of profits being earned by incumbent firms. The threat of entry will depend on the existence of barriers to entry and the reaction of existing competitors. The main barriers to entry include: economies of scale, capital requirements, product differentiation, access to distribution channels and cost advantages independent of size.

The bargaining power of buyers: the power is increased in the following circumstances.

- Concentration of buyers and high volumes: where there is a concentration of buyers in relation to the number of suppliers, and the volume purchase of any one buyer is high, the importance of the buyer towards the supplier increases.
- Purchases are standard or undifferentiated: buyers are confident they can always find an alternative supplier
- Switching costs are low
- There is threat of backward integration: example, coca cola operates their own bottling subsidiaries while also using independent contractors to bottle and distribute their products, cause they can always threaten to use their own production capacity.

The bargaining power of suppliers: suppliers can exert power over participants in an industry by raising prices or reducing quality of purchased goods and services. Suppliers are powerful under the following circumstances:

- Concentration of suppliers
- Suppliers are faced with few substitutes
- Differentiated products and high switching costs
- Threat of forward integration: when suppliers have the ability to integrate forwards into the buyer's industry and compete with their buyers.

The threat of substitute products and services: the threat of substitute is determined by: the price-performance ratio. The more attractive this ratio of substitute products, the greater the restraint on the prices that can be charged and therefore on an industry's profit.

The intensity of rivalry among competitors in an industry: rivalry can increase when competitors in an industry see an opportunity to improve their market position. However this will invariably be met by retaliatory moves from other organizations in the industry. The following factors affect competitive rivalry:

- Numerous or equally balanced competitors
- Industry growth rate
- High fixed costs: high fixed costs, increases pressure for companies to gain economies of scale, this will lead to a fight for market share.
- Lack of differentiation
- High exit barriers: this may hinder firms needing to exit the industry
- **The industry life cycle:** suggest that industries go through four stages of development: introduction, growth, maturity and decline. The life cycle helps an organization to see how it is positioned in terms of the development of its markets. The different stages of the industry life cycle will have an impact upon competitive conditions facing the organization.

Introduction stage: this stage is characterized by slow growth in sales and high costs as a result of limited production.

Growth stage: sales increase rapidly as the market grows, allowing firms to reap the benefits of economies of scale. The increase in sales brings greater profits, which in turn attracts new entrants to the market.

Maturity stage: sees a slowing in sales growth and profits as the market becomes saturated. Efficient production and low cost become more important. As market share can only be achieved at the expense of competitors. Rivalry becomes therefore more intense.

Decline stage: firms experience a fall in sales and profitability. Consumer loyalty shift to new products, based on newer technologies.

- **Strategic groups:** strategic groups within an industry constitute a cluster and inform us that just because competitors occupy the same industry does not make them competitors. Like BMW and Mercedes are competitors, but Porsche and Nissan are not.

Strategic map: is a useful tool for comparing the strategies of organizations in an industry. An organization selects two characteristics that can differentiate firms within the industry and draws the vertical and horizontal axes. The two axes might include characteristics such as price, product range, geographical coverage and reliability.

Mobility barriers: the same way that an organization may be prevented from entering an industry by barriers to entry, mobility barriers inhibit movements between strategic groups.

In undertaking strategic group analysis, an organization can better understand its industry structure. By mapping rivals following similar strategies into strategic groups, an organization can ascertain their most direct competitors.

#### Chapter 4: the internal environment: value-creating activities

Value chain analysis: looks at the activities that go to make up a product or service with a view to ascertaining how much value each activity adds. It was devised by Porter to help an organization assess its internal resources. The value or margin of a product is calculated by the amount of revenue it earns, so if we know the total cost of each product then the difference between the total revenue and total cost is the profit margin. It is increasingly recognized that organizations can also add value through cooperation with their suppliers, customers and distributors. This process is referred to as the value chain system and recognizes that an organization's own value chain will interact with the chain prevalent in other organizations.

We can see that an organization is a collection of activities. All these activities can be captured using the value chain analysis. In assessing an organization's activities it is important to analyse these at the level of strategic business units (SBU). The activities contained within the value chain are classified by Porter as primary and support activities.

- **Primary activities:** are activities which are directly involved in the creation of a product or service. The 5 primary activities are:

<b>Inbound logistics</b>	These activities cover receiving, storing and distributing inputs to the product. They include: material handling, warehousing, inventory control, vehicle scheduling and returns to suppliers
<b>Operations</b>	These activities deal with transforming an organization's inputs into final products such as machining, assembly, testing, printing, packaging and facility operations
<b>Outbound logistics</b>	These activities are associated with collecting, storing and distributing the product/service to the customer. Outbound logistics include: warehousing, delivery, order processing, scheduling and material handling
<b>Marketing &amp; sales</b>	This includes activities that make a product available for buyers to purchase and induces them to buy. Includes: advertising, promotion, sales force, quoting, channel selection/relations and pricing
<b>service</b>	These activities enhance or maintain the value of products, such as installation, repair, training, parts supply, and product adjustment

- Support activities: are activities which ensure that the primary activities are carried out efficiently and effectively. The four generic support activities are:

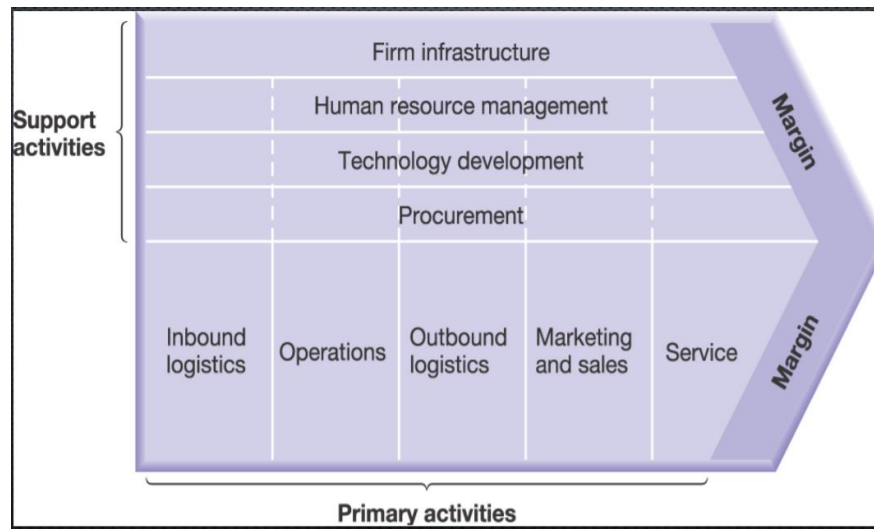
<b>Procurement</b>	This activity deals with the process of purchasing resource inputs to support any of the primary activities. Inputs to the organization's productive process include such things as raw materials, office supplies and building
<b>Tech development</b>	This activity covers an organization's 'know-how', its procedures and any use of technology that has an impact upon product, process and resource development
<b>HRM</b>	These activities include: recruiting, selection, training, development and remuneration of employees. They may support individual, support and primary activities.
<b>Firm infrastructure</b>	This consists of activities which usually support the entire value chain, such as general management, planning, finance, accounting, quality management.

These two activities provide the link between an organization's strategy and its implementation. Because once the organization is seen as a collection of activities, every employee will understand their role in the strategy.

Each category of primary and support activities includes a further three activities which impact on competitive advantage. These are

- Direct activities: involve creating value for the buyer, e.g. through product design
- Indirect activities: indirect activities allow direct activities to take place, e.g. maintenance

- quality assurance: ensures that appropriate quality of the other activities is maintained e.g. through monitoring and testing.



Evaluating the value chain: in deciding which activities to include within the value chain, an organization needs to be aware of their contribution to its competitive advantage. Value chain analysis is much more than evaluation of the activities within the chain. To be effective, value chain analysis needs to recognize and understand the relationship or linkages between these activities. The aim is to see if a given activity can be undertaken differently and thereby improved, providing competitive advantage.

Porter suggest that linkages can lead to competitive advantage in two ways: optimization and coordination.

- Optimizing: an organization may spend more on the development of the product design and the quality of its materials in order to avoid greater maintenance costs during the product's use
- Coordination: an organization can reduce its costs or improve its ability to differentiate by better coordinating activities in its value chain.

SWOT analysis: allows an organization to determine the extent of the strategic fit between its capabilities and the needs of its external environment. This implies that the organization has some understanding of the value-chain activities that underpin its strengths and weaknesses.

Limitations of the swot analysis, within the swot analysis you usually get long lists with strengths and weaknesses which all are weighted the same in theory, but in reality most of the time this is not the case. And sometimes factors can act as a strength or weakness, or opportunity or threat. This depends on whether from which point of view you are looking. The swot analysis is very aimed at the current industry, thereby the tipping points which could change the industry are overlooked.

## Chapter 5: the internal environment: a resource-based view of strategy

Resource-based view of strategy: is often seen as an alternative perspective for Porter's five forces framework('outside-in'). The resource-based view emphasizes the internal capabilities of the organization in formulating strategy to achieve a sustainable competitive advantage in its markets and industries. If we see the organization as made of resources and capabilities which can be configured to provide it with competitive advantage. In other words, its internal capabilities determine the strategic choices it makes in competing in its external environment('inside-out'). Clearly, a organization will pay attention to the configuration of its value-chain activities. This is because it will need to identify the capabilities within its value-chain activities which provide it with competitive advantage.

The resource based view is based on two assumptions about the resources and capabilities that each firm possesses. The assumptions are:

- Resource heterogeneity: this implies that different firms competing in the same industry may possess different resources and capabilities. As a result, a firm competing in the same industry may be able to undertake activities better than its rivals in the same industry.
- Resource immobility: this implies that the resource and capability differences that exist between firms may continue over time. The reason being it is too costly for the firms who do not possess these resources and capabilities to develop or acquire them. This helps to explain why some firms consistently outperform other firms.

Resources: may be thought of as inputs that enable an organization to carry out its activities. Where organization in the same industry and with similar resources, but differing in performance, we might



deduce that they vary in the extent to which they utilize their resources. Resources can be categorized as:

- **Tangible resources:** refer to physical assets that an organization possesses and can be categorized as physical resources, financial resources, and human resources.
- **Intangible resources:** comprise brand names, patents and copyrights, an organization's ability to innovate, and reputation.

Resources per se do not confer any benefit on an organization. It is an organization's capability that allows it to deploy these resources towards a desired task. Therefore, resources are the source of an organization's capability. We can distinguish between:

- **Threshold capabilities:** is necessary for a firm to be able to compete in the marketplace. In this respect, all competing firms possess threshold capabilities.
- **Distinctive capabilities:** are necessary to achieve competitive advantage. A prerequisite for a distinctive capability is that it must be highly valued by the customer and difficult for your competitors to imitate.

**Core competences:** collective learning of individual members within an organization and their ability to work across organizational boundaries. All core competences are distinctive capabilities but not the other way around. There are three tests for the core competences:

1. A core competence should provide access to a wide variety of markets, e.g. Honda's distinctive capabilities in engine design and production have enabled it to compete in markets such as cars, lawnmowers and powerboats
2. A core competence should make a significant contribution to the perceived customer benefits of the end products. E.g. BMW has distinctive capabilities in engineering, which allow it to produce high quality cars that sell at premium.
3. A core competence should be difficult for competitors to imitate. E.g. in the US Southwest airlines competitors have found that having similar resources have not enabled them to replicate what makes the airline so successful. In the UK, competitors of Ryanair have been unable to deconstruct their success

The VRIO framework and sustainable competitive advantage: in order to assess the extent to which a capability may provide an organization with a sustainable competitive advantage we can make use of the VRIO framework, the framework asks four questions

<b>Value</b>	Do an organization's capabilities allow it to exploit environmental opportunities and neutralize environmental threats?
<b>Rarity</b>	Are capabilities possessed by only a few competitors?
<b>Imitability</b>	Are capabilities costly for other organizations to acquire or imitate?
<b>Organization</b>	Is the firm organized to allow it to exploit the valuable, rare, and difficult to imitate capabilities it possesses?

If to all of the 4 questions the answer is 'yes', then it is a sustainable competitive advantage.

**Criticisms of the resource-based view:** a common criticism made of the resource-based view is that it says very little on the important issues of how existing resources and capabilities can develop and

change over time. And how new capabilities might be developed. Another criticism is that the role played by managers in the organization is often assumed to be fulfilled and therefore seldom addressed.

## Chapter 6: business strategy

Business strategy is a means of separating out and formulating a competitive strategy at the level of the individual business unit/strategic business unit. A strategic business unit is a distinct part of an organization which focuses upon a particular market or markets for its products and services. It should be remembered that a parent company sets the overall strategy. The key to bear in mind with business strategy is that it is always in pursuit of a sustainable competitive advantage.

A competitive advantage is about performing different activities or performing similar activities in different ways. Porter argues that competitive strategy is about developing a defensible position in an industry, that enables you to effectively deal with the five competitive forces.

Porter developed three generic strategies to help an organization outperform rivals within an industry, and so successfully position itself against the five forces.

1. Overall cost leadership: involves a firm begin the lowest cost producer within the industry while maintaining the industry standard. This allows the firm to outperform rivals within the industry because it can charge lower prices and its lowest-cost base still allows it to earn profit. E.g. Ryanair
2. Differentiation strategy: is based on organization producing products or services which are perceived by customers as unique or superior to competitor offerings. It presents an opportunity to create greater value by meeting customer needs more closely than rivals. It is this perceived added value that is the basis on which customers are prepared to pay a premium price. E.g. Apple
3. Focus strategy: allows an organization to target a segment or niche within the market. The segment may be based on a particular customer group, geographical market, or specific product line. Unlike the other two strategies, a focus strategy is aimed at serving a particular target market efficiently. This strategy is adopted by companies selling high-end jewellery and fashion brands.

Cost leadership strategy:

A cost leadership strategy requires an organization to pursue:

- Aggressive construction of efficient-scale facilities
- Vigorous pursuit of cost reductions from experience
- Tight cost and overhead control
- Avoidance of marginal customer accounts
- Cost minimization in areas like R&D, service, sales force and advertising

A tactic for cost reduction is the experience curve, which means the more you produce the lower the cost per product manufactured.

Advantages of this strategy are:

- It allows an organization to generate above-average profitability even where intense competition exist
- Low cost companies have an advantageous position to compete on price which effectively acts as a barrier to entry the industry as an outsider
- Low cost competitors will be in a better position to counter substitutes( such as Ryanair and the Eurotunnel or ferry

Risk of following this strategy:

- It can be expensive, as the organization continually updates its capital equipment
- Competitors may be able to imitate
- A change in technology may invalidate the cost leader's past investments in capital equipment and allow competitors to take market share
- Customers tastes may change, which results in them being less price sensitive and more willing to buy a differentiated product.

Differentiation strategy:

Ways to differentiate are:

- Product design or brand image (BMW, Apple)
- Customizing products to suit consumers specific requirements
- State-of-the-art technology
- Marketing abilities
- Reliability
- Customer service

Advantages of this strategy are:

- Differentiation provides a defense against rivalry, because it creates brand loyalty that helps the organization against price competition
- This brand loyalty also works as a barrier to enter the industry
- The power of buyers is constrained as they lack a comparable alternative
- This strategy provides organization's with higher margins that enables it to deal more easily with cost pressures from suppliers
- Due to brand loyalty it is protected against substitutes

Risks of this strategy are:

- The price may not be so far above competitors that consumers perceive the difference as not worth paying
- Need for differentiated product may decline
- Competitors may narrow the attribute of differentiation that results in consumers being faced with a viable substitute

Focus strategy:

Advantages of this strategy:

- Same as with the previous two strategies

Risks of this strategy:

- That the segment may not be durable
- Broad-based competitors believe the segment represents an attractive submarket and out-focuses the focuser
- The difference between the segment and the main market narrows, leaving focus-based competitors at a disadvantage.

Resource-Based Approach to Strategy Formulation:

The resource-based strategy view argues there are two fundamental reasons for making the resources and capabilities of the firm the foundation of its strategy:

- Because internal resources and capabilities are the basic of the direction for a strategy
- Resources and capabilities are the primary source of profit.

The aim of the resource based approach is to maximise Ricardian rents

Resources: inputs into the production process.

Capability: the capacity to perform a task or activity.

“What market you’re in seems inappropriate in such a changing environment”

Organizational routines: regular, predictable and sequential patterns of work activity undertaken by members of an organization.

Durability: the rate at which an organization’s resources and capabilities depreciate or become obsolete.

Transparency: the ease with which a competitor can identify the capabilities which underpin a rival’s competitive advantage.

Transferability: how easily a competitor can access the resources and capabilities necessary to duplicate an incumbent’s strategy.

Replicability: the use of internal investments to copy the resources and capabilities of competitors.

### **Implications for strategy formulation**

Most valuable resources: those that are difficult to identify, imperfectly transferable and difficult to imitate.

Resources-> Capabilities->Competitive advantage->Strategie->Identify resource gaps->Resources->enz.

Sustainable competitive advantage must be ensured by upgrading resources and capabilities based on the believed future competition. Assessing the external environment correctly is thus necessary to evaluate trends.

Core competencies are the resources and capabilities needed to compete successfully in the future.

Blue ocean is a strategic position unoccupied by competitors that has the potential for demand creation and highly profitable growth. Arises when organizations focuses on value innovation.

Value innovation occurs when organizations shift their focus from beating the competition to making the competition irrelevant by placing equal emphasis on both value and innovation

## **Blue ocean strategy**

The creators of this strategy suggest that companies need to create and capture blue oceans of uncontested and market space. They divide the business world in terms of:

- Red oceans: represent all the industries that currently exist today; the known market space
- Blue oceans: represent all the industries not in existence today; the unknown market space

In red oceans, industry boundaries are clearly defined and accepted by competitors in the industry. The objective is to outperform your rivals and gain a greater share of existing demand. As more firms compete for this finite demand, so profits and growth rates reduce. In contrast, a blue ocean represents a strategic position unoccupied by competitors that has the potential for demand creation and highly profitable growth. Most blue oceans are created within red oceans, by expanding existing industry boundaries.

## **The strategy canvas**

To build a blue ocean we use an analytical framework called the strategy canvas. It captures the range of factors which the industry competes on and invests in; the critical success factors, those factors which are valued by the customer and which allow the company to compete in the industry. The horizontal axis of strategy canvas includes the critical success factors. On the vertical axis, we show the value a company offers the buyers in terms of each of these critical factors. A high score on the vertical axis means a company offers buyers more, and therefore invest more, in that factor.

## **Strategy formulation in turbulent markets**

How can organizations formulate successful strategies to achieve sustainable competitive advantage? The answer lies in a clearer understanding of the competitive conditions that operate in the marketplace, and the relationship between an environment's turbulence and the choice of strategy.

There are four different competitive markets:

1. Equilibrium: this environment is characterized by long periods of little or no competence-destroying turbulence incumbent leaders exercise control through barriers to entry. A challenger must make these barriers to entry irrelevant.
2. Fluctuating equilibrium: the environment is characterized by rapid turbulence based on frequent competence enhancing disruptions. Challengers try to destroy the underlying core competencies of the leader and move the environment to punctuated equilibrium or disequilibrium.
3. Punctuated equilibrium: this is characterized by brief dynamic periods based on discontinuous change or competence destroying revolutions. This is particularly so in industries which experience fast technological change followed by dominant standard. The leader has to decide when and how to respond to the next revolution. The challenger seeks to disrupt the stability sought by the leader.
4. Disequilibrium: this the most challenging of the hypercompetitive environments, characterized by frequent and discontinuous disruptions. The leaders will constantly be creating new competencies, and deliberately disrupting themselves before their rivals do. Examples include Apple's introduction of new products, which intentionally cannibalizes their existing product.

The challengers have to disrupt this environment in ways that cannot easily be matched or change the environment to become less disruptive.

## Chapter 7: corporate strategy

Once the purpose of the organization is determined, for instance to maximize shareholder value, the role of corporate strategy is to enable the organization to fulfil that purpose. Therefore, corporate strategy defines the scope of the industries and markets within which the organization competes in order to achieve its purpose. Business strategy in contrast, determines how it will compete successfully in those markets and contribute to the corporate strategy.

Corporate parent: exists when an organization is made up of multiple business units. The goal of the corporate parent is to make the business units perform better collectively than alone. When this happens it is called: synergy.

### Growth strategies

In order to grow, organization can pursue a number of different strategies depending on the level of risk they are willing to countenance, their capabilities, and their management expertise. There are four strategies that an organization might follow:

- Market penetration: increase market share in your existing markets using your existing products.
- Market development: entering new markets with your existing products
- Product development: developing new products to sell in your existing markets
- Diversification: developing new products to serve new markets

The first three strategies are particularly relevant to organizations that operate within the boundaries of an individual business. However, an organization that seeks to broaden its scope of activities will be concerned with how it can best diversify into different businesses.

Market penetration: is a low risk strategy cause it aims to gain market share, by using its existing products. Therefore, it can rely upon the organization's existing resources and capabilities. To achieve penetration, the organization will usually improve its product quality and levels of service, backed by promotion spend.

Product development: involves developing new products for your existing markets. The ability to innovate is crucial in rapidly changing consumer markets. A strategy of product development is necessary where organizations are faced with shorter product life cycles. A challenge is that it might be expensive and it carries a greater risk of failure.

Market development: involves entering new markets with the firm's existing products. This may be done by targeting new market segment or geographical areas, or by devising new uses for its products. As with the previous strategies market development builds on an organization's resources and capabilities. Although the organization will have extensive knowledge of its product, its experience with the new markets will be less complete, thus increasing the level of risk.

Diversification: here we are dealing with an organization that seeks to broaden its scope of activities by moving away from its current products and markets and into new products and new markets. Although

this will involve the greatest level of risk, it may be necessary where an organization's existing products and markets offer little opportunity for growth.

Related diversification: refers to entry into a related industry in which there is still some link with the organization's value chain. There is vertical integration, which occurs when an organization goes 'upstream' towards its inputs, or 'downstream' closer to its ultimate customer. The more control the organization has over the different stages of its value chain, the more vertically integrated it is. Horizontal integration takes place when an organization takes over a competitor or offers complementary products at the same stage within the value chain.

### Portfolio analysis

Boston consulting group matrix (BCG matrix): this matrix was developed by boston consulting group. This matrix plots an organization's business units according to its industry growth and its relative market. Industry growth rate can be determined by reference to the growth rate of the overall economy. Therefore, if the industry is growing faster than the economy we can say it is a high growth industry. A business unit's relative market share is defined as the ratio of its market share in relation to its largest competitor within the industry. A business unit that is the market leader will have a market share greater than 1.0.

A business unit can fall within one of our four strategic categories in which it will be characterized as:

- Star: high growth. High market share
- Cash cows: experience high market share, but low market growth or mature industries
- Question marks: compete in high growth industries, but have low market share
- Dogs: low market share, low market growth



### Strategic evaluation

A method to assess the strategy applied to your organization and see whether it is the best option is to assess the strategy according to its

- Suitability: there should be some consistency between the strategy, the opportunities within the external environment, the capabilities of the organization and the organizational objectives
- Feasibility: concerns whether a strategy will work in practise, an organization must possess the necessary resources such as: finance, technological expertise, marketing and others
- Acceptability: whether it is accepted by the stakeholders

There is also another test, with different criteria:

- Consistency: a strategy may not present any inconsistent goals and policies
- Consonance: allows organization to evaluate the economic relationships that characterize the business, also helps determine whether or not sufficient value is being created for long term.
- Advantage: a strategy must create competitive advantage in one of the following areas: superior skills, superior resources, superior position

- **Feasibility:** is to ensure that the proposed strategy does not overtax organization's available resources or create insoluble problems

## Chapter 8

Globalization refers to the linkages between markets that exist across national borders. These linkages may be economic, financial, social or political. This implies that what happens in one country has an impact on occurrences in other countries. In contrast, localization implies that national differences between countries are important and that organization must take account of these differences in their product offerings, distributions and product promotions if they are to be successful.

### **International strategy**

The motives for firms to expand internationally can be evaluated by looking at:

organizational factors:

- **Role of the management:** the perception of the senior management will play a role in the reasoning of going internationally, this may arise when an organization is in a industry known as 'economies of scale' when spreading costs over greater units of outputs is way more cost efficient.
- **Firm specific factors:** the size of the firm, and the international appeal for the product.

Environmental factors:

- **Unsolicited proposals:** such a proposal may come about from an organization being approached by a foreign government, distributor or customer.
- **The bandwagon effect:** refers to organizations who follow competitors, cause they do not want to miss out on chances.
- **Attractiveness of the host country:** the market size of countries and favourable regime towards foreign direct investment will be attractive to organizations.

### **Types of international strategy**

**Multidomestic strategy:** is aimed at adapting a product for use in national markets and thereby responding more effectively to the changes in local demand conditions.

**Global strategy:** with this the organization seeks to provide standardized products for its international markets. So it can benefit from the effect of economies of scale

**International strategy:** is based upon an organization exploiting its core competencies and distinctive capabilities in foreign markets. E.g. Nike, which does it design and development in the US, but manufacturing in China. Disadvantage of this is that you are vulnerable to currency appreciations.



Transnational strategy: is one in which an organization is confronted with multidimensional strategic requirements in other words, it must simultaneously achieve global efficiency, national responsiveness and a worldwide leveraging of its innovations and learning.



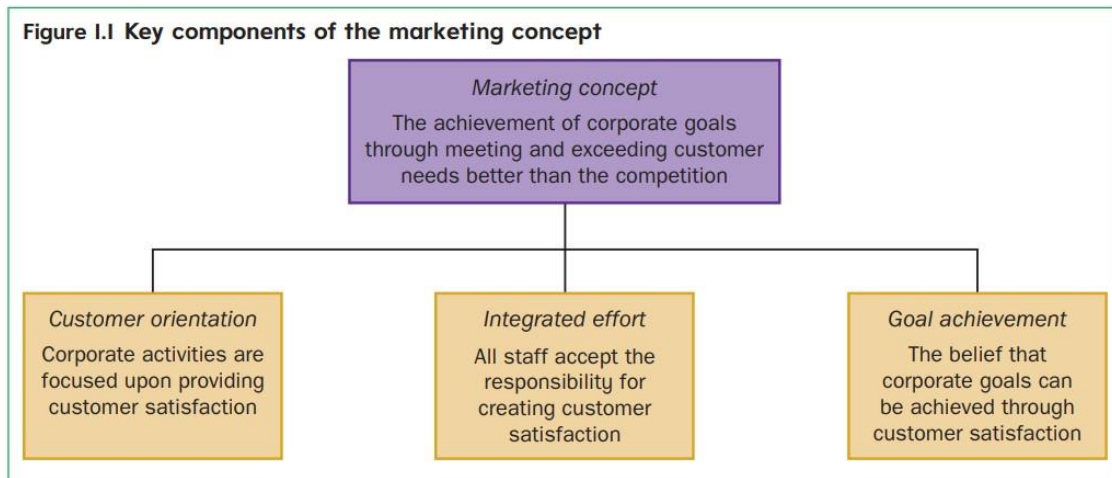
## Summary 2: Marketing

### Marketing summary Chapter 1 The nature of marketing

#### 1. What is marketing?

**Modern marketing concept:** 'the achievement of corporate goals through meeting and exceeding customer needs better than the competition'

- Three conditions must be met before the marketing concept can be applied:



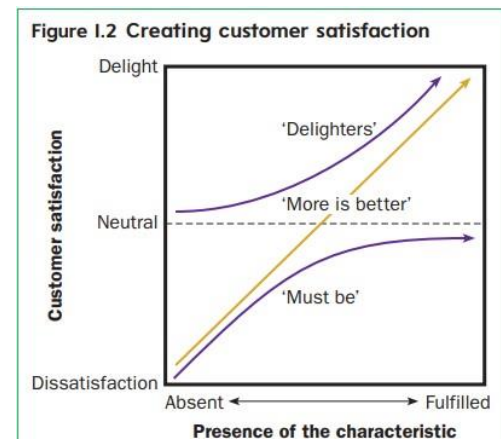
#### 2. The nature of customer value

Customer value = perceived benefits – perceived sacrifice Kano model:

'**must bes**' are expected and thus taken for granted (planes must depart on time)

'**more is better**' characteristics can take satisfaction past neutral and into the positive satisfaction range (no response to a call = dissatisfaction, quick response = rise to positive satisfaction)

'**delighters**' unexpected characteristics that surprise the customer, their absence does not cause dissatisfaction, but their presence generates delight



#### 3. Four core forms of customer value

- **Price value:** product is cheap (RyanAir, Aldi)
- **Performance value:** perceived quality levels, convenience, innovativeness, attractive features and functionality (Dyson)
- **Emotional value:** when differences between products are minimal, but customers are emotionally attached to the company, created through marketing activity (Coca-Cola, Volvo)

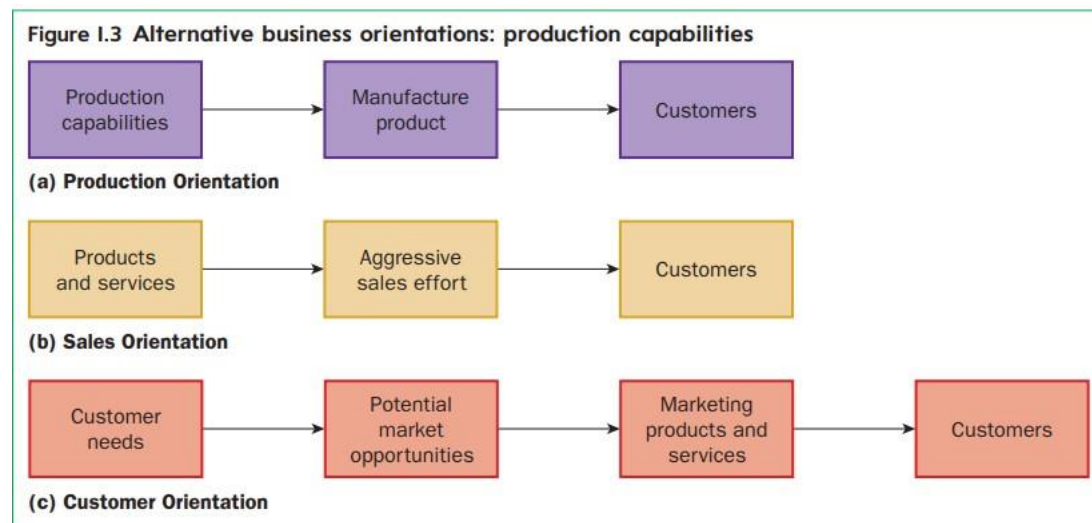
- **Relational value:** the quality of service received by the customers, when customer finds a good-quality service provider, they may be willing to stay with this provider and as relationship builds the high level of trust is established between the parties (restaurants, business taxation services)
  - Notion of the **lifetime value of a customer**
- **Customer relationship management (CRM)** - systems to get to know their customers better and to interact with them on a regular basis

**Challenge for organizations:** become a value leader in one of those 4 dimensions: Ryanair (price value leader in aviation) or Louis Vuitton (emotional value leader in luxury fashion goods) → successful because **clearly defined value proposition** or USP (unique selling point).

The key role of customer value enables us to offer the following definition of marketing: **Marketing is the delivery of value to customers at a profit.**

#### 4. The development of marketing

There is no guarantee that all companies will adopt a marketing orientation.



Production orientation-1930; Sales orientation-1950; Customer orientation-1960/70, but all three are still present.

Newer business orientations – **social marketing concept** (sustainable marketing) - holds that marketing strategy should deliver value to customers in a way that maintains or improves both the **consumer's and society's well-being**.

**Market-driven/outside-in firms** - seek to anticipate as well as identify consumer needs, and build the resource profiles necessary to meet current and anticipated future demand. Leading customer needs!

**Market and internal -oriented businesses:**

Table I.I Market-orientated businesses vs internally orientated businesses

Market-orientated businesses	Internally orientated businesses
Customer concern throughout business	Convenience comes first
Know customer choice criteria and match with marketing mix	Assume price and product performance key to most sales
Segment by customer differences	Segment by product
Invest in market research (MR) and track market changes	Rely on anecdotes and received wisdom
Welcome change	Cherish status quo
Try to understand competition	Ignore competition
Marketing spend regarded as an investment	Marketing spend regarded as a luxury
Innovation rewarded	Innovation punished
Search for latent markets	Stick with the same
Be fast	Why rush?
Strive for competitive advantage	Happy to be me-too

**The scope of marketing - Social marketing** refers to the use of marketing techniques in order to change or maintain people's behaviour for the benefit of the individual or society as a whole (politics, anti-smoking, alcohol awareness, sun safety, water safety, sexual health and exercise)

## 5. Marketing, consumption and society

Nature of marketing from 3 min perspectives:

- **Managerial view:** marketing as a functional activity within organizations and as a philosophy for doing business that puts customers at the centre of things
- **Consumer view:** consumers are not just the recipients of the value created by organizations but, in many instances, co-create that value through: reviewing products and services, producing usergenerated content, generate new product ideas and improve services.
- **Societal view:** the relationship with society as a whole, organizations cannot operate in isolation, **macromarketing**-the field of research within marketing that studies the role of marketing in society, considering issues such as marketing systems, market regulation, ethics, social responsibility and sustainable marketing, **circular economy**-economic systems must eliminate waste

### Article: Ten charts that show how US shopping behavior is changing

- Flight to online
  - Digital shopping is here to stay
  - Millennials and high-income earners are in lead when it comes to shopping online
- Shock to loyalty
  - Consumers are switching brands
  - Brands need to ensure strong availability and also convey value

- Need for hygiene transparency
  - US consumers are changing how they shop in response to health and safety concerns
- Back to basics and value
  - Consumer shopping intent is focused on essentials
  - Consumers want value for their money—especially in essential categories
- Rise of homebody economy
  - Americans are changing how they spend their time at home
  - Americans are concerned about going back to regular activities outside the home

### **Behaviors vary by consumer segment**

*Affluent and unaffected:* optimism about the future, are able to stay at home during pandemic, shop more online, less price sensitive due to greater job stability.

*Uprooted and underemployed:* feeling major impact on both their finances and health due to job insecurity, low optimism about future economic conditions, they are trading down to essentials and value, swapping out brands, and shopping online when possible.

*Financially secure but anxious:* 65 years old or older, pessimistic about economic conditions after covid, the greatest need for hygiene transparency, with above-average concerns on safety and well-being and concerns about the ability to get necessary supplies.

*Out trying to make ends meet:* their jobs and job security have been heavily impacted by COVID-19, minority groups, less likely to be able to stay at home (lower likelihood to be part of the homebody economy), strongly moving toward shopping for essentials and value.

*Disconnected and retired:* retired, over 65, and have a lower income level than the financially-secure-but-anxious segment, optimistic about economic conditions after COVID-19, less likely to display any of the next-normal characteristics, no changes in shopping behaviour.

## **Chapter 3 Understanding customer behavior**

### **1. The dimensions of customer behavior** Core questions:

- Who is important in the buying decision?
- How do they buy?
- What are their choice criteria?
- Where do they buy? - When do they buy?

### **2. Who buys?**

Blackwell, Miniard and Engel describe five roles in the buying decision-making process.

**Initiator:** the person who begins the process of considering a purchase. Information may be gathered by this person to help the decision. (kid)

**Influencer:** the person who attempts to persuade others in the group concerning the outcome of the decision.

Influencers typically gather information and attempt to impose their choice criteria on the decision.  
(sister)

**Decider:** the individual with the power and/or financial authority to make the ultimate choice regarding which product to buy. (parents)

**Buyer:** the person who conducts the transaction. The buyer calls the supplier, visits the store or goes online, makes the payment and effects delivery. (parent)

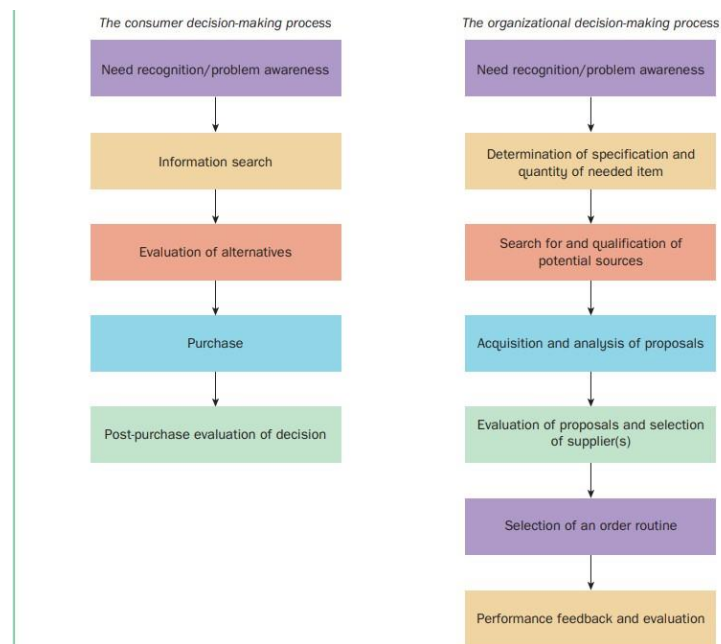
**User:** the actual consumer/user of the product (kids)

Multiple role in the buying group may be assumed by one person

**Organizational buying** – in hands of decision-making unit (DMU) or buying centre, the marketing task is to identify and reach the key members in order to convince them of the product's worth.

### 3. How they buy?

- **Information processing approach**



**Need recognition** – occur as a result of routine depletion (food, petrol) or unpredictable events (breakdown of a car), marketers should be aware of **need inhibitors** – that is, those factors that prevent consumers from moving from need recognition to the next stage of the buying decision process (delivery costs).

**Information search** – may involve personal sources (friends) and commercial sources (advertisements), online (trivago, compare.com), objective is to build the **awareness set** (the array of brands that may provide a solution to a problem)

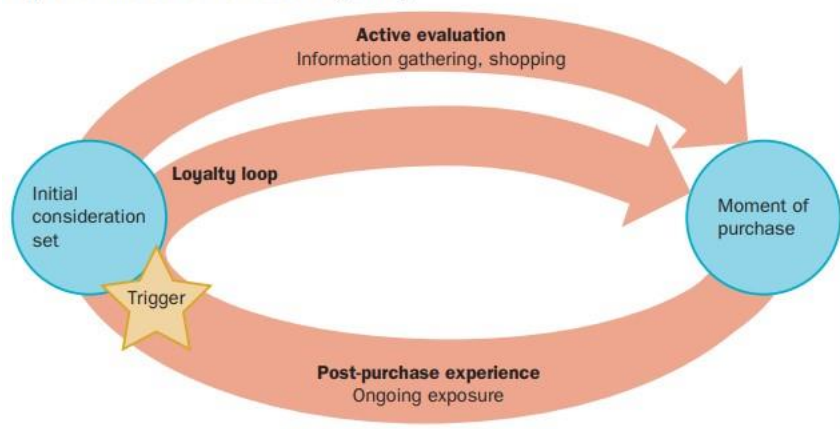
- Reducing the awareness set is the first step in the **evaluation of alternatives**

**Evaluation of alternatives**- awareness set → screening filter → **evoked set** (those products that buyer seriously considers before making a purchase)

**Post purchase evaluation of decision** – customers may be satisfied or have concerns (cognitive dissonance), four ways in which dissonance is likely to be increased: owing to the expense of the purchase; when the decision is difficult; when the decision is irrevocable; when the purchaser is inclined to experience anxiety. Managing expectations is the key for reducing dissonance

- **Consumer decision journey**

Figure 3.3 The consumer decision journey



- Viewing consumption as a circular activity.
- Number of alternatives may actually grow as the ease of information search online allows for the discovery of new brands and products during the buying process. Brands that were not considered may end up becoming a candidate for selection.
- More active post-purchase experience, where the unwrapping and unboxing of purchases may be filmed and shared
- **Consumer culture theory (CCT)**

Consumption is much less rational or conscious experience. It is socio-cultural or experiential activity driven by emotions. That is why consumers derive pleasure from shopping or search for certain meanings in the brands they choose.

**Table 3.1 The information processing approach vs consumer culture theory**

Attribute	Information processing approach	Consumer culture theory
Level of analysis	Individual	Society
Focus	Cognitive processes	Context of consumption
Purpose of consumption	Utilitarian	Experiential
Process of consumption	Logical	Random
Key consumption influence	Rationality	Social

### Types of purchase decision

- **Extended problem solving:** consumers are highly involved in a purchase, have adequate time available for deliberation, high degree of information research, high potential for post-purchase dissatisfaction or cognitive dissonance.
- **Limited problem solving:** consumer has some experience with product so internal search, through memory
- **Habitual problem solving:** low consumer involvement and a perception of limited differences between brands, happens when consumer repeat-buys products
- **Variety-seeking behaviour:** by low product involvement but where there are perceived differences between brands

### 4. What are the choice criteria?

**Table 3.2 Choice criteria used when evaluating alternatives**

Type of criteria	Examples
Technical	Reliability Durability Performance Style/looks Comfort Delivery Convenience Taste
Economic	Price Value for money Running costs Residual value Life-cycle costs
Social	Status Social belonging Convention Fashion
Personal	Self-image Risk reduction Morals Emotions

⑨ Performance

⑨ Cost

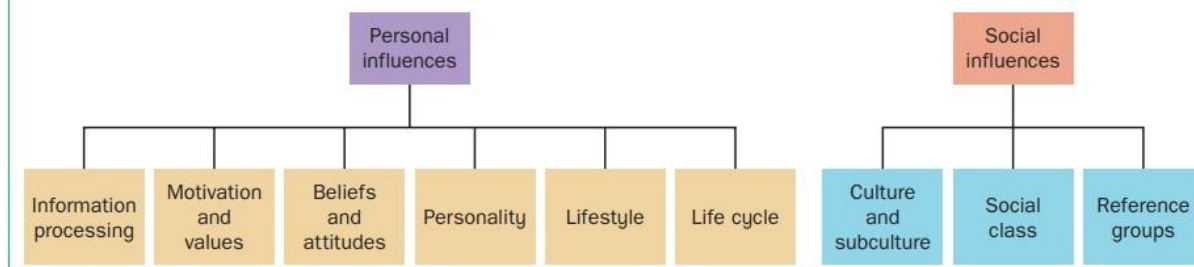
⑨ Image

⑨ How product relates psychologically



## 5. Influences on customer behaviour

Figure 3.5 Personal and social influences on consumer behaviour



### Personal influences:

- **Information processing:** process by which a stimulus is received, interpreted, stored in memory and later retrieved. Two aspects: perception and learning.

Perception: developing innovative ways to create multi-stimuli experience, 3 processes: selective attention, selective distortion (consumers distort the information they receive according to their beliefs), selective retention (only a selection of messages may be retained in memory)

### Learning:

- Classical conditioning - (by advertising repeatedly)
- Operant conditioning - the more rewarding the response, the stronger the likelihood of the purchase being repeated (free samples)
- Rote learning - learning without conditioning ('Lemsip is for flu attacks', the consumer may remember that Lemsip is a remedy for flu attacks)
- Vicarious learning - we may learn the type of clothes that attract potential admirers by observing other people (in adverts 'admiring glance' and we imagine that the same will happen to us if we buy this dress) ■ Reasoning - reading a detailed product review or watching a sales presentation

Semiotics is the study of the correspondence between signs and symbols, and their roles in how we assign meanings.

- **Motivation and values:** what are the motives that cause us to select one experience over another, or choose to spend our time or money in certain ways? Maslow's hierarchy of needs(basic psychological, safety, belongingness, esteem and status, self-actualization); evolutionary psychologists: 4 needs (survive, reproduce, select kin, reciprocate). Distinction between **needs and wants**
- **Beliefs and attitudes:** beliefs about oneself (self-concept) drives a significant element of consumption "we are what we possess". An 'attitude' is an overall favourable or unfavourable

evaluation of a product or service. Changing attitudes: old spice “the man your man could smell like” advertisements made old spice more appealing for youth

- **Personality:** is the sum of the inner psychological characteristics of individuals, which lead to consistent responses to their environment. Big 5: openness (to new experience), conscientiousness (reliability, self control), agreeableness (friendliness), stability (emotional), extraversion. Extent to which we possess each of these traits will be reflected in our behaviour and in our consumption choices.
- **Lifestyle:** refers to the pattern of living as expressed in a person’s activities, interests and opinions. A company may choose to target a particular lifestyle group with a product offering, and use advertising that is in line with the values and beliefs of this group
- **Life cycle:** consumer behaviour may depend on the ‘life stage’ people have reached

#### Social influences:

- **Culture and subculture:** traditions, taboos, values and basic attitudes of the whole society within which an individual lives. - **Social class**
- **Reference groups:** a group of people that influences an individual’s attitude or behaviour, main role here has an opinion leader(probably socially active)

## **6. Influencer marketing**

It involves the use of social media influencers to drive a brand’s message to reach target segments. Three categories of influencers: **celebrity** influencers, who may have millions of followers; **macro**-influencers (100,000-plus followers); and **micro**-influencers (1,000–100,000 followers). Challenges: may be expensive. When choosing an influencer, a brand must ensure that they are aligned with the brand’s overall content strategy and brand image. No regulations.

## **7. Influences on organizational buying behaviour**

The demand for many organizational goods is derived from the demand for consumer goods, which means that small changes in consumer demand can have an important impact on the demand for industrial goods.

**Figure 3.7 Influences on organizational purchasing behaviour**



**Buy class:** organizational purchases are distinguished as:

New task – the need for the product has not arisen previously, a great deal of information is required

Straight re-buy – organization buys previously purchased items, from suppliers already judged acceptable

Modified re-buy – 2 extremes: 1) regular requirement for the product exists, buying alternatives are known, but change has occurred (delivery problem)

Buy classes affect organizational buying in following ways:

- Membership of DMU changes
- Decision making process may be much longer

as the buy class changes

- In terms of influencing DMU members, they are likely to be much more receptive to new task and modified re-buy situations than straight re-buys.

### **Product type:**

materials – to be used in the production process, e.g.

aluminium components – to be incorporated in the finished

product, e.g. headlights plant and equipment – for example,

earth-moving equipment

products and services for MRO (maintenance, repair, operation) – for example, spanners, welding equipment and lubricants.

The people who take part in the decision-making process tend to change according to product type. The decisionmaking process tends to be slower and more complex as product type moves along the following continuum:

MRO → components → materials → plant and equipment

**The importance of purchase:** Important when: large sums of money are considered, high

uncertainty **Features of organizational purchasing practice**

- Just in time(JIT): aims to minimize stocks by organizing a supply system that provides materials and components as they are required. Purchasing inventory, production downtime and inspection costs reduced. Product design, the quality of produced item improved. Close co-operation between manufacturer and suppliers.
- Online purchasing:

Vertical electronic marketplaces: industry specific

Horizontal electronic marketplaces: cross industry boundaries, companies seeking supplies post their offers on websites

- Centralized purchasing: Centralization encourages purchasing specialists to concentrate their energies on a small group of products, thus enabling them to develop an extensive knowledge of cost factors and the operation of suppliers

**Relationship marketing** organizational buying has become increasingly characterized by very close relationships between buyers and sellers (reduced risk, improved communication, suppliers may become strategic partners, new product development). Companies have reorganized their sales forces to reflect the importance of managing customer relationships effectively –key account management. Reverse marketing – process where the buyer attempts to persuade the supplier to provide exactly what the organization wants. B2b context – sometimes leases (contract to rent for example a car from other firm)

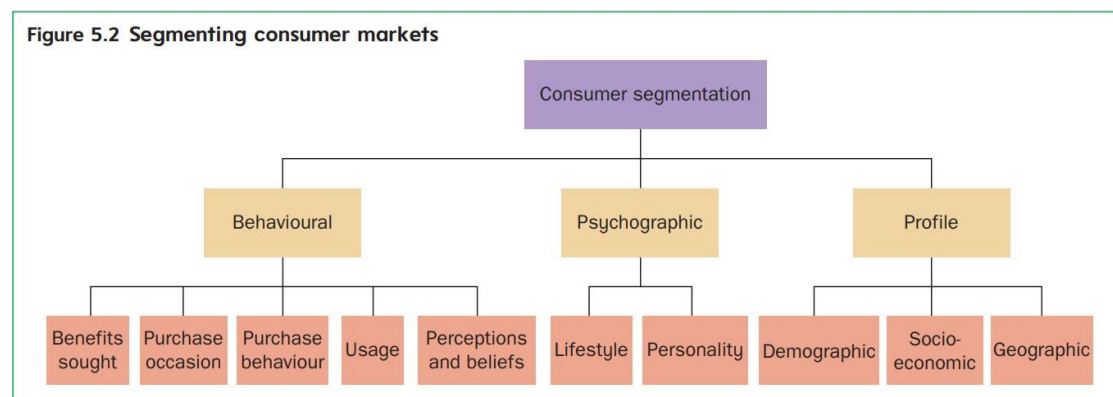
## Chapter 5 Market segmentation, targeting and positioning

**Market segmentation** ‘the identification of individuals or organizations with similar characteristics that have significant implications for the determination of marketing strategy’. Involves the division of a **diverse market into** a number of **smaller submarkets** that have **common features**.

### Benefits of market segmentation (better atatching of customer needs)

- enhanced profitability
- more effective targeting of communications
- opportunities for segment dominance
- improved customer retention
- enhanced opportunities for growth

### 1. SEGMENTING consumer markets



## 2. Consumer segmentation criteria (change over time)

Table 5.1 Consumer segmentation methods

Variable	Examples
<i>Behavioural</i>	
Benefits sought	Convenience, status, performance
Purchase occasion	Self-buy, gift, special occasions
Purchase behaviour	Brand loyal, brand switching, innovators
Usage	Heavy, light
Media behaviour	Snapchat, Instagram, Netflix, radio
<i>Psychographic</i>	
Lifestyle	Trendsetters, conservatives, sophisticates
Personality	Conscientious, agreeable, extrovert
<i>Profile</i>	
Age	Under 12, 12–18, 19–25, 26–35, 36–49, 50–64, 65 and over
Gender	Female, male
Life cycle	Young single, young couples, young parents, middle-aged empty-nesters, retired
Social class	Upper middle, middle, skilled working
Terminal education age	16, 18, 21 years
Income	Income breakdown according to study objectives and income levels per country
Geographic	North vs south, urban vs rural, country
Geodemographic	Upwardly mobile young families living in larger owner-occupied houses, older people living in small houses, European regions based on language, income, age profile and location

Some of the more popular bases for segmentation:

**Benefits sought** – why people buy in a market, example: Colgate Cavity Protection (decay prevention), Colgate Max Fresh (fresh breath), Colgate Kids (taste), Colgate Sparkling White and Ultrabrite Advanced Whitening (white teeth), and Colgate Sensitive (sensitive teeth).

**Purchase behavior** – degree of brand loyalty

**Usage** – whether they are heavy users (most marketing attention), light users or non-users of a selected product category

**Lifestyle** – categorizing people by their way of life, particular lifestyle groups have predictable media habits. Marketers can then use these media to reach their chosen segments.

**Age** – baby, children (animals in advertisements), working mothers, people over 50 years of age likely to become increasingly important in the future (grey consumers), women over 50 years of age is one of the fastest-growing demographic segments

**Geography** – country or regions in the country or on the basis of city size. Popular in recent years: a combination of geographic and demographic variables into geodemographics. A major strength of geodemographics is that it can link buyer behaviour to customer groups

Table 5.2 The Acorn targeting classification

Categories	% of UK population	Groups	% in UK population
A: Affluent Achievers	22.5	1 Lavish Lifestyles	1.3
		2 Executive Wealth	12.4
		3 Mature Money	8.8
B: Rising Prosperity	9.1	4 City Sophisticates	3.2
		5 Career Climbers	5.9
C: Comfortable Communities	27.2	6 Countryside Communities	6.4
		7 Successful Suburbs	6.1
		8 Steady Neighbourhoods	8.3
		9 Comfortable Seniors	2.5
		10 Starting Out	4.0
D: Financially Stretched	22.5	11 Student Life	2.5
		12 Modest Means	7.4
		13 Striving Families	8.1
		14 Poorer Pensioners	4.5
E: Urban Adversity	17.7	15 Young Hardship	5.1
		16 Struggling Estates	7.9
		17 Difficult Circumstances	4.7

### 3. Segmenting organizational markets

#### Organizational segmentation criteria:

**Size** – size of buying organization, large organizations have greater order potential, more formalized buying and management processes, increased specialization of function, and special needs.

**Industry** – identified by the Standard Industrial Classification (SIC) codes. Different industries may have unique requirements from products

**Geographic location** - The purchasing practices and expectations of companies in Central and Eastern are likely to differ from those in Western Europe.

**Choice criteria** - The key criteria used by buyers when they are evaluating supplier offerings. Price is important for one segment and product performance for another.

**Purchasing organization** - Decentralized versus centralized purchasing. Centralized associated with experts in buying a range of products.

### 4. Five criteria for successful segmentation

- 1) **Effective:** the segments identified should consist of customers whose needs are relatively homogeneous within a segment, but significantly different from those in other segments. If buyer needs in different segments are similar, then the segmentation strategy should be revised.
- 2) **Measurable:** it must be possible to identify customers in the proposed segment, and to understand their characteristics and behaviour patterns. For example, some personality traits, like 'extrovert' or 'conscientious', might be difficult to pin down, variables like age or occupation would be more clear-cut.

- 3) **Accessible:** the company must be able to formulate effective marketing programmes for the segments that it identifies. In other words, it must be clear what kinds of promotional campaign might work best for the segment, how the products might best be distributed to reach the segment, and so on.
- 4) **Actionable:** the company must have the resources to exploit the opportunities identified through the segmentation scheme. Certain segments – for example, in international markets – might be identified as being very attractive but the company may not have the resources or knowledge necessary to serve them.
- 5) **Profitable:** segments must be large enough to be profitable to serve. Very small segments may be unprofitable to serve, but though advances in production and distribution technologies, increasingly, microsegments can be profitable.

## 5. TARGET marketing (after segmentation)

Refers to the choice of specific segments to serve, and is a key element in marketing strategy. Organization needs to evaluate the segments to decide which ones to serve using the five criteria above.



**Undifferentiated marketing** – when no differences in customer characteristics. The cost of developing a separate marketing mix for different segments may outweigh the potential gains of meeting customer needs more exactly (market heterogeneity, but rather than try to respond to all differences, to focus only on the critical ones in order to develop offerings that appeal to as large a slice of the market as possible)

**Differentiated marketing** – Specific marketing mixes can be developed to appeal to all or some of the segments when market segmentation reveals several potential targets. Risks associated with using this strategy are: creating confusion in the marketplace and spreading the organization's resources too

thinly

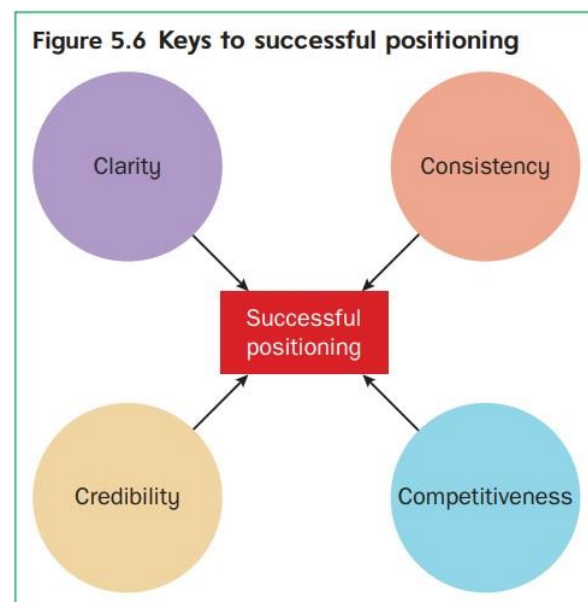
**Focused marketing** – just because a company has identified several segments in a market does not mean that it should serve them all. Company develops a single marketing mix aimed at one target (niche) market, companies with limited resources. One of the challenges for focused marketers is to evolve their targeting strategy effectively as the market grows (sports nutrition supplements only for bodybuilders → but regular gymgoers also started to use them).



**Customized marketing** – they will discuss face to face with each customer their requirements, and tailor their services accordingly. High value of orders and the special needs of customers. Advances in technology (Nike, you can design your shoes on the site). **Personalization** - ‘an approach where brands deliver messages, products, experiences and services on a one-to-one basis by leveraging data and technology to meet, or anticipate an individual customer’s needs’ whereas customized marketing involves the co-creation of products with customers, personalization may lead also to the creation of products for new customers and observing, usually through data analytics, that they have a profile similar to some existing customer. Personalization is about more than product creation – it incorporates other elements, personalized labelling, advertising and experiences.

## 6. POSITIONING

*The act of designing the company’s offering so that it occupies a meaningful and distinct position in the target customer’s mind.* It’s linking **your product** or service to the **solutions** that consumers seek and ensuring that, when they **think about those needs**, **your brand** is one of the first that **comes to mind**. Developing a positioning strategy



What position to try to occupy in the market? - consideration of three variables, customers, competitors and the company itself. Customers - we must examine what attributes matter to them, find some differential advantage that cannot easily be matched and build a position based on its unique attributes. Once the overall positioning strategy is agreed, the next step is to develop a positioning statement. This is a memorable, image-enhancing, written summation of the product’s desired stature

The critical attributes of effective positioning are as follows:

**Clarity:** the idea must be perfectly clear, both in terms of target market and differential advantage. Complicated positioning statements-boo.

**Consistency:** because people are bombarded with messages daily, a consistent message is required to break through this noise.

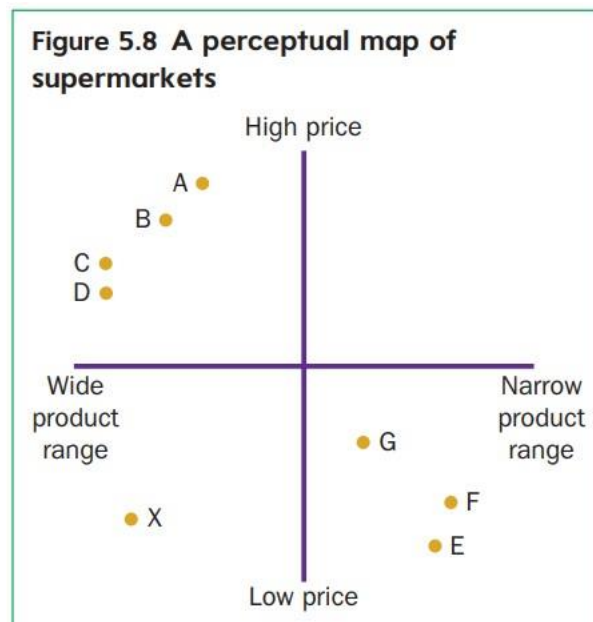
Confusion will arise if, this year, we position on ‘quality of service’ and next year change this to ‘superior product performance’.

**Credibility (wiarygodność):** the selected differential advantage must be credible in the minds of target customers. An attempt to position roll-your-own cigarette tobacco as an upmarket exclusive product failed due to lack of credibility.

**Competitiveness:** the chosen differential advantage must possess a competitive edge. It should offer something of value to the customer that the competition is failing to supply.



Perceptual map – a useful tool to determine position of the brand in the marketplace



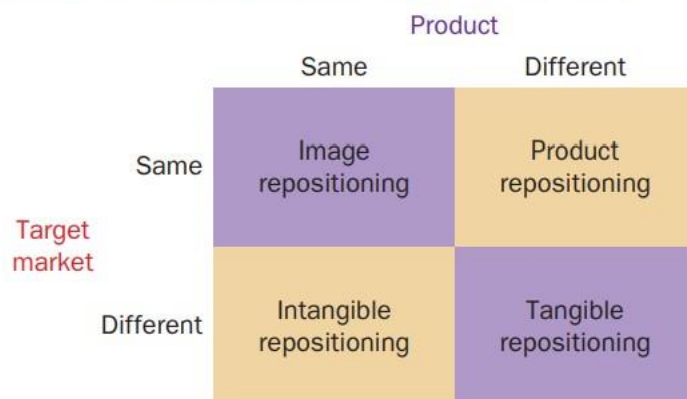
Key steps in producing a perceptual map:

1. Identify a set of competing brands
2. Identify – using qualitative research (e.g. group discussions) the important attributes consumers use when choosing between brands.
3. Conduct quantitative marketing research where consumers score each brand on all key attributes.
4. Plot brands on a two-dimensional map

## 7. Repositioning

Involves changing the target market, the differential advantage, or both bc of changing customer tastes or poor sales performance.

**Figure 5.9 Alternative repositioning strategies**



**Image repositioning** – change the image of the product

**Product repositioning** – for example, in the intensely competitive food delivery market, Just Eat has had to constantly improve its ordering and customer service app.

**Intangible repositioning** – targeting different market

**Tangible repositioning** – a company may decide to move up- or downmarket by

introducing a new range of products to meet the needs of its new target customers.

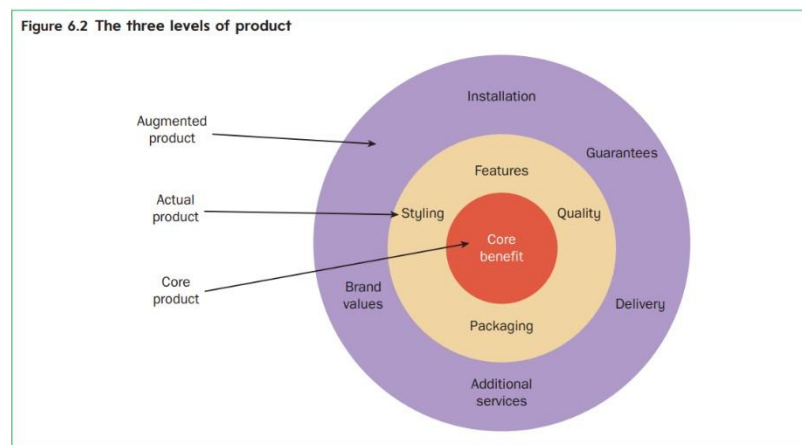
## 1. What is product?

In marketing terms, **any form of value** that is offered in exchange **for money, votes or time** is a **product**. Products is a mix of tangible and intangible components

**Brands** fulfill the function of distinguishing the offering of one company from others in a competitive environment

## 2. Product differentiation

Around the basic benefit is the **'actual product'** the consumer purchases (oven), there is also a third level of product, namely the **'augmented product'**. This is the additional bundle of benefits that are added to a product, which typically includes elements like guarantees, additional services and additional **brand values**. Product differentiation can take place at any of those three levels.



**Core differentiation** – arises when there are significant technology breakthroughs, therefore the core benefit of keeping track of our appointments has moved from paper diaries to electronic ones stored on PCs or mobile phones.

**Actual differentiation** – occurs when organizations aim to compete on the basis of elements of the product such

as its quality, its design, its features or its packaging.

**Augmented differentiation** – for mature consumer brands most differentiation occurs at this level, additional services and offerings

## 3. Branding

### The benefits of brands to organizations

- **Company value:** financial value of companies may be enhanced by having strong brands, the concept of **brand equity** is used to measure the strength of the brand in the marketplace
- **Consumer preference and loyalty:** strong brand names can have positive effects on customer perceptions and preferences, retention of customers and loyalty
- **Barrier to competition:** The impact of the strong, positive perceptions held by consumers about top brands means it is difficult for new brands to compete
- **High profits**
- **Base for brands extensions:** Examples include Pepsi Max, Diet Coke, Heineken 0.0 and Google Scholar. The new brand benefits from the added value that the brand equity of the core brand bestows on the extension.

### The benefits of brands to customers

- **Communicate features and benefits:** Brands are source of information about a product
- **Reduce the risk in purchasing:** Consumers risks when they purchase: functional risks (that the product does not perform to expectations), financial risk (that it is not worth the price that is paid) and social risk (that the product produces social embarrassment). Brands reduce these risks because consumers can trust the brands they choose based on past experiences
- **Simplify the purchase decision:** Providing shortcuts for product choices
- **Provide symbolic value:** Brands are powerful indicators of the consumer's personality type

#### 4. Building brands

Naming brands, 3 brand name strategies:

**Family brand name** – philips, heinz, is used for all products. Risk: if one of the brands receives unfavourable publicity or is unsuccessful, the reputation of the whole range of brands can be tarnished. This is also known as 'umbrella branding'.

**Individual brand name** – does not identify a brand with a particular company, this may be necessary if each brand requires a separate unrelated identity. Toyota, which abandoned its family brand name when it launched its upmarket executive car, the Lexus.

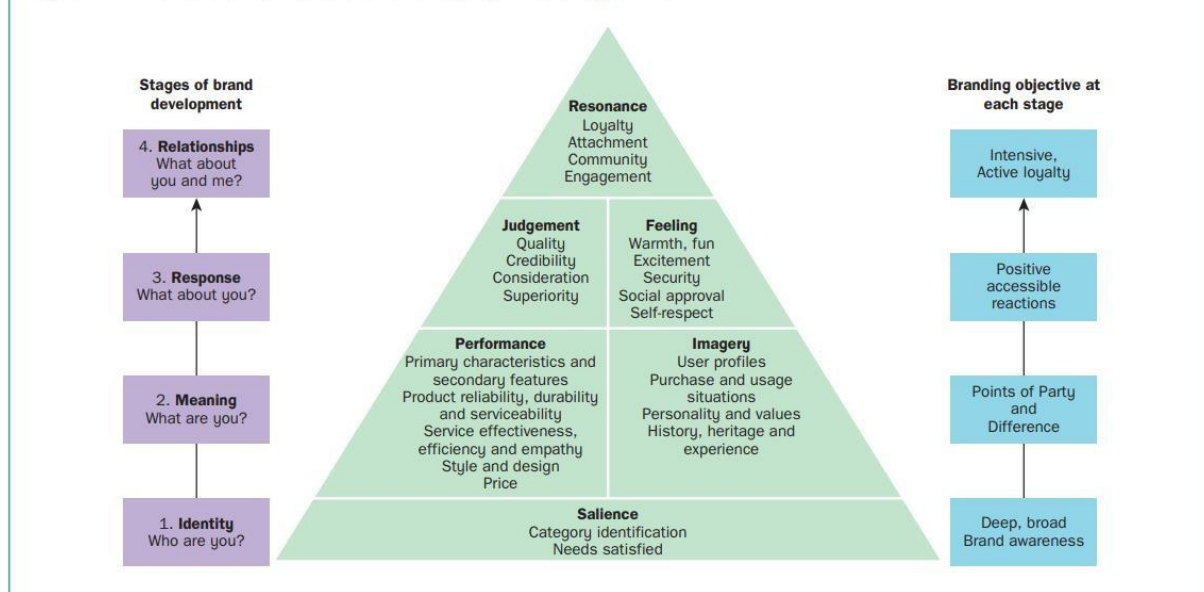
**Combination brand names** – Microsoft Teams, volkswagen polo

Brand name should evoke positive associations, be memorable and easy to pronounce, suggest product benefits, be distinctive, not infringe an existing brand name. Legal protection for a brand name, brand mark or trade character is provided through the **registration of trademarks**

Developing brands

- It's a long-term activity

Figure 6.3 The customer-based brand equity model pyramid



**Brand salience (1<sup>st</sup> step)** - which is a measure of how easily and often customers think of the brand under various purchase and consumption situations, built through the creation of distinctive brand assets as well as their overall marketing communications activities

**Brand's positioning (2<sup>nd</sup> step)** - creating a meaningful and distinct image in the target customer's mind. Brand imagery is sometimes described in terms of the functional and symbolic elements of the brand.

**Brand resonance (3<sup>rd</sup> step)** - refers to the relationship that consumers have with a brand and how loyal they feel towards it

## 5. Managing brands

**Brand extension** - the use of an established brand name on a new brand within the **same market**

**Brand stretching** – when an established brand name is used for brands in **unrelated**

**markets** **Global branding** - reduce campaign costs and generate global uniformity

for brands Co-branding:

**Product-based co-branding** - linking of two or more existing brands from **different companies** to form a **product** in which **both brand names** are **visible** to the consumer

- Parallel co-branding: two independent brands join forces to form a combined brand
- Ingredient co-branding: one supplier explicitly chooses to position its brand as an ingredient of a product.

Advantages of product-based co-branding: differentiation, reduce cost of product introduction

**Communications-based co-branding** - linking of two or more existing brands from different companies or business units for the purpose of joint communications, for example one brand can recommend

another, stimulate interest (mcdonalds and disney which gives the former exclusive global rights to display and promote material relating to new Disney movies in its outlets), sponsorship deals (Shell's brand name appearing on Ferrari cars)

## 6. Managing product and brand portfolios

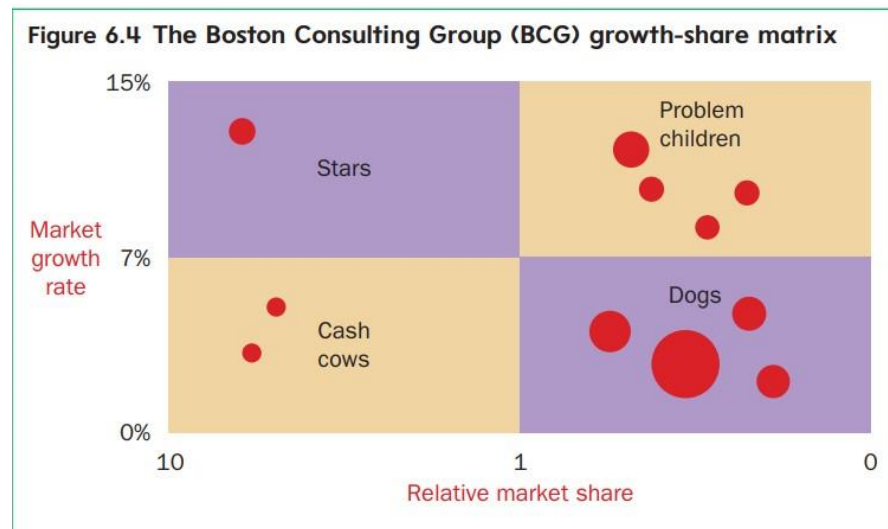
Some companies have a large portfolio of products or brands. They can be described in terms of a company's **product line and mix**.

**Product line** - a group of products that are closely related in terms of their functions and the benefits they provide

- **depth of the product line** - the number of variants offered within the product line.
- **'product mix'** - the total set of brands or products marketed in a company. It is the sum of the product lines offered.
- **width of the product mix** - the number of product lines an organization offers.

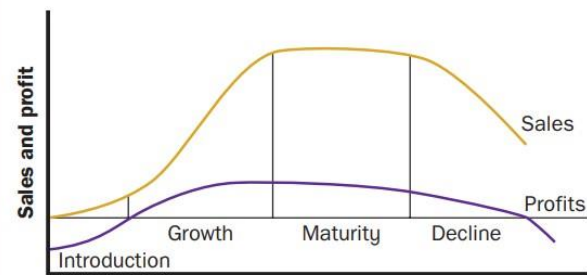
**Portfolio planning** – the process of managing groups of brands and product lines

The term *brand architecture* is used to describe the way in which a collection of brands are related to, and differentiated from, one another.



The size of the circles reflects the proportion of revenue generated by each product line.

Figure 6.5 The product life cycle



	Introduction	Growth	Maturity	Decline
Strategic market-ing objective	Build	Build	Hold	Harvest/manage for cash
Strategic focus	Expand market	Penetration	Protect share	Productivity
Brand objective	Brand awareness/trial	Brand preference	Brand loyalty	Brand exploitation
Products	Basic	Differentiated	Differentiated	Rationalized
Promotion	Creating awareness/trial	Creating awareness/trial repeat purchase	Maintaining awareness/repeat purchase	Cut/eliminated
Price	High	Lower	Lowest	Rising
Distribution	Patchy	Wider	Intensive	Selective

## 7. Managing brands and product lines over time: the product life cycle

### 8. New product

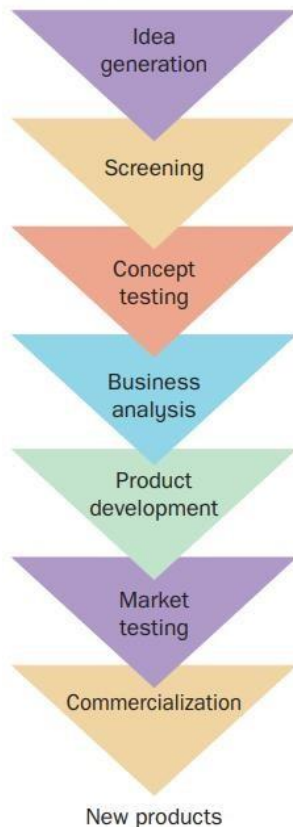
development 4 broad

categories of new

product:

- 1) **Product replacements:** these account for about 45 per cent of all new product launches, and include **revisions** and **improvements** to **existing** products (Ford Focus replacing the Fiesta), **repositioning** (existing products such as Lucozade being targeted at new market segments) and **cost reductions** (existing products being reformulated or redesigned so that they cost less to produce).
- 2) **Additions to existing lines:** these account for about 25 per cent of new product launches and take the form of new products that add to a company's existing product lines. This produces greater product depth. An example is the launch by Weetabix of a brand extension, Oatibix, to compete with other oatbased cereals.
- 3) **New product lines:** these total around 20 per cent of new product launches and represent a move into a new market. For example, in Europe, Mars has launched a number of ice cream brands, which made up a new product line for this company. This strategy widens a company's product mix.
- 4) **New-to-the-world products:** these total around 10 per cent of new product launches and create entirely new markets. For example, the video games console, the electric car and the 3D printer have created new markets because of the highly valued customer benefits they provided

**Figure 6.6 The seven-stage new product development process**



**Idea generation** - sources of new product ideas can be **internal** to the company: scientists, engineers, marketers, salespeople and designers. Some companies use the brainstorming technique to stimulate the creation of ideas, use financial incentives to persuade people to put forward ideas.

Sources of new product ideas can also be **external** to the company: distributors, customers the most common sources of inspiration for new ideas continue to be employees inside the organization, rather than players outside the firm.

**Screening** – new product ideas have to be screened in order to evaluate their commercial value. Open discussion or criteria.

**Concept testing** - the basic product idea will be expanded into several product concepts, each of which can be compared by testing with target customers. Allows the views of customers to enter into the new product development process at an early stage.

**Business analysis** - Estimates of sales, costs and profits will be made, based on the results of the concept test, as well as on considerable managerial judgement.

**Product development** - It is usually necessary to integrate the skills of designers, engineers, production, finance and marketing specialists so that product development is quicker, less costly and results in a high-quality product that delights customers. Costs are controlled by a method called target costing.

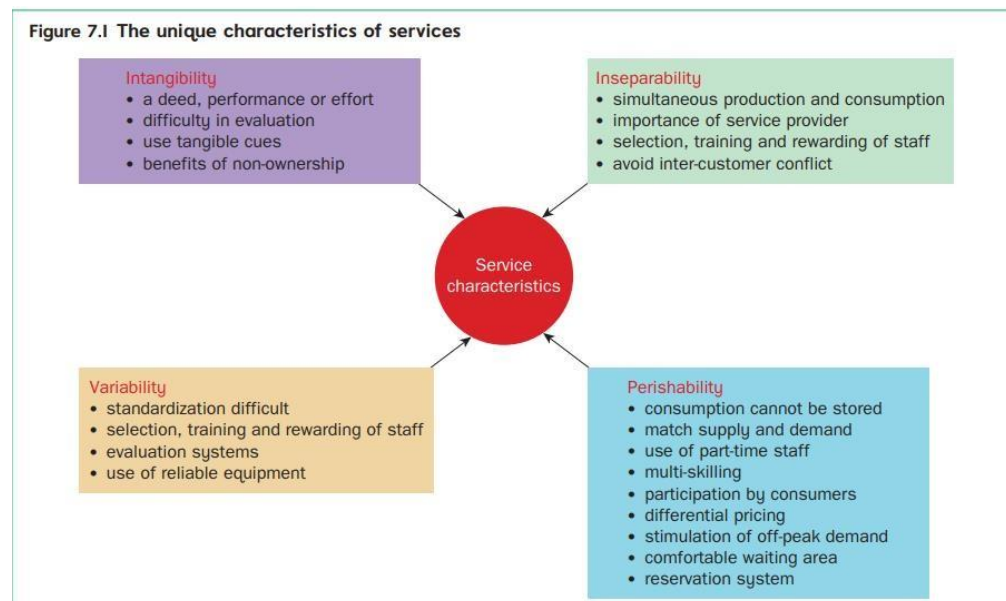
**Market testing** - The basic idea is to launch the new product in a limited way so that consumer response in the marketplace can be assessed. There are two major methods: the simulated market test and test marketing. Simulated test - realistic market situation in which a sample of consumers choose to buy goods from a range provided by the organizing company. Test marketing - when the new product is launched in one, or a few, geographical areas chosen to be representative of its intended market

**Commercialization** - the launch of the product in the marketplace. An effective commercialization strategy relies on marketing management making clear choices regarding the target market (where it wishes to compete), and the development of a marketing strategy that provides a differential advantage (how it wishes to compete)



Almost all goods that are offered in a marketplace contain both tangible and intangible elements. High on tangible elements = products, high on intangible elements = services

## 1. The unique characteristics of services



**Intangibility** – performance, effort, not an object, difficulty in evaluation bc you don't know if vacations are gonna be nice, products = search properties (they can be examined in advance), services = experience properties (can be assessed only after experienced), Some services (medical operation or a car service), possess credence properties=it is not possible to evaluate them even after they have been consumed. The task is to provide an indication of likely service quality (brochures, pictures, testimonials of happy customers). Intangibility means that a customer cannot own a service.

**Inseparability** – services have simultaneous production and consumption. Haircut, medical operation, psychoanalysis, pop concert. Service provider = integral part of the customer satisfaction. The selection, training and rewarding of staff who are service people is of fundamental importance in the achievement of high service quality. Enjoyment of the service is dependent not only on the service provided, but also on other consumers. Adequate provision to avoid intercustomer conflict (eg noise, smoke)

**Variability** – service quality may be subject to variability, so standardization is difficult, two McDonalds may have different service quality bc of respective managers and staff. Two marketing courses at the same university may vary in terms of quality, depending on the lecturer. Need for rigorous selection, training and rewarding of staff. Evaluation systems = allow customers to report on their experiences with staff. Finding the balance between human and automated service delivery

**Perishability** – consumption cannot be stored for the future. A hotel room or an airline seat that is not occupied today represents lost income that cannot be gained tomorrow. Important to match the supply and demand of services. Supply flexibility can be varied through the use of part-time staff during peak periods, multi-skilling of staff, Demand may be smoothed through lower pricing to encourage customers to visit during off-peak periods, effective queuing systems, reservation systems.



## 2. Managing services

enterprises 4 key issues:

**Physical evidence:** customers look for clues to the likely quality of a service by inspecting the tangible evidence or the *servicescape* ( looking through restaurant window, décor,

**People:** bc of inseparability of production and consumption in services, firm's personnel occupy a key position in influencing customer perceptions of quality. *Service encounter* = interaction between service provider and customer. Service employees will treat the customers well if the company treats them well, *service profit chain* = happy workforce=happy customers=profitability. *Internal marketing!* – selecting, training and motivating staff members to provide customer satisfaction

**Process:** procedures, mechanisms and flow of activities by which a service is acquired. 2 elements: visible to the customer and invisible to the customer but is still critical to service delivery. Service process decisions involve tradeoff between levels of service quality (effectiveness) and productivity (efficiency) – online banking, self scanning in supermarkets, self-service at restaurants and gas stations. **Service branding:** reputation, brand name, word of mouth 5 core dimension of service quality:

- 1) **Reliability:** is the service consistent and dependable?
- 2) **Assurance:** that customers can trust the service company and its staff.
- 3) **Responsiveness:** how quickly do service staff respond to customer problems, requests and questions?
- 4) **Empathy:** that service staff act in a friendly and polite manner, and care for their customers.
- 5) **Tangibles:** how well managed is the tangible evidence of the service (e.g. staff appearance, décor)

4 gaps that are the main cause of service quality problems

**Gap 1** - gap between **what customers expect** from a service provider and **what the senior management team** in the service organization **thinks that customers expect**. Senior management too far from customers, effective research to close the gap

**Gap 2** - gap between **senior management perceptions** and the **service-level criteria** that they set for the organization. This gap can be closed by ensuring that **customer service goals are an important part** of the **organization's targets** for the planning period.

**Gap 3** - gap between the **service-level targets set by the organization** and the **actual level of service** that is delivered by frontline staff. Closing this gap by good internal marketing (training, selection).

**Gap 4** - gap between **what firms tell their customers to expect** in their external communications and **what they actually deliver**.

Delivering service quality requires constant attention to the four potential gaps in the service delivery system.

Service recovery - Service recovery strategies should be designed to solve the problem and restore the customer's trust in the firm, as well as improve the service system so that the problem does not recur in the future. 1) set up a tracking system to identify system failures 2) Service staff should be motivated to report problems and solutions so that recurrent failures can be identified and fixed

### 3. Relationship marketing

Customers may also value having a close relationship with a service provider, relationship benefit the service provider it is cheaper for the organization to retain existing customers than to gain new ones. The **quality** of the **relationship** that develops will often **determine** its **length**.

**Conditions that suggest using relationship marketing activities:** 1) There is an ongoing or periodic desire for the service on the part of the customer, e.g. insurance or theatre service vs funeral service. 2) The customer controls the selection of a service provider, e.g. selecting a hotel versus entering the first taxi in an airport waiting line. 3) The customer has alternatives from which to choose, e.g. selecting a restaurant vs buying water from the only utility company service in a community.

**Six benefits to service organizations in developing and maintaining strong customer relationships:** Increased purchases, Lower costs, Lifetime value, Sustainable competitive advantage, Word-of-mouth, Employees job satisfaction. **Benefits for the customer:** Risk reduction, customization of service, reduction of customer's switching costs, social and status benefits

Relationship marketing strategies vary in the degree to which they bond the parties together.

**Three levels of retention strategy based on the types of bond used to cement the relationship:**

**Level 1** - bond is primarily through **financial incentives** (higher discounts on prices for larger-volume purchases, or loyalty points resulting in lower future prices) but easy for competitors to copy so low potential for sustainable competitive advantage

**Level 2** - building long-term relationships through **social** as well as **financial bonds**. Raises the potential for a sustainable competitive advantage. Customers become clients, the relationship becomes personalized and the service customized. This type of relationship include communication with customers, sending cards, seminars. Some hotels keep records of their guests' personal preferences such as their favourite newspaper and alcoholic drink.

**Level 3** - bonding is formed by **financial, social** and **structural bonds**. Structural bonds tie service providers to their customers through providing solutions to customers' problems that are designed into the service delivery system. For example, **logistics companies often supply their clients with equipment that ties them into their systems.**

### Customer relationship management (CRM) systems

A single database is created from customer information to inform all staff who deal with customers. CRM = methodologies, technologies and e-commerce capabilities used by companies to manage customer relationships. Interactions between a customer and an organization take place across a variety of channels, such as the sales force, call centres, websites, email and social media. All these interactions need to be recorded, kept up to date and shared effectively across the organization. Businesses frequently find that they are subject to the Pareto Principle, or 80/20 rule – that is, that **80 per cent of**

**their profits may come from 20 per cent of their customers.** At a very simple level what this means is that **some customers may be more important than others**, perhaps the company should invest more in those valuable customers. Other researchers have recommended classifying customers on the basis of their value to the organization using labels such as platinum, gold, silver and lead. Silver and gold customers need to be moved up the scale, lead customers are gradually 'fired'.

Customer relationship management allows firms to measure the following:

**Customer retention:** What proportion of customers are **staying** with the firm, and are these the customers it **wants** to retain?

**Customer defection:** What proportion of customers are **leaving** the firm? Are these the customers that the firm would want to '**fire**' or the ones it would rather **retain**?

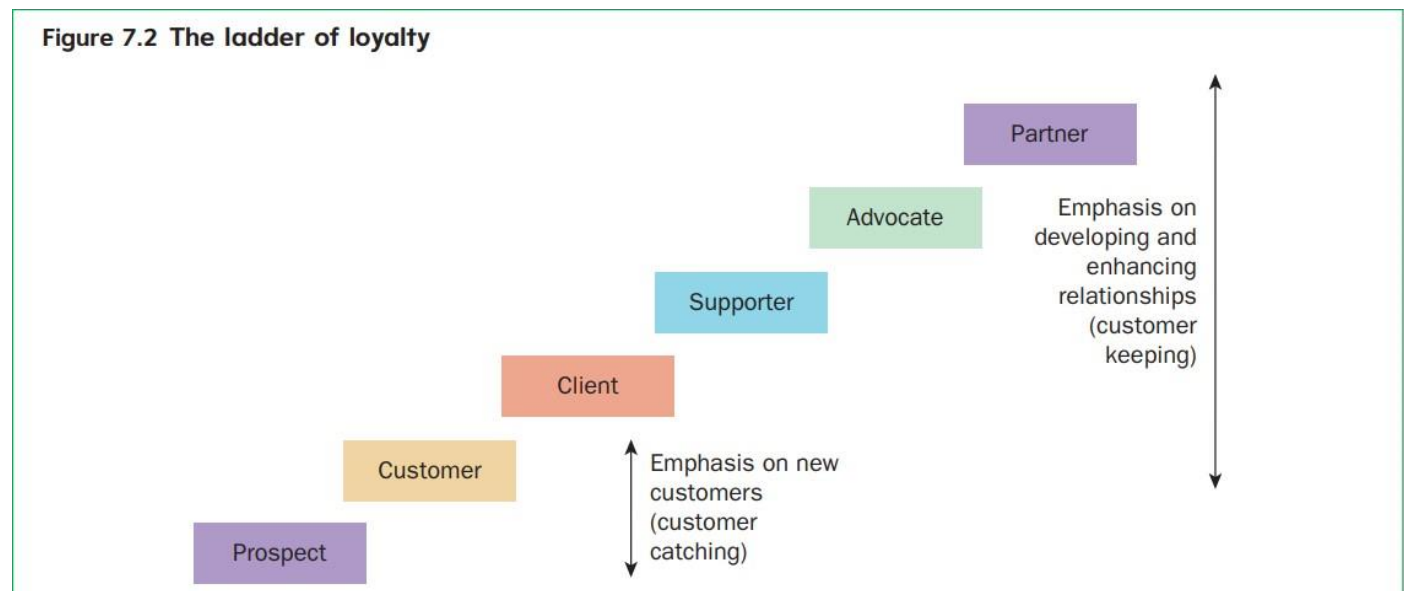
**Customer acquisition:** What proportion of **new customers** are arriving on to the firm's books as a **result** of its **marketing** activities?

### Customer loyalty and retention

Advocates - not only purchase an organization's products but also actively recommend them to their friends and colleagues.

Partners - trust and support the organization and actively work with it.

Measure of advocacy = brand's Net Promoter Score. Measures the likelihood of customers recommending it to others.



Customer brand engagement = ways in which customers now interact with organizations, ranging from becoming fans or followers on social media, to posting online reviews, to generating new product ideas.

Customer brand engagement is defined as the level of a customer's cognitive, emotional and behavioural investment in specific brand interactions.

Not only are customers satisfied with brand or service experiences but they are also emotionally connected

(expressing love or passion for a brand). Customer engagement = have a positive effect on a firm's performance, and this effect is stronger in B2B (versus B2C) firms and in services rather than manufacturing firms. It is recommended that firms develop and execute a customer engagement strategy.

#### 4. Experiential marketing

Creation of **customer experiences** is another **avenue** for organizations to **deliver value for customers**.

5 types of experience: **sensory** experiences (SENSE), **affective** experiences (FEEL), creative **cognitive** experiences (THINK), **physical** experiences, behaviours and lifestyles (ACT), and **social identity** experiences (RELATE).

Organizations either partner with existing events or create entirely new ones.

#### 5. Marketing in non-profit organizations

##### Characteristics of nonprofit marketing

**Education vs meeting current needs:** not only as meeting the current needs of their customers but also educating them in terms of new ideas and issues, cultural developments and social awareness. Healthy eating, reduced cigarette and alcohol consumption, safe sex, safe driving, human rights and racial equality. Commercial marketing techniques, such as consumer research, segmentation and marketing mix development, are frequently used to achieve these types of goals.

**Multiple publics:** Most non-profit organizations serve several groups. The two broad groups are donors, who may be individuals, trusts, companies or government bodies, and clients, who include audiences, patients and beneficiaries. The need to satisfy both donors and clients is a complicated marketing task. Non-profit organizations need to adopt marketing as a coherent philosophy for managing multiple public relationships.

**Measurement of success and conflicting objectives:** For non-profit organizations, measuring success is not so easy. In universities success measured in terms of research output, number of students taught. But– more students and a larger range of courses may reduce the time available for research. Decision-making is therefore complex in non-profit orientated organizations.

**Public scrutiny:** Public-sector non-profit organizations are never far from the public's attention. The reason is that they are publicly funded from taxes. This gives them extra newsworthiness and they have to be particularly careful not to become embroiled in controversy.

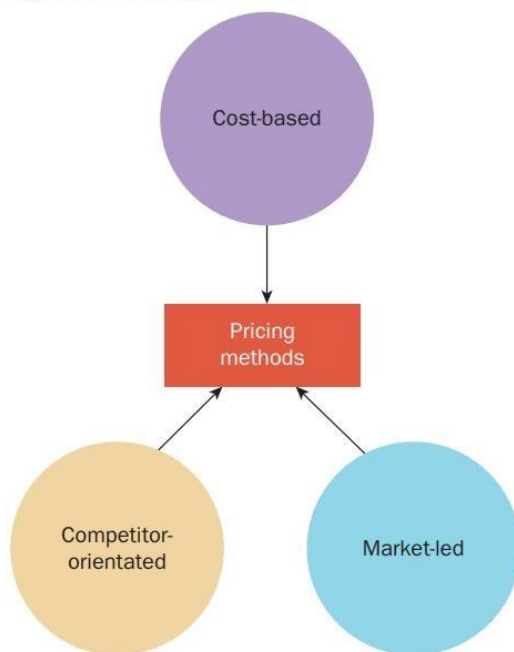
##### Marketing procedures for non-profit organizations:

**Target marketing and differentiation** - non-profit organizations can segment their target publics into donors and clients (customers). Within each group, sub-segments of individuals and organizations need to be identified. These will be the targets for **persuasive communications** and the **development of services**. The needs of each group must be understood. The brand name is important. 'Oxfam' suggests the type of work the organization is mainly concerned with – relief of famine. Market segmentation and targeting are key in the marketing of political parties. Potential voters are segmented according to their propensity to vote and their likelihood of voting for a particular party. **Developing a marketing mix**

## Chapter 8 Value through pricing

### 1. Key considerations when setting prices

Figure 8.1 Pricing methods



select the supplier that quotes the lowest price.).

**Cost-based pricing** - it can give an indication of the minimum price that needs to be charged in order to break even. The procedure is illogical because a sales estimate is made before the price is set. it focuses on internal costs rather than the customer's willingness to pay. Some companies will set prices below full costs (known as direct cost pricing, or **marginal cost pricing**). For example where seats on an aircraft or rooms in hotels are unused at any time, that revenue is lost.

**Competitor-oriented pricing** - may take any one of three forms:

1)Where firms follow the prices charged by leading competitors, 2)Where producers take the going-rate price,3)Where contracts are awarded through a **competitive bidding process**(the drawing up of detailed specifications for a product and putting the contract out to tender. Potential suppliers may quote a price that is known only to themselves and the buyer the buyer will

**Market-led pricing** - the more value a product gives compared with the competition, the higher the price that can be charged. ways of estimating value to the customer:

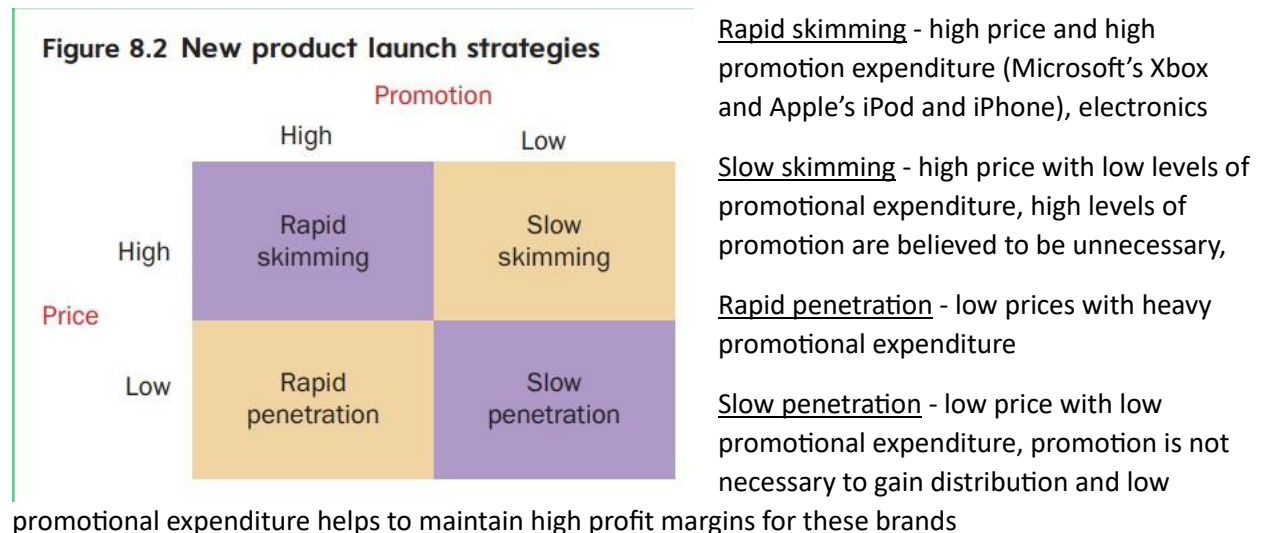
- Trade-off analysis: measurement of the trade-off between price and other product features
- Experimentation: placing a product on sale at different locations with varying prices

- Economic value to the customer (EVC) analysis: A high EVC may be because the product generates more revenue for the buyer than the competition or because its operating costs (such as maintenance, operation or start-up costs) are lower over its lifetime

## 2. Other factors influencing price-setting decisions

**Positioning strategy** - the choice of target market and the creation of a differential advantage may have a huge impact on price. Price is a powerful positioning tool because, for many, it is an indicator of quality. Psychological pricing – manipulation of the reference prices that consumers carry in their heads. So, the price of most grocery products ends in '.99'.

**New product launch strategy** - When launching new products, price should be carefully aligned with promotional strategy



**Product-line strategy** - where the price of a new product fits into their existing product line. Where multiple segments are attractive, modified versions of the product should be designed, and priced differently, not according to differences in costs, but in line with the respective values that each target market places on a product.

**Competitive marketing strategy** - pricing of products should be set within the context of the firm's competitive strategy. 4 strategic objectives:

Build - for price-sensitive markets, a build objective for a product implies a price lower than that of the competition. For price-insensitive markets, price in these circumstances will be dependent on the overall positioning strategy thought appropriate for the product

Hold - where the strategic objective is to hold sales and/or market share, the pricing strategy is to maintain or match the price relative to the competition. This has implications for price changes: if the competition reduces prices, then our prices would match this price fall.

Harvest - implies the maintenance or raising of profit margins, even though sales and/or market share are falling. The implication for pricing strategy would be to set premium prices.

Reposition - changing market circumstances and product fortunes may necessitate the repositioning of an existing product. May involve a price change, the direction and magnitude of which will be dependent on the new positioning strategy for the product.

**Channel management strategy** – When products are sold through distributors or retailers, the list price to the customer must reflect the margins required by them.

**International marketing strategy** - first challenge that managers have to deal with is that of price escalation. Means:

a number of factors can combine to put pressure on the firm to increase the prices it charges in other countries (additional costs of shipping and transporting costs to a foreign market, margins paid to local distributors, customs duties or tariffs that may be charged on imported products, differing rates of sales taxes). International prices are often higher, they can also be lower where levels of disposable income are low. It is important for firms to guard against parallel importing – this is when products destined for an international market are re-imported back into the home market and sold at levels lower than the company charges.

### 3. Managing price changes

Three key issues associated with initiating price changes

**Table 8.2 Initiating price changes**

	Increases	Cuts
Circumstances	Value greater than price Rising costs Excess demand Harvest objective	Value less than price Excess supply Build objective Price war unlikely Pre-empt competitive entry
Tactics	Price jump Staged price increases Escalator clauses Price unbundling Lower discounts	Price fall Staged price reductions Fighter brands Price bundling Higher discounts
Estimating competitor reaction	Strategic objectives Self-interest Competitive situation Past experience	

**Circumstances** – price increase: if customers place a higher value on the product than is reflected in its price could mean that a price increase is justified, rising costs, and reduced profit margins, may also stimulate price rises, excess demand (wiodomo), final circumstance when companies may decide to raise prices is when embarking on a harvest objective. Prices are raised to increase margins even though sales may fall. Price cuts: a price is high compared with the value, excess supply leading to excess capacity, adoption of a build objective.

**Tactics** – price jump or fall, staged price increases or reductions, escalator clauses(the contracts for some organizational purchases are drawn up before the product is made), price unbundling(allows each element in the offering to be priced separately in such a way that the total price is raised), maintain the list price but lower discounts to customers.

Companies contemplating a price cut have three choices in addition to a direct price fall: 1) A company defending a premium-priced brand that is under attack from a cut-price competitor may choose to maintain its price while introducing a fighter brand. 2) Where a number of products and services that tend to be bought together are priced separately, price bundling can be used to lower the price. 3) Discount terms can be made more attractive by increasing the percentage.

#### Reacting to competitors' price changes

	Increases	Cuts
When to follow	Rising costs Excess demand Price-insensitive customers Price rise compatible with brand image Harvest or hold objective	Falling costs Excess supply Price-sensitive customers Price fall compatible with brand image Build or hold objective
When to ignore	Stable or falling costs Excess supply Price-sensitive customers Price rise incompatible with brand image Build objective	Rising costs Excess demand Price-insensitive customers Price fall incompatible with brand image Harvest objective
<i>Tactics</i>		
Quick response	Margin improvement urgent	Offset competitive threat
Slow response	Gains to be made by being customers' friend	High customer loyalty

#### 4. Customer value through pricing

**Price leadership** has become the central value proposition for firms in a wide variety of industries BUT offering low prices means that profit margins may be tight. Tools to assist in that challenge:

- Cost management: example, flights go to small regional airports where landing charges are low, employees pay for their own uniforms and training
- Yield management: monitoring of demand or potential demand patterns, this information can be stored and used to set prices for rooms or flights, which vary from day to day, for the next year.
- Dynamic pricing: this means that prices are adjusted continually, based on demand and potential demand



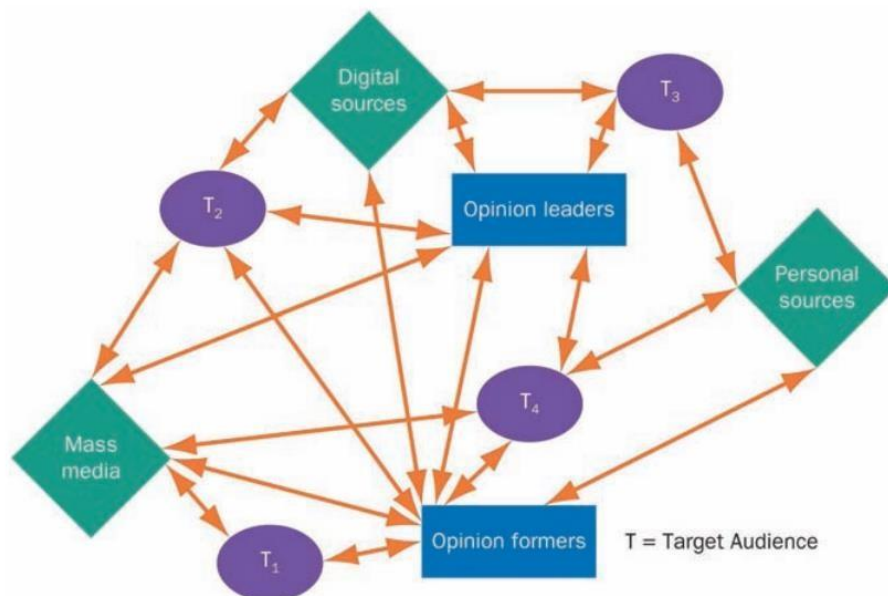
## Chapter 10 Mass Communications Techniques

What kinds of messages we should create and how we should communicate them. Range of techniques available to the marketer is usually known as the 'promotional mix'. 5 considerations will have a major impact on the choice and mix of promotional tools a company will use:

- 1) **Resource availability and the cost of promotional tools:** to conduct a national advertising campaign may require several million euros. If resources are not available, cheaper tools, such as direct marketing or publicity, may have to be used.
- 2) **Market size and concentration:** if a market is small and concentrated then personal selling may be feasible, but for mass markets that are geographically dispersed, advertising, social media marketing or direct marketing may be the correct choice.
- 3) **Customer information needs:** if an organization wants to correct consumer misconceptions, public relations may be preferred. If what is required is the development of brand image, a well-chosen sponsorship may be more appropriate.
- 4) **Product characteristics:** industrial goods companies tend to spend more on personal selling than on advertising, whereas consumer goods companies tend to do the reverse.
- 5) **Push versus pull strategies:** a distribution push strategy involves an attempt to sell into channels (retailers), and may be dependent on industrial exhibitions and trade promotions. A consumer pull strategy bypasses intermediaries to communicate directly to end consumers. Advertising and consumer promotions are more likely to be used.

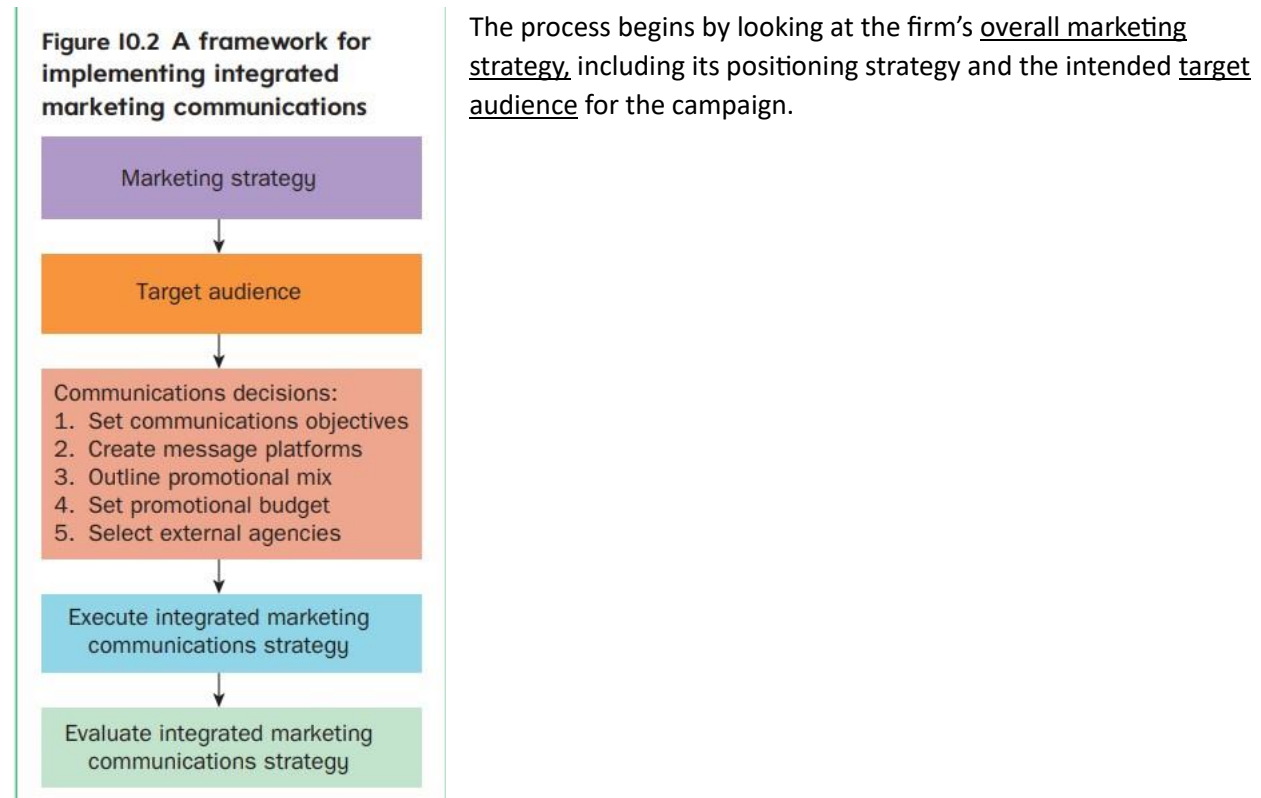
### 1. Integrated marketing communications

Figure 10.1 The communication process



**Integrated marketing communications** is the system by which companies co-ordinate their marketing communications tools to deliver a clear, consistent, credible and competitive message about the organization and its products.

### Stages in developing an integrated communications campaign



### Organizing for campaign development

There are four options open to an advertiser when organizing for campaign development:

- co-operation with people from the media
- the advertising function may be conducted in-house
- working with an advertising agency
- use in-house staff for some advertising functions, but to use specialist agencies for other

### 2. Advertising Defining advertising objectives

Advertising can have a number of communications objectives: *creating awareness*(new product is being launched, new market entrance), *stimulating trial* (car advertising encouraging motorists to take a test drive), *positioning products*(in the minds of consumers), *reminding*(customers of sales or special offers), *providing support*(for the company's sales force). **Setting the advertising budget**

4 methods of setting advertising budgets: *the percentage of sales method* - the amount allocated to advertising is based on current or expected revenue, *competitive parity method* - companies set their advertising budgets based upon matching competitors' expenditures, or using a similar percentage of sales figure as their major competitor, *affordability method* - firms make a decision on the basis of what they think they can afford, *objective and task method/ zero-based budgeting* - advertising budget depends upon communication objectives and the costs of the tasks required to achieve them. It forces management to think about objectives, media exposure levels and the resulting costs.

## Message decisions

**Advertising message** translates an organization's basic value proposition into **an advertising platform** – that is the words, symbols and illustrations that are attractive and meaningful to the target audience. Challenge: keep the message adaptable across various media. Creative treatments can be used, from *lifestyle*, to *humour*, to *shock* advertising. *Comparative advertising* is another popular approach fused by companies like low-cost airlines, supermarkets and banks to demonstrate price advantages.

## Media decisions

Choice of media class (e.g. television vs press) and media vehicle (e.g. a particular newspaper or magazine) are two key decisions. Major media class and vehicle options (the media mix):

Media class	Media vehicle
Television	<i>Channel 4 News</i> ; Eurosport
Radio	Classic FM; Radio Nova
Newspapers	<i>Guardian</i> ; <i>El Mundo</i>
Magazines – consumer	<i>Hello!</i> ; <i>Glamour</i>
Magazines – business	<i>Marketing Week</i> ; <i>Construction News</i>
Outdoor	Billboards; bus shelters; London Underground
Internet	Google AdWords; YouTube videos; Facebook advertising
Cinema	Particular movies
Exhibitions	Motor Show; Ideal Home
Product placement	TV programmes; music videos; video games
Ambient	Street pavements; buildings

Media class decision affected by: advertising budget, competitive activity, retail trade Media vehicle affected by: readership and viewership figures.

## Executing the campaign

When an advertisement has been produced and the media selected, it is sent to the chosen media vehicle for publication or transmission. A key organizational issue is to ensure that the right advertisements reach the right media at the right time.

## Evaluating advertising effectiveness

Measurement can take place before, during and after campaign execution. *Pre-testing* – part of the creative process,

*Post-testing* - to assess a campaign's effectiveness once it has run

## 3. Sales promotion

Examples include money off and free gifts (consumer promotions), and discounts (trade promotions) Why sales promotion is popular?

Impulse purchasing: favours promotions that take place at the point of purchase.

The cost of advertising and advertising clutter: these factors erode advertising's cost-effectiveness.

Shortening time horizons: the attraction of the fast sales boost of a sales promotion is raised by greater rivalry and shortening product life cycles.

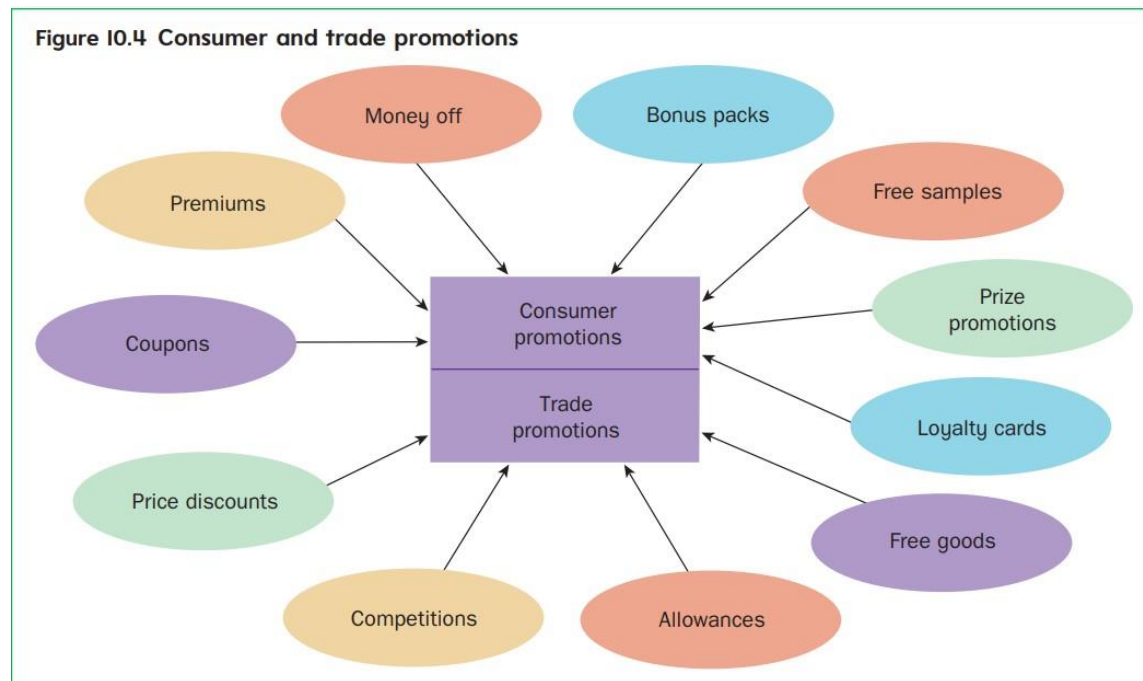
Competitor activities: in some markets, sales promotions are used so often that all competitors are forced to follow suit.

Measurability: measuring the sales impact of sales promotions is easier than for advertising since its effect is more direct and, usually, short term

### Sales promotion strategy

- Sales promotion objectives: to boost sales
- Highly successful method of sales promotion includes: *encouraging trial*, sampling and couponing are particularly effective methods of inducing trial.
- Certain promotions, by their nature, encourage *repeat purchasing* of a brand over a period of time.
  - Some promotions are designed to encourage customers *to purchase larger pack sizes*.

- Trade promotions are usually designed to *gain distribution and shelf space*. **Selecting the type of sales promotion to use**



### Consumer promotion techniques

Money-off promotions - provide direct value to the customer

Bonus packs - give added value by providing consumers with extra quantity at no additional cost ('Buy 10, get 2 free')

Premiums - any merchandise offered free or at low cost as an incentive to purchase a brand; they can come in three forms: free in-pack or on-pack gifts, free in the-mail offers and self-liquidating offers, where consumers are asked to pay a sum of money to cover the costs of the merchandise

### Trade promotion techniques

The trade may be offered (or may demand) **discounts** in return **for purchase**, which may be part of a joint promotion whereby the retailer agrees to devote **extra shelf space, buy larger quantities, engage in a joint competition and/or allow in-store demonstrations**. An alternative to a price discount is to offer **more merchandise at the same price** (free goods) – for example, 13 items (or cases) for the price of 12. The pharmaceutical industry is one of the biggest users of trade promotions. Trade promotions involve gifts, samples and industry-sponsored training courses. Drug companies often pay medical communications agencies to recruit and train leading doctors, specialists and academics as 'key opinion leaders' (KOLs). These people are paid to promote certain drugs to other doctors.

**Final stage in a sales promotion campaign involves testing the promotion:** pre-testing techniques: group discussions, hall tests, experimentation. After the sales promotion has been implemented, the effects must be monitored.

#### **4. Public relations and publicity**

Organizations have a variety of stakeholders (employees, shareholders, the local community, the media, government and non-governmental organizations) whose needs they must take into account. Public relations is concerned with all of these groups, public relations activities include publicity, corporate advertising, seminars, publications and charitable donations.

Publicity is a major element of public relations. It is defined as the communication of information about a product or organization by the placing of news about it in the media without paying for the time or space directly.

3 key tasks of publicity department:

- 1) **The message has high credibility:** the message has greater credibility than advertising because it appears to the reader to have been written independently (by a media person) rather than by an advertiser.
- 2) **No direct media costs:** since space or time in the media does not have to be bought there is no direct media cost. But this is not cost free. Someone has to write the news release etc.
- 3) **No control over publication:** unlike advertising, there is no guarantee that the news item will be published. This decision is taken out of the control of the organization and into the hands of an **editor**. A key factor in this decision is whether the item is judged to be **newsworthy**. Newsworthy items include where a company does something first, such as a new product or research breakthrough, new employees or company expansions, sponsorships, etc. There is no guarantee that the content of the news release will be published in the way that the news supplier had intended.

#### **5. Sponsorship**

*'A business relationship between a provider of funds, resources or services and an individual, event or organization which offers in return some rights and association that may be used for commercial advantage.'* 5 principal objectives of sponsorship:

**Gaining publicity:** Event sponsorship can provide exposure to millions of people, sponsorship provides ample opportunity to create publicity in the news media.

**Creating entertainment opportunities:** creating entertainment opportunities for customers and the trade. It invites some of its clients to this sponsored event, where key personalities from the fashion world may also be present (fashion event).

**Fostering favourable brand and company associations:** Red Bull has built a global brand on the back of the sponsorship of everything from Formula 1 motor racing to extreme sports such as cliff diving. Both

the sponsor and the sponsored activity become involved in a relationship, with a transfer of values from the activity to the sponsor

**Improving community relations:** Sponsorship of schools, by providing low-cost personal computers, as Tesco has done – and supporting community programmes can foster a socially responsible, caring reputation for a company

**Creating promotional opportunities:** Sweatshirts, bags, pens, and so on, carrying the company logo and name of the event, can be sold to a captive audience

#### Managing sponsorship

- Brand risks: the choice of entity to sponsor is fraught with risk, to avoid such risks some sponsors prefer to sponsor events, but this is not a fail-safe solution either
- Ambush marketing: refers to the activities of those companies that try to associate themselves with an event without paying any fee to the event owner. Nike has been a particularly successful ambush marketer at various

Olympic Games. The activity is legal as long as no attempt is made to use an event symbol, logo or mascot

- Creativity: there is so much clutter and so many brand messages surrounding major sporting events that it requires clever and engaging brand activation to stand out and drive consumer engagement.

## **6. Other promotional techniques**

Exhibitions - of all the promotional tools available, they are the only one that brings buyers, sellers and competitors together in a commercial setting

Product placement - placing of products and/or their logos in movies, television programmes, songs and video games, usually in return for money.

Ambient advertising and guerrilla marketing - *Ambient advertising* refers to advertising carried on outdoor media that does not fall into the established outdoor categories such as billboards and bus signs. Therefore advertising that appears on shopping bags, on petrol pump nozzles, on balloons or on banners towed by aeroplanes, on street pavements, on overhead lockers on aircraft. *Guerrilla marketing* - the delivery of advertising messages through unexpected means and in ways that almost 'ambush' the consumer in order to gain attention.

## **Chapter 11 Direct and Online Communications Techniques**

### **1. Direct marketing**

It's the term used to describe the distribution of products, information and promotional benefits to target consumers through **interactive communication** in a way that allows response to be measured (telemarketing, direct response advertising and email). Direct marketing campaigns can, then,

have a range of objectives including to improve sales and profits, to acquire or retain customers, or to create awareness.

- Direct mail
- E-mail: Metrics used to assess the effectiveness of campaigns: *bounce rate* (emails will bounce if the address is no longer valid or the email is caught by a spam filter), *open rate* – what percentage of emails were opened, *click-through rate* – the percentage of recipients who clicked on email content, *conversion rate* – the percentage of emails leading to a sale, *unsubscribe rate* – the number of consumers unsubscribing from the mailing list.
- Telemarketing
- Direct response advertising (DRA): it is designed to elicit a direct response such as a click on a link, an order, enquiry or a request for a visit.
- Catalogue marketing

## 2. Online communications

**B2B** and **B2C** commerce but also **C2C** and **C2B**.

**Core objectives of digital communications:**

**Figure II.I The marketing funnel**



1. Awareness: online communications can be an effective means of helping consumers become aware of product or service
2. Engagement: companies might use digital communications to try to build levels of engagement with them.
3. Discovery: the ultimate aim of marketing activities in commercial firms is often to generate sales. Internet has enabled firms to engage in retargeting. Consumers rarely buy on a first visit to a website, opting instead to browse several sites or postpone purchases until later.
4. Purchase
5. Retention: online

communications may be designed to assist with retaining customers through interacting with them post-purchase or helping to assist with customer service issues



### 3. Web design

Design of an online presence needs to be directed by two elements: business objectives derived from current situation analysis, and target audience requirements (customers, suppliers, staff and other stakeholders).

Measure of website effectiveness. **Bounce rate**, which is the percentage of visitors to a particular website who navigate away after viewing just one page. **Dwell time** measures the length of time a visitor spends on a webpage before moving back to a search results page.

#### Elements of effective web design:

**Presentation:** make it professional and clear

**Usability:** focuses on assessing how easily the user can complete their task online, Each element of the website should be relevant, up to date, accessible and clear for the user.

**Navigation:** (menus, breadcrumbs, links) needs to be familiar and easy to use.

**Testing:** before launching a website online, it needs to be tested for errors and performance.

**Reviews and maintainance:** customers become testers, and marketers need to react to them and their suggestions. Well-designed website will increase customers' confidence, attitude and satisfaction, lowering perceived risk and, ultimately, leading to increased purchase intention.

Content and copywriting : Pulizzi and Barrett recommend that companies need to change their mind-sets to implement a successful content strategy. They recommend using the **BEST** principles:

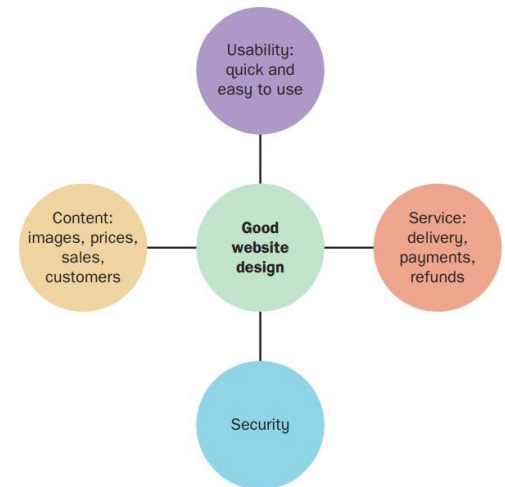
**Behavioural** – is there a purpose in the content? What action do you want to trigger in customers?

**Essential** – don't publish content that will become just space filler. If your customers visit a page that is about nothing, they will leave and never come back.

**Strategic** – your content delivered online needs to support your overall business objectives and be an integral part of your marketing activity.

**Targeted** – don't use the same content across a variety of platforms. Each platform attracts different people for a reason, so make sure your content is always relevant for them.

Figure II.3 Key factors in building a well-designed website



#### 4. Search engine optimization

The key aim for search engines like Google and Bing is to provide relevant search results for their users who have entered a search query. Therefore, results are ranked using a complex algorithm that will determine the position given to each individual webpage.

Some of Google's major updates:

Panda: 2011, downgrading sites assessed as having poor or spammy content, plagiarized content or having engaged in keyword stuffing (a practice whereby keywords are repeated many times) Penguin: 2012, targeted manipulative links tactics.

Hummingbird: 2013 producing more relevant results by understanding the meaning behind queries. Matching searcher intent increased the focus on webpage content.

Pigeon: 2014 high-quality, local search results. This update used location and distance as key factors influencing results ranking.

Mobile: 2015, ranking boost to websites optimized for mobile devices and lowered the rankings of those that were not. Mobile rankings were done at page level rather than website level.

RankBrain: 2015, deliver better search results based on relevance and machine learning. It took account of metrics such as bounce rates.

Possum: 2016, improved results based on location.

Fred: 2017, penalized websites that were set up primarily to generate advertising and affiliate revenue, such as blogs.

Medic: 2018, providing trustworthy advice to people searching for money- or health-based terms by penalizing sites with no expertise, authority or trust (EAT).

Bert: 2019, better understand user search intent by rewarding wellconstructed content.

**Optimizing websites for search:** keywords, content, links, localization

#### 5. Content marketing

- *out-bound marketing*: television advertising, radio advertising, sponsorship
- *in-bound marketing*: online marketing communications
- **Content marketing** has been defined as: a strategic marketing approach focused on **creating valuable, relevant and consistent content** to *attract* and *retain* a clearly defined audience – and ultimately to drive profitable customer action.
- Consumers themselves can also create content, known as **user-generated content**, or UGC, which in turn may be used by organizations in their marketing activities

Content marketing campaigns

**Strategy and objectives:** All forms of content produced need to reflect and communicate brand values(strategy and positioning). Content might be used to create awareness, to engage consumers, to

inform decision-making or help consumers solve problems, and so on. A good knowledge of the target audience will help to clarify objectives

**Content type:** Different types of content can play different roles in an organization's content marketing strategy.

Examples: *news stories* and *blog content* → online presence current and up to date, will help to boost search rankings.

*White papers* and *e-books* → more detailed forms of content, used to indicate expertise in a particular field.

*Infographics* and *slideshows* → graphical representation of some material. *Images* and *videos* → highly shareable.

**Distribution platforms:** how content will be distributed - influenced by *campaign objectives* and *content type*, examples: organization's website, linkedin, yt, fb, twitter, bloggers, influencers and journalists (earned media), also decisions need to be made about the timing of the content

### **Assessment of effectiveness**

#### The role of content marketing

- recognition of the importance of storytelling in marketing (the winner (Nike), the outlaw (Marlboro) and the creator (Lego))
- leading brands have formally adopted the structures and processes of the 'newsroom' in order to assist them in creating and delivering relevant, current and engaging content.

## **6. Online advertising**

### Search engine advertising

Search ads are given priority, appearing before the organic results. The advertiser is not paying for the ad to be displayed (as one would when using a billboard or advertising on television, for example) but only when a user clicks on the actual ad. This is known as PPC, or 'pay per click'.

### **Search advertising campaigns, the key stages:**

**Target audience:** the target audience for the campaign will require careful consideration.

**Objectives:** clarification of objectives is critical at the outset (eg. to drive traffic to a website or to promote special offers)

## **Keywords**

**Budgets:** multiple search advertising campaigns are run simultaneously; therefore decisions need to be made regarding the overall budget size and its allocation across the various campaigns.

**Advertising copy:** writing the advertising copy is a challenging exercise as search ads are limited to 130 characters, which includes the headline (keywords), body copy of the advert (which should say something compelling) and the destination URL (your website or social media page)

**A/B testing:** creating effective search advertising campaigns takes time and practice. Different combinations of keywords, ad copy and landing pages should be trialled to determine which work best.

**Measuring effectiveness:** search engine advertising companies provide users with a suite of metrics that can be used to test effectiveness. Some of the most critical include click-through rate (percentage of users that clicked on the ad), cost per click (average amount paid per click), ad position (average position the ad appears in on the rankings) and conversion rate (ratio of orders or leads to the number of clicks).

## Display advertising (placement of adverts on webpages)

- **Banner advertising:** banner adverts are the original and most popular form of digital display advertising. They are static adverts that come in a variety of sizes and shapes, frequently appearing across the top or on the side bar of a webpage.
- **Pop-up advertising:** the least popular forms of display advertising as they are interruptive.
- **Rich-media advertising:** rich-media adverts refers to all forms of display that have some active features, such as video, skippable video (popular on YouTube), ads containing live information, or adverts that interact with the viewer.

**Programmatic advertising** - an automated system for the buying and selling of online display adverts. Transactions between them can be facilitated by a variety of players, most notably *ad brokers*, who bring buyers and sellers together, *demand-side platforms (DSPs)* that allow buyers to buy on many different platforms through a single interface, and *ad exchanges*, where adverts are bought and sold. Key development that illustrates the strengths of the automated process is *real-time bidding (RTB)*.

## Social and native advertising

**Social advertising:** refers to adverts placed on social media platforms like Facebook, Instagram, Twitter, YouTube, TikTok and Snapchat

**Native advertising:** paid advertising that matches the form, feel and function of the content of the media on which it appears. Sponsored Facebook posts, Twitter-promoted tweets, BuzzFeed-branded articles, advertiserfunded videos or web TV.

## **7. Mobile marketing**

**Proximity marketing** - Enabling location on a mobile app means that marketers also know where you are, which allows them to reach out to you with marketing messages. The use of wireless devices to distribute marketing messages to specific locations

**Mobile apps** - shoppers can use apps to scan a barcode and compare product prices in another store. Apps have been developed that allow consumers to pay bills, make insurance claims and buy products. Branded mobile apps, which are apps that display a brand's identity in the name of the app, or through a logo or other brand marks, have become increasingly popular.

## **8. Managing and evaluating online campaigns**

Term performance marketing has become commonplace when thinking about the measurability of digital communications.

The kinds of question we might seek to answer include 'How effective are our online advertising activities?', 'How effective is our social media presence?', 'How effective is our web presence?', and so on. Doing so requires three broad sets of considerations, as follows:

- 1) **Activity (input) metrics:** these metrics show our inputs and investments (e.g. number of content posts, frequency, type of posts; number of search and display ads, and so on).
- 2) **Interaction (response) metrics:** these metrics show how our target audience engages with content and advertising, such as number of fans/likes/followers, comments, shares, reach, click-throughs, and so on.
- 3) **Performance (outcome) metrics:** these metrics focus on outcomes of our activity, such as leads generated, referrals, conversions, return-on-investment, and so on.

## Summary 3: Economics

### Introduction economics: Economic issues and concepts L1, Ch1

#### Basic of economics

- The economy is generally good at delivering what we want
  - ➔ **SELF ORGANIZATION: Following their own self-interests economic actors do what is best for themselves, given the resources constraints, and respond to price incentives**
    - Introduced by Adam Smith in 1723-1730
    - “Invisible hand”
    - “The massive number of interactions that characterize any economy cannot all be motivated by benevolence (Wohllwollen)”
    - 1883 – 1946: John M. Keynes, Economic policies of governments
    - 1971 - now: Thomas Piketty, Wealth concentrations and distribution past 250y
- Micro economy: studies how and why basic resources are transformed by producers into all the many goods and services that modern consumers want

#### Main Concepts

##### Scarcity

- The problem of choice under conditions of scarcity – core of economics
  - Resources (factors of productions):
    - ➔ LAND (natural resources, such as land, forests, minerals etc.)
    - ➔ LABOR (mental and physical human resources)
    - ➔ CAPITAL (tools, machinery etc. which are used to make more goods)
    - ➔ ENTREPRENEURSHIP (those who takes risks by introducing new products and new ways of making old products)
- ⇒ Factors of production

##### Efficiency

- The scarce resources are organized to produce the max possible output of goods and services that people wish to consume

##### Trade-offs and Opportunity costs (OC)

- A compromise: a balance achieved between two desirable but incompatible features
- OC is a measure of cost expressed as alternatives given up, rather than in terms of money => highlights the choice which has to be made by measuring the cost of anything that is chosen in terms of the alternative that could have been chosen instead

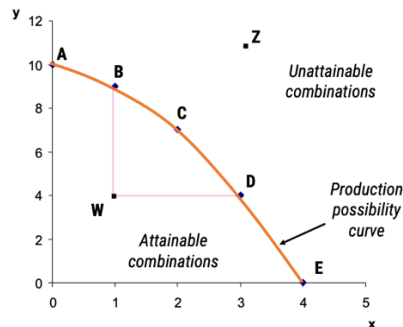
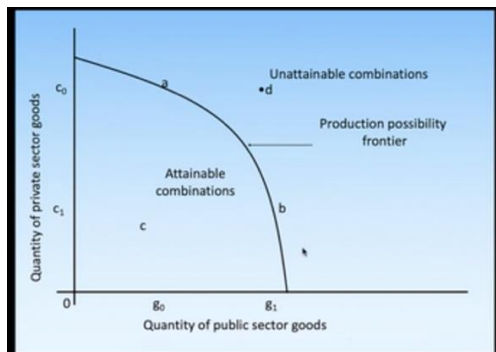
#### Production possibility frontier (curve)

- Public sector (roads, schools, hospitals) <- -> private sector (goods consumers buy)
- GDP (Gross domestic product): a nation's total output of all goods and services over one year
- **Production possibility boundary**: all combinations of goods and services to be produced when all nations are efficiently employed
  - ➔ Points outside the boundary show combinations that cannot be obtained because there are not enough resources to produce them
  - ➔ Points on the boundary are just obtainable; that are the combinations that can just be produced using all the available supplies of resources
  - ➔ It is negatively sloped, cause in a fully employed economy, more of one good can be produced only if resources are freed by producing fewer other goods

## 1. Scarcity

Example:

	X (cars)	Y (food)
A	0	10
B	1	9
C	2	7
D	3	4
E	4	0



- Point a and b represent efficient uses of society's resources
- Point c represents either an inefficient use or a failure to use all the resources available
- Point W is attainable since it is within the curve and has enough labor that can be used but it is not efficient since not all resources are used
- All combinations below the curve are attainable combinations
- Point Z is an unattainable combination since it uses too many resources → not be able to produce that and afterwards any other combination

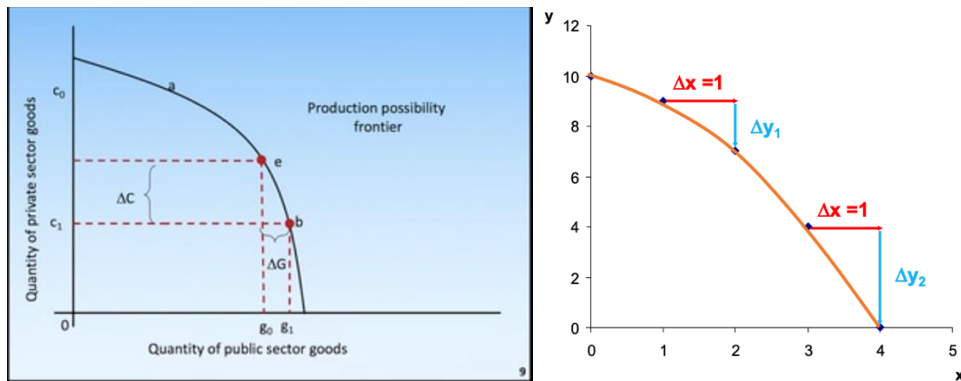
→ scarce resources (e.g., fixed amount of human labor/workers)

Combination A: only produces food and no cars. Example E: only produces cars and no food

→ it is important that there are no leftovers of available resources

## 2. Opportunity costs (negative slope):

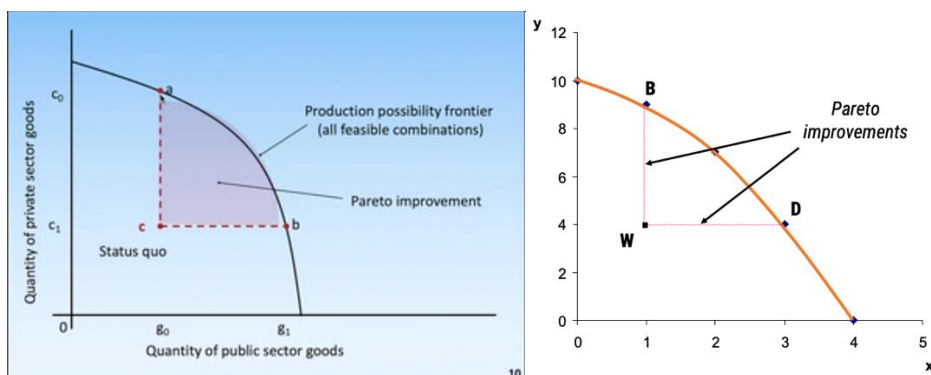
- > of good1 only if < of good2
- OC here: loss of production of 1 good for the possibility to produce another
- Increasing OC: Steepness of the curve and trade-off  $\Delta C/\Delta G$
- The further we move from the left to the right within the curve, the higher the trade off and the higher the demand of one good we have to give up to gain the other
- The increasing slope indicates increasing opportunity cost as more and more private goods must be given up for each additional unit of public goods



- We would have to give up some units of y to produce one unit of x → resources are scarce
- Increasing OC of x:  $\Delta y_1 < \Delta y_2$
- The further down we move the function the larger the OC of x seems to be
- Increasing the OC seems to be related to the increase of steepness of the production-possibility curve
- As the production of y decreases, the willingness of consumers to give up y for 1 additional unit of x decreases more and more
- What is the OC in case of point W? →

### 3. Efficient production (pareto efficiency)

- An employment of resources such that no more goods can be produced without taking resources away from the production of another good
- Efficient production = optimal allocation of scarce resources (no “leftovers”)
- **Pareto efficiency** (named after Vilfredo Pareto) = Allocation of scarce resources such that no more units of one good can be produced without taking resources away from the production of another good → Point W is not pareto efficient but the points on the curve are since we would need to take away resources from another point to produce one
- **Pareto improvement** = A change in the allocation (reallocation) of scarce resources that allows to produce more units of one good without taking resources away from the production of another good

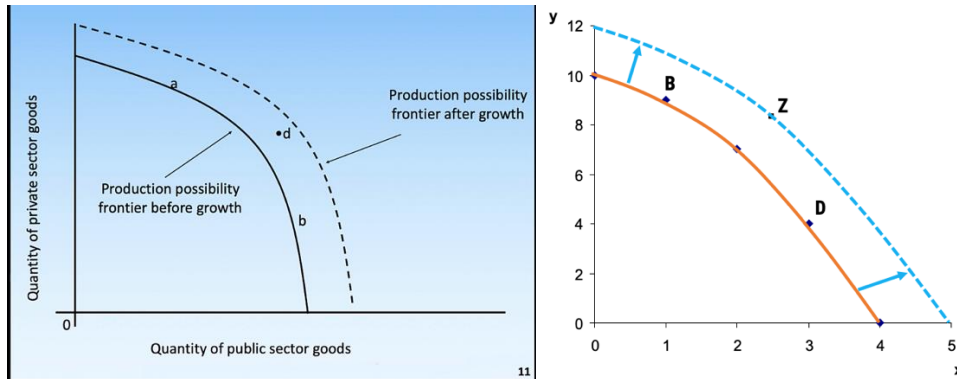


### 4. Economic growth

- Economy's efficiency to produce goods and services may increase over time, for example due to technological change
- Economy's capacity to produce goods increases over time



- Economic growth shifts the production-possibility boundary outward, allowing more of all commodities to be produced



## Theory of the firm: L1, Ch5

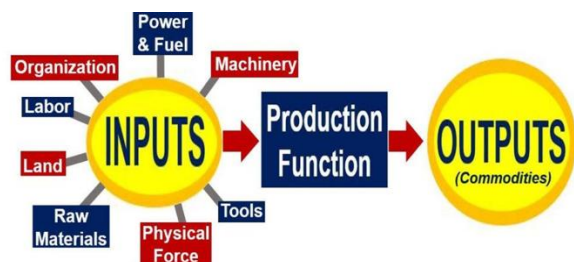
### Theory of the firm

= explains and predicts behavior of firms on the market

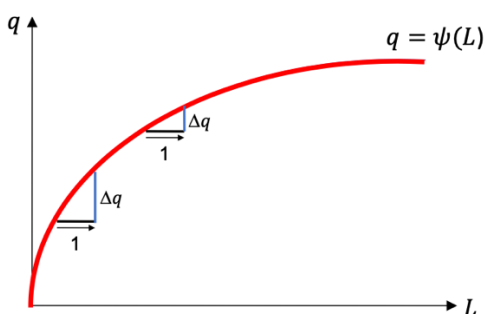
- What is 'a firm' in economics?
  - The central economic agent that makes decisions about the production of specific goods and services
- 1. A firm can be regarded as a single decision-making unit (e.g., what quantity of resources should be acquired? What quantity of output should be produced?)
- 2. Firms are profit maximizers: their actions are driven by the desire to generate as much profit for their owners as possible

### Production function

- The production of a firm describes the relationship between output  $q$  it produces (i.e., goods and services) and the inputs  $f$  (i.e., resources) employed in the production process
- The production function describes a boundary or frontier representing the limit of output obtainable from each feasible combination of inputs.
- Firms use the production function to determine how much output they should produce given the price of a good, and what combination of inputs they should use to produce given the price of capital and labor.
- The production function also gives information about increasing or decreasing returns to scale and the marginal products of labor and capital
- Inputs are usually divided into 4 categories: **land** (nature), **labour** (workers), **capital** (machines, factories), **intermediate products** (by other firms); **technology/innovation** might be another category (entrepreneurship)
- Formal representation:  $q = \psi(f_1, \dots, f_m)$
- $M$  = specific number of inputs



- For simplification, we focus on two inputs:  $q = \psi(L, C)$
- To further simplify matters, we hold input C constant:  $q = \psi(L, C \text{ constant})$



- Cobb-Douglas production function
- Only input  $L$  is variable: Short-term analysis
- Shows the maximum possible quantity of output  $q$  given a specific quantity of input  $L$
- Decreasing slope → **Law of diminishing returns**: Increasing quantities of a variable input lead to a decreasing output ( $\Delta q$ ) per additional unit of that input

→ for example, in a kitchen when there is one more cook additional to the already working four cooks the ???

- **Marginal product (MP)** = the increase in cost that accompanies a unit increase in output; the partial derivative of the cost function with respect to the output. Additional costs associated with producing one more unit of output
- change in output  $q$  resulting from a marginal change (increase or decrease by one unit) of input  $L$ :

$$MP(L) = \frac{\partial \psi(L, C \text{ const})}{\partial L} = \frac{\partial q}{\partial L} > 0$$

- More of an input always creates more of an output → that is why the relationship must be larger than 0

$$\frac{\partial MP(L)}{\partial L} = \frac{\partial^2 q}{\partial L^2} < 0$$

- **Average product (AP)** = output  $q$  per unit of input  $L$

$$AP(L) = \frac{\psi(L, C \text{ const})}{L} = \frac{q}{L} > 0$$

$$\frac{\partial AP(L)}{\partial L} < 0$$

**Theory of the firm 2.0: L2, Ch.5**

### Profit maximizing output:

- Firms need to determine the level of output that will maximize their profit  $\pi$

$$\text{Profit} = \text{Revenue from outputs} - \text{Cost of production}$$

$$\pi = R - C$$

$$\max \pi = p \times q^* - c(q)$$

- How can we determine the profit-maximizing output level  $q^*$ ?
- $R$ = revenue;  $C$ = cost;  $p$ = price;  $q$ = profit-maximizing output level

#### Cost of production:

- **Total cost  $c(q)$**  is the total cost of producing any given rate of output
- Total cost is divided into two parts:

$$\text{total costs} = \text{total variable cost} + \text{total fixed costs}$$

$$c(q) = c_v(q) + c_F$$

- **Average cost  $AC(q)$**  is the total cost of producing any given output divided by the number of output units produced

$$AC(q) = \frac{c(q)}{q}$$

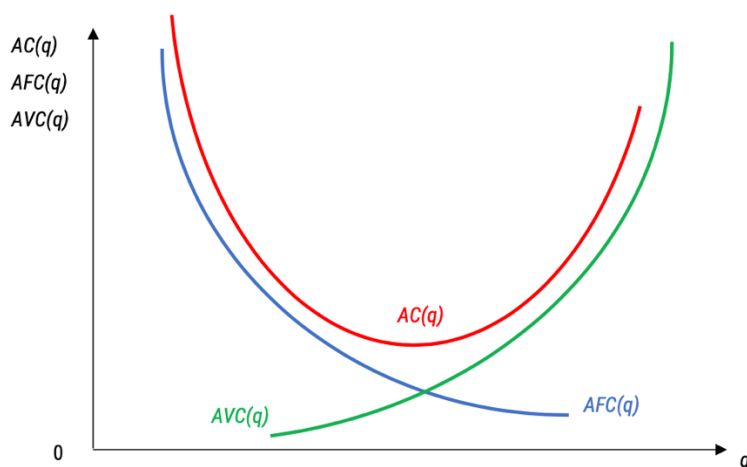
- Average cost  $AC(q)$  can be divided into **average variable costs  $AVC(q)$**  and **Average fixed costs  $AFC$** :

$$AC(q) = AVC(q) + AFC = \frac{c_v(q)}{q} + \frac{c_F}{q}$$

- **Marginal costs  $MC(q)$**  is the increase in total cost resulting from increasing the rate of production by 1 additional (marginal) unit

$$MC(q) = \frac{\partial c(q)}{\partial q}$$

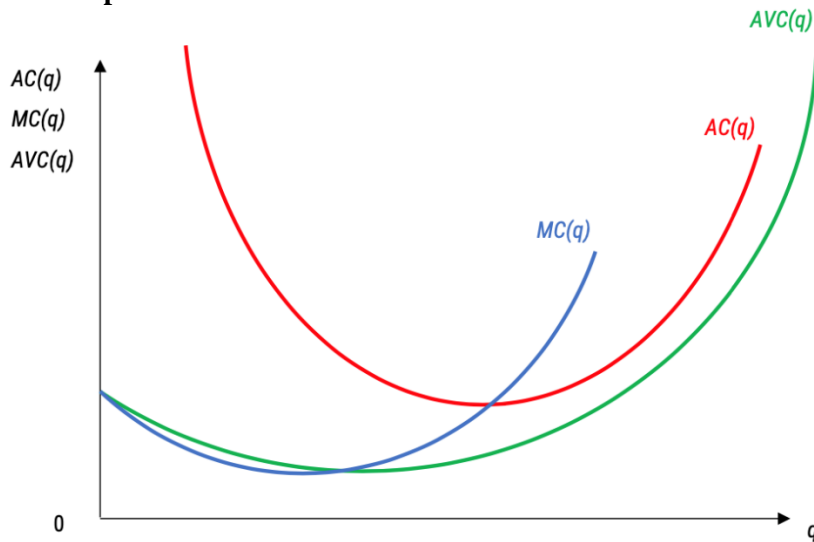
#### Graph 1 for the cost of production:



- The curve of the AFC is decreasing as we divide a fixed amount of number or units ( $C_f$ ) by an increasing number of quantity units
- The curve of the AVC ( $q$ ) is increasing as the costs rise the more units we add or produce (increasing cost per output unit  $\rightarrow$  the more we produce the more expensive it gets)

- The curve of the  $AC(q)$  is negatively bell shaped as the ???

**Graph 2: cost of production**



- Shape of the  $AC(q)$  and  $AVC(q)$  is the same as it is with the  $AFC(q)$  but the marginal costs and the average variable costs start at zero

### Costs of production example - Exercise 1:

This is the “Cost function”:  $c(q) = q^2 + 1 \rightarrow$  now create the different cost structures from this function  
Answer:

- Variable costs:  $c_v(q) = q^2$
- Fixed costs:  $c_F = 1$
- Average variable costs:  $AVC(q) = \frac{c_v(q)}{q} + \frac{q^2}{q} = q$
- Average fixed cost:  $AFC = \frac{c_F}{q} = \frac{1}{q}$
- Average cost:  $AC(q) = \frac{c(q)}{q} = \frac{q^2}{q} = q + \frac{1}{q}$
- Marginal cost:  $MC(q) = \frac{\partial c(q)}{\partial q} = 2q$

### Costs of production example - Exercise 2:

Grolsch brewery in Enschede produces a quantity of  $q = 100$  units of beer. The costs of production can be described by the following cost function:

$$c(q) = 100 + q^{0.5}$$

A smaller local brewery asks Grolsch to produce one extra unit of beer and offers to pay 0.08€ for this unit.

Should Grolsch accept the offer?

Answer:

What are the production costs of the additional unit of beer?

- $AC(100) = \frac{c(q)}{q} = \frac{100 + q^{0.5}}{q} = \frac{100}{q} + \frac{q^{0.5}}{q} = \frac{100}{q} + q^{0.5} * q^{-1} = \frac{100}{100} * q^{-0.5} = \frac{100}{100} * 100^{-0.5} = 1,1$

- $MC(100) = \frac{\partial c(q)}{\partial q} = 0.5 * q^{-0.5} = 0.5 * 100^{-0.5} = 0.05$

Yes, they should accept the request as the difference between the MC of 5 cents and the price offered by the small brewery of 8 cents per unit is 3 cents and they therefore make a profit.

→ we look at the MC because the fixed costs play a role in the AC which do not play a role in the decision to extend the output

### Profit maximizing output:

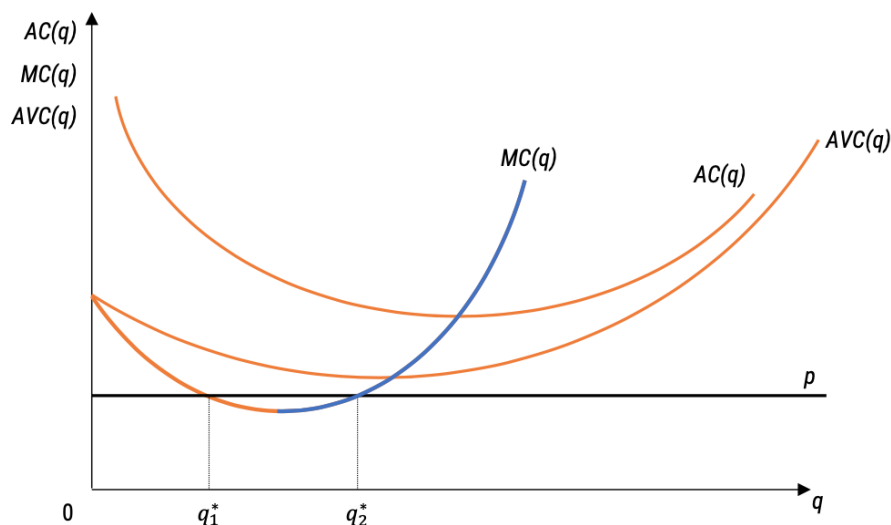
$$\max \pi = p_{con} * q^* - c(q)$$

- (1) Taking the first-order derivative:  $\frac{\partial \pi}{\partial q} = p_{con} - \frac{\partial c(q)}{\partial q} = 0$
- (2) Rearranging the equation:  $p_{con} = \frac{\partial c(q)}{\partial q}$
- (3) **Condition for the optimal output level:**  $p_{con} = MC$

Interpretation:

- To reach the profit maximum, the firm will increase its production until the costs of the last produced output unit (MC) equal the market price of an output unit (p constant)
- If  $p_{con} > MC$ : the firm should increase its output level
- If  $p_{con} < MC$ : the firm should decrease its output level

### Firms supply function:



- $p_{con} = MC$
- $\frac{\partial MC}{\partial q} > 0$
- Increasing slope of the MC curve allows to determine a profit maximizing output level
- We find a firm's supply function along the ascending part of the MC curve
  - Price is always the same for each output unit (which is why it is p constant)
  - At both intersections  $q_1^*$  and  $q_2^*$  the price is equal to  $MC(q)$  → two potential output levels of optimal output
- Which of the two is the optimal output? There can only be one

- The function of the MC is above the price curve → each unit we are producing, the MC is larger than the price, so we always generate a loss → no sense in producing less than  $q_1^*$  units
- $q_2^*$ : makes sense to go into area between  $q_1$  and  $q_2$  since they make profit as the price line is always above the MC line → suggests that each individual unit always makes profit, but technically there is no profit-maximizing output level
- But! If the MC line is always below the price, a firm would want to produce an infinite level of output

→ therefore  $q_2^*$  would be the optimal output level

- If we pass  $q_2^*$  and produce more, we would lose money as the MC costs is afterwards higher than the price = generating loss (we would be willing to reduce the output level until we produce exactly the output level of  $q_2^*$ )
- We would start in between  $q_1$  and  $q_1^*$  but move towards  $q_2^*$  because for  $q_2^*$  we would have exactly price = MC which is the optimal condition

→ Where do we find the supply function of the firm?

- the MC curve as a descending and an ascending part and we will only find the optimum point along the ascending part as that is the only part where we will generate a profit and not a loss

### Firm's supply function: short-term supply

- under certain conditions, production is not economically viable:

Profits of production < "Profits" of non-production

$$\bar{p} \cdot q - c_v(q) - c_F < -c_F$$

$$\bar{p} \cdot q - c_v(q) < 0$$

$$\bar{p} \cdot q < c_v(q)$$

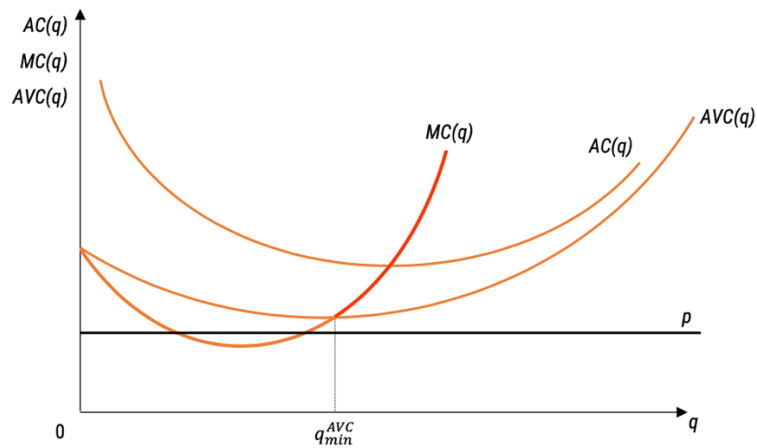
$$\bar{p} < \frac{c_v(q)}{q}$$

$$\bar{p} < AVC$$

Interpretation:

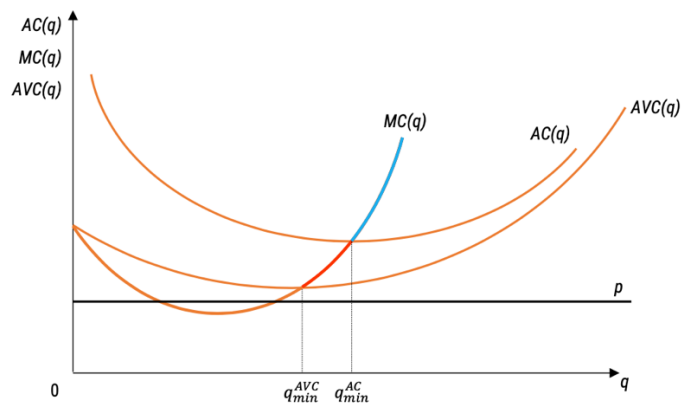
- if the market price  $p_{con}$  is lower than AVC, producing output would always lead to losses. Hence, firms refrain from production

Graph 1:



- to determine a firm's short-term supply function, we can neglect fixed costs of production (as this type of costs cannot be changed in the short term)
- In the short term, firms produce output if  $p_{con} = AVC$

Graph 2:



- To determine a firm's long-term supply function, we consider fixed costs of production (in addition to variable costs)
- In the long term, firms produce output if  $p_{con} = AC$

## Consumption Theory: L3, Ch.4

Consumption theory:

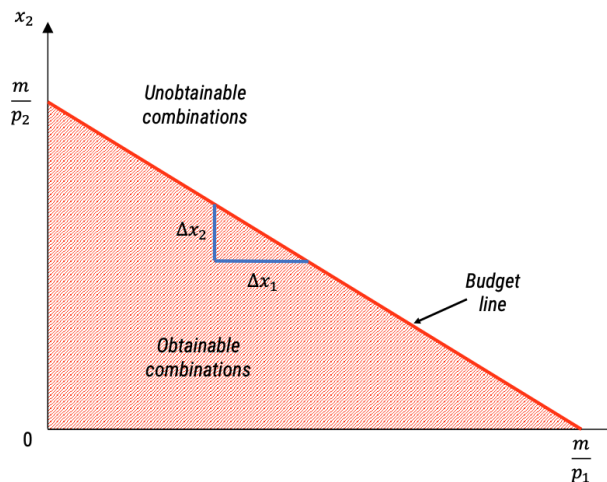
- Explains and predicts behavior of consumers/ households on the market
- In this theory nothing is for free
- Theory comes from the income that we earn

→ assumptions:

- Other things being equal, households always prefer more of any one good to less of the same good (“more is always better than less”)
- To consume goods, certain market prices have to be paid
- Given their budget constraint (defined by the income earned), households consume the best/ most they can afford

→ rational behavior

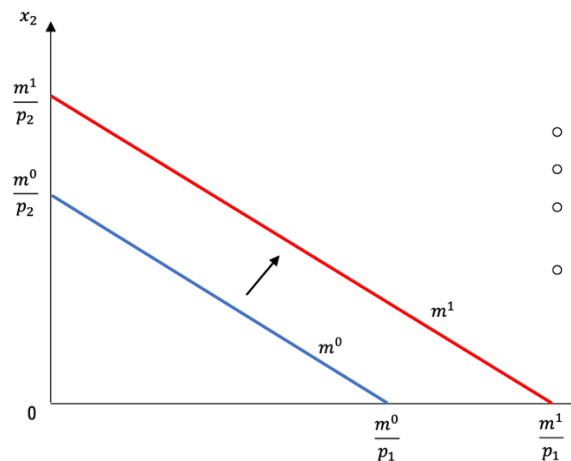
Household's budget constraints:



- Two goods, 1 and 2 (for example, clothing and food), with quantities  $x_1$  and  $x_2$  and prices  $p_1$  and  $p_2$
- Budget  $m$  used for the consumption of these two goods
- Budget constraint:  $x_1 * p_1 + x_2 * p_2 \geq m$
- The budget line shows all obtainable combinations of  $x_1$  and  $x_2$ , given budget  $m$
- Slope of the budget line is the negative of the ratio of the two prices:  $-p_1/p_2$
- Opportunity cost

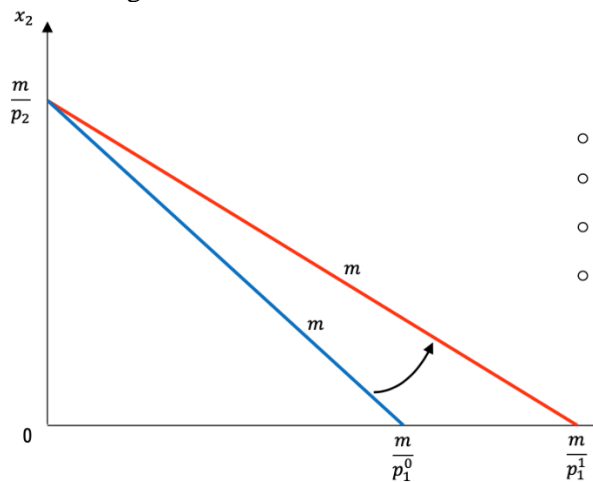


Change in income:



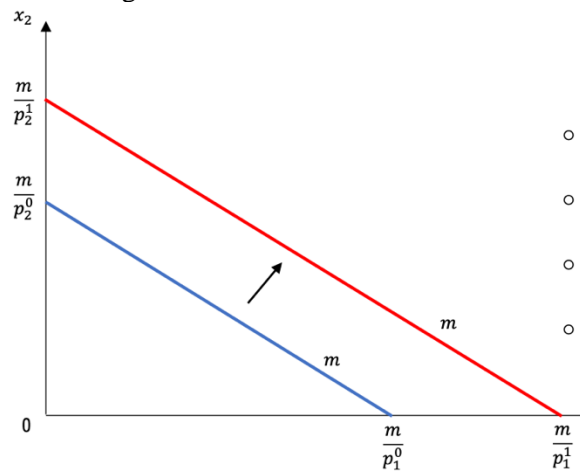
- For example, rising income  $m^1 > m^0$
- Prices are held constant
- Parallel shift of the original blue budget line (shifting outwards)
- The set of obtainable combinations of  $x_1$  and  $x_2$  increases (as the household can afford a higher quantity of both)
  - Average price rises then falls
  - MP vs AP  $\rightarrow$  a mathematical relationship; the key is that the average curve slopes upward if the marginal product is above it, if a new worker is to raise average production, the addition is greater than the average

Price change:



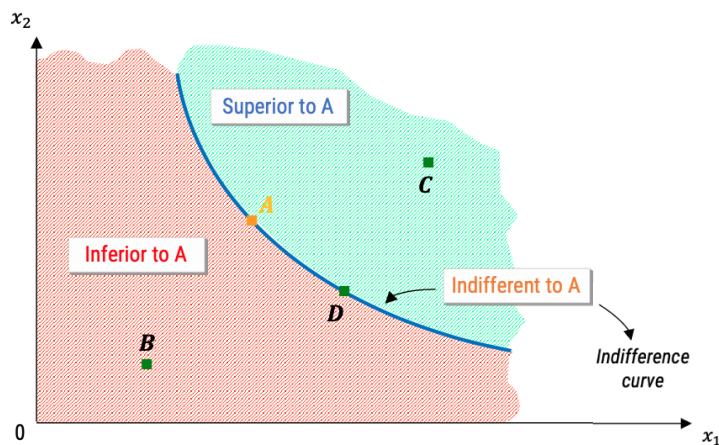
- Price reduction for good 1:  $p_1^0 > p_1^1$
- Budget  $m$  and price  $p_2$  are held constant
- Budget line turning outwards (in point  $m/p_2$ )
- Purchasing power (= “real income”) of the household increases (while “money income” remains constant)

### Price change 2.0:



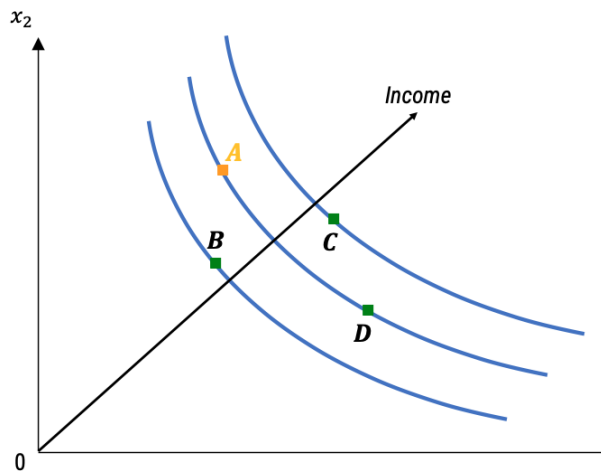
- Price reduction for both goods (proportional):  $p_1^0 > p_1^1, p_2^0 > p_2^1$
- Budget  $m$  (= “money income”) is held constant
- Purchasing power (= “real income”) of the household increases
- Budget line shifting outwards (in parallel to the original blue budget line)

### Indifference curve:



- Which consumption bundles (combination of  $x_1$  and  $x_2$ ) does the household prefer
- **Indifference curve** = set of consumption bundles that the household values equally and is indifferent (see A and D)
- C is valued higher than (preferred to) A and D
- B is least valued (least preferred) of all four alternative consumption bundles

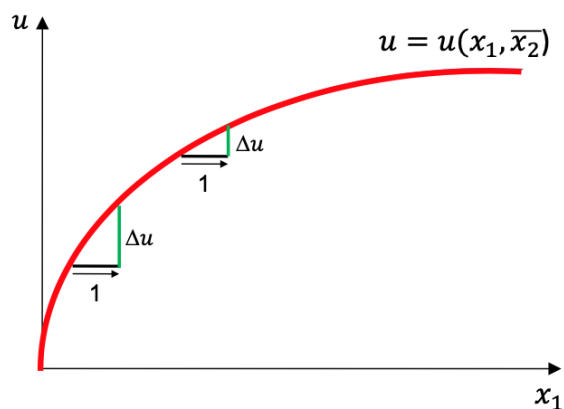
Indifference curve 2.0:



- A set of indifference curves is called an indifference map
- Higher income allows the household to move to higher valued consumption bundles (i.e., by moving outward the “Income” arrow)
- → households prefer higher indifference curves over lower ones (see: “more is always better than less”)

Utility function:

- How can we measure the preferences of households for specific consumption bundles?
- So far, it is only possible to say whether a consumption bundle is valued higher/ preferred to another consumption bundle
- The actual indifference in preferences is not quantifiable
- The utility function assigns a specific utility value to individual consumption bundles, making these bundles comparable:
  - Equally valued consumption bundles receive the same utility value
  - Preferred consumption bundles get assigned higher utility values
- Formal representation:  $u = u(x_1, x_2)$
- We hold  $x_2$  constant:  $u = u(x_1, \bar{x}_2)$



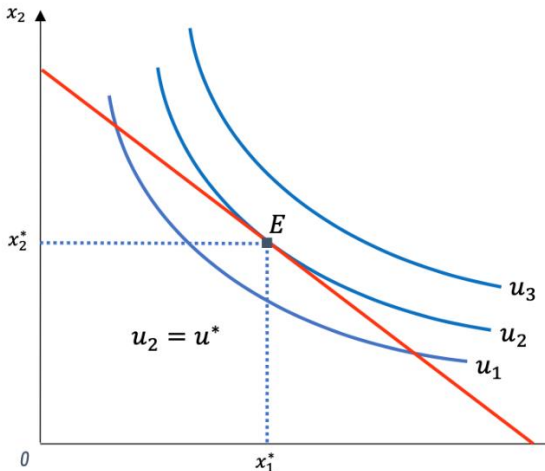
- “Cobb-Douglas” utility function

- Shows the utility level  $u$  given specific quantity of good  $x_1$
- Marginal Utility (MU) of  $x_1$  = Change in utility level  $u$  resulting from a marginal change (increase or decrease by one unit) of good  $x_1$ :

$$MU(x_1) = \frac{\partial u(x_1, x_2 \text{con})}{\partial x_1}$$

- Decreasing slope  $\rightarrow$  Law of diminishing marginal utility = The marginal utility generated by an additional unit of good  $x_1$  ( $\Delta u$ ) diminishes as the household consumes more of it, holding constant the consumption of all other goods

Utility-maximization consumption:



- Each indifference curve has assigned a utility value  $u \rightarrow$  Consumption bundles on the same indifference curve have the same utility value
- The further away the indifference curve from the origin, the higher its utility level ( $u_1 < u_2 < u_3$ )
- Equilibrium  $E$  of the household = utility-maximization consumption:
  - Choose the consumption bundle that delivers the highest utility, given the available budget
  - $E$  is defined by the tangent of the indifference curve and the budget line

Utility-maximization consumption 2.0:

- In Equilibrium  $E$ :

Slope of the indifference curve = slope of the budget line

$$\frac{MU_1}{MU_2} = \frac{p_1}{p_2}$$

**$\rightarrow$  Condition for the optimal (=utility-maximizing) consumption of goods  $x_1$  and  $x_2$**

Interpretation:

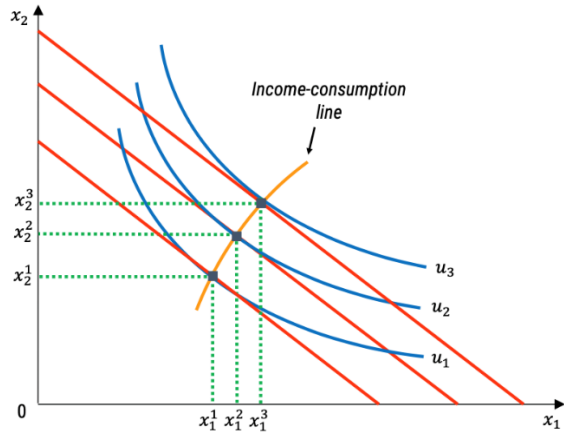
- The ratio of marginal utilities of  $x_1$  and  $x_2$  (left-hand side) is equal to the ratio of prices  $p_1$  and  $p_2$  (right-hand side)
- The willingness of the household to choose a specific combination of  $x_1$  and  $x_2$  (left-hand side) is equal to the willingness of the market to provide this specific combination of  $x_1$  and  $x_2$  (right-hand side)

## Consumption Theory 2.0: L4, Ch. 3/4

Income consumption line:

- How does the demand for a good change when the household's income increases?

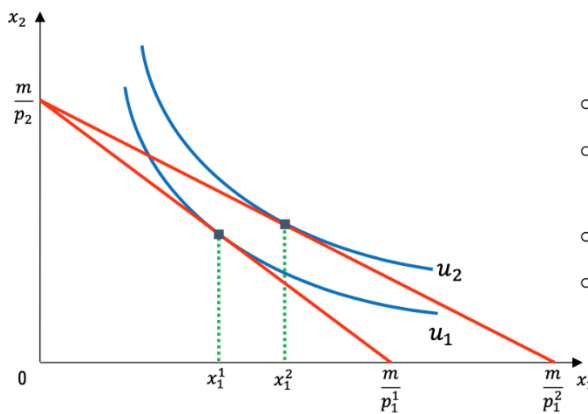
$$\frac{\partial x_i}{\partial m}, i = 1, 2$$



- Increases in income shift the budget line outward in parallel, creating new equilibria
- Income-consumption line joins all equilibria
- Shows how a household's demand reacts to changes in income with price  $p_1$  and  $p_2$  held constant

$$\frac{\partial x_1}{\partial m} > 0, \frac{\partial x_2}{\partial m} > 0$$

Price-consumption line: normal good



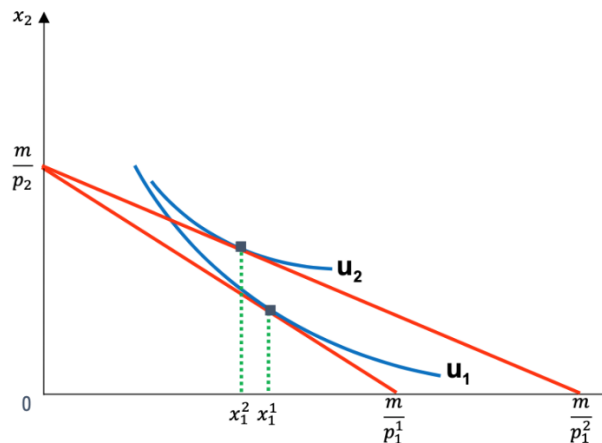
- How does the demand for a good change when the price for those good changes?

$$\frac{\partial x_i}{\partial p_i}, i = 1, 2$$

- Price reduction for good  $x_1$ :  $p_1^1 > p_1^2$
- Budget line pivots outward in point  $\frac{m}{p_2}$
- Normal good:  $\frac{\partial x_1}{\partial p_1} < 0$
- If  $p_1 \uparrow$  then  $x_1 \downarrow$ , if  $p_1 \downarrow$  then  $x_1 \uparrow$

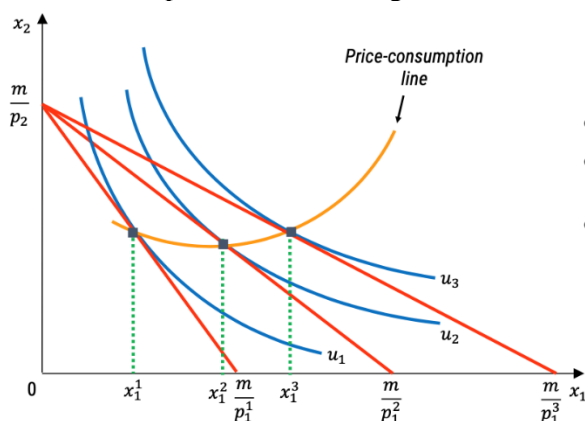
### Price consumption line: Giffen good

- Giffen good is a very special case, but interesting to know



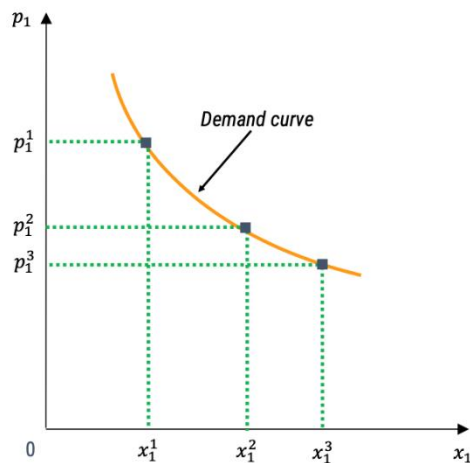
- Price reduction for good  $x_1$ :  $p_1^1 > p_1^2$
- Budget line pivots outward in point  $\frac{m}{p_2}$ , creating new equilibria
- Normal good:  $\frac{\partial x_1}{\partial p_1} > 0$
- If  $p_1 \uparrow$  then  $x_1 \downarrow$ , if  $p_1 \downarrow$  then  $x_1 \uparrow$
- Historical example of a Giffen good = potatoes during the Great Famine in Ireland (1845-1849)
  - $x_1$  = potatoes,  $x_2$  = meat
  - The price of potatoes rose sharply due to a poor harvest
  - The purchasing power of disposable income fell to the point where households stopped eating meat altogether and consumed even more potatoes than before the price increase
  - As the price of potatoes fell again, household's purchasing power increased. However, then they used their disposable income to consume more meat again, while the consumption of potatoes decreased

### Price-consumption line: Normal good



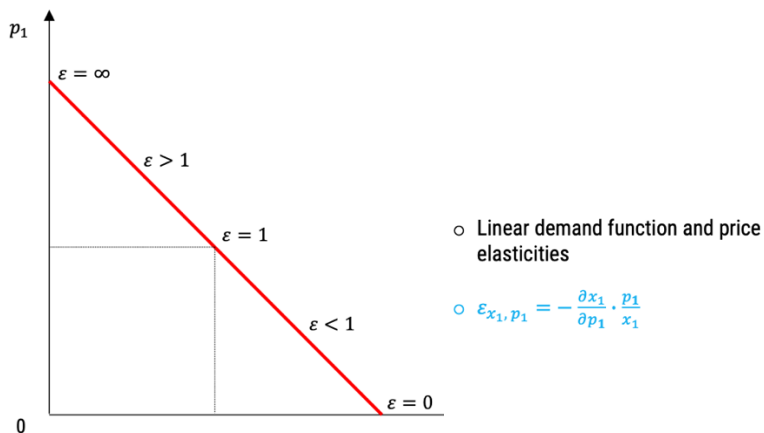
- $x_1$ :  $p_1^1 > p_1^2 > p_1^3$
- Price-consumption line (here: for normal goods) joins all equilibria
- Shows how a household's demand reacts to a change in one price ( $p_1$ ), with money income ( $m$ ) and the other price ( $p_2$ ) held constant

Household's demand curve:



- The points on the price-consumption line provide the information needed to draw a demand curve
- Shows the quantity demanded of good  $x_i$  ( $i = 1, 2$ ) depending on the market price  $p_i$
- Formal representation  $x_i = x_i(p_i)$ ,  $i = 1, 2$
- $\frac{\partial x_1}{\partial p_1} < 0$ : negative slope of the demand function
  - “Law of demand”: the lower the price of a product, the larger the quantity demanded, other things being equal

Household's demand elasticities:



- How sensible does a household's demand react to price and income changes?
  - Elasticities can help answer this question because they are measures of responsiveness
- (1) Price elasticity of demand = sensitivity of the quantity demanded to a marginal change in prices
  - Defined as ratio of percentage change (%) in quantity demanded to a one-percent change in price
  - Formal representation:  $\varepsilon_{x_1, p_1} = - \frac{\frac{\partial x_1}{\partial p_1}}{\frac{x_1}{p_1}} = - \frac{\partial x_1}{\partial p_1} * \frac{p_1}{x_1}$
  - $\frac{\partial x_1}{\partial p_1}$  is the slope of the demand function, which is usually negative
  - Therefore,  $\varepsilon_{x_1, p_1} > 0$

Interpretation:

- The larger  $\varepsilon_{x_1, p_1}$ , the more elastic (sensitive) demand reacts to a one-percent change in price
- For example,  $\varepsilon_{x_1, p_1} = 2$ : One-percent change in price leads to a two-percent change in quantity demanded



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Household's demand elasticities 2.0:

- (2) Income elasticities = sensitivity of the quantity demanded to a marginal change in income
  - Defined as ratio of percentage change (%) in quantity demanded to a one-percent change income
  - Formal  $\varepsilon_{x_1, m} = - \frac{\frac{\partial x_1}{x_1}}{\frac{\partial m}{m}} = - \frac{\partial x_1}{\partial m} * \frac{m}{x_1}$

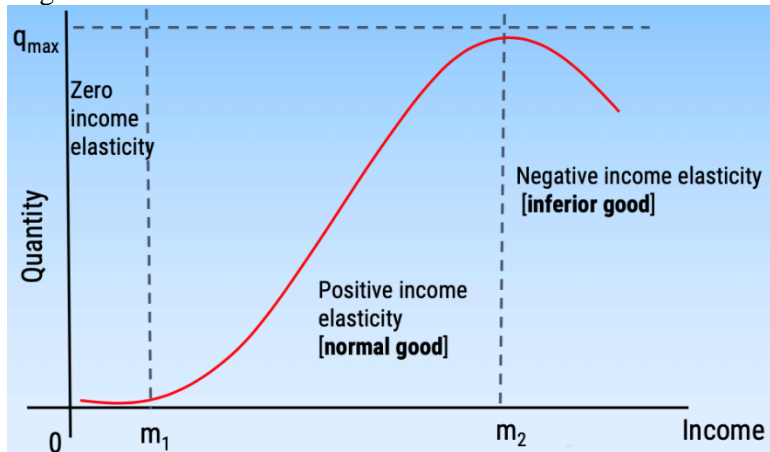
Interpretation:

- The larger  $\varepsilon_{x_1, m}$ , the more elastic (sensitive) demand reacts to a one-percent change in income
- $\varepsilon_{x_1, m} > 1$ : income-elastic demand, for example for luxury goods (e.g., clothing, travel, cars, jewelry etc.)
- $\varepsilon_{x_1, m} = 1$ : unit income-elastic demand (homothetical preferences)
- $\varepsilon_{x_1, m} < 1$ : income-inelastic demand. For example, for necessary goods (e.g., food, drinks, medicine)

Special case:

- $\varepsilon_{x_1, m} < 0$ : negative income elasticity for 'inferior goods' (=goods of which we consume less the more income we have)

Engel curve:





(3) Cross-elasticity = sensitivity of the quantity demanded of one good to a marginal change in price of the other good

- Defined as ratio of percentage (%) change in quantity demanded to a one-percent change in the price of the other good

- Formal representation:  $\varepsilon_{x_1, p_2} = - \frac{\frac{\partial x_1}{x_1}}{\frac{\partial p_2}{p_2}} = - \frac{\partial x_1}{\partial p_2} * \frac{p_2}{x_1}$

Interpretation:

- The sign of  $\varepsilon_{x_1, p_2}$  indicates the type of relationship between  $x_1$  and  $x_2$
- $\varepsilon_{x_1, p_2} > 0$ :  $x_1$  and  $x_2$  are substitutes (e.g., tea vs. coffee, VISA vs. Mastercard, Coca Cola vs. Pepsi)
- $\varepsilon_{x_1, p_2} < 0$ :  $x_1$  and  $x_2$  are complements (e.g., car and gasoline/battery, letter and stamp)

## Market theory: L5, Ch. 2/6

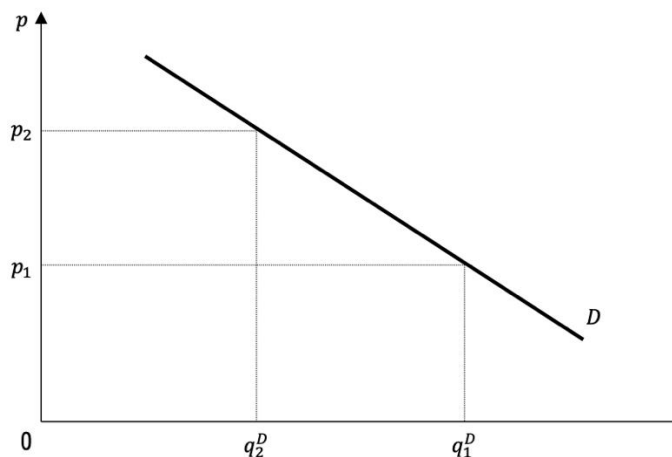
Market theory:

- Explains and predicts market transactions between firms and consumers

Assumptions:

- Efficient coordination of economic activities, i.e., the plans of firms and consumers, taken place on markets
- Firms plan to sell goods at the highest possible price, consumers plan to buy goods at the lowest possible price (rational behaviour!)
- The market price as an instrument coordinating individual decisions and actions

Demand function:

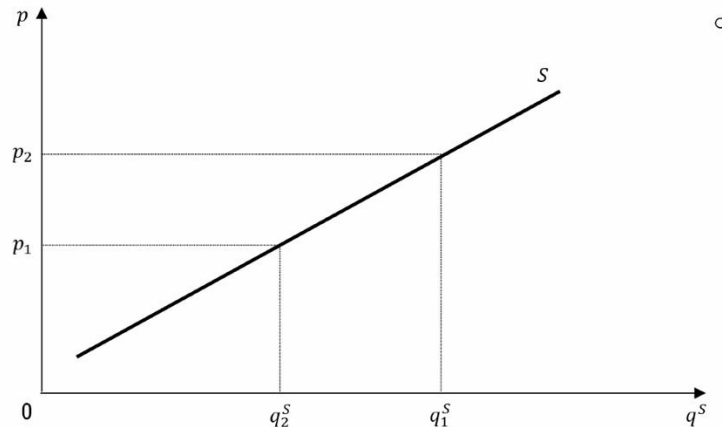


- Formal representation:
  - Normal:  $q^D(p) \rightarrow$  what consumers are demanding depending on the market price
  - Inverted:  $p(q^D) \rightarrow$  exact price level that needs to be on the market so that consumers demand this quantity
- Plan of the consumers (0no realized transactions):  $\Delta q^D = \frac{\partial q^D(p)}{\partial p} * \Delta p$
- Decreasing slope  $\rightarrow$  law of demand:  $\rightarrow$  decreasing slope of the demand function relates to the law of demand
- Income and substitution effect

$\rightarrow$  market price  $p$  is depended on the demand

→ Capital delta is an absolute change for example in the number of products sold and a small delta reflects a derivative ( $\partial$ ) substitution effect: if a price is increasing and the demand is increasing as well, we will just find a substitute such as a cheaper similar product

Supply function:

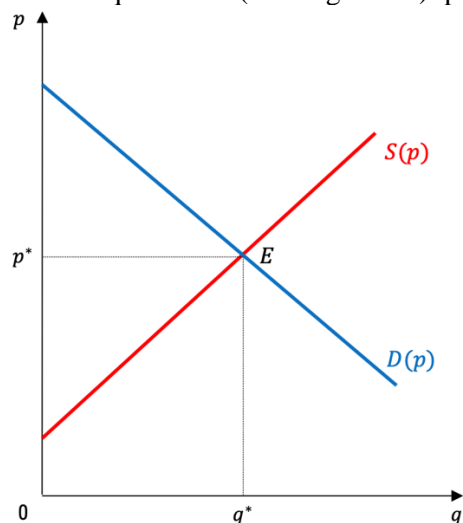


- Formal representation:
  - Normal:  $q^S(p) \rightarrow$  quantity supplied given a certain market price  $p$
  - Inverted:  $p(q^S) \rightarrow$  price that must be in place so that firms produce the quantity demanded
  - Plan of the firms (= no realized transactions):  $\Delta q^S = \frac{\partial q^S(p)}{\partial p} * \Delta p$
  - Increasing slope  $\rightarrow$  theory of supply

→ only tells us what firms would supply if the market price  $p$  was given, not a real-life function

→ decrease in the price leads to a decrease supplied and an increase in the price leads to an increase of quantity

Market equilibrium (Gleichgewicht): perfect competition



◦ in  $E$ :

$$D(p^*) = S(p^*)$$

$$q_D(p^*) = q_S(p^*)$$

$$p(q_D^*) = p(q_S^*)$$

$$p(q_D^*) = \frac{\partial c}{\partial q}$$

Assumptions: market in perfect competition

- Many buyers and sellers  $\rightarrow$  influence the market price (=price-takers)
- Identical or homogenous products are sold  $\rightarrow$  buyers have no incentive to choose a different seller

- Perfect knowledge → buyers are well informed about the characteristics of the product and the prices charged by the seller (+ there is only one price)

Market equilibrium:

- Supply = demand → leads supply and demand to match each other
- Plan of the firms = plan of the consumers
- $q^S(p^*) = q^D(p^*)$
- Equilibrium price  $p^*$  as coordination instrument (coordinates supply and demand)

→ in perfect competition the participants have zero power on the market price, cannot influence it and must adjust their behaviour to the current market price

→ identical or homogenous products are sold → we are not differentiating between different types, just the car or the food or clothes

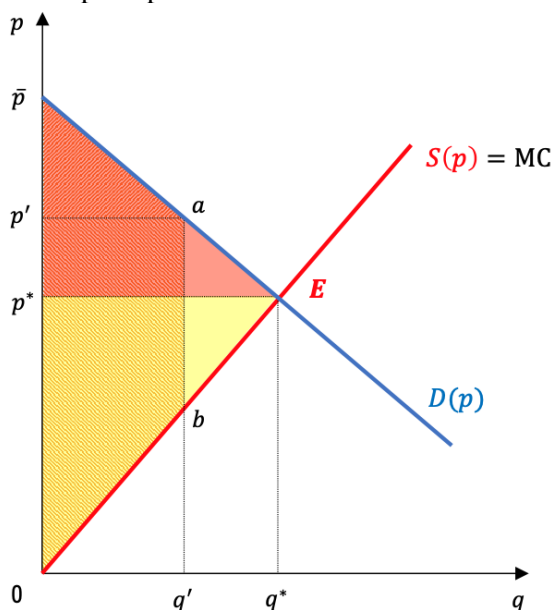
Efficiency of the market equilibrium:

- Do markets work efficiently? Do they ensure Pareto-optimal allocations (e.g., efficient use of scarce resources)?
  - In a market equilibrium, Pareto efficiency is achieved when there is no other allocation that makes one economic agent better off without simultaneously making one or more others worse off
  - = when the sum of consumers' surplus and producers' surplus is maximized

→ Consumers' surplus = difference between the total value consumers place on all output units (i.e., their willingness to pay) and the price they actually pay (*something consumers might have from the market: the difference between the total value consumers place on all output units (i.e., their willingness to pay) and the price they actually pay*)

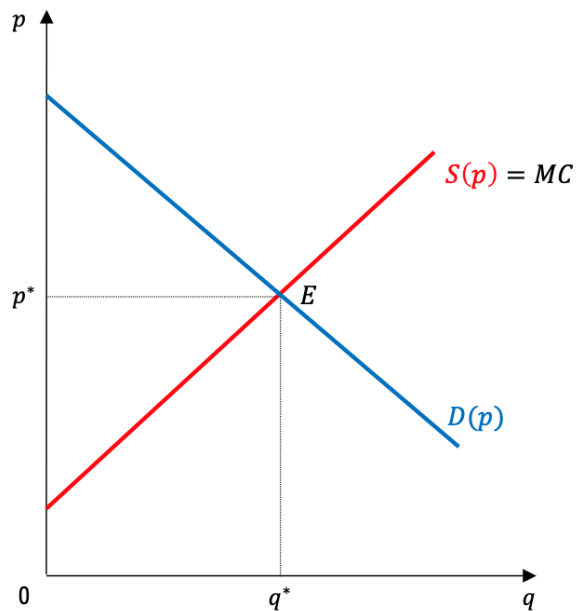
→ Producers' surplus = total amount producers are paid for a product less the total variable costs of production (*something producers get from the market: total amount producers are paid for a product less the total variable costs of production*)

- Question: how does the sum of consumers' and producers' surplus at a price other than the equilibrium price compares to the sum of consumers' and producers' surplus at the equilibrium price  $p^*$ ?



- At price  $p'$ :
  - Consumers' surplus:  $CS' = p'p(\text{con})a$

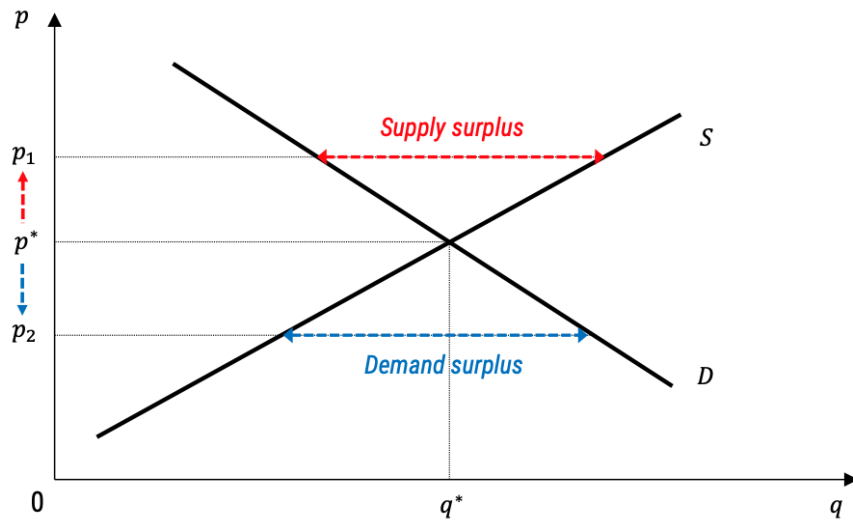
- Producers' surplus:  $PS' = 0p'ab$
  - At price  $p^*$ :
    - Consumers' surplus:  $CS^* = p^*p(\text{con})E$
    - Producers' surplus:  $PS^* = 0p^*E$
  - Comparing both scenarios:
    - $CS^* + PS^* > CS' + PS'$
    - $\text{Welfare}^* > \text{Welfare}'$
- Equilibrium E is pareto-efficient



Deviations from the equilibrium:

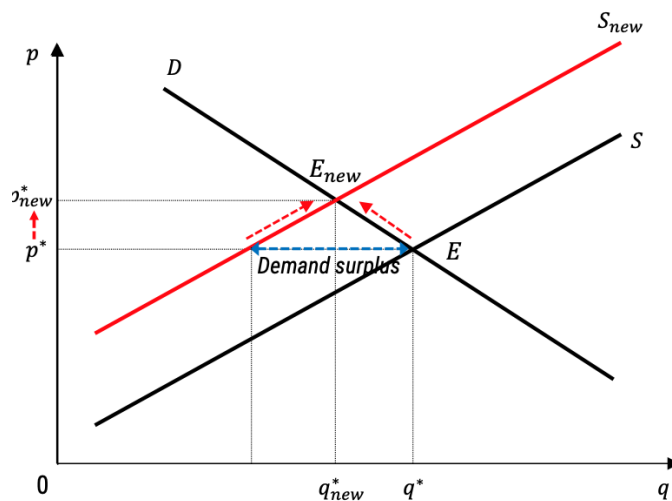
- For any quantity  $q < q^*$ , firms are willing to produce at a price ( $p^*$ ) lower than consumers are willing to pay ( $D(p)$ ) → increase of production is welfare-enhancing
- For any quantity  $q > q^*$ , firms' cost of producing an additional unit ( $MC$ ) are higher than consumers' marginal willingness to pay ( $D(p)$ ) → increase of production beyond  $q^*$  is not welfare-enhancing

Determination of price:



Determination of price 2.0:

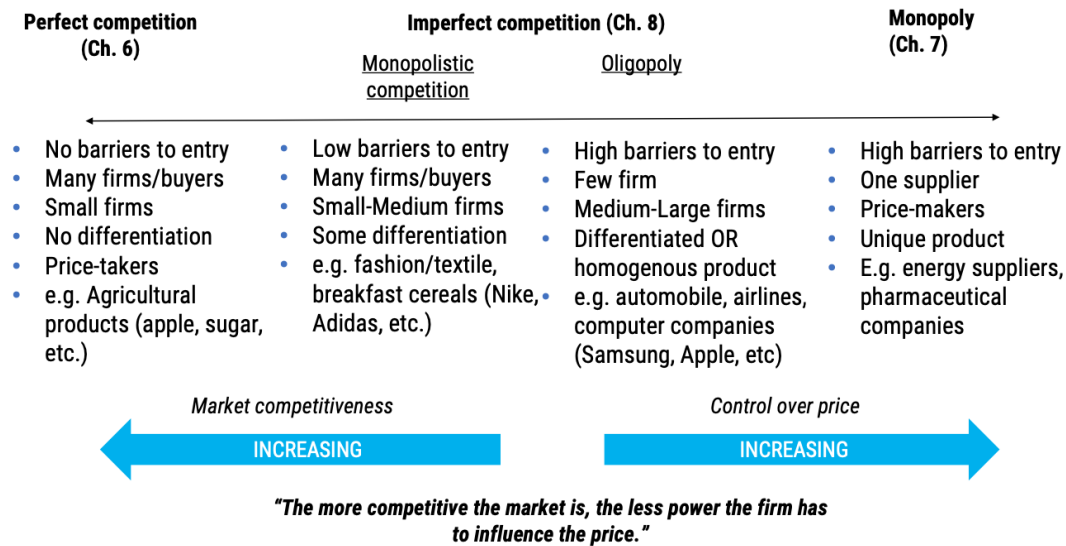
- How does the market equilibrium respond to an exogenous shock?



- Example 2: increase in production costs (e.g., due to legal regulations)
  - Decrease in production volume (due to increased costs) shifts the supply curve inward in parallel
  - At price  $p^*$ , demand is larger than supply (= demand surplus)
  - Price  $p^*$  adjusts to the level of  $p_{new}^*$  inducing an increase in supply and a decrease in demand
  - At price  $p_{new}^*$ , demand equals supply

→ new market equilibrium  $E_{new}$  emerges

Overview of market structures:

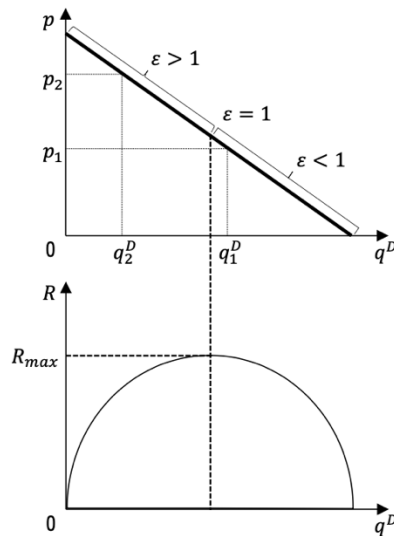


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## Market theory 2.0: L6, Ch. 2/6

Monopoly: key features

- So far: competitive markets with perfect competition, where market participants (sellers and buyers) cannot determine the market price  $p_{con}$
- In the following: imperfect competition → a smaller number of market participant son one side of the market
- Monopoly market → one market participant on the supply side (= monopolist), large number of market participants on the demand side:
  - No close substitutes for the product provided by the monopolist
  - High entry barriers for other firms (e.g., patents, brand names, high production capacities, prohibition of competition etc.)
  - Monopolist fully controls the supply of the commodity and sets the monopoly price → price is no longer considered as given, but is a function of quantity →  $p(q)$
  - Due to the large number of buyers, demand of any one buyer constitutes an infinitely small share of the total demand (they have no market power!) → buyers must pay the price  $p(q)$  set by the monopolist



- The monopolist is a profit-maximizer, chooses the optimal combination of price  $p$  and quantity  $q$  on the negatively sloped demand curve
- Trade-off!  $\rightarrow$  higher quantity at a lower price vs. low quantity at a higher price
- Profit maximum of the monopolist cannot be found along the inelastic part of the demand function! Why?
  - Elastic demand reacts very sensitive to marginal price changes  $\rightarrow$  percentage change in quantity is higher than change in price  $\rightarrow$  total revenue is increasing with increasing quantity
  - Maximum total revenue  $R_{max}$  is reached at unity elasticity
  - For inelastic demand, the percentage change in quantity is lower than the percentage change in price  $\rightarrow$  total revenue is decreasing with increasing quantity

Profit maximizing output:

- Profit maximizing behaviour if the monopolist  
 $\text{Profit} = \text{Revenue from outputs} - \text{cost of production}$

$$\max \pi(q) = R(q) - C(q) = p(q) * q - c(q)$$

(1) Taking the first-order derivative:  $\frac{\partial \pi}{\partial q} = p(q) + \frac{\partial p}{\partial q} * q - \frac{\partial c(q)}{\partial q} = 0$

(2) Rearranging the equation:  $p(q) + \frac{\partial p}{\partial q} * q = \frac{\partial c(q)}{\partial q}$

(3) **Condition for the optimal output level:  $MR = MC$  (marginal revenue = marginal cost  $\rightarrow$  which is the equilibrium for the market price**

- Monopoly price is higher than marginal cost:  $p(q) + \frac{\partial p}{\partial q} * q = \frac{\partial c(q)}{\partial q}$

$$p(q) = \frac{\partial c(q)}{\partial q} - \frac{\partial p}{\partial q} * q > \frac{\partial c(q)}{\partial q}$$

$$\rightarrow \frac{\partial p}{\partial q} < 0$$

- $< 0$  means they move into opposite directions (monopoly market smaller than 0)
- In a monopoly market, the marginal price is larger than the marginal cost

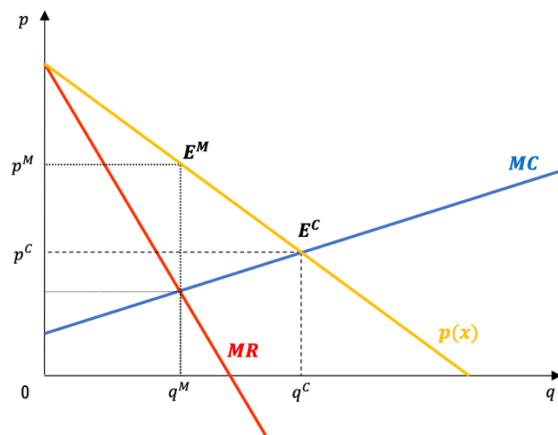
- In a competition market, price is equal to marginal cost:  $p + \frac{\partial p}{\partial q} * q = \frac{\partial c(q)}{\partial q}$

$$p = \frac{\partial c(q)}{\partial q} - \frac{\partial p}{\partial q} * q = \frac{\partial c(q)}{\partial q}$$

$$\rightarrow \frac{\partial p}{\partial q} = 0$$

- The difference of the price relationship for competition market and monopoly? In a monopolistic market, the price is set by the monopolist and seen as a function of quantity whereas in a competition market, the price is given
- In a competition market the prices are fixed which is why there would not necessarily be a change in quantity if there is a change in price
- Price equal to mc is optimum (competition)

Market equilibrium:

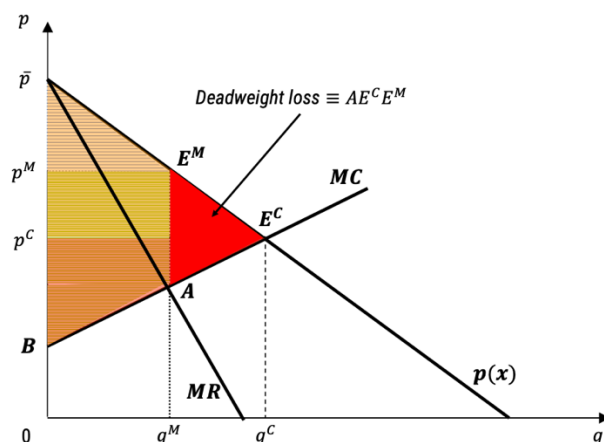


→ why is the slope of the MR function twice as steep as the demand function?

- Linear demand function:  $p(q) = a - bq$
- Slope of the demand function:  $\frac{\partial p}{\partial q} = -b$
- Revenue function:  $R = p(q) * q = (a - bq) * q = aq - bq^2$
- Marginal revenue function:  $MR = \frac{\partial R}{\partial q} = a - 2bq$
- Slope of the MR function:  $\frac{\partial MR}{\partial q} = -2b$



Allocative efficiency of the market equilibrium:



- Monopoly market:  
 Consumers' surplus:  $CS^M \equiv p^M E^M p_{con}$   
 Producers' surplus:  $PS^M \equiv B A E^M p^M$
- Competition market:  
 Consumers' surplus:  $CS^C \equiv p^C E^C p_{con}$   
 Producers' surplus:  $PS^C \equiv B E^C p^C$

- Comparing both market situations:

$$\begin{aligned} CS^M &< CS^C \\ PS^M &> PS^C \\ CS^M + PS^M &< CS^C + PS^C \\ \text{Welfare}^M &< \text{Welfare}^C \end{aligned}$$

→ **monopolies are disadvantageous especially in the short – run**

Static vs. dynamic efficiency:

- Short-term perspective
- Monopolies are allocatively inefficient:  $q^M < q^C, p^M > p^C$   $CS^M < CS^C, PS^M > PS^C, \text{Welfare}^M < \text{Welfare}^C$
- Deadweight loss  $\equiv AE^C E^M$  → Solution: policy intervention via competition policy, antitrust law etc.

Dynamic efficiency:

- Long-term perspective
- Monopolies provide incentive for firms to start production activities/generate markets
- Example: pharmaceutical industry, biotechnology –Y risky investments in R&D, high production costs
- Patents create temporary monopolies → patent owning firm benefits from profits in a monopoly market
- From a dynamic, long-term perspective, monopolies can be beneficial for economy/ society

## Module 6 overview: Innovation & Entrepreneurship

Module code: 202000565

! Disclaimer: always check what you need to study corresponds with the content of the summaries, courses can be changed which could cause changes in study material for your exams

Below you find information about which courses you have this module, and about the summaries for this module. If you made a summary for a course this module you can send them to [education@stress.utwente.nl](mailto:education@stress.utwente.nl) and depending on how many summaries we have for this course you will receive compensation for your work.

### Courses

- Innovation management
- Entrepreneurship
- Data analysis III: Big Data Analytics
- Innovation Tournament

### Summary 1

**Course:** Innovation management\*

**Book:** Schilling, M.A. (2019): *Strategic Management of Technological Innovation*. McGraw-Hill.

**Chapters:**

**Year the summary was received:** 2023

### Summary 2

**Course:** Entrepreneurship\*

**Book:** Nielsen, S. L., K. Klyver, M. R. Evald and T. Bader (2021). *Entrepreneurship in Theory and Practice; Paradoxes at Play*. Edward Elgar publishing.

**Chapters:**

**Year the summary was received:** 2023

### Summary 3

**Course:** Methodology & Techniques: Big Data analytics\*

**Book:** -

**Chapters:** -

**Year the summary was received:** 2020

\* There is another summary available on [www.stress.utwente.nl](http://www.stress.utwente.nl)

## Summary 1: Innovation Management

### Innovation book summary

#### Chapter 1 – Importance of innovation

**Technological innovation** - the act of introducing a new device, method, or material for application to commercial or practical objectives.

- Technological innovation is now often the single most important competitive driver in many industries. Many firms receive more than one-third of their sales and profits from products developed within the past five years.
- The aggregate impact of technological innovation can be observed by looking at **gross domestic product (GDP)** - the total annual output of an economy as measured by its final purchase price. Technological innovation increased the amount of output achievable from a given quantity of labor and capital.
- Technological innovation may result in negative **externalities** - Costs (or benefits) that are borne (or reaped) by individuals other than those responsible for creating them. Thus, if a business emits pollutants in a community, it imposes a negative externality on the community members; if a business builds a park in a community, it creates a positive externality for community members.
- Increasing importance of innovation has been driven by the globalization of markets and the advent of advanced technologies that enable more rapid product design and allow shorter production runs.

#### 1. Innovation by industry: the importance of strategy

##### The innovation funnel

- Only about one in nine projects that are initiated is successful, and from those launched to the market, only about half earn a profit.
- It takes about 3000 raw ideas to produce one significantly new and successful commercial product.
- Successful innovation requires an in-depth understanding of the dynamics of innovation, a well-crafted innovation strategy, and well-developed processes for implementing the innovation strategy.

##### The strategic management of technological innovation

Part 1: Sources of innovation, types and pattern of innovation, standards battles, modularity and platform competition, timing of entry

Part 2: Defining the organization's strategic direction, choosing innovation projects, collaboration strategies, protecting innovation

Part 3: organizing for innovation, managing new product development process, managing new product development teams, crafting a deployment strategy

## Chapter 2 – Sources of innovation

**Innovation** – the practical implementation of an idea into a new device or process.

Sources of innovation as a system – innovations come from linkages between universities, firms, individuals, private nonprofits and government-funded research.

### 1. Creativity

**Idea** - something imagined or pictured in the mind. **Creativity** - the ability to produce novel and useful work. The most creative works are novel at the individual producer level, the local audience level, and the broader societal level.

#### Individual creativity

It's a function of person's *intellectual abilities, knowledge, personality, motivation and environment*.

**Intellectual abilities:** intelligence; memory; ability to look at problems in unconventional ways; to analyze which ideas are worth pursuing; to convince others that the ideas are worthwhile; to let their mind engage in a visual mental activity termed *primary process thinking* (can result in combining ideas that are not typically related, leading to what has been termed *remote associations* or *divergent thinking*)

**Knowledge:** an individual with only a moderate degree of knowledge of a field might be able to produce more creative solutions.

**Personality:** “openness to experience” reflects an individual's use of active imagination, aesthetic sensitivity, attentiveness to emotion, a preference for variety, and intellectual curiosity.

**Motivation:** people are more likely to be creative if they work on things they are genuinely interested in and enjoy. **Environment:** supportive environment with time for the individual to explore their ideas independently

#### **Organizational creativity**

It's a function of creativity of the *individuals* within the organization and a *variety of social processes* and *contextual factors* that shape the way those individuals interact and behave.

- Suggestion box, intranet, employee idea systems, innovation competitions where employees form their own teams and compete, the best ideas are pitched to senior management in a “Shark Tank” style competition, creativity training programs

### 2. Translating creativity into innovation

#### **The inventor**

- have mastered the basic tools and operations of the field in which they invent, but they have not specialized solely in that field; instead they have pursued two or three fields simultaneously - they are curious and more interested in problems than solutions.
- they question the assumptions made in previous work in the field.
- they often have the sense that all knowledge is unified. They seek global solutions rather than local solutions

#### **Innovation by users**

- users often have both a deep understanding of their unmet needs and the incentive to find ways to fulfill them, they create solutions for their own needs

### R&D by firms

- reasearch: *basic research* (targeted at increasing scientific knowledge for its own sake. It may or may not have any long-term commercial application.); *applied research* (targeted at increasing knowledge for a specific application or need.)
- development: activities that apply knowledge to produce useful devices, materials, or processes
- research and development refers to a range of activities that extend from early exploration of a domain to specific commercial implementations.
- science-push approach: assumed that innovation proceeded linearly from scientific discovery, to invention, to engineering, then manufacturing activities, and finally marketing.
- the demand-pull approach: innovation was driven by the perceived demand of potential users. Research staff would develop new products in efforts to respond to customer problems.

### Firm linkages with customers, suppliers, competitors and complementors

- alliances with customers, suppliers, complementors, and even competitors to jointly work on an innovation project or to exchange information and other resources in pursuit of innovation
- collaborators can pool resources such as knowledge and capital, and they can share the risk of a new product development project.
- most frequent collaborators are universities, customers, suppliers
- External vs. Internal sourcing of innovation: doing in-house R&D helps to build the firm's *absorptive capacity*, enabling it to better assimilate and utilize information obtained externally.
- *absorptive capacity* - ability of an organization to recognize, assimilate, and utilize new knowledge

### Universities and government-funded research

- Universities: to increase the degree to which university research leads to commercial innovation, many universities have established technology transfer offices - offices designed to facilitate the transfer of technology developed in a research environment to an environment where it can be commercially applied.
- Government-Funded research: science parks – districts to foster r&d collaboration between government, universities and private firms; incubators – institutions designed to nurture the development of new businesses that may otherwise lack access to funding/advice

### Private nonprofit organizations

- private research institutes, nonprofit hospitals, private foundations, professional or technical societies, academic and industrial consortia, and trade associations

## 3. Innovation in collaborative networks

### Technology clusters

Regional clusters of firms that have a connection to a common technology, and may engage in buyer, supplier and complementor relationships, research collaboration. Region may be a city or neighbourhood countries.

- knowledge that is **complex**(many underlying components, many interdependencies between components) or **tacit**(cannot be documented) may require frequent and close interaction

to be meaningfully exchanged - closeness and frequency of interaction can influence a firm's willingness to exchange knowledge (trust)

- **agglomeration economies**: the benefits firms reap by locating in close geographical proximity to each other

### **Technological spillovers**

Occur when the benefits from the research activities of one firm (or nation or other entity) spill over to other firms (or nations or other entities). Spillovers are thus a positive externality of research and development efforts.

## Chapter 3 - Types and patterns of innovation

**Technology trajectory** – the path technology takes through its lifetime, may refer to its rate of performance improvement, rate of diffusion, or other change of interest.

### 1. Types of innovation

4 of the dimensions most commonly used to categorize innovations

are: **Product vs Process innovation**

Product – embodied in the outputs of an organization (snapchat filters)

Process – way of conducting business (reducing defect rates)

**Radical vs Incremental**

Radical – innovation that's very new and different from prior solutions (wireless telecommunication)

Incremental – makes a relatively minor change from existing practices (changing phone screen to be more crackresistant)

**Competence Enhancing vs Competence Destroying**

Competence enhancing – builds on existing knowledge and skills

Competence destroying – renders existing knowledge and skills obsolete, whether an innovation is competence destroying or enhancing depends on the perspective

**Architectural vs Component**

Architectural – changes the overall design of a system or the way its components interact with each other

Component – innovation to one or more components that doesn't significantly affect the overall configuration of a system

### **Using the dimensions**

Each of the above dimensions shares relationships with others. Architectural – more radical and competence destroying.

### 2. Technology s-curves

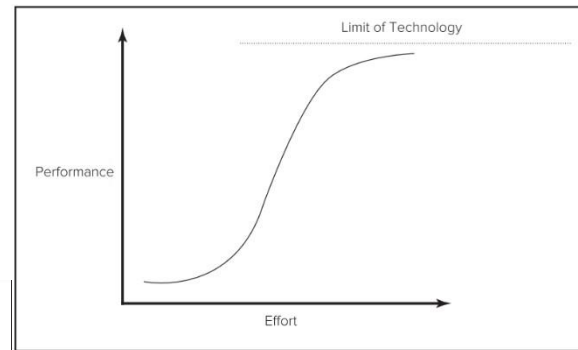
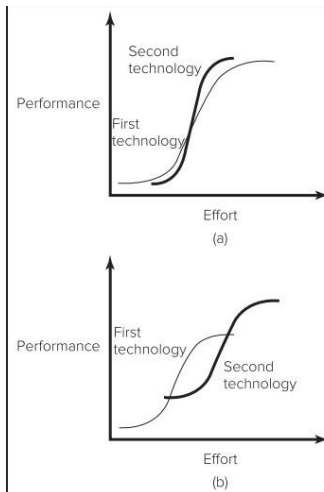
The rate of a technology's performance improvement and the rate at which the technology is adopted in the marketplace conforms to an s-shape curve. S-curves in technology performance and diffusion are related, but they are different processes

### S-curves in technological improvement (performance) ⑦

Performance improvement in the early stages is slow because the fundamentals of the technology are poorly understood. Until the technology has established a degree of legitimacy, it may be difficult to attract other researchers to participate in its development. As scientists or firms gain a deeper understanding of the technology, improvement begins to accelerate. Measures for assessing the technology are developed, permitting researchers to target their attention toward those activities that reap the greatest improvement per unit of effort, and rapidly. However, at some point, begin to set in. As the technology begins cost of each marginal improvement flattens.

Technologies do not always reach their **technology ⑦** a technology that fulfills a building on an entirely new knowledge chemical photography to digital compact discs to MP3. In early stages, technology may reap lower returns than

technology, and firms are often reluctant to switch. BUT if the disruptive technology has a steeper s-curve **(A)** or an s-curve that increases to a higher performance limit **(B)** there may come a time when the returns to effort invested in the new technology are much higher than effort invested in the incumbent technology.



performance to increase diminishing returns to effort to reach its inherent limits, the increases, and the s-curve

limits bc of **discontinuous** similar market need by base. Examples: from photography, from audio on effort invested in a new effort invested in the current

### S-curves in technology diffusion (adoption in the marketplace)

Obtained by plotting the cumulative number of adopters of the technology against time. S-shape curve bc adoption is initially slow when an unfamiliar technology is introduced, but when better understood and adopted it rises.

### S-curves as a prescriptive tool

It's argued that managers can use the s-curve model as a tool for predicting when a technology will reach its limits, and as a guide for whether and when a firm should move to a new more radical technology. Firms can use data on the investment and performance of their own technology or data on the overall industry investment in a technology and the average performance achieved by multiple proucers.

### Limitations of s-curve model as prescriptive tool

It's rare that the true limits of a technology are known in advance. The shape of the s-curve is not certain. Whether switching to a new technology will benefit a firm depends on: (a) the advantages offered by the new technology, (b) the new technology's fit with the firm's current abilities, (c) the new technology's fit with the firm's position in complementary resources, (d) the expected rate of diffusion of the new technology. A firm that follows an s-curve model too closely could end up switching technologies earlier or later than it should.

### 3. Technology cycles

The emergence of a new technological discontinuity can overturn the existing competitive structure of an industry, creating new leaders and new losers - Creative destruction, key driver of progress (Schumpeter)

Utterback; Abernathy; Anderson, Tushman: technology evolution model – technology passed through distinct phases. 1) *Fluid phase/Era of ferment*: uncertainty about technology and its market, experimentation, consensus 2) *Specific phase/Era of incremental change*: dominant design - product design that's adopted by the majority of producers creating a stable architecture on which industry can focus its efforts. Efficiency and market penetration

## Chapter 7 – Choosing innovation projects

- Developing innovative new p&s: expensive, time-consuming, risky.
- Firms have to make difficult choices about which projects are worth the investment, those projects must be pursued with a rigorous and well-thought-out development process.
- **Capital rationing** - The allocation of a finite quantity of resources over different possible uses.

### 1. The development budget

- Most firms are forced to choose between multiple valuable projects or obtain external financing because of constraints in capital and other resources
- Many firms use a form of **capital rationing** in formulating their new product development plans. The firm sets a fixed R&D budget (often % of previous year's sales), and then uses a **rank ordering** of possible projects to determine which will be funded.
- Firms might establish this budget on the basis of industry benchmarks or historical benchmarks of the firm's own performance
- **R&D intensity**: the ratio of R&D expenditures to sales. Some industries (notably drugs, special industry machinery) spend considerably more of their revenues on R&D than other industries
- The rank ordering used in capital rationing may be established by methods such as: **quantitative**(discounted cash flow analysis, options analysis); **qualitative**(screening questions, portfolio mapping); combination of multiple methods

### 2. Quantitative methods for choosing projects (metody ilościowe)

Quantitative methods of analyzing new projects usually entail (obejmują) converting projects into some **estimate of future cash returns** from a project.

- rigorous mathematical and statistical comparisons of projects, the quality of the comparison is ultimately a function of the quality of the original estimates.
- accuracy of such estimates can be questionable—in highly uncertain or rapidly changing environments.
- the most commonly used quantitative methods include discounted cash flow methods and **real options**.

#### Discounted cash flow methods

- Many firms use some form of discounted cash flow analysis to evaluate projects.
- Discounted cash flows are quantitative methods for assessing whether the anticipated future benefits are large enough to justify expenditure, given the risks.



- Discounted cash flow methods take into account the payback period, risk, and time value of money.
- Two most commonly used forms of DCF analysis for evaluating investment decisions are:

**Net present value (NPV)** - The discounted cash inflows of a project minus the discounted cash outflows. ⑦ asks: given a particular level of expenditure, particular level(s) and rate of cash inflows, and a discount rate, what is this project worth today?

**Internal rate of return (IRR)** - The rate of return yielded by a project, normally calculated as the discount rate that makes the net present value of an investment equal zero. ⑦ asks: Given a particular level of expenditure and particular level(s) and rate of cash inflows, what rate of return does this project yield?

- Both methods enable the decision maker to incorporate some basic measure of risk. Riskier projects may be examined by using a higher discount factor in NPV analysis.
- Managers also often calculate discounted cash flow measures using best-case and worst-case cash flow estimates.

### NPV – Net Present value of a project

Calculation of the NPV of a project: 1) identify inflows and outflows 2) choose discount rate 3) find the PV of each cash flow (to account for risk and the time value of money) 4) sum all discounted cash flows

- ⑨ Present value of cash inflows can then be compared to the present value of cash outflows:

$$NPV = PV \text{ of cash inflow} - PV \text{ of cash outflows}$$

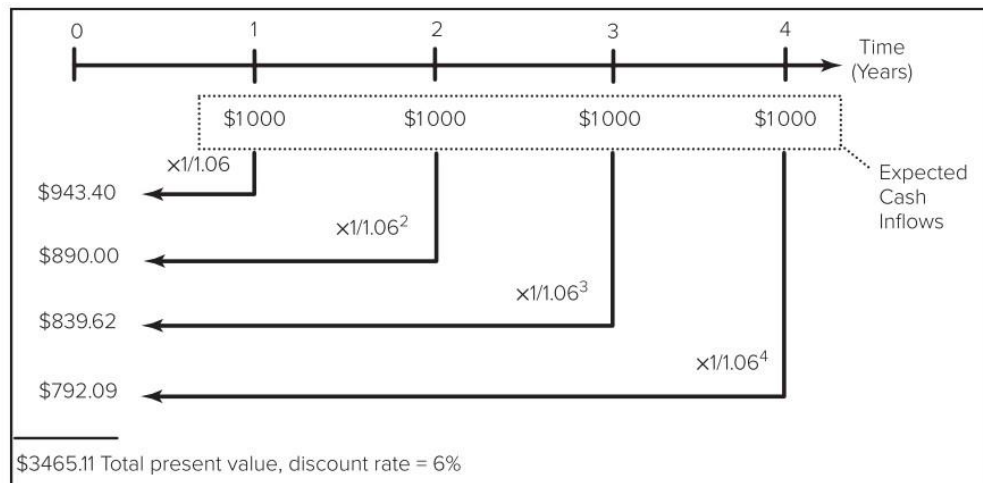
(If this value is  $>0$  the project generates wealth)

$$PV \text{ of cashflow} = \text{cashflow} \times 1/(1+r)^t$$

- ⑨ To find the present value of cash inflow and outflows, each cash flow must be discounted back to the current period using a discount rate. In the example, the present value of the future cash flows ( $r=6\%$ ) is \$3465.11.

Thus, if the initial cost of the project were less than \$3465.11, the net present value of the project is positive.

**FIGURE 7.3**  
Example of  
Present Value  
of Future Cash  
Flows



⑨ If there are cash outflows for multiple periods (as is common with most development projects), those cash outflows would have to be discounted back to the current period. If the cash inflows from the development project were expected to be the same each year (as they were in Figure 7.3), we can use the formula for calculating the present value of an annuity instead of discounting each of the cash inflows individually.

⑨ The present value of C dollars per period, for t periods, with discount rate r is given by the following formula:  $Annuity\ present\ value = C \times \frac{1 - \frac{1}{(1+r)^t}}{r}$  (total present value, 3465.11)

r

⑨ This amount can then be compared to the initial investment. If the cash flows are expected in perpetuity (forever), then a simpler formula can be used:  $Perpetuity\ present\ value = C \times 1/r$

⑨ PV of the costs and future cash flows can be used to calculate the discounted payback period (the time required to break even on the project using discounted cash flows).

**Discounted payback period** - The time required to break-even on a project using discounted cash flows. Example: the initial investment required was \$2000. Using the discounted cash inflows, the cumulative discounted cash flows for each year are

777

- The investment will be paid back sometime between the end of year 2 and the end of year 3.

- The accumulated discounted cash flows by the end of year 2 are \$1833.40, so we need to recover \$166.60 in year 3. Since the discounted cash flow expected for year 3 is \$839.62, we will have to wait  $\$166.60/\$839.61 \approx 0.20$  of a year. Thus, the payback period is just over two years and two months.

Year	Cash Flow
1	\$ 934.40
2	1833.40
3	2673.02
4	3465.11

## IRR – Internal rate of return

⑨ IRR of a project is the discount rate that makes the NPV of the investment zero. Managers can compare this rate of return to their required return to decide if the investment should be made.

⑨ Done by trial and error, substituting progressively higher interest rates into the NPV equation until the NPV is driven down to zero.

## 3. Disadvantages of quantitative methods

- Discounted cash flow estimates are only as accurate as the original estimates of the profits from the technology, and in many situations, it is extremely difficult to anticipate the returns of the technology.

- One of the most common mistakes managers make in their innovation strategy is to insist on “seeing the numbers” It is difficult to compute the size of a market that does not yet exist.

- Such methods discriminate heavily against projects that are long term or risky, and the methods may fail to capture the strategic importance of the investment decision.

- Technology development projects play a crucial role in building and leveraging firm capabilities and creating options for the future. Investments in new core technologies are investments in the organization’s capabilities and learning, and they create opportunities for the firm that might otherwise be unavailable.

#### 4. Qualitative methods

Many factors in the choice of development projects are extremely difficult to quantify, or quantification could lead to misleading results. **Screening questions**

- A management team is likely to discuss the potential costs and benefits of a project the team may create a list of screening questions that are used to structure this discussion.
- These questions might be organized into categories:

##### Role of customer

###### *Market*

- Who are the most likely customers of the new product?
- How big is this market? Are there other likely markets for the product?

###### *Use*

- How will customers use the product?
- What new benefits will the product provide the customer?

###### *Compatibility and Ease of Use*

- Will the product be compatible with the customer's existing complements?
- Will the product require significant new learning on the part of the customer?

###### *Distribution and Pricing*

- Where will the customer buy the product?
- Will the product require installation or assembly?

##### Role of capabilities

*Existing Capabilities* · Does the new project leverage the firm's core competencies or sources of sustainable competitive advantage? · Will the project render some of the firm's existing competencies obsolete or cannibalize existing products? If so, does the firm have a transition strategy to handle possible cash flow implications?

###### *Competitors' Capabilities*

- Do one or more competitors have better capabilities for developing this project?
- If the company does not develop this technology, are competitors likely to?

###### *Future Capabilities*

- Will the project help the firm build new capabilities that will allow it to achieve its strategic intent?
- What other products/markets will the new capabilities enable the firm to

develop? Project timing and cost

###### *Timing*

- How long will the project take to complete?
- Is the firm likely to be first to market? Is pioneering the technology a desirable strategy?

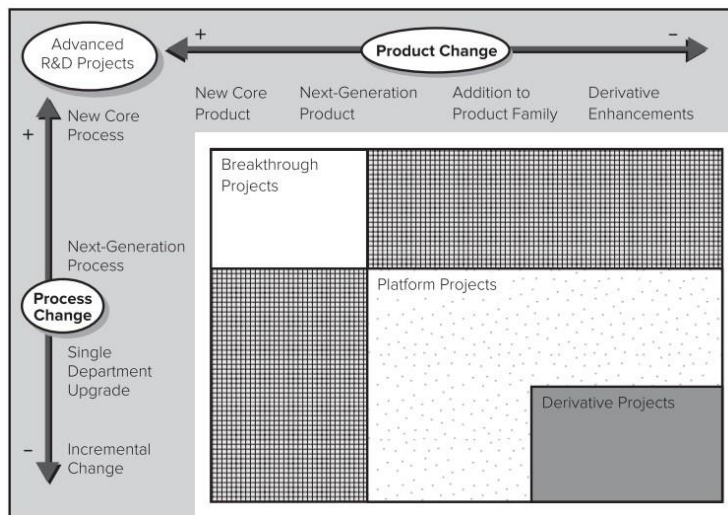
###### *Cost Factors*

- How much will the project cost? What is the potential variability in these costs?
- What will the manufacturing costs be? At what rate are these costs expected to decline with experience?
- Managers can use the questions to structure debate about a project, or they can create a scoring mechanism that can then be weighted according to importance

##### **The aggregate project planning framework**

- Many companies map their R&D portfolio according to levels of risk, timing of cash flows and resource commitment.

- Can be used to compare desired balance of project with actual one; better allocate resources; identify capacity constraints
- Project map:



Four types of development projects on this map: **Advanced R&D projects:** precursor to commercial development projects, necessary to develop cuttingedge strategic technologies.

**Breakthrough projects:** involve development of products that incorporate revolutionary new product and process technologies.

**Platform projects:** typically offer fundamental improvements in the cost, quality, and performance of a technology over preceding generations.

**Derivative projects:** involve incremental changes in products and/or processes. A platform project is designed to serve a core group of consumers, whereas derivative projects represent modifications of the basic platform design to appeal to different niches within that core group.

- Companies that use the project map categorize all their existing projects and projects under consideration by the resources they require (e.g., engineers, time, capital, etc.) and by how they contribute to the company's product line.
- The company can then map the project types and identify gaps in the development strategy.
- Managers can also use the map to identify their desired mix of projects, and allocate resources accordingly. The mix of projects represented on such a map should be consistent both with the company's resources, strategic position, and with its strategic intent.
- Typical firm experiencing moderate growth might allocate 10 percent of its R&D budget to breakthrough innovation, 30 percent to platform projects, and 60 percent to derivative projects. Firm pursuing significant growth might allocate higher percentages to breakthrough and platform projects, while a firm that needs to generate more short-term profit might allocate a higher percentage to derivative projects.
- Mapping the company's R&D portfolio encourages the firm to consider both short-term cash flow needs and long-term strategic momentum in its budgeting and planning.

## Q-Sort

- Simple method for ranking objects or ideas on a number of different dimensions.
- Individuals in a group are each given a stack of cards with an potential project on a card. Then a series of project selection criteria are presented (technical feasibility, market impact), and for each criterion, the individuals sort their cards in rank order (best fit with strategic intent) or in categories (technically feasible versus infeasible) according to that criterion. Individuals then compare their rank orderings and discuss.

## 5. Combining quantitative and qualitative information

## Conjoint analysis

- A family of techniques (discrete choice, choice modeling, hierarchical choice, trade-off matrices, and pairwise comparisons) used to estimate the specific value individuals place on some attribute of a choice.
- The most common use of conjoint analysis is to assess the relative importance to customers of different product attributes, for example: customers are given a series of cards describing different models of a camera with different features and prices. The individuals are then asked to rate each in terms of its desirability (on a scale 1-10) or asked to order the models in terms of which they would most likely buy.
- Multiple regression is then used to assess the degree to which each attribute influences the overall rating, resulting in the assignment of specific weights to individual criteria. These weights provide a quantitative assessment of the trade-offs that customers implicitly consider in their evaluation of products.

## Data Envelopment Analysis

- (DEA) is a method of assessing a potential project (or other decision) using multiple criteria that may have different kinds of measurement units.
- For a particular set of potential projects, a firm might have cash flow estimates, a ranking of the project's fit with existing competencies, a ranking of the project's potential for building desired future competencies, a score for its technical feasibility, and a score for its customer desirability. Each of these measures captures something that is qualitatively different, and the numbers assigned to them are based on different units of measure.
- Data envelopment analysis uses linear programming to combine these different measures from the projects to create an efficiency frontier that represents the best performance on each measure.
- **Efficiency frontier:** The range of hypothetical configurations that optimize a combination of features.
- The biggest advantage of DEA: enables comparisons of projects using multiple kinds of measures.

## Chapter 11 – Managing the new product development process

### 1. Objectives of the new product development process

Successful NPD, must simultaneously achieve three sometimes-conflicting goals: (1) maximizing the product's fit with customer requirements, (2) minimizing the development cycle time, (3) controlling development costs.

#### Maximizing fit with customer requirements

- Offering more compelling features, better quality, more attractive pricing than competition
- The firm may not have a clear sense of which features customers value the most, resulting in the firm's overinvesting in some features at the expense of features the customer values more.
- Firms may also overestimate the customer's willingness to pay for particular features
- Firms may also have difficulty resolving heterogeneity in customer demands; if some customer groups desire different features from other groups, the firm may end up producing a

product that makes compromises, and the resulting product may fail to be attractive to any of the customer groups.

### Minimizing development cycle time

- products that achieve a very close fit with customer requirements can fail if they take too long to bring to market
- development cycle time: The time elapsed from project initiation to product launch
- new product brought to the market late: customers committed to other products - product brought to market early: more time to develop complementary goods - many development costs are directly related to time.
- a company that is slow to market with a particular generation of technology is unlikely to be able to fully amortize the fixed costs of development before that generation becomes obsolete.
- companies that are slow to market may find that by the time they have introduced their products market demand has already shifted to the products of a subsequent technological generation.
- company with a short development cycle can quickly revise or upgrade its offering as design flaws are revealed or technology advances. A firm with a short development cycle can take advantage of both firstmover and second-mover advantages. **Controlling development costs**
- firm develops a product that exceeds customer expectations and brings it to market early, only to find that its development costs have ballooned so much that it is impossible to recoup the development expenses even if the product is enthusiastically received by the market
- development efforts must be not only *effective*, but also *efficient*.

## 2. Sequential vs partly parallel development processes

**Sequential development process** - before the mid 1990' most US companies proceeded from one development stage to another sequentially. The process included a number of gates, where managers would decide whether to proceed to the next stage, send the project back to a previous stage for revision, or kill the project.

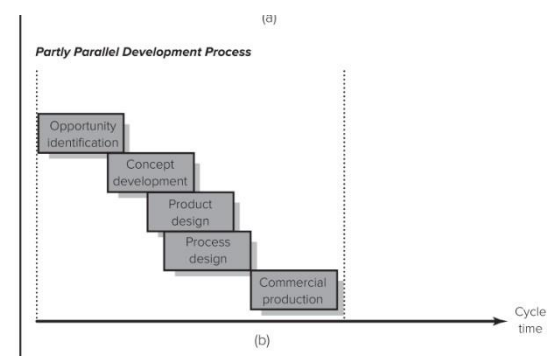
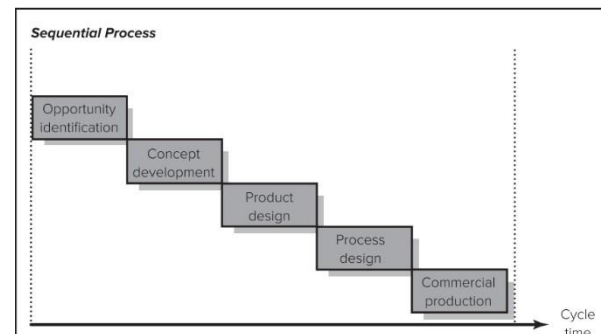
Opportunity identification+concept development: marketing and R&D. Product design: R&D. Process design: manufacturing.

Problems: 1) at the product design stage when R&D engineers fail to communicate with manufacturing engineers. 2) sequential process has no early warning system to indicate that planned features are not manufacturable 3) cycle time can lengthen as the project iterates back and forth between the product design and process design stages.

**Partly parallel development process** - A development process in which some (or all) of the development activities at least partially overlap. That is, if activity A would precede activity B in a partly parallel development process, activity B might commence before activity A is completed.

- **Concurrent engineering** – type of parallel development process involves not only conducting product development stages simultaneously, but also takes into account downstream stages of a product's lifecycle eg maintenance and disposal

Sometimes parallel development processes increase risk, costs.



### 3. Project champions

- Firms should assign a senior member of the firm to champion a new product development project
- Senior executives have power, authority, they can facilitate the allocation of human and capital resources, can stimulate communication and cooperation
- **Risks of championing:** clouding judgement abt the true value of the project, managers may be unable or unwilling (bc of optimism) to admit that the project should be killed ⑦ firms then create antichampions, devil's advocates

### 4. Involving customers and suppliers in the development process

#### Involving customers

The screening decision should focus on the new product's advantage and superiority to the consumer, and the growth of its target market. End customer ⑦ most able to identify the max. performance capabilities and min. service requirements of a new product. Customers involved as an info source or co-developers.

*Beta testing* – to get customer input early in the development process. Beta version of a product is an early working prototype released to users for testing and feedback.

Agile development - processes commonly used in software where overall product is broken down into smaller independent pieces that are worked on by autonomous self-organizing teams. Features are developed into *minimum viable products* and presented to customers quickly so that the overall product can be rapidly and continuously adapted.

Lead users - firms should focus on the input of them in their development efforts rather than a large sample of customers. Lead users are those who face the same needs of the general marketplace but face them months or years earlier than the bulk of the market, and expect to benefit significantly from a solution to those needs.

#### Involving suppliers

Suppliers may be members of the product team or consulted as an alliance partner. In either case, they can contribute ideas for product improvement or increased development efficiency. Supplier may be able to suggest an alternative input (or configuration of inputs) that would achieve the same functionality but at a lower cost. Suppliers can ensure that inputs arrive on time and that necessary changes can be made quickly to minimize development time.

Crowdsourcing - distributed problem-solving model (innovation challenge) where a design problem or production task is presented to a group of people who voluntarily contribute their ideas and effort in exchange for compensation, intrinsic rewards, or a combination of both.

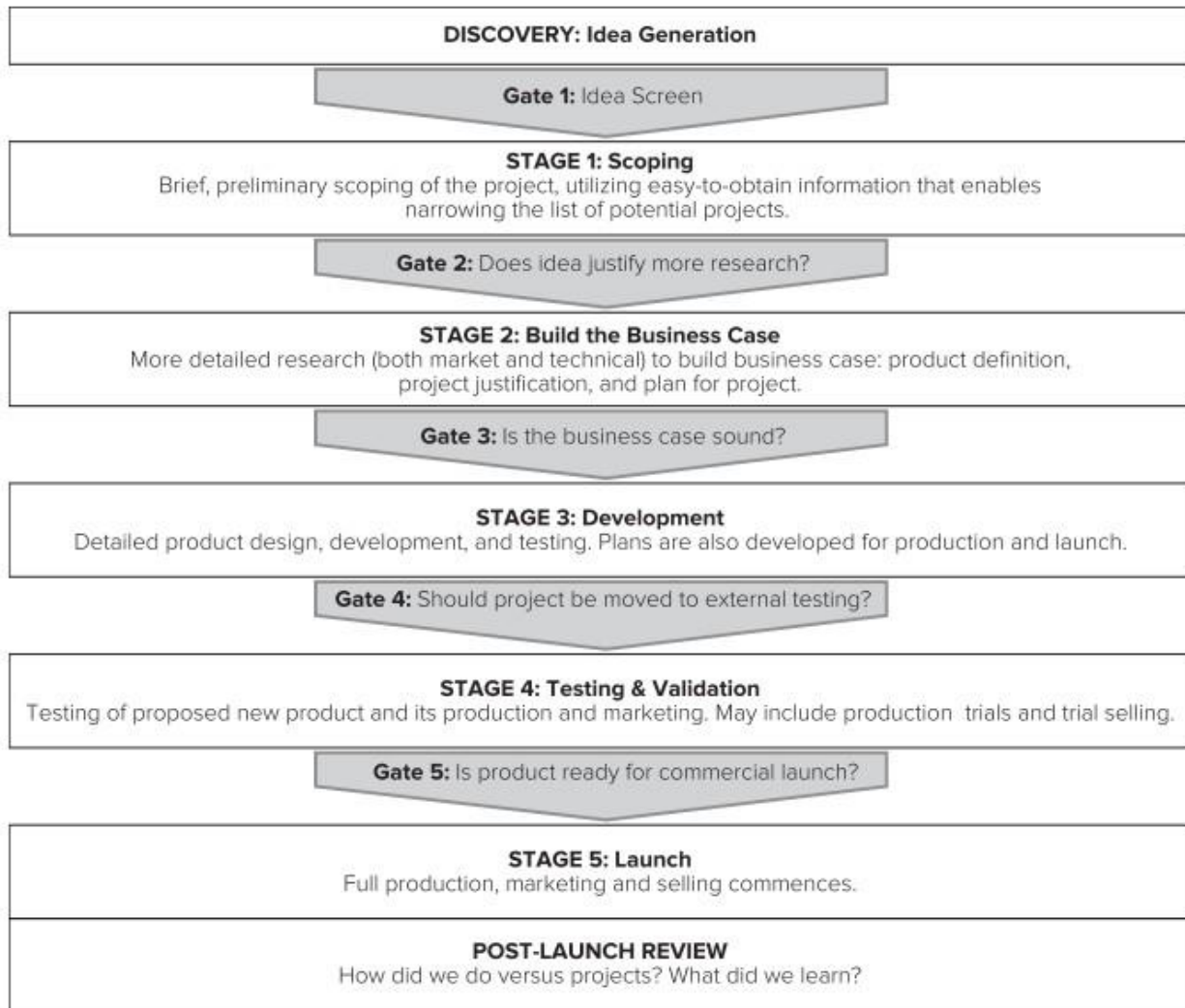
Crowdsourcing challenges go through a 4 step process:

1. Need translation. A clear, concise, and compelling need statement is articulated that reduces industry jargon to a minimum, and that brings the challenge down to its most basic science.
2. Connecting. The innovation challenge must be broadcast to the network of potential solution providers that have been selected as most suitable to respond.
3. Evaluation/Selection. Submitted proposals get an in-depth review, and the most interesting solution proposals get selected and collated in the form of a report.
4. Acquisition. The firm engages with the solution provider and negotiates an agreement to transfer knowledge, a license, patent, and so on.

## 5. Tools for improving the new product development process

### Stage-gate processes (Robert G. Cooper)

- Implementing go/kill decision points – gates established in the development process where managers must evaluate whether or not kill the project.



- At each stage, a cross-functional team of people (led by a project team leader) undertakes parallel activities designed to drive down the risk of a development project.
- At each stage of the process, the team is required to gather vital technical, market, and financial information to use in the decision to move the project forward (go), abandon (kill), hold, or recycle the project.

**Stage 1**, the team does a quick investigation and conceptualization of the project.

**Stage 2**, the team builds a business case that includes a defined product, its business justification, and a detailed plan of action for the next stages.

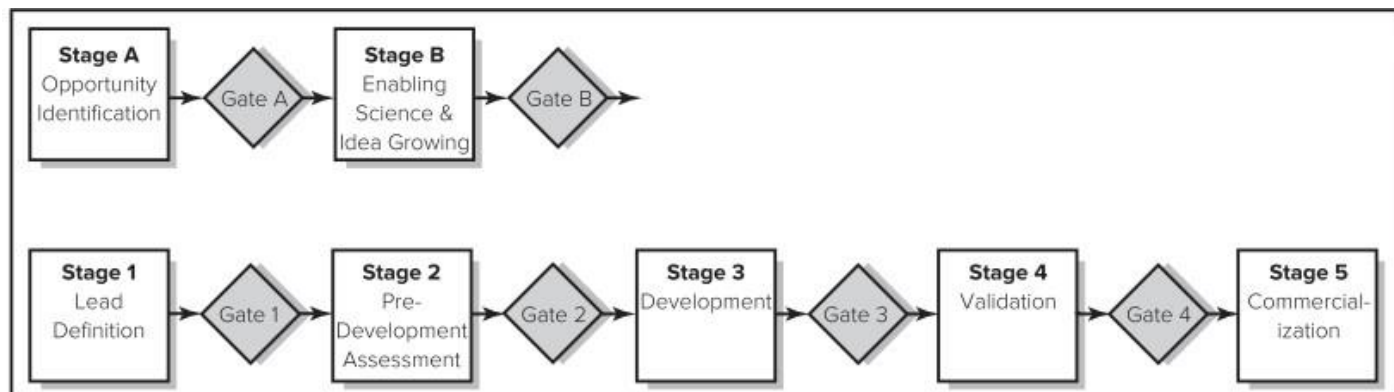
**Stage 3**, the team begins the actual design and development of the product, including mapping out the manufacturing process, the market launch, and operating plans. The team also defines the test plans utilized in the next stage.



**Stage 4**, the team conducts the verification and validation process for the proposed new product, and its marketing and production.

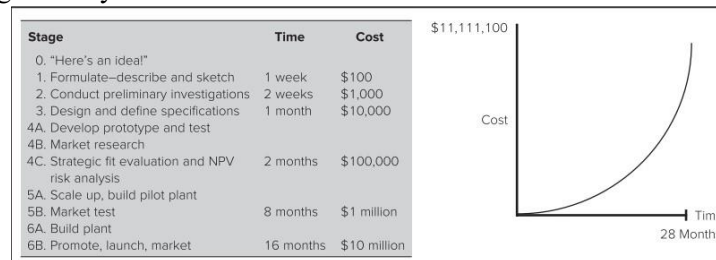
**Stage 5**, the product is ready for launch, and full commercial production and selling commence.

- **Go/kill gates** are designed to control the quality of the project and to ensure that the project is being executed in an effective and efficient manner. **Each gate has three components:** deliverables (the results of the previous stage and inputs for the gate review), criteria (the questions or metrics used to make the go/kill decision), and outputs (the results of the gate review process and may include a decision such as go, kill, hold, or recycle; outputs should also include an action plan for the dates and deliverables of the next gate).
- Each stage of a development project costs more than the stage preceding it, breaking down the process into stages deconstructs the development investment into a series of incremental



commitments.

- Escalation costs and cycle time for each stage of a typical development process in a manufacturing industry



- Exxon managers created their own extended stage-gate system to include directed basic research. The resulting stage-gate system included two basic research stages and five applied research and development stages.

Stage A, the company identifies the potential business incentives and competitive advantages of an envisioned technology. The company then develops a basic research plan that establishes specific scientific deliverables, the methods of achieving these deliverables, and the required resources.

Stage B, execution of the plan developed in Stage A, using scientific methods to generate leads for addressing the business opportunity.

Stage 1 then identifies the best leads, using “proof-of-principle” assessments to establish whether the leads are feasible.

Stages 2 through 5 proceed according to a typical stage-gate process.

## Quality Function Deployment (QFD) – The house of quality

- Developed in Japan a comprehensive process for improving the communication and coordination among engineering, marketing, and manufacturing personnel.
- The organizing framework for QFD is the “house of quality”:

	Engineering Attributes	Importance	Weight of Door	Stiffness of Hinge	Tightness of Door and Seal	Tightness of Window Seal	Competitor A	Competitor B	Evaluation of New Design
Customer Requirements	Easy to Open	15	9	3			7	4	
	Stays Open on Hill	10	3	9			6	7	
	Does Not Leak	35			9	9	7	6	
	Isolates Occupant from Road Noise	20	1		9	9	4	7	
	Crash Protection	20	9				4	7	
Relative Importance of Each Engineering Attribute			365	135	495	495			
Design Targets									

- the house of quality is a matrix that maps customer requirements against product attributes.

- matrix is completed in a series of steps:

1. **Team identifies customer requirements** in figure here, market research has identified 5 attributes that customers value the most in a car door (easy to open etc.)
2. **Team weights customer requirements in terms of their relative importance from customer's**

**perspective** info may be obtained from focus group sessions or direct interaction with the customers. Weights are usually percentages (complete list totals 100%).

**3. Team identifies the engineering attributes that drive the performance of the product** in this case a car door, in figure, 4 attributes are highlighted (from the weight of the door, to the tightness of the window seal).

**4. Team enters the correlations between engineering attributes** to assess the degree to which one characteristic may positively or negatively affect another. Correlations are entered into the matrix that creates the roof of the house. In this case, the negative sign between door weight and hinge stiffness indicates that a heavy door reduces the stiffness of the hinge.

**5. Team fills in the body of the central matrix**, each cell indicates the relationship between an engineering attribute and a customer requirement. A number (in this example, one, three, or nine) is placed in the cell located at the intersection of each row (customer requirements) with each column (engineering attributes), which represents the strength of relationship between them. The cell is left blank if there is no relationship.

**6. Team multiplies the customer importance rating of a feature by its relationship to an engineering attribute** (one, three, or nine). These numbers are then summed for each column, yielding a total for the relative importance of each engineering attribute.

**7. Team evaluates the competition.** A scale of one to seven is used (one - requirement is not addressed, and seven - requirement is completely satisfied) to evaluate the competing products (in this case A and B) on each of the customer requirements.

**8. Team determines target values for each of the design requirements** using the importance ratings and the scores for competing products (the door's optimal weight in pounds).

**9. Team creates product design based on targets from step 8 and evaluates it**, the team assesses the degree to which each of the customer requirements has been met, entering 1-7 in the far right column and compares the new design with the scores of competing products.

## Design for manufacturing

- Another method of facilitating integration between engineering and manufacturing, and of bringing issues of manufacturability into the design process as early as possible, is the use of design for manufacturing methods (DFM).
- DFM is a way of structuring the new product development process. Involves articulating a series of design rules, a set of commonly used design rules:

Design Rule	Impact on Performance
Minimize the number of parts	Simplifies assembly; reduces direct labor; reduces material handling and inventory costs; boosts product quality
Minimize the number of part numbers (use common parts across product family)	Reduces material handling and inventory costs; improves economies of scale (increases volume through commonality)
Eliminate adjustments	Reduces assembly errors (increases quality); allows for automation; increases capacity and throughput
Eliminate fasteners	Simplifies assembly (increases quality); reduces direct labor costs; reduces squeaks and rattles; improves durability; allows for automation
Eliminate jigs and fixtures	Reduces line changeover costs; lowers required investment

- purpose of design rules is to reduce costs and boost product quality by ensuring that product designs are easy to manufacture. The easier products are to manufacture, the fewer the assembly steps required,
- the benefits of adopting DFM rules can be dramatic.

Considering manufacturing at an early stage of the design process

can shorten development cycle time, by lowering costs and increasing product quality, DFM can increase the product's fit with customer requirements.

## Failure modes and effects analysis (FMEA)

- is a method by which firms identify potential failures in a system , classify them according to their severity, and put a plan to prevent the failures from happening
- 1<sup>st</sup> potential failure modes are identified, 2<sup>nd</sup> modes are evaluated on three criteria of the risk they pose: severity, likelihood of occurrence, inability of controls to detect it, 3<sup>rd</sup> each criterion is given a score(1-lowest risk, 5-highest), 4<sup>th</sup> risk priority number is created for each failure mode multiplying its scores together (risk priority number =severity x likelihood of occurrence x inability of controls to detect), 5<sup>th</sup> firm can prioritize its development efforts to failure modes that pose the most composite risk

## Computer-Aided Design(CAD)/Computer-Aided Engineering(CAE)/Computer-Aided Manufacturing(CAM)

- CAD and CAE are the use of computers to build and test product designs
- CAD enables the creation of a three-dimensional model
- CAE makes it possible to virtually test the characteristics of this model (strenght, reliability etc)
- CAM is the implementation of machine-controlled processes in manufacturing. It's faster, more flexible then traditional manufacturing
- CAM's recent incarnation is 3-dimensional printing

## 6. Tools for measuring the new product development performance

- Measures of the success of the NPD process can help management to: 1) Identify which projects met their goals and why.
- 2) Benchmark the organization's performance compared to that of competitors or to the organization's own past performance.
- 3) Improve resource allocation and employee compensation.
- 4) Refine future innovation strategies.
  - Multiple measures are important because any measure used singly may not give a fair representation of the effectiveness of the firm's development process
  - Firm's development strategy, industry and other environmental circumstances when formulating measures and interpreting results

### **New product development process metrics**

Firms use a number of methods to indicate the effectiveness and efficiency of the development process. To use such methods, firm has to define a finite period in which the measure is to be applied in order to get an accurate view of the company's current performance; this also makes it easier for the manager to calculate a response. The following questions can then be asked:

1. What was the average cycle time (time to market) for development projects? How did this cycle time vary for projects characterized as breakthrough, platform, or derivative?
2. What percentage of development projects undertaken within the past five years met all or most of the deadlines set for the project?
3. What percentage of development projects undertaken within the past five years stayed within budget?
4. What percentage of development projects undertaken within the past five years resulted in a completed product?

### **Overall innovation performance**

Firms also use methods to assess their overall performance at innovation. Such measures include:

1. What is the firm's return on innovation? (This measure assesses the ratio of the firm's total profits from new products to its total expenditures, including research and development costs, the costs of retooling and staffing production facilities, and initial commercialization and marketing costs.)
2. What percentage of projects achieve their sales goals?
3. What percentage of revenues are generated by products developed within the past five years?
4. What is the firm's ratio of successful projects to its total project portfolio?

## **Chapter 10 – Organizing for innovation**

1. Size and structural dimensions of the firm

### **Size: Is bigger better?**

- 1940 J. Schumpeter proposed that large firms would be more effective innovators bc, 1) large firms are more able to obtain financing for R&D projects 2) firms with larger sales volume

over which to spread the fixed costs of R&D would have higher returns than firms with lower sales volume

- Large firms have better developed marketing, financial planning etc, have greater global reach to obtain info, they are in better position to take on large or risky innovation projects
- But as a firm grows, its R&D efficiency might decrease because of a loss of managerial control. The bigger a firm gets the more difficult it can become to effectively monitor and motivate employees. Large firms may also be less innovative because their size can make them less responsive to change.
- High number of employees, existing customers and suppliers can make it difficult to change the course quickly
- Strategic commitments can lead to an Icarus Paradox—a firm's prior success in the market can hinder its ability to respond to new technological generations.
- Small firms = more flexible and entrepreneurial than large firms, can easily monitor employees
- Many firms found ways to make large firms feel small. One method is to break firm into smaller subunits. In industries with high-speed technological change many large firms have been disaggregated. (terms such as modular, virtual, network organization)

## 2. Structural dimensions of the firm

**Centralization** is the degree to which decision-making authority is kept at top levels of the firm, decentralization is the degree to which decision-making authority is pushed down to lower levels of the firm. Centralization can refer both to geographical location of activities (the degree to which activities are performed in a central location for the firm) and to where power over activities is located. When decision-making about new project is pushed down to the lowest levels of the firm – greater quantity and variety of projects, much risk of performing the same R&D activities in multiple divisions

**Formalization** is the degree to which the firm utilizes rules, procedures and written documentation to structure the behavior of individuals. May lower employees creativity.

**Standardization** is the degree to which activities in a firm are performed in a uniform manner. By minimizing variation, standardization can limit the creativity.

**Mechanistic structures** high degree of formalization and standardization, causing operations to be almost automatic. Greater operational efficiency. Unsuitable for fostering innovation.

**Organic structures** low degree of formalization and standardization, employees may not have well-defined job responsibilities, operations characterized by high degree of variation. Better for innovation.

**The ambidextrous organization** it's the ability of an organization to behave almost as two different types of companies at once. Divisions of a firm may have different structures and control systems, cultures, patterns of operations. Organizational form that is composed of multiple internally inconsistent architectures that can collectively achieve both short-term efficiency and long-term innovation. "Skunk works" - there can be significant gains from isolating new product development teams from the mainstream organization.

## 3. Modularity and "loosely coupled" organizations

Another method firms use to strike a balance between efficiency and flexibility is to adopt standardized manufacturing platforms or components that can then be mixed and matched in a modular production system.

### **Modular products**

- Modularity refers to the degree to which a system's components may be separated and recombined.
- Making products modular can exponentially increase the number of possible configurations achievable from a given set of inputs

### **Loosely coupled organizational structures**

- Development and production activities are not tightly integrated but rather achieve coordination through their adherence to shared objectives and common standards
- Advances in information technology have enabled loosely coupled organizational structures to become more common
- Disadvantages: activities that require the frequent exchange of complex or tacit knowledge are likely to need closer integration than a loosely coupled development configuration can offer; integrated firm also has mechanisms for resolving conflict that may be more effective or less expensive than those available in the market.

## **4. Managing innovation across borders**

- Foreign markets offer diverse sources of information and other resources, they may have diverse product needs and different operating norms
- Innovations developed in this decentralized manner may never be diffused to other divisions.
- Divisions that are accustomed to developing their own innovations may be reluctant to share them with others for fear of giving away their proprietary knowledge. They may also be reluctant to adopt other divisions' innovations because of the belief that innovations that are not developed locally will not suit their local market needs (a phenomenon known as not-invented-here syndrome).

**Center-for-global strategy** - conducting all innovation activities at a centralized hub. These innovations are then deployed globally throughout the company. The centralization of innovation activities enables management to:

- Tightly coordinate all R&D activities (across both functions and projects).
- Achieve greater specialization and economies of scale in R&D activities while avoiding duplication of activities in multiple divisions.
- Develop and protect core competencies.
- Ensure that innovations are standardized and implemented throughout the company

**Local-for-local strategy** – opposite of center-for-global strategy. Each division of the firm conducts its own R&D activities tailored for the needs of the local market. Managers will choose this strategy when divisions are very autonomous and markets are highly differentiated

**Locally leveraged strategy** – each division of the firm conducts its own R&D activities, but the firm attempts to leverage resulting innovations throughout the company.

**Globally linked strategy** – innovation activities are decentralized but also centrally coordinated for the global needs of the corporation. Each geographically decentralized division might be charged with a different innovation task that serves the global company's needs

## Chapter 12 – Managing new product development teams

### 1. Constructing NPD teams

#### Team size

NPD teams range from few members to hundreds. Teams are valuable for refining and executing ideas, not always early ideation phases. Large teams can create more administrative costs, communication problems and delays. As the size increases ⑦ the potential for **social loafing** – when an individual in a team does not exert the expected amount of effort and relies on the work of others.

#### Team composition

Cross-functional communications is very important. R&d needs info input from marketing about customer requirements, manufacturing info for determining price and quality, r&d needs to design products that are easy to manufacture. Lack of communication=longer cycle times. Solution ⑦ **cross-functional teams** – teams where members are drawn from multiple functional areas, such as r&d, marketing, manufacturing(..).

Cross-functional teams and other types of diversity ⑦ people who enter firm at different times

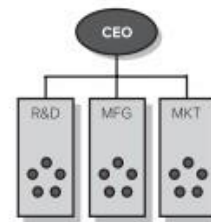
(organizational tenure diversity) have different contacts outside the firm (more resources), cultural diversity = more viewpoints, better problem solving

(age,gender,education)⑦ demographic diversity.

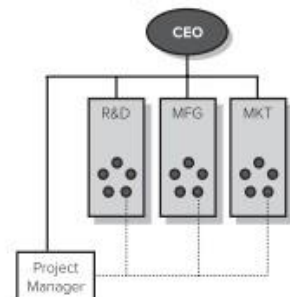
BUT! Diversity of members can increase coordination and communication costs bc of **homophily** – the tendency for people to like similar to themselves people.

Solution: longterm contact in heterogenous teams and incentives. Kichuk and Wiesner explored that 5 personality factors influenced the NPD teams success ⑦ personality traits for NPD team were high extroversion, agreeableness and low neuroticism.

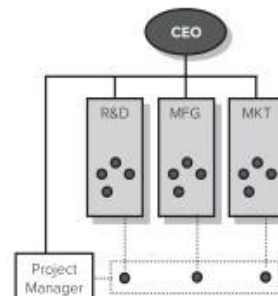
(a) **Functional Team Structure**  
No cross-functional integration; employees remain within functional departments.



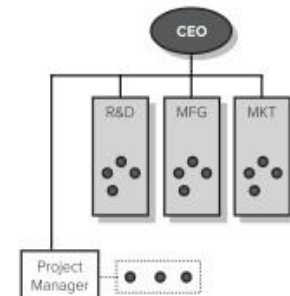
(b) **Lightweight Team Structure**  
Employees remain within functional departments but project manager provides cross-functional integration.



(c) **Heavyweight Team Structure**  
Project manager provides cross-functional integration; team members are collocated but still report to functional managers also.



(d) **Autonomous Team Structure**  
Project manager provides cross-functional integration; team members are collocated and report only to project manager.



### 2. The structure of NPD teams

Teams can be structured in number of ways. 4 types:

- (a) **Functional** – members remain in their functional departments and report to their functional manager.

They periodically meet to discuss the project.

Temporary, members spend less than 10% of their time to work on project, no project manager, little opportunity for cross-functional cooperation



- (b) Lightweight – members remain in their functional departments and report to their functional manager. Temporary, 25% of time spend on team-related activities, BUT they have project manager and liaison personnel. Managers are junior or middle management employees (no authority), this team structure is good for project with no requirements for high level of communication and coordination.
- (c) Heavyweight – members are removed from their functional departments so that they can be *placed* with project manager. Project managers in heavyweight teams are senior managers(outrank functional managers, have authority to command resources and evaluate, reward members). Majority of the group is is oftend full-time dedicated to the project. Often temporary, appropriate for platform projects(major changes from existing product).
- (d) Autonomous – members are removed from their functional departments and dedicated fulltime (and often permanently) to the development team. Team members are places with project manager who is senior. Project manager is given full control over resources contributed from different functional departments. Autonomous teams are permitted to create their own policies and reward systems, they act like independent divisions of the firm. Good for breakthrough projects and some major plaform projects.

### 3. The management of NPD teams

#### Team leadership

Leader:

- Responsible for directing the team's activities, maintaining team's alignment with project goals, serving as a communicator between team and senior management
- In heavyweight or autonomous may also be responsible for evaluation, compensation and promotion of team members, effective leaders are more related to team success than project champions ot senior management
- In heavyweight and autonomous project manager must be someone who has high status, is good at conflict resolution, have multilingual skills (able to talk the language of marketing, engineering and manufacturing)

#### Team administration

Heavyweight and autonomous teams develop a **project charter** and a **contract book** to ensure that members have a clear focus and commitment to NPD. **Project charter** ⑦ has project mission, and articulates exact and measurable goals for the project, might include a vision statement and background statement (why this project is important for the organization). Describes who is on the team, % of time spend on team activities by them, may has team's budget, reporting timeline, key success criteria of the project. **Contarct book** ⑦ must be

Characteristics	Functional Team	Lightweight Team	Heavyweight Team	Autonomous Team
Project manager	None	Junior or middle manager	Senior manager	Senior manager
Power of project manager	NA	Low	High	Very high
Time spent on team activities	Up to 10%	Up to 25%	100%	100%
Location of team members	Functions	Functions	Collocated with project manager	Collocated with project manager
Length of commitment to team	Temporary	Temporary	Long-term but ultimately temporary	Permanent
Evaluation of team members	Functional heads	Functional heads	Project manager and functional heads	Project manager
Potential for conflict between team and functions	Low	Low	Moderate	High
Degree of cross-functional integration	Low	Moderate	High	High
Degree of fit with existing organizational practices	High	High	Moderate	Moderate-low
Appropriate for:	Some derivative projects	Derivative projects	Platform projects/ breakthrough projects	Platform projects/ breakthrough projects



negotiated by core team members and senior managers, it defines in detail the basic plan to achieve the goal in project charter. It will estimate the resources required, development time schedule, it's a tool for monitoring and evaluating team's performance. It's also a mechanism for establishing team commitment to the project and sense of ownership over the project, later members sign the contract.

### **Managing virtual teams**

Virtual teams ⑦ teams in which members may be a great distance from each other but are able to collaborate intensively using videoconferencing, groupware etc. it's valuable for companies whose operations are highly global. Challenges in developing trust, resolving conflict and exchanging tacit knowledge

## **Chapter 8 – Collaboration strategies**

### **1. Reasons for going solo**

No need to collaborate with other organizations. Collaborating would put firm's proprietary technologies at risk/seeks to have full control over the project's development and returns.

- (1) Availability of capabilities – firm has all of the necessary capabilities for the project or there are no partners that can provide capabilities needed and firm is forced to develop them on their own.
- (2) Protecting proprietary technologies – fear of giving up proprietary technologies, firm wishes to have exclusive control over any proprietary technologies created during the development project
- (3) Controlling technology development and use – they have that desire for pragmatic reasons (the new technology is expected to yield high margins and the firm does not wish to share rents with collaborators) or cultural reasons (a company's culture may emphasize independence and self-reliance)
- (4) Building and renewing capabilities – even if partnering would save money, firms choose to engage in solo development even because they believe that development efforts are key to building and renewing their capabilities.

### **2. Advantages of collaborating**

- (1) Acquiring capabilities and resources quickly – company gains rapid access to important complementary assets by entering into strategic alliances or licensing arrangements. Reduction in cycle time.
- (2) Increasing flexibility – obtaining some necessary capabilities or resources from a partner rather than building them in-house= reduction in asset commitment and can help enhance firm's flexibility. Important in markets with rapid technological change. Firms may seek to avoid committing to fixed assets when technology is progressing rapidly.
- (3) Learning from partners – close contact between firms can facilitate transfer of knowledge and creation of new knowledge that individual firms could not have created alone.
- (4) Resource and risk pooling – sharing costs and risks, when project is uncertain or expensive.
- (5) Building a coalition around a shared standard

### **3. Types of collaborative arrangements**

### **Strategic alliances**

Temporary relationship that can take many forms, formal/informal, short/long-term, can include an equity investment made by the partners in each other (equity alliances), used for development of new technology or penetrating new market faster and cheaper, used to learn from each other or develop new competencies. Alliance relationships often lack shared language, routines and coordination. There is also the risk of partners taking the firm's intellectual property for their own advantage. It's useful to categorize alliance strategy in two dimensions:

Capability complementation – combining (“pooling”) the capabilities and other resources of partner firms, but not necessarily transferring those resources between the partners.

Capability transfer – exchange of capabilities across firms in such a manner that partners can internalize the capabilities and use them independently of the particular development project.

### **Joint ventures**

Type of strategic alliance that entails significant structure and commitment, involves a significant equity investment from each partner and results in establishment of new separate entity, contractual arrangements with specification of capital and resources committed by partners and division of any profits earned by the venture.

### **Licensing**

A contractual arrangement whereby one organization or individual obtains the rights to use the proprietary technology

(or trademark, copyright) of another organisation or individual. Enables firm to rapidly acquire technology (or something else) it doesn't possess. For licensor it can enable the firm's technology to penetrate a wider range of markets. Licensing from another firm is less expensive for licensee than developing the technology in-house. Licensing agreements impose many restrictions on the licensee, enabling the licensor to retain control over how the technology is used. Sometimes firms license their technologies to preempt their competitors from developing their own.

### **Outsourcing**

If a firm does not possess the competencies, facilities, or scale to perform all the value-chain activities for the new innovation effectively or efficiently. Common form of outsourcing is contract manufacturing ⑦ when a firm hires another firm (often specialized manufacturer) to manufacture its products. Reliance on outsourcing may cause the firm to miss important learning opportunities, outsourcing can impose high transaction costs for a firm

### **Collective research organizations**

Number of forms: trade associations, university-based centres or private research corporations.

## **4. Choosing a mode of collaboration**

Summary of some trade-offs between solo internal development and various modes of collaboration:

	Speed	Cost	Control	Potential for Leveraging Existing Competencies	Potential for Developing New Competencies	Potential for Accessing Other Firms' Competencies
<b>Solo Internal Development</b>	Low	High	High	Yes	Yes	No
<b>Strategic Alliances</b>	Varies	Varies	Low	Yes	Yes	Sometimes
<b>Joint Ventures</b>	Low	Shared	Shared	Yes	Yes	Yes
<b>Licensing In</b>	High	Medium	Low	Sometimes	Sometimes	Sometimes
<b>Licensing Out</b>	High	Low	Medium	Yes	No	Sometimes
<b>Outsourcing</b>	Medium/High	Medium	Medium	Sometimes	No	Yes
<b>Collective Research Organizations</b>	Low	Varies	Varies	Yes	Yes	Yes

**Solo internal development** – slow and expensive, risky, total control, high potential to develop new competencies, makes sense for a firm that has competencies related to new technology, capital, and has a lot of time

**Strategic alliances** – many forms so the

speed, cost, time and degree of control varies. Most alliances offer opportunities for leveraging existing competencies or developing new ones, they may or may not offer potential for accessing another firm's competencies.

**Joint ventures** – much more structured, may be slightly faster than alliances, more appropriate when the firm needs the access to other firm's competencies.

**Licensing in** – fast way to access a new technology that's typically lower in cost than developing it internally, firm has limited discretion over what it can do with technology and low degree of control.

**Licensing out** – fast way for a firm to extend the reach of its technology, firm has some control over the technology, but also retains a moderate amount of control through restrictions in the license agreement. Licensing out leverages the firm's existing competencies. Little opportunity for developing new competencies. It's sometimes a way of expanding its technology into products/markets in which it has little expertise.

**Outsourcing** – giving up a moderate amount of control to rapidly access another firm's expertise/lower costs. Firm pays less to outsource than it would to develop the capability in-house. Little opportunity to develop new

competencies but can leverage firm's existing competencies. May be appropriate for firm activities that are not central to its competitive advantage, activities that would cause the firm to give up flexibility if performed in-house, or activities in which a firm is at cost/quality disadvantage.

Collective research organizations – long-term commitment, many forms, cost and control vary, good for leveraging, building new competencies, good for learning from other participants, useful in industries that have complex technologies.

## 5. Choosing and monitoring partners

### Partner selection

Success of collaborations depend on the partners chosen, factors that can influence how well suited partners are to each other: size, strength, complementarity of resources, alignment of their objectives, similarity of values and culture.

These are summarized by two dimensions:

**Resource fit** – degree to which potential partners have resources that can be effectively integrated into a strategy that creates value, may be complementary or supplementary. Apple's computer technology with Canon's printer engine technology.

**Strategic fit** – degree to which partners have compatible objectives and styles. Not knowing a partner's true objectives or forging an alliance with a partner with incompatible objectives can result in conflict, wasted resources, and forfeited opportunities

*Impact on Opportunities and Threats in the External Environment*

- How would the collaboration change the bargaining power of customers or suppliers?
- Would the collaboration impact the threat of entry? For example, is the partner likely to become a new competitor?

Does the partnership raise barriers to entry for other potential entrants?

- Would the collaboration influence the availability of complementary goods or the threat of substitutes? *Impact on Internal Strengths and Weaknesses*

- How would the collaboration leverage or enhance the firm's strengths? Does the collaboration put any of those strengths at risk?

- How would the collaboration help the firm overcome its weaknesses? *Impact on Strategic Direction*

- How does this collaboration fit with the firm's statement of strategic intent?

- Is the collaboration likely to help the firm close any resource or technology gap between where it is now and where it would like to be?

**Partner monitoring and governance**

Successful collaboration agreements ⑦ have clear, flexible monitoring and governance mechanisms. The more resources put at risk by the collaboration, the more governance structure imposed in the relationship. 3 main types of governance mechanisms: alliance contracts, equity ownership, relational governance.

**Alliance contracts** – legally binding contractual arrangements to ensure that partners are fully aware of their rights and obligations and have legal remedies available if a partner violate the agreement. Such contracts typically include:

- What each partner is obligated to contribute to the collaboration, including money, services, equipment, intellectual property, and so on.
- How much control each partner has in the arrangement.
- When and how proceeds of the collaboration will be distributed.

**Equity ownership** – when each partner contributes capital and owns a specified right to a percentage of the proceeds from the alliance.

**Relational governance** – self-enforcing norms based on goodwill, trust, and reputation of the partners. These typically emerge over time through repeated experiences of working together.

Chapter 4 – Standards battles, modularity and platform competition

The technology cycle almost invariably exhibits a stage in which the industry selects a **dominant design**. Once this design is selected, producers and customers focus their efforts on improving their efficiency in manufacturing, delivering, marketing, or deploying this dominant design, rather than continue to develop and consider alternative designs.

1. Why dominant designs are selected

**Dominant design** – a single product or process architecture that dominates a product category, usually 50% or more of the market. It's a *de facto standard*, meaning that while it may not be officially enforced it has become a standard for the industry.

Markets coalesce around a single dominant design bc of increasing returns to adoption in a industry ⑦ it's when the *rate of return* from a product or process increases with the size of its installed base. The more technology is adopted, the more valuable it becomes.

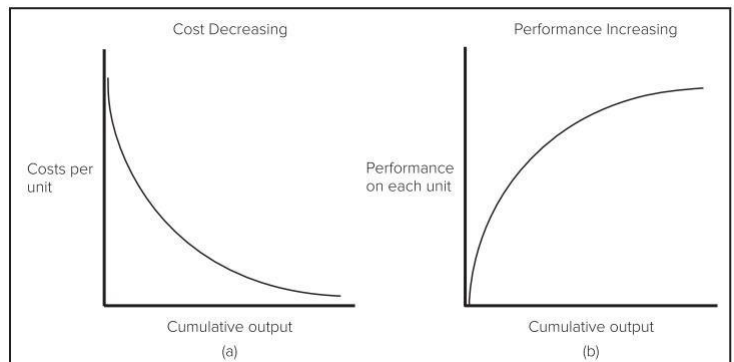
Two primary sources of increasing returns are 1) learning effects 2) network externalities

### Learning effects

The more technology is used, the more it's developed and more effective, efficient it becomes. Example of learning effects: **learning curve** – as individuals and producers repeat a process they learn to make it more efficient. Standard learning curve forms:

- Organizational learning scholars typically model the learning curve as a function of cumulative output: performance increases, or cost decreases, with the number of units of production, usually at a decreasing rate.

- Form of the learning curve  $y = ax^{-b}$ , where  $y$  = # of direct labor hours required to produce unit,  $a$  = # of direct labor hours to produce the first unit,  $x$  = cumulative # of units produced,  $b$  = learning rate.



### Prior learning and absorptive capacity

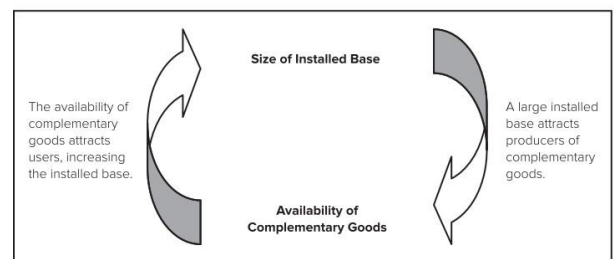
Absorptive capacity – the ability of an organization to recognize, assimilate, and utilize new knowledge. It's being build as firm invests in prior learning.

### Network externalities

- Network externalities, also termed *positive consumption externalities*, this is when the value of a good to a user increases with the number of other users of the same or similar good. Eg. Railroads, telecommunications.

- Network externalities also arise I markets that don't have physical good, where compatibility is important. # of users of particular technology is than called **installed base**. For example the installed base of a part. video game console refers to the # of those consoles that are installed in homes worldwide.

- They arise also when complementary goods are important. Manu products are functional or desirable hwne there is a set of complementary goods available for them.



### Government regulation

- In some industries there is a legally induced adherence to a dominant design, it's bc of the impact of customer welfare.

### The result: Winner-take-all markets

- Natural monopolies, some alternatives may survive by focusing on niche markets, majority of the market may be dominated by a single(or few) design.

- Increasing returns to adoption also imply that technology trajectories are characterized by **path dependency** – it's when end results depend greatly on the events that took place leading up to the outcome. Its often impossible to reproduce the results that occur in such a situation.

## 2. Multiple dimensions of value

There is a value of stand-alone technology, then it combines with the value created by the size of the installed base and availability of complementary goods.

### Technology's stand-alone value

- Can be driven by many things, the functions it enables the customer to perform, aesthetic qualities, ease of use.
- To identify the different aspects of utility a new technology offers customers: W. Chan Kim, R.

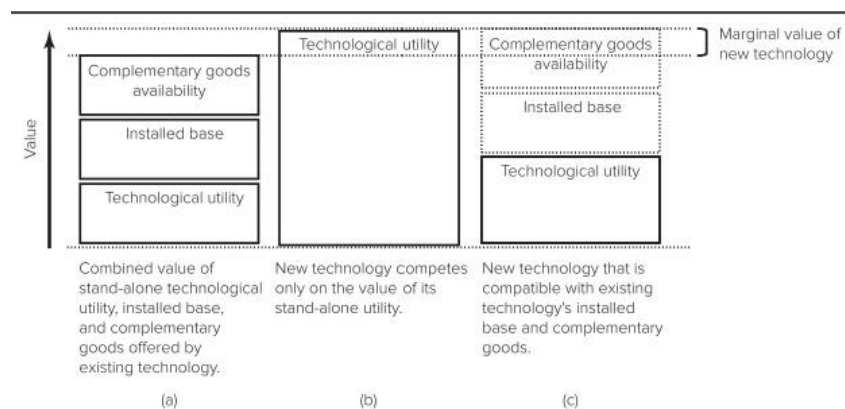
Mauborgne developed a “Buyer Utility Map”. 6 different utility levers, 6 stages of the buyer experience cycle.

- Stages: purchase, delivery, use, supplements, maintenance, disposal.
- Utility levers: customer productivity, simplicity, convenience, risk, fun and image, environmental friendliness
- Each cell provides an opportunity to offer a new value proposition to a customer. A new technology might offer a change in value in a single cell or in a combination of cells.

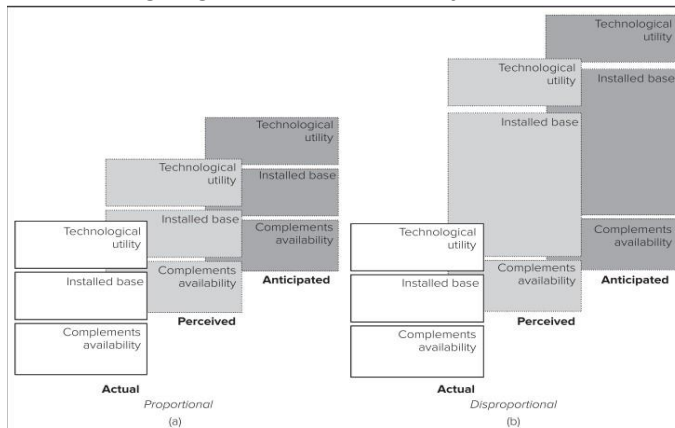
	Purchase	Delivery	Use	Supplements	Maintenance	Disposal
Customer productivity	Price of Prius slightly higher than comparable nonhybrid models		Offers speed and power comparable to nonhybrid models	Can stop less often for gas, saving money and time		
Simplicity	Buyer may feel less able to assess value of vehicle		Operates like a regular combustion engine vehicle	Refuels like a regular combustion engine vehicle		Hybrids have larger batteries that would have to be recycled and disposed of at end of life
Convenience		Will be sold through traditional dealer channels	Does not have to be plugged into electrical outlet	Can purchase fuel at regular gas stations	Maintenance is similar to regular combustion engine vehicle	
Risk			Buyer might face a higher risk of product failure because it embodies a new technology		Buyer might have difficulty finding replacement parts because of new technology	Prius might be more difficult to resell or have lower resell value
Fun and image		Connotes image of environmental responsibility				
Environmental friendliness	Buyers feel they are helping support the development of more environmentally friendly cars		Emits lower levels of pollutants	Requires less use of fossil fuels		

### Network externality value

- In industries characterized by network externalities, the value of a technological innovation to users will be a function not only of its stand-alone benefits and costs, but also of the value created by the size of its installed base and the availability of complementary goods (a).
- The new technology must be able to offer greater overall value (b)



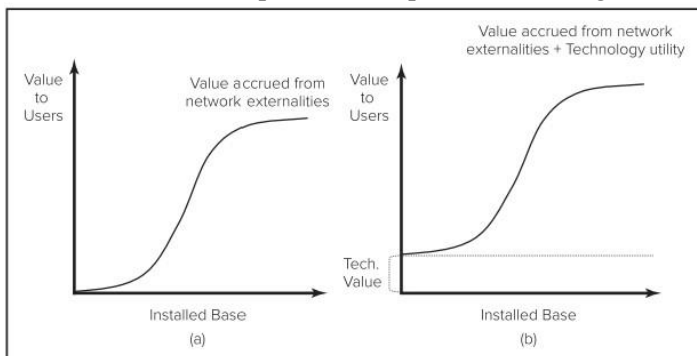
- New technology may be made compatible with the existing technology's installed base and complementary goods (c)
- When users are comparing the value of new technology to an existing one, they are weighing a combination of objective information, subjective, and expectations for the future



- Each of the primary value components also has corresponding **perceived** or **anticipated** value components.
- In (a) the perceived and anticipated value are proportional to their corresponding actual components - In (b) it's disproportional, perceived installed base may exceed the actual installed base, or customers expect that a technology will have a much larger installed base than competitors

### Competing for design dominance in markets with network externalities

Graphs that illustrate how differing technological utilities and network externality returns to installed base or market share impact the competition for design dominance:



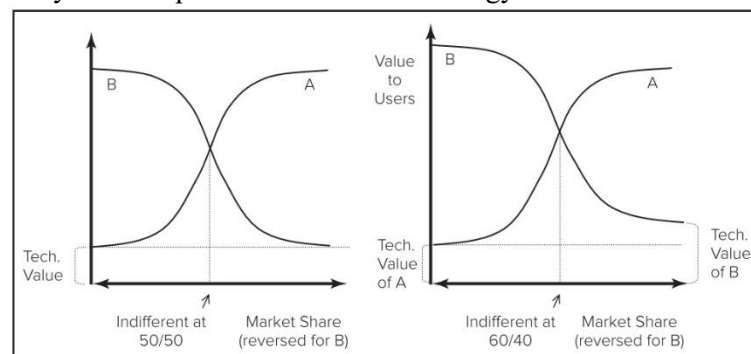
- Those figures examine whether network externalities create pressure for a single dominant design vs. a few dominant designs by considering the rate at which value increases with the size of the installed base AND how large installed base is needed before network externality benefits are achieved

- The value of a good to a user increases in an s-shape (a), the benefits increase slowly.

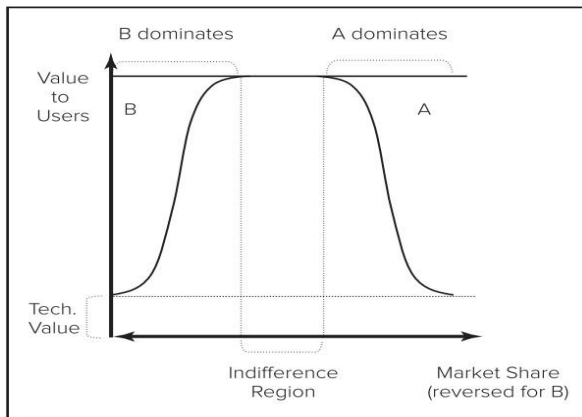
- There is also considered the stand-alone functionality of the technology (b), here a base lever of technological utility was added to the graph. - When two technologies compete for dominance, customers will compare the overall value yielded/expected from each technology

- In figure on the right, technologies A and B offer similar technological utility, and shape of network externality returns curves.

- This graph shows that at every point where A has less than 50% market share, B will yield greater overall value. When both have 50% market share, they yield the same overall value, and customers will be indifferent.







- Another scenario: when customers attain their desired level of network externality benefits at lower levels of market share (graph on the left)
- The curves flatten out sooner, implying that the max. amount of network externality value is obtained by customers at lower levels of market share (video game console industry).
- Such markets may not experience great pressure to select a single dominant design; two or more platforms may successfully coexist.

### 3. Modularity and platform competition

Industry players often use *modularity* to create a *platform ecosystem*, where many different firms contribute to the product system.

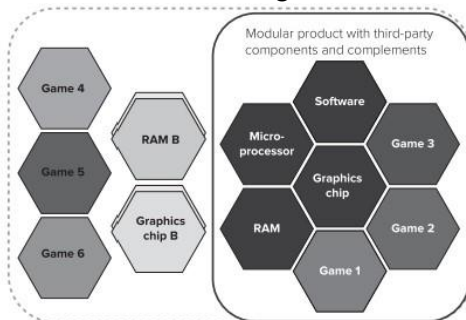
#### Modularity

It's the degree to which a system's components can be separated and recombined. (computer for eg). Each of those components of a computer (monitor) can be thought as a bundle (monitor has a power input, plastic package etc.)

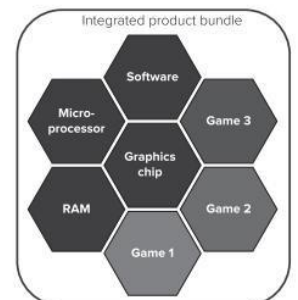
How products are being made modular? (A,B,C on the right). In each of these stages, the product has become increasingly modular.

- Modular products often offer more choices over function, design, scale

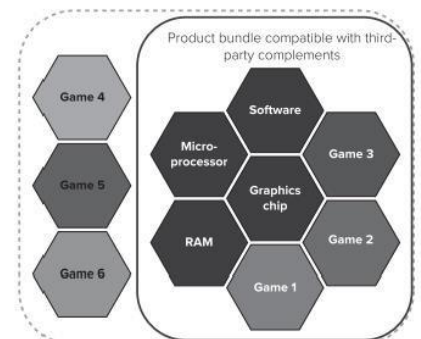
**C. Product bundle with third-party components and complements:**  
• Customer has even greater range of configuration choices  
Example: Android device



**A. Traditional integrated product bundle:**  
• Provider tries to meet buyers needs itself.  
• No customization, no external compatibility  
Example: Nokia E90 Communicator



**B. Product bundle with third-party complements:**  
• Compatibility with third-party choices expands options for customers  
Example: Apple iPhone



- Components are reused in different combinations, so high variety with scale of economies in manufacturing in manufacturing the individual components (*economies of substitution*)

- Modularity in a product system is valuable when there are diverse technological options available to be recombined and heterogeneous customer preferences

#### Platform ecosystems

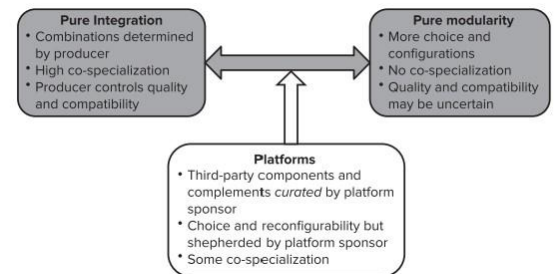
Platform ecosystem refers to a system of mutually dependent entities mediated by a stable core, they have some degree of mutual dependence. Platforms as a compromise between *pure modularity* and *pure integration* (pic on the right):



Platforms will be more valuable than a tightly integrated product when: (a) customers are diverse and want more choices than a single firm can provide,  
 (b) when third-party options are diverse and high quality,  
 (c) when compatibility with third-party products can be made seamless without integration, and/or  
 (d) when the platform sponsor is powerful enough that it can retain control over quality and the overall product architecture without producing the complements itself.

Platforms will be more valuable than a purely modular system when

- (a) complements are nonroutine purchases with uncertainty (and thus the customer prefers to have some shepherding (opieki?) by the platform sponsor),
- (b) when some integration between the platform and its complements provides performance advantages, and/or (c) when important components of the ecosystem require subsidization (the market is unlikely to provide all the complements the end customer needs at adequate quality or value).



## Chapter 5 – Timing of entry

**First movers** – first entrants to sell in a new product/service category

**Early followers** – entrants that are early to market but not first

**Late entrants** – entrants that don't enter the market until the time the product begins to penetrate the mass market or later

### 1. First-mover advantages

#### Brand loyalty and technological leadership

- Long-lasting reputation as a leader, brand loyalty, company's image
- They can shape customer's expectations
- If aspect that customers come to expect in a technology are difficult to imitate, being the technology leader can yield sustained **monopoly rents** ⑦ the additional returns (higher revenues or lower costs) a firm can make from being a monopolist, such as the ability to set high prices, set lower costs due to greater bargaining power over suppliers

#### Preemption of scarce assets

- Firms that enter the market early can preemptively capture scarce resources such as key locations, government permits, patents, access to distribution channels, and relationships with suppliers.
- Example: companies that wish to provide any wireless communication service must license the rights to broadcast over particular radio frequencies from the government.

#### Exploiting buyer switch costs

- Once buyers have adopted a good, they often face costs to switch to another good

#### Reaping increasing returns advantages

- In an industry with pressures encouraging adoption of a dominant design, the timing of a firm's investment in new technology development may be particularly critical to its likelihood of success.

## 2. First-mover disadvantages

**Incubent inertia** – tendency for incumbents to be slow to respond to changes in the industry environment due to their large size, established routines, or prior strategic commitments to existing suppliers and customers.

### **R&D expenses**

- Developing a new technology often entails significant research and development expenses, and the first to develop and introduce a technology typically bears the brunt of this expense.
- The new product development failure rate can be as high as 95%, being the first to develop and introduce an unproven new technology is expensive and risky.
- Later entrants often do not have to invest in exploratory research and they can observe the market's response to product features and decide how to focus its development efforts

### **Undeveloped supply and distribution channels**

- When a firm introduces a new-to-the-world technology, often no appropriate suppliers or distributors exist

### **Immature enabling technologies and complements**

- When firms develop technologies, they often rely on other producers of **enabling technologies** ⑦ component technologies that are necessary for the performance or desirability of a given innovation.

### **Uncertainty of customer requirements**

- A first mover to the market may face considerable uncertainty about what product features customers will ultimately desire and how much they will be willing to pay for them

## 3. Factors influencing optimal timing of entry

How does a firm decide whether to attempt to pioneer a technology category or to wait while others do so:

1. How certain are customer preferences?
2. How much improvement does the innovation provide over previous solutions?
3. Does the innovation require enabling technologies, and are these technologies sufficiently mature?
4. Do complementary goods influence the value of the innovation, and are they sufficiently available?
5. How high is the threat of competitive entry?
6. Is the industry likely to experience increasing returns to adoption?
7. Can the firm withstand early losses?
8. Does the firm have resources to accelerate market acceptance?
9. Is the firm's reputation likely to reduce the uncertainty of customers, suppliers and distributors?

#### 4. Strategies to improve timing options

- It's assumed that timing of entry is a matter of choice for a firm
- If the firm intends to refine an earlier entrant's technology and beat the earlier entrant to market with a new version of this technology, it must have *fast-cycle development processes*.

### Chapter 9 – Protecting innovation

#### 1. Appropriability

Appropriability ⑦ the degree to which a firm is able to capture the rents from its innovation, it is how easily and quickly competitors can imitate the innovation.

- If knowledge base is **tacit** or **socially complex** (it arises through complex interactions between people), competitors will typically find it very difficult to duplicate.

#### 2. Patents, trademarks, copyrights

Patent ⑦ protects an invention, protects a process, machine, manufactured item, or variety of plant

Trademark ⑦ protects words or symbols, it's an indicator used to distinguish the source of a good Copyright ⑦ protects an original artistic or literary work, it's protecting works of authorship

#### Patents

- Inventors can apply for patent protection over their inventions
- Utility patent: new process, machine, manufactured item; design patent: original and ornamental design for manufactured item; plant patent:: discovery and asexual reproduction of a distinct and new variety of plant
- To qualify for a patent usually an invention must be:
  1. Useful – must produce a desirable result, solve a problem
  2. Novel – not already patented or described in public literature
  3. Not obvious – person with skill in the area of the patent would not be expected to achieve the same invention with a normal amount of effort.
- What's not patentable: substituting one material for another (plastic for metal), changing the size of an already existing device, making something more portable, altering an item's shape, substituting an element for an equivalent element
- Lasts for 20 years

#### **Major international patent treaties**

- There is no world patent

- Many inventors want to patent their inventions in many countries simultaneously
- ⑦ treaties
- The Paris Convention Priority: IP treaty adhered to by 177 countries
- Patent Cooperation Treaty: 152 countries *Patent strategies*
- Typically inventor seeks a patent bc they want to make and sell the invention themselves
- They can also license the technology to other or sell the patent rights to another firm that can better utilize the technology
- Firms may also seek patents just to limit the options of competitors or to earn revenues through aggressive patent lawsuits it's "**patent trolling**"
- In industries with complex technologies such as computers, software, and telecommunications a dense web of overlapping patents known as "patent thickets" can make it very difficult for firms to compete or innovate without falling prey to patent suits by other firms in technology domain.

### **Trademarks and service marks**

- A trademark is a word, symbol, design that is used to distinguish the source of goods.
  - A service mark is basically the same as trademark, but distinguished the provider of a service rather than a product.
  - Words, pictures, slogans, but also sounds, tones, smells
  - In most countries the rights to a trademark or service mark are established in the legitimate use of a mark and don't require registration, but registration is beneficial.
- Major international trademark treaties** the World Intellectual Property Organization administers a System of International Registration of Marks governed by two treaties: the Madrid Agreement Concerning the International Registration of Marks and the Madrid - Protocol. Countries that adhere to either (or both) the Madrid Agreement or Madrid Protocol are part of the Madrid Union.

### **Copyright**

- It's a form of protection granted to works of authorship, in the US the authors of literary, dramatic, musical, artistic works can obtain a copyright protection.
- Like trademarks, copyright is established by legitimate use of work.
- The owner of the copyright has the exclusive right to do or authorize others to do the following:

reproduce the work in copies, distribute copies of the work to public by sale or other transfer of ownership (rental, lease), perform/display the work publicly

- It is not a violation of copyright for others to use copyrighted material for purposes such as criticism, comment, news reporting, teaching, scholarship, or research.

### **Copyright protection around the world**

Copyright protection varies from country to country. Most countries do offer copyright protection to both domestic and foreign works, and there are international copyright treaties for

simplifying the process of securing such protection. Berne Convention specifies a minimum level of copyright protection of all member countries

### 3. Trade secrets

**Trade secret** ⑦ information that belongs to a business that is held private.

- While the formula for a beverage is not patentable, it can be considered a trade secret
- Information is considered trade secret only if it (a) offers a distinctive advantage to the company in the form of economic rents (b) remains valuable only as long as the information remains private
- Trade secrets include also: information about a firm's customers, marketing strategies, manufacturing processes
- Information qualifies as a trade secret under the Uniform Trade Secret Act when: info is not generally known, have economic importance, trade holder must exercise measures to protect the secrecy of the info.
- The uniform trade secret act states that no individual or group can copy, use or benefit from trade secret without owner's permission if they meet any of the conditions:
  1. They are bound by a duty of confidentiality (e.g., employees, lawyers).
  2. They have signed a nondisclosure agreement.
  3. They acquire the secret through improper means such as theft or bribery.
  4. They acquire the information from someone who did not have the right to disclose it.
  5. They learn about the secret by mistake but have reason to know that the information was a protected trade secret.

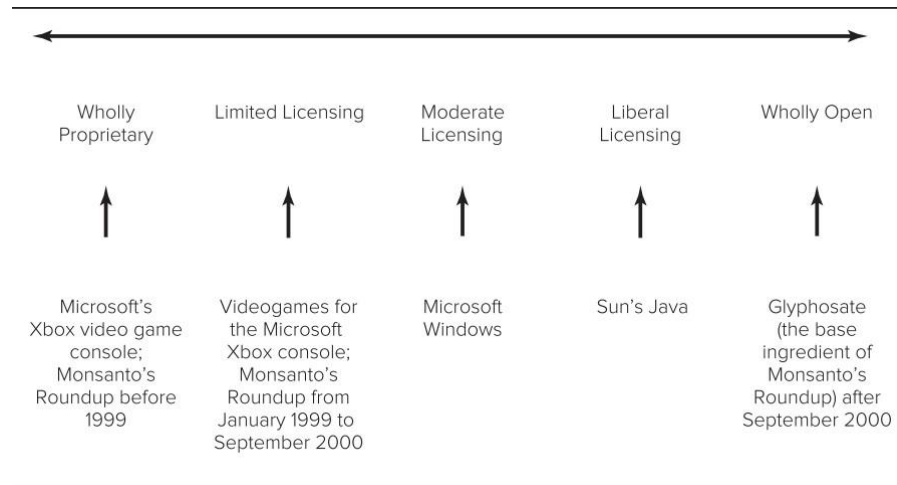
### 4. The effectiveness and use of protection mechanisms

- It varies across industries, in pharmaceuticals patents are very effective, in electronics patent and copyrights provide little protection bc other firms can invent around the patent without infringing on it.
- It is also difficult to enforce patents protecting industrial processes such as manufacturing techniques
- If patents provide little protection, the firm may rely more heavily on trade secrets
- In industries characterized by increasing returns, firms sometimes choose to liberally diffuse their technologies to increase their likelihood of rising to the position of dominant design.
- This enviable position can be so lucrative that firms may be willing to lose money in the short term to improve their technology's chance of rising to the position of dominant design
- So, firms may diffuse their technologies through **open source software** or licensing

- firms often adopt a strategy of partial protection for their innovations, falling somewhere on the continuum between **wholly proprietary systems** and **wholly open systems**.

**Wholly Proprietary Systems** ⑦ goods based on technology that is owned and vigorously protected through patents, copyrights, secrecy or other mechanisms, they may be legally produced only by their developers

**Wholly Open Systems** ⑦ goods based on technology that is not protected and that's freely available for production by other producers



### Advantages of protection

- proprietary systems offer greater rent appropriability, so their developers often have more money and incentive to invest in technological development, promotion, and distribution.
- If a single firm is the primary beneficiary of its technology's success, it has much greater incentive to invest in further developing the technology.
- The sponsor of a proprietary technology might also adopt a penetration pricing strategy (i.e., it may offer the technology at a low price or free) to rapidly build its installed base
- Protecting the technology also gives the developing firm **architectural control** over the technology. It is the ability of a firm/s to determine the structure, operation, compatibility and development of a technology.

### Advantages of diffusion

- Open technologies may increase more rapid adoptions,
- If multiple firms are producing, distributing, and promoting the technology, the technology's installed base may accumulate much more rapidly than if one firm alone is responsible for such activities.
- Competition among producers may drive the price of the technology down, making it more attractive to customers. Both customers and complementary goods providers may also perceive the technology as better (or its future more certain) if there are multiple companies backing the technology.

### ***Production Capabilities, Marketing Capabilities, and Capital***

If the firm is unable to produce the technology at sufficient volume or quality levels, then protecting the technology so that the firm is its sole provider may significantly hinder its adoption.

Similarly, if complementary goods influence the value of the technology to users, then the firm must (a) be able to produce the complements in sufficient range and quantity, (b) sponsor their production by other firms, or (c) encourage collective production of the complements through a more open technology strategy.

### ***Industry Opposition against Sole-Source Technology***

Sometimes other industry members are able to exert strong pressure against the adoption of a technology that would give one (or a few) producer(s) undue control and power, causing a technology that is restricted to such production to be rejected or more hotly contested than a more open technology.

### ***Resources for Internal Development***

If a firm does not have significant resources (capital, technological expertise) to invest in the technology's functionality, it may have difficulty producing a technology that has an initial performance level, and rate of improvement, that the market finds attractive.

### ***Control over Fragmentation***

For technologies in which standardization and compatibility are important, maintaining the integrity of the core product is absolutely essential, and external development can put it at risk.

### ***Incentives for Architectural Control***

Architectural control over the evolution of a technology is always valuable; however, it becomes particularly valuable if a firm is a significant producer of complements to the technology in question. A firm with architectural control can typically design the technology to be compatible with its own complements and incompatible with those of competitors. If the technology is chosen as the dominant design, this architectural control allows the firm to ensure that it reaps the lion's share of the rewards in complements production.

## **Chapter 13 – Crafting a deployment (rozlokowanie) strategy**

### **1. Launch timing**

#### **Strategic launch timing**

- Firms try to decrease development cycles to decrease their costs and to increase their timing of entry options
- Firm can strategically use their launch timing to take advantage of business cycle or seasonal effects to position product with respect to previous generations of related technologies, and to ensure that production capacity and complementary goods are in place.

## Optimizing cash flow vs embracing cannibalization

A second key point about timing of entry is also illustrated in the video game industry. For firms introducing a next generation technology into a market in which they already compete, entry timing can become a decision about whether and to what degree to embrace **cannibalization** ⑦ it's when a firm's sales of one product (or at one location) diminish the sales of another of its products (or at another of its locations)

If a firm's current product is very profitable, the firm will often delay introduction of a next generation product until profits have begun to significantly decrease for the current product. BUT in industries driven by technological innovation, delaying the introduction of a next generation product can enable competitors to achieve a significant technological gap.

### 2. Licensing and compatibility

- Making a technology more open (partially opening through licensing) could speed its adoption, but there are risks by making technology open,
- If a firm completely opens its technology, other producers may drive the price of the technology down to a point at which the firm is unable to recoup its development expense.
- Opening a technology completely may cause its underlying platform to become fragmented as different producers alter it to their needs, resulting in loss of compatibility across producers and the possible erosion of product quality.
- In deploying a technological innovation, often a firm must decide how compatible (or incompatible) to make its technology with that provided by others or with previous generations of its own technology.
- If there is an existing technology with a large installed base or availability of complementary goods, the firm can sometimes leverage the value of that installed base and complementary goods by making its technology compatible with current products
- If the firm wishes to avoid giving away its own installed base or complementary goods advantages to others, it may protect them by ensuring its products are incompatible with those of future entrants
- Firms must also decide whether or not to make their products **backward compatible** with their own previous generations of technology. **Backward compatible** ⑦ when products of a technological generation can work with products of a previous generation, example, a computer is backward compatible if it can run the same software as a previous generation of the computer.

### 3. Pricing

- Price simultaneously influences the product's positioning in the marketplace, its rate of adoption, and the firm's cash flow.
- Before a firm can determine its pricing strategy it must determine the objectives it has for pricing model:
- **Survival price strategy** ⑦ if a firm is in an industry with intense competition the firm's objective may be simply survival. The price is then set to cover variable costs and fixed costs (short-run strategy that doesn't create long-term profits)
- **Maximizing current profits** ⑦ the firm first estimates costs and demand and then sets the price to max. cash flow or rate of return on investment (emphasizes current performance but may sacrifice long-term performance)



- **Maximum market skimming** ⑦ firms will initially set prices high on new products, high price may signal that the new product is a significant innovation, may attract competitors to the market and can slow adaptation of the product. If costs are expected to decline rapidly with the volume of units produced, a skimming strategy can actually prove less profitable than a pricing strategy that stimulates more rapid customer adoption.
- **Penetration pricing** ⑦ often used to *maximize market share*, when achieving high volume is important. It's when a price of a good is set very low (or free).
- Another way to manipulate consumers' perception of the costs is through a "**freemium**" model, where the base product is free, but additional features or capacity have a price.

#### 4. Distribution

##### **Selling direct vs. Using intermediaries**

- Firms can sell their products directly to users through their direct sales force or an online ordering system or mail-order catalog. Alternatively, firms can use **intermediaries** such as manufacturers' representatives, wholesalers, and retailers.
- **Manufacturers' representatives** ⑦ Independent agents that promote and sell the product lines of one or a few manufacturers. Used when direct selling is appropriate but the manufacturer does not have a sufficiently large direct sales force to reach all appropriate market segments.
- **Wholesalers** ⑦ Companies that buy manufacturer's products in bulk, and then resell them (often in smaller or more diverse bundles) to other supply channel members such as retailers.
- **Retailers** ⑦ Companies that sell goods to the public.
- Intermediaries also provide other services such as: transporting goods, carrying inventory, providing selling services and handling transactions with customers, geographically dispersed retail sites (location convenience)
- **Selling direct** gives the firm more control over the selling process, pricing, and service.
- **Original equipment manufacturers (OEMs)/value-added resellers** ⑦ provide an even more crucial role in the distribution process. OEM buys products (or components of products) from other manufacturers and assembles them into a product that is customized to meet user needs. The OEM then sells this customized product under its own name and often provides marketing and service support for the product. OEMs are very common in the computer and electronics industries where manufacturers are often specialized in the production of individual components but users prefer to purchase whole, assembled products. Dell Computer, is a very successful OEM in the computer industry.
- In some industries internet have enabled **disintermediation** ⑦ it's when the number of intermediaries in a supply channel is reduced, for example when manufacturers bypass wholesalers.

To determine whether to use intermediaries and what type of intermediaries would be appropriate, the firm should answer the following questions:

1. *How does the new product fit with the distribution requirements of the firm's existing product lines?* For example, if the firm already has a large direct sales force and the new product would fit well with this direct sales system, there may be no need to consider other distribution options.
2. *How numerous and dispersed (rozproszona) are customers, and how much product education or service will customers require? Is prepurchase trial necessary or desirable? Is installation or customization required?* If customers are dispersed but require little product education or service, mail

order or online ordering may suffice. If customers are dispersed and require moderate amounts of education, service, or prepurchase trial, using intermediaries is often a good option because they can provide some on-site education and service and/or trial. If customers are not dispersed, or will require extensive education and service, it may be necessary for the firm to provide the education and service directly.

3. *How are competing products or substitutes sold?* The firm must consider how competing or substitute products are sold, because this both determines the nature of the existing distribution channel options and shapes customer expectations about how products will be purchased. For example, if customers are used to purchasing the product in a retail environment where the product can be viewed, handled and customers can receive personal sales assistance, they may be reluctant to switch to a sales channel with less contact, such as online purchasing

### **Strategies for accelerating (przyspieszyć) distribution**

- It's important to rapidly deploy technology when the industry is likely to select a single technology as the dominant design
- Rapid deployment enables the technology to build a large installed base and encourages the developers of complementary goods to support the technology platform.

#### ***Alliances with distributors***

- Firms introducing a technological innovation can use strategic alliances or exclusivity contracts to encourage distributors to carry and promote their goods.
- By providing a distributor a stake in the success of the new technology, the firm may be able to persuade the distributor to carry and promote the new technology aggressively.

#### ***Bundling relationships***

- Firms can also accelerate distribution of a new technology by bundling it with another product that is already in wide use. It enables the new technology to benefit from the success of another product that already has a large installed base. ***Contracts and sponsorship***
- Firms can also set up contractual arrangements with distributors, complementary goods providers, and even large end users (such as universities) to ensure that the technology is used in exchange for price discounts, special service contracts, advertising assistance.
- Example: when medical equipment manufacturers introduce new medical devices, they will often donate or lend a number of these machines to large teaching hospitals.

#### ***Guarantees and consignment (komis)***

- If there is market uncertainty about the new product, the firm can encourage distributors to carry the product by offering them guarantees (such as promising to take back unsold stock) or agreeing to sell the product on consignment.
- Example: Nintendo agreed to sell the Nintendo Entertainment System to distributors on consignment: Nintendo would be paid only for consoles that were sold, rather than requiring distributors to buy consoles up front.

## **5. Marketing**

- Marketing strategy for a technological innovation must consider both the nature of the target market and of the innovation

## Major marketing methods

### *Advertising*

- To build public awareness, it requires that the firm craft an effective advertising message and choose advertising media that can convey this message to the appropriate target market.
- In developing an advertising message, firms often attempt to have balance between achieving an entertaining and memorable message vs. providing a significant quantity of information.
- The media used are chosen based on their match to the target audience, the richness of information or sensory detail they can convey, their reach (the number of people exposed), and their cost per exposure.

### *Promotions*

Promotions are usually temporary selling tactics that might include: offering samples or free trial; offering cash rebates after purchase; including an additional product (a “premium”) with purchase; offering incentives for repeat purchase; offering sales bonuses to distributor or retailer sales representatives; using cross-promotions between two or more noncompeting products to increase pulling power; using point-of-purchase displays to demonstrate the product’s features.

### *Publicity and Public relations*

- Many firms use free publicity (such as articles that appear in a newspaper or magazine about the company or its product) to effectively generate word of mouth.
- Other firms rely on internally generated publications (e.g., annual reports, press releases, articles written by employees for trade magazines or other media) to reach and influence target markets.
- **Viral marketing** is an attempt to capitalize on the social networks of individuals to stimulate word-of-mouth advertising. Information is sent directly to a set of targeted consumers that are well-positioned in their social networks.

## Tailoring the marketing plan to intended adopters

- Innovations tend to diffuse through the population in an s-shape pattern whereby adoption is initially slow because the technology is unfamiliar; it then accelerates as the technology becomes better understood and utilized by the mass market, and eventually the market is saturated so the rate of new adoptions declines.
- These stages of adoption have been related to the adopter categories of innovators (in the very early stages); followed by *early adopters*, which cause adoption to accelerate; then the *early majority* and *late majority* as the innovation penetrates the mass market
- The characteristics of these groups make them responsive to different marketing strategies:

Innovators and early adopters are typically looking for very advanced technologies that offer a significant advantage over previous generations. They are willing to take risks and to pay high prices, they may also demand considerable customization and technical support.

Early majority, requires that the company communicate the product’s completeness, its ease of use, its consistency with the customer’s way of life, and its legitimacy. For this market segment, detailed technical information is not as important as using market channels with high reach and high credibility.

Late majority and laggards, firms will often use similar channels as those used to target the early majority, although emphasizing reducing the cost per exposure. The marketing message at this stage must stress reliability, simplicity, and cost-effectiveness.

### **Using marketing to shape perceptions and expectations**

When distributors and customers are assessing the value of a technological innovation, they are charmed not only by evidence of the innovation's **actual value**, but also by **their perception of the innovation's value and their expectations for its value in the future**. Advertising, promotions, and publicity can play a key role in influencing the market's perceptions and expectations about the size of the installed base and the availability of complementary goods. Preannouncements can generate excitement about a product before its release, while press releases can convince customers and distributors that the product's installed base will increase rapidly. The firm's reputation may create a signal about its likelihood of success. Firms may also use credible commitments such as major fixed capital investments and guarantees to convince stakeholders that the firm has what it takes to challenge the incumbents.

#### ***Preannouncements and press releases***

- A firm that aggressively promotes its products can increase both its actual installed base and its perceived installed base.
- Since perceived installed base may drive subsequent adoptions, a large perceived installed base can lead to a large actual installed base. Such a tactic underlies the use of **vaporware**—preadvertised products that are not actually on the market yet and may not even exist—by many software vendors.
- Vaporware may also buy a firm valuable time in bringing its product to market.

#### ***Reputation***

- Customers, distributors, and complementary goods producers will use the firm's track record for technological innovation as an indicator of the new product's functionality and value.
- The firm's prior commercial success acts as an indicator of the firm's ability to build and manage the necessary support network around the new technology (distribution, advertising, alliances) to create the necessary momentum in the installed base–complementary goods cycle.

#### ***Credible commitments***

- A firm can also signal its commitment to an industry by making substantial investments that would be difficult to reverse.

## Summary 2: Entrepreneurship

### Chapter 1 - What is entrepreneurship?

- Entrepreneurship is a complex phenomenon that occurs in many different contexts, and varies in terms of its scope, process, and output.
- Desire for 'independence' and the need for 'achievement' that drives the potential entrepreneur
- Creating/discovering new opportunities is the core of entrepreneurship
- 1970s Bolton&Birch entrepreneurship as means to generate jobs and economic growth
- Entrepreneurship helps to develop a healthy competition in the economy
- Entirely new industries and markets arise because of the activities of entrepreneurs

#### 1. A historical flashback

- **Economic tradition** – war, including the conquest of countries was regarded as a form of entrepreneurship, acquisition of resources was considered as a part to exploit new opportunities; 1755 entrepreneurship introduced in the literature Cantillon is an important pioneer in the field; for him entrepreneur's function was to buy something cheaply and sell it as high a price as possible; entrepreneur is a person who obtains and distributes resources at risk, bringing the economy towards equilibrium; end of 1700s entrepreneur as a person who plans, supervises, organizes or even owns factors of production.; 1800s distinction between those who supply funds and those who create profit

1900s, Knight – entrepreneur's function is to carry uncertainty, 3 types

1. Different outcomes in the future exist and are known – entrepreneur must calculate the probabilities and make decisions
2. Future outcome exists but is not known in advance
3. True uncertainty, the future outcome does not exist and it is not possible to know anything about it

Schumpeter - the entrepreneur is an innovator who, by combining existing things, generates new opportunities and organizations in the economy: he or she is the main source of development in the economy; starting point is an equilibrium until an entrepreneur generates new opportunities; the imbalance contributes to developing an economy, new option can take a form of:

1. the introduction of new products or quality
2. the introduction of new production methods
3. the opening of new markets
4. the utilization of new supply sources
5. the reorganization of an industry

Schumpeter assumes that new organizations will outperform existing organizations – creative destruction

- **Socio-psychological tradition** – 1960s-80s entrepreneurship as a psychological mentality; 1970 Hornaday&Bunker map of traits of successful entrepreneurs ('energetic participation', 'confidence', 'desire to be your own boss' and 'need to accomplish'); 1980s subject is being criticized on 3 fronts:
  1. Studying individual traits ignores the influence that personal traits have on each other, and how environmental factors play a role in entrepreneurial behavior

2. Psychological perspective led to wide range of traits, and entrepreneur has been presented as 'everyman'
3. The studies did not make it possible to empirically identify the entrepreneur's personality in the crowd.

Psychological research route has, over the years, been supplemented by a sociological tradition where the emphasis is placed on relationships between people rather than on the individual.

- **Emergence tradition** - newer theories have focused on understanding entrepreneurship as an organizing process that leads to a particular output, the formation of a new organization. What distinguishes entrepreneurs from non-entrepreneurs is not personality traits but the fact that entrepreneurs form new organizations 1980s.; entrepreneurship research focuses mainly on the process that leads to the creation of a new organization
- **Opportunity tradition** – competitor for the emergence tradition, the opportunity tradition defines entrepreneurship as: 'discovery, evaluation, and exploitation of opportunities to introduce new goods and services, ways of organizing, markets, processes and raw materials'; Eckhardt&Shane define opportunities as 'situations in which new goods, services, raw materials, markets and organizing methods can be introduced through the formation of new means, ends, or means–ends relationship'

## 2. Complementary approach

- All entrepreneurial processes pass through the same stages and that these stages can be identified in advance. Some stage models deal with the organization's overall lifecycle from the earliest starting point through to the end, for example, Kroeger distinguishes between 1) initiation, 2) development, 3) growth 4) maturity and 5) decline.
- Today the emergence and opportunity traditions represent two dominating perspectives in entrepreneurship research aiming to improve our understanding of the entrepreneurial process.
- Definitions of an entrepreneur: Bygrave&Hofer a person 'who perceives an opportunity and creates an organisation to pursue it'; Shane 'Entrepreneurship is an activity that involves the discovery, evaluation, and exploitation of opportunities to introduce new goods and services, ways of organising markets, processes and raw materials through organising efforts that previously had not existed'
- Entrepreneurship: opportunity organizing → evaluation → emergence
- Processes associated with the emergence, evaluation and organizing of new opportunities are complex
- 5 themes that influence the entrepreneurial process 1) the individual 2) resources 3) network 4) the business plan 5) design thinking

## 3. The significance of the context

- the flower (new organisation), the gardener (entrepreneur), the garden (context)
- context within which entrepreneurship develops makes a difference it affects the type of network and resources that the entrepreneur has access to during the opportunity emergence, evaluation and organizing, contexts confront the entrepreneur with different barriers and opportunities.
- Example: An entrepreneur within the context of a university may feel constrained by academic norms with their focus on knowledge generation, rather than action and commercialization.

#### 4. The international variation

- Entrepreneurship develops within national, regional and local contexts and is influenced by the rules, norms and values that exist there

Key concepts:

**entrepreneurship:** emergence of new opportunities which are evaluated and exploited through organising

**the emergence tradition:** emphasizes on the creation of new organizational structures which function as a frame for an opportunity related to a specific market demand

**the opportunity tradition:** another tradition within entrepreneurship research that focuses on new opportunities as the core of entrepreneurship

**the entrepreneurial process:** the movement from discovering or creating an opportunity, to evaluation of the opportunity, to finally exploiting it through organising

**entrepreneur/intrapreneur:** the individual who initiates, strives for, and organizes entrepreneurship

**opportunity:** an idea which is evaluated as capable of creating value for others

**opportunity emergence:** the process in which the opportunity emerges led by individuals who discover or create the opportunity

**opportunity evaluation:** the process in which the entrepreneur evaluates to what extent the idea represents an attractive opportunity

**opportunity organizing:** the creation of some meaningful structures that support the realization of the opportunity, for instance to collect resources, to coordinate activities and to involve others so that the wanted output can be obtained

#### Chapter 2 – Who is the entrepreneur?

##### 1. Theories of entrepreneurship

The development of theory about the entrepreneur as an individual can be considered in three phases.

- 1) Optimistic phase: 1960-70s, entrepreneurs are born with a variety of traits that produce a universal and specific entrepreneurial personality that we can identify.
- 2) Critical phase: 1980s, the entrepreneur is seen as a much more complex phenomenon and it is not enough to look for personality traits, more dynamic theories that focus on the interaction between individual and environment, individuals are not born as entrepreneurs, but are made into entrepreneurs
- 3) Focus on personality again: 2000s, BUT rather than concentrating on identifying individual traits this research develops a more dynamic understanding of the entrepreneurial personality through the analysis of cognitive processes, intent, identity, etc.

*Are entrepreneurs: born or made?*

#### Types of entrepreneurs

- ‘Novice’ - no entrepreneurial experience
- ‘Habitual’ - has previous entrepreneurial experience
- ‘Serial’ - constantly establishing and selling organisations
- ‘Portfolio’ - owns several organisations simultaneously
- ‘Hybrid’ - is simultaneously self-employed and employed
- ‘Nascent’ - is in the process of considering the establishment of a new organisation – he or she can be either a ‘novice’, ‘habitual’, ‘serial’ or ‘portfolio’ entrepreneur

- 'Intrapreneur' - acts entrepreneurially within an existing organisation

### **The entrepreneur is born**

Schumpeter, entrepreneurial activity comes from special individuals who have the:

- Desire to establish a private kingdom
- Will to conquer
- Joy of creating

#### Character traits

Character trait research → to find out what differentiates the population of entrepreneurs from other groups in society. The thinking behind trait research is that some people have certain attributes that make it more likely that they will find or create

an opportunity and pursue it through organising. Examples: apt to take risks, need to perform, independent, aggressive leader, creative, tolerant of uncertainty.

Entrepreneurship Big Five: risk-taking propensity, need for achievement, need for autonomy, self-efficacy, and internal locus of control;

#### Genes

Shane → certain gene combinations increase an individual's odds of ending up as an entrepreneur, but those combinations are still not identified. Certain gene combinations might influence an individual's personality traits, cognitive skills and environment selection, and through those impacts, the chances of individuals becoming entrepreneurs. Individuals might also be genetically predisposed to search and select friends that are entrepreneurial, even environmental effects, such as role model or social network effects involve some degree of genetic predisposition.

BUT behavioral genetics is not only about genes; For example, studies show that many environmental effects have a genetic component and that the effect of environment depends on genes. Behavioral genetics does not eliminate the idea of the environment or socialization at all. It is combinations of genes rather than one gene that matters. It is combinations of genes in interaction with the environment that matters. One combination of genes can have several behavioral effects. So, one unspecified combination of genes might make an individual become a gambler, violent, or an entrepreneur, depending on their environmental stimuli (their parents, friends).

### **The entrepreneur is made**

#### Focusing on the upbringing and demography

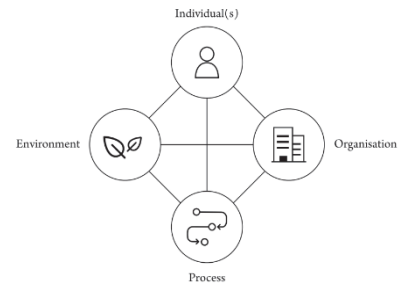
- the entrepreneurial personality is shaped not only by birth, but also early childhood and demographic factors are important (birth order, education, gender)

#### A wider picture of the entrepreneur

- one can explain the entrepreneur's person in a broader and more process-oriented context
- entrepreneur as being formed by the interaction between the individual and a number of more environmental components.



- Here we use contingency theories → systems consist of various interacting components. Whether an individual becomes an entrepreneur or not, depends therefore on the situations and experiences that the individual encounters. Furthermore, the interaction between the various components makes the formation of very different entrepreneurial processes and entrepreneurs possible. Gartner contingency model:



### The entrepreneur's cognitive processes

- Cognition → the study of how the mind and our thoughts are organized. It's about the entrepreneur's intellect rather than traits; how he or she understands and what he or she thinks about what is taking place in their environment and within themselves.
- The cognitive approach can be used to understand why some individuals find or create opportunities and pursue them, while others do not; why some even choose to become entrepreneurs and others do not; whether entrepreneurs think differently from others, etc.
- Shane: the literature has identified three cognitive characteristics that make entrepreneurs exploit opportunities:
  - 1) Entrepreneurs are more optimistic in their impulse processing than others.
  - 2) Entrepreneurs have more willingness to generalize based on small samples than others. They therefore tend to take big decisions, even though they don't have much information available.
  - 3) Entrepreneurs use their intuition more than others.

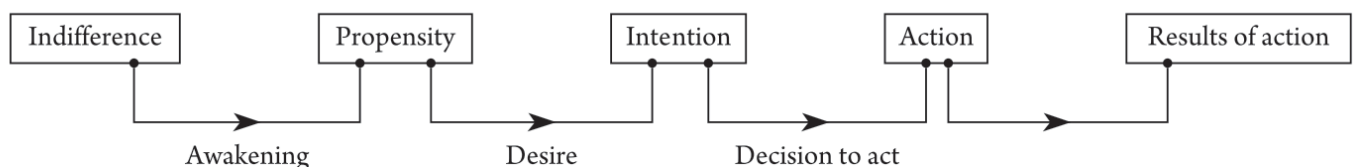
### Identity and the entrepreneur

- Understanding the entrepreneur as an individual through identity research
- Identity as a relatively stable core that individuals carry with them into the entrepreneurial process, and which guides the individual in the unknown situation
- Identity as a constantly changing socially constructed phenomenon.
- One definition focuses on how entrepreneurs make sense of themselves within their environment 'a person's sense of who he or she is in a setting'.
- An individual is assumed to have multiple identities. The entrepreneurial individual is not just an entrepreneur. He or she is maybe also a parent. These other identities play a part in how individuals understand and perform entrepreneurial identity.
- According to this research, all people can potentially develop an entrepreneurial self-understanding. Who it is that creates such an understanding depends on the social relationships the individual is involved in, self- image or desire for certain future identities.

### The individual's process towards entrepreneurship

The process can be influenced by whether the entrepreneur sees themselves as a born or made entrepreneur.

Fayolle: individual's journey toward entrepreneurship:



Phase 1 – the individual’s process towards entrepreneurship is understood as being based on **indifference** situation where individuals are not yet aware of entrepreneurship

Phase 2 – an entrepreneurial **awakening** may occur, which stimulates the individual’s interest and **desire** for entrepreneurship

Phase 3 – awakening can help individuals become motivated to engage in entrepreneurship and develop entrepreneurial **intentions**

Phase 4 – propensity triggers the **decision to act** as an entrepreneur

Phase 5 – over time the **result** of an operation arises

- Ajzen’s ‘theory of planned behavior’ also reflects the process of intention prior to action. Intention is an indicator of how hard an individual will work to achieve something – for example entrepreneurship, and ‘as a general rule, the stronger the intention to engagement in a behaviour, the more likely should be its performance’
- Entrepreneurial actions are not random or a result of social stimuli. They are also the result of an internal rational individual intention to perform an entrepreneurial act.
- Ajzen’s theory → intention is referred to as the crystallization of 3 variables:
  - perceived behavioral control: how difficult or simple the individual perceives the entrepreneurial project.
  - subjective norms: the extent to which individuals perceive a social pressure to perform or not perform the entrepreneurial action.
  - attitude towards the behaviour: the degree to which individuals will choose the entrepreneurial action, rather than another action – view of the action’s favorability
- The more the individual experiences behavioral control, the greater the respect awarded to the action by society, and the more the individual considers the act to be favorable, the stronger the individual’s intentions to become an entrepreneur, which increases the individual’s need to discover or create an opportunity.
- Action sometimes precedes the individual’s intention to journey toward entrepreneurship
- Shane concludes: ‘People can and will discover entrepreneurial opportunities without actively searching for them’

## 2. Entrepreneurs: born or made?

	Born	Made
Who is the entrepreneur?	Special super-individuals	All are potential entrepreneurs
Perception of the entrepreneur	Stable over time – once an entrepreneur, always an entrepreneur	The entrepreneur is created through a process
Stimulation	Internal character features	External factors
Research focus	Character features attached to the entrepreneurial personality	The interacting individual and contextual factors that create individuals, cognitive processes and identity
Objectives	To be able to predict and point out the entrepreneur in the crowd	To understand the entrepreneur and how an entrepreneur is created

## Chapter 3 – Emergence of opportunities

Discovery or creation of opportunities – core of entrepreneurial theory

Idea concept – ideas come before opportunities, but not all of ideas turn into opportunities

### 1. Theories of entrepreneurship

Two perspectives on what an opportunity is:

- 1) Opportunities are around us all the time, they are just waiting to be discovered
- 2) Opportunities are something belonging to the future, which is created through the way the individual acts and interacts with other people as well as his or her ability to reflect on these.

*Opportunities are discovered or created?*

### **Opportunity vs. idea**

An opportunity is an idea that is evaluated as being able to create value for others and a market can be realized.

Criteria for the evaluation are whether the idea is:

- Anchored: bound to a product, service, experience that creates value for others
- Attractive: others are willing to pay for the value that represents the idea
- At the right time and place: environment is mature enough to receive the entrepreneur and his idea
- Capable of being done: opportunity is practically feasible (refers to the entrepreneur's possession of, or ability to acquire access to, the resources, expertise, legitimacy, and knowledge required in order to make the idea of value to others.)

### **The extent of intentions and capabilities**

- It doesn't matter whether individuals have discovered or created opportunities if they do not intend to exploit them through organizing.
- Bhav: two different paths to entrepreneurship
  - 1) the entrepreneurial process starts with the individual intending to start an organisation and then looking for an opportunity
  - 2) the entrepreneurial process begins with the individual, randomly, discovering or creating an opportunity, after which the intention to exploit it develops.
- Society at any given time consists of a population where some have an intention to initiate entrepreneurship, some are in possession of an opportunity, some are in possession of both an opportunity and an intention, and some are in possession of either an opportunity or an intention.
- GEM (Global Entrepreneurship Monitor) is an international research project that aims to identify:
  - correlations between a country's entrepreneurship activity and socio-economic growth
  - how entrepreneurial activity varies across countries
  - which national framework conditions encourage a country's entrepreneurial activities.

### **Types of opportunities**

Schumpeter – opportunities will emerge through new combinations of existing resources - violation of the existing balance that exists in markets,

Kirzner – opportunities are characterized by the entrepreneur's use of existing market information to see whether there are 'holes' in the market in terms of resources that can be used more efficiently than they are currently. Is there potential value in the market that has not yet been optimally used by others? Focus on optimizing and making an existing market effective - compensation for disequilibrium and are instrumental in creating a balance in the markets

### **Discovering opportunities**

- Kirznerian opportunity is objective in nature. It is a part of our environment (profit gaps in the market) just waiting to be discovered. So, we can take it for granted that opportunities exist as part of our world even though we are not always aware of them.
- Kirzner introduces the concept of 'alertness' to capture this type of discovery. The term refers to: 'the ability to notice, without search, opportunities that have hitherto been missed'
- A group of entrepreneurs with diverse backgrounds to see the same technology. They arrived at different ways of looking at the technology as a potential opportunity, depending on the information and experience they possessed. The opportunity is objective, but the discovery of the opportunity is linked to the individual.
- Access to information is important to opportunity discovery and explains that such access will depend on our life experience, social networks and our efforts to seek opportunities.
- Our ability to discover opportunities depends on our absorptive capacity (i.e., our ability to interpret information in a useful manner, for example, to see solutions to the problems we face), intelligence and cognitive processes.

### Creating opportunities

- Opportunities are not 'concrete realities waiting to be noticed, discovered, or observed by entrepreneurs.' Instead, opportunities are something created by humans: 'opportunities and markets have to be invented, fabricated, constructed, made'.
- If opportunities are not objective phenomena, they can instead be seen as social constructs, which are created in everyday life through entrepreneurs' interaction with others, their contexts and themselves
- Opportunity creation is a process where the entrepreneur does not necessarily determine the development. The entrepreneur is just one of many actors who have influence on the process.

		Discovered	Created
Effectuated action → whereas new opportunities emerge from unique mixtures of discovery and creation, the action of the entrepreneur is always effectuated action.	2. Opportunities:		
	discovered or created?		
	Opportunity character	Objectively given unit in the environment	Dependent on the interactions of the individual
	Opportunity emergence	Involves discovery	Involves creation
	Opportunity source	The individual who is attentive towards existing market information	The individual who creates by means of his or her creativity
	Opportunity status	The opportunity is stable	The opportunity is dynamic
		Opportunity type	Kirznerian hole in the market
			Schumpeterian market rupture

## Chapter 4 – Evaluation of opportunities

The entrepreneurial process involves the evaluation of each opportunity, whereby the entrepreneur seeks to determine whether the idea that he or she intends to pursue, creates value in the eyes of the market and can thus be considered as a real, strong, and feasible option. 'Evaluation is the key to differentiate an idea from an opportunity'.

### 1. Theories of entrepreneurship

Two perspectives on opportunity evaluation:

Instrumental – emphasizes how opportunity evaluation is a means to achieve a particular result or goal

Legitimate – emphasizes that the creation of legitimacy is essential for the evaluation of options.

According to this perspective, the entrepreneur's success depends on whether he or she can get others (including the entrepreneur's organisation) to accept the

opportunity as being valuable and attractive. It's a social process in which the entrepreneur, through interaction with the market, achieves an impression of whether the idea represents an opportunity or not.  
*Evaluation is instrumental or legitimate?*

### What is evaluation?

Traditionally, evaluation is defined as 'the systematic determination of merit, worth, and significance of something or someone using criteria against a set of standards'

### The instrumental evaluation

- Most widespread in the literature
- The perspective, in a situation with uncertainty and risk, provides the entrepreneur with some clear and simple guidance on how to evaluate and even predict whether an idea profitable.
- Consists of a series of tools to gather information that can support the evaluation process, tools are rational and analytical
- The instrumental perspective gives the entrepreneur control over the evaluation process with the entrepreneur's own situation as a starting point
- Instrumental collection of evidence → dividing the evaluation into areas: 1)product/service 2)the market/industry 3)organization 4)financing
- A procedural model of opportunity evaluation:



- No universal agreement on these areas, another important factor is human factor (skills of entrepreneur/team)
- Evaluation is undertaken by considering internal (the market) and external (human) factors

### Evaluation of opportunities with great potential

Opportunities differ in scope and potential, some are large some are local, how to evaluate the potential of a specific opportunity in advance?

(Wickham) 3 key criteria for evaluating opportunities: scale-size, scope-value in short and long term, span-durability over time

(Hindle) 3 levels of evaluation model: 1)idea is assessed on its viability, 2)development potential 3) whether it can be implemented. For each of these levels 5 dimensions, product, market, industry, people and money, are evaluated. The model is called Venture Intelligence Quotient (VIQ):

THE VIQ FRAMEWORK		Module I Idea Assessment	Module II Idea Enhancement	Module III Venture Implementation	Level 1: Idea assessment -evaluation whether the idea is worth pursuing Level 2: Idea enhancement -strengthening the idea -idea potential is identified and understood Level 3: Venture implementation
	Product	Innovation IP Protection	Value Proposition	Development Operations	
	Market	Market receptiveness	Target market Dynamics	Distribution Communications	
	Industry	Industry attractiveness	Sustainable com- petitive advantage	Competitor Map	
	People	Personal aspirations Connectedness	Ability to execute	Milestones Risks	
	Money	Revenue Model Margins & Cash cycle	Break-even, Turning cash	Financial plan Investment offering	

-effective implementation of the idea

-suggestions about how the entrepreneur can build a new organisation based on idea

5 dimensions:

5 dimensions:

- product = the essence of the idea, which may be a product, service, experience, or process.
- market = the group of clients and organisations who are interested in the idea and have the resources to acquire the product or service that the idea represents.
- industry = organisations offering the same or substitute products, services, experiences or processes.
- people = the entrepreneur/the entrepreneurial team.
- money = the financial dimension.

### Evaluation through the creation of legitimacy

- Evaluation is not always an instrumental process with the areas defined in advance, it's not always systematic, time-limited, analytic process based on certain tools
- Reasons might be that few ideas are ready to be tested here and now through an instrumental evaluation process, entrepreneur may not have time
- Legitimate evaluation= integral part of everyday entrepreneurial processes, only by acting on the idea, confronting others with the idea and testing its attractive aspects, negative aspects, etc. in a social context it is possible to know if the idea represents an opportunity
- Here, the evaluation focuses on whether the idea is attractive to others rather than just the entrepreneur, or how the idea could be modified so that it is attractive to others.
- Legitimacy= something is legitimate if it complies with the norms, values, beliefs, practices and procedures that are accepted by a particular social group
- Idea can be considered a legitimate option when the economic, social and political surroundings accept its existence as a valid part of the market
- The more "new" the idea is, the more problems, bc convincing others of the idea's relevance and legitimacy is hard bc environment may have difficulty understanding the idea and what to do with it
- Innovative entrepreneur: lacks confidence of others, lacks role models to lean on

- Without the legitimacy, the entrepreneur will have difficulty in raising the necessary capital, recruiting employees, getting customers etc.
- Legitimacy can't be obtained, evaluated from behind a desk and through symbolic actions and planning. It is through action and interaction with other actors
- Our best self is the self that is legitimate in the eyes of others, and this we can only find by interacting with others.

#### Legitimacy as a process

The process by which new idea gain legitimacy, 4 phases:

- 1)innovation – the creation of the idea
- 2)local validation – characterized by local stakeholders who must be convinced that the new opportunity is possible to relate to and makes sense in the context of existing norms, values, procedures, etc.
- 3)diffusion – once accepted in the local environment, new opportunity can start to spread into other contexts
- 4)general validation – because of the spread, the new object will, over time, become more widely accepted as a natural part of the environment. The spread is dependent on social interaction and acceptance, which controls the progress of the process.

#### Strategies for building legitimacy

Various actions that the entrepreneur may make to convince the environment of legitimacy in terms of the idea's relevance.

- the entrepreneur may imitate other organisations that have already been accepted into the environment,
- may seek to obtain official certificates to emphasize that the idea makes sense
- it may be appropriate for entrepreneurs to cooperate with others to gain legitimacy in society, for example through a new trade organisation or a new network, rather than seeking legitimacy separately.
- other strategy for building legitimacy is to focus on creating trust among key stakeholders that will provide the entrepreneur with access to knowledge, resources, etc.
- symbolic actions such as producing a business card, website
- entrepreneur can draw on people who have high legitimacy within a particular business area
- contact with an existing organisation that has legitimacy can provide a route to greater legitimacy. If an entrepreneur can write 'trusted by' a well- known organisation on the business card, it helps to overcome his or her 'liability of newness'.
- According to the legitimacy perspective the entrepreneur doesn't pursue a practical strategy in creating legitimacy, the process of legitimacy tends to be experimental and exploratory, with the entrepreneur, through daily actions in the market, looking out for signals that tell if the idea is perceived as legitimate.
- Through attempts to convince others → entrepreneur receives feedback, can take the form of resources, knowledge, new opportunities, advice
- Evaluation takes place in the process and it is also here that the criteria for what should be evaluated are created. → evaluation becomes a progressive and procedural journey where the entrepreneur creates an assessment of the idea as a potential opportunity.

## 2. Evaluation: instrumental or legitimate?

	Instrumental	Legitimate
Evaluation perception	Tool to achieve a certain objective	Legitimacy creation
Evaluation objective	To state the direction for action	To convince the actors of the market of the idea
Evaluation criteria	They should be formulated before the process	They emerge during the entrepreneurial process
Evaluation process	Rational, systematic and analytic	Social, interactive, experimental and exploring
Evaluation character	Evaluation and entrepreneurial action are two separate activities	Evaluation and entrepreneurial action are two inseparable activities

### **Instrumental perspective**

1) Views evaluation as a means for achieving a particular goal. The goal indicates directions for action so that it can be determined how and whether the idea can become a viable opportunity. Evaluation criteria are defined prior to the actual evaluation process and the evaluation itself is limited in time.

2) Criteria emerge from analytical frameworks: VIQ tool or the business plan.

3) Frameworks often indicate a linear, systematic chain of evaluation activities that the entrepreneur must undertake to achieve the goal.

4) Instrumental perspective → evaluation and actual entrepreneurial action as two separate activities. First evaluation and then action based on the evaluation's recommendations.

### **Legitimacy perspective**

1) Legitimacy building is the essential point of the evaluation process, which takes place on a continuous basis and aims to convince market participants of the idea's potential.

2) Criteria for evaluation are not determined in advance, but in the legitimation process, where interaction with the market signals what criteria are relevant: the evaluation process is social, interactive, experimental and exploratory.

3) The entrepreneur can build trust, acceptance and understanding, which can end up in receiving a lot of feedback

4) The entrepreneur takes the idea into the market and tests it. This highlights how, according to the legitimacy perspective, the evaluation process and the entrepreneurial act are two inseparable processes.

## Chapter 10 – Design thinking

- It's a unique creative approach to launching and developing entrepreneurial processes
- Reasons why design is relevant to entrepreneurship: 1) it offers a way of thinking that makes entrepreneurs able to solve complex entrepreneurial issues in new ways. 2) entrepreneurs gain access to design methods and processes that can enable entrepreneurial opportunities to be discovered/created.

### 1. Theories of entrepreneurship

*Entrepreneurial thinking or design thinking?*

### **Three views of design thinking**

Design thinking is about the way designers think and act.



	The designer	The discipline	Organisational resource
Focus	The designer's way of thinking and working	Design as a theoretical discipline that is relevant to many other fields	Organisations in need of innovation, differentiation, etc.
Purpose	Understanding how designers solve problems	Present approaches to working with wicked problems	Innovation, strategy-making, organisational transformation
Starting point	Design problems are complex and problems and solutions co-evolve	Design problems are wicked problems	Organisational problems are design problems
Key contributions	Schön (1983); Cross (2006)	Simon (1969); Buchanan (1992)	Dunne and Martin (2006); Brown (2009); Verganti (2009)

### The designer

First view based on the designer, how he/she works with problem solving and their cognitive style within this process

### The discipline

Design thinking can also be seen as a more general theoretical discipline, a branch of knowledge. We are all potentially designers. Concept of wicked problems – hard to work out, constantly changing. Design thinking task is to

find solutions to wicked problems

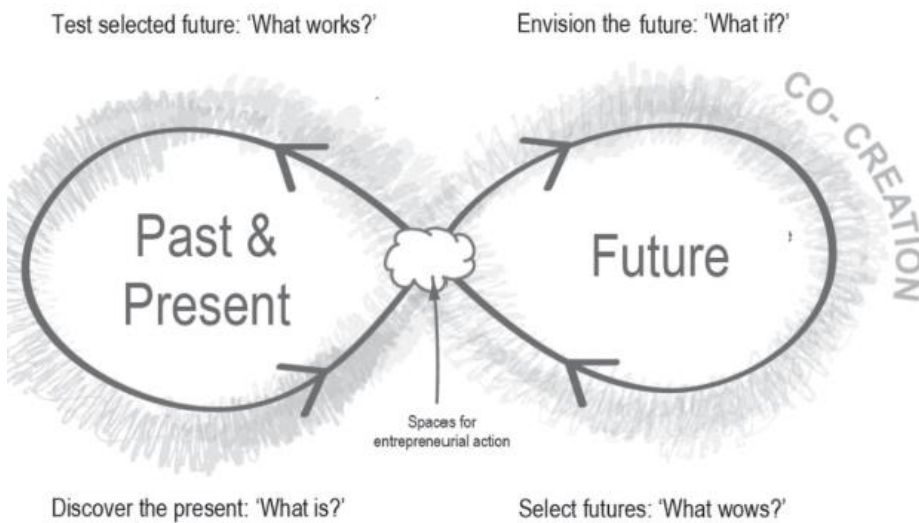
### Organizational resource

Design thinking is typically related directly to challenges in businesses, such as innovation. Design thinking here is defined as 'a discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value'. Contributions in

the first two columns explain design thinking in design terms, this last approach increasingly tends to turn the concept into an analytical business understanding. Ambidexterity – balance between exploitation and exploration, design thinking provides an idea of how businesses can use both logics, thus creating a better balance between exploitation and exploration.

### **The design thinking process**

- Constant movements between exploitative and explorative thinking/action
- Interaction between the past, present and future
- Design thinking process as consisting of 7 sub-processes (Simon): define, research, ideate, prototype, choose, implement, learn
- Design thinking process as consisting of 3 sub-processes (Brown): inspiration, ideation, implementation
- The design thinking process model:



#### Discover the present: 'What is?'

- design thinking process can begin anywhere in the figure, usually 'what is' is first,
- 'what is' is the past and present of the problem area, a crucial part here is listening and understanding of the users and other stakeholders
- various methods of data collection and problem identification methods, e.g. ethnographic interviews and observation methods, techniques from anthropology, cultural probes and journey mapping and personas.

#### Envisioning the future: 'What if?'

- different brainstorming techniques and related methods of provocation, e.g. constraints, analogies and random stimulation methods are used to create many alternative images of the future potential for solutions and opportunities.
- to ensure that things are recreated in new ways, design thinking time and resources are often invested to include users, other stakeholders, experts, etc. in the 'What if?' process.
- co-creation process, which may have the advantage of being interdisciplinary.

#### Select futures: 'What wows?'

- prototype-driven process, an early draft, example or model
- By continually gathering design process knowledge and ideas into a prototype and bringing it quickly to the market, the design thinker receives enriched feedback. Physical forms are easier to relate to. The feedback may lead to new prototypes

#### Test futures: 'What works?'

- activities in 'What works?' are associated with the 'What wows?' processes.
- through testing and acting in the market we can find out what works
- learning launching processes can be used to create understanding of what works.
- Brown: a guide to what will work is whether the project is feasible (possible to implement in the foreseeable future), viable (a likely part of a business model) and desirable (wanted by, and meaningful for, other people).

### **Design thinking methods**

There are two meta-methods, for the design thinking process:

- 1)'thinking with the hands' - the designer uses it to produce ideas, concepts, things, etc. tangible through visualization and prototype construction.
- 2)co-creation – concerned with discovery, creation, evaluation and launching the new product or idea through creative and social interaction processes engaging the users, suppliers, manufacturers, experts and other stakeholders in the design thinking process.

## Entrepreneurial thinking

- entrepreneurial thinking=discovery-driven way of thinking and acting entrepreneurially, at the core are the discovery, evaluation and exploitation of existing opportunities
- two fundamental conditions for entrepreneurship: lucrative opportunities and enterprising individuals.
- entrepreneurial opportunities are defined as ‘those situations in which new goods, services, raw materials, and organizing methods can be sold at greater than their cost of production’
- it’s entrepreneur’s unconscious alertness that makes him or her able to recognize the opportunities for entrepreneurial profit.
- to qualify as an entrepreneur, it’s not enough to discover a lucrative opportunity, opportunity must also be organized and transformed into market value and entrepreneurial profit

## Design thinking

- conscious approach to entrepreneurship in the sense that using relatively concrete and systematic processes and methods, the entrepreneur can proactively apply design thinking to shape new opportunities and the entrepreneurial process as such.
- design thinking cannot stand alone. It assists entrepreneurship.
- there are many factors independent of design thinking that are crucial to how the entrepreneurial process will proceed: the individual’s entrepreneurial traits, resources and networks, or stakeholder resources and motivation.
- new entrepreneurial opportunities are ‘designed’ through frequent and creative movement between the past, present and future, which involves exploitation as exploration and discovery as creation. Movement occurs in close interaction and co-creation with relevant actors
- focus is on people’s needs, empathy, co-creation

## 2. Entrepreneurship: entrepreneurial thinking or design thinking?

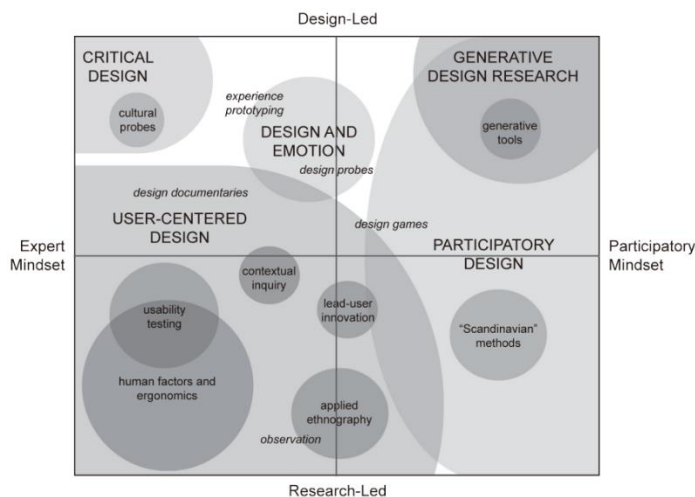
	Entrepreneurial thinking	Design thinking
Main orientation	Exploitation of past and present	Exploitation and exploration of past, present and future
Driving forces	Discovery driven	Driven by the interplay between discovery and creation, empathy, rapid prototyping and co-creation
Approach	Unconscious alertness	More conscious
Who	The individual	Socially constructed
Assumption of the entrepreneurial process	Linear	Iterative
Future orientation	Low	High and multiple
Output	Entrepreneurial value	Human value
Key focus	The back end	The front end
Constraints	Have to be eliminated	A way forward

## Lecture 3 – Article: Empathic Design

**Empathic design** - building creative understanding of users and their everyday lives for new product development (NPD). Creative understanding is a combination of rich, cognitive and affective understanding and translation into user-centered products. *Design for user experience*.

The design for user experience - four principles

- 1) Balancing rationality and emotions in building understanding of users' experience – holistic approach, the balance is found by combining observations of what people do with interpretations of what people think, feel, dream.
- 2) The need to make emphatic inferences about users and their possible futures – empathy, envisioning possible future situations of product use.
- 3) Involving users as partners in NPD
- 4) Engagement of design team members as multi-disciplinary experts in performing user research – roles of designer and researcher mutually interdependent, research skills for data + design skills.



Sanders' topography on design research:

Vertical: research led – design led approaches, research led focus on users present and past, design led focus on transforming and understanding users' experiences

Horizontal: expert mindset – participatory mindset, expert: researcher is seen as an expert and the user as a subject, designing for users, participatory: user is seen as a partner who actively participates in NPD process, designing with users.

Empathic design, involve users as partners in NPD (principle 3), equally relies on designers' personal insight and creativity in envisioning possible future situations of product use (principle 2), so it's positioned in between the two groups of approaches, where it overlaps the area of "design and emotion."

### Emphatic design in industrial context

design research approaches (emphatic design) need to be embedded on 5 levels within an organization to be useful:

culture → mindset → methodology → methods → tools&techniques

#### The empathic design process in Phillips baby care:

- A) convincing – project manager about the value of empathic design
- B) preparing – team identified research questions, selected areas of research, recruited parents
- C) gathering – couples participated in sessions in their homes, where parents explained what they had created in their probes (packages of tools and exercises), results: data in the form of video recordings, completed probes, posters and photos.
- D) analyzing and E) structuring – the people researchers pre-structured and pre-analyzed the data and developed 3 kits each reflected one parenting style
- F) sharing – the team and the project manager worked on the preparation kits individually over five days
- G) checking – external market research agency confronted the end-user insights with parents in focus group sessions
- H) ideating – in the end four end-user insights were selected for concept ideation. The selection of end-user insights was based on parents' responses as well as insights from business and technology perspectives.

### **Project dynamics that challenged the empathic design effort:**

- Redistribution of resources (B. preparing) – During preparation, activities regarding other corporate project were prioritized, manpower of empathic design, was cut down.
- Redefinition of stakeholder roles (C. gathering and D. analyzing) – After user experience data had been gathered and analyzed, decisions about target group and ways of working and collaborating, were reconsidered as part of a new collaboration set-up with Philips Design
- Out of sync schedules (D. analyzing and E. structuring) – Due to developments within the larger organization, business planning and empathic design activities were suspended.
- Changing project team (H. ideating) – Two new team members and eight guest members joined the team. These people had not been part of the earlier design process, and did not share the creative understanding that had shaped the project.

### **Small changes of team composition affected the empathic design process:**

- New project manager (C. gathering) – Halfway through gathering, the project manager left the team and a new project manager was assigned to the project.
- New team member (F. sharing) – Halfway through sharing the data, the empathic design work group was reinforced by a new team member, who insisted to bring in user data that had been gathered in other studies.

### **3 cultural and methodological changes necessary for successfully practicing empathic design in a technology-oriented industrial context:**

#### **Change 1** From focusing on rational approaches to include empathic approaches in NPD.

- Challenge 1: stakeholders wanted solid evidence but empathic design doesn't provide this; its strength lies in raising awareness of users' life, stories about users can't be easily quantified.
- Challenge 2: creative understanding needed to be translated into deliverables approved by the organization, personal ones were lost in translation process; ways of translating "that feel for the user" are not established yet.
- Challenge 3: stakeholders tend to focus on findings that direct ideation into a specific product direction, rather than to focus on more open-ended findings. stakeholders also choose to generate solutions to small-scale problems that have been brought up most by the user.

#### **Change 2** From seeing users as informers of NPD to seeing users as partners.

- Challenge 4: empathic design proposes frequent meetings with users, but user research here was often thought as a separate activity, in general the user involvement was not accommodated by organization.
- Challenge 5: in empathic design creative understanding of users' experiences drives motivation, but in practice emphasis was on technology development and user research was considered as one of several activities that inform technology development.

#### **Change 3** From being informed of user research to being engaged in user research.

- Challenge 6: Empathic design advises researchers to engage designers in user research. But it leaves unspecified who is part of the design team and who is a designer, who should be engaged, who informed?
- Challenge 7: The NPD process covers several stages; it involves different parties and people over time. People who join or take over the project in a later stage need to be able to include the user perspective as well, without starting the empathic design process all over again.
- Challenge 8: Less experienced researchers have tendency to overfocus on partial results, and they have difficulties in translating their creative understanding of users into product ideas. Empathic

design offers hardly any tools that enable multi-disciplinary teams, including non-designers and non-researchers, to participate in empathic design.

### Lecture 3 Article: Prototypes

#### **Focus on questions about the design of the artifact itself:**

- What *role* will it play in a user's life?
- How should it *look* and *feel*?
- How should it be *implemented*?

#### **Suggestions for designers:**

• Define "prototype" broadly. Sometimes very simple representations make highly effective prototypes. We define a prototype as any representation of a design idea – regardless of instrument; and designers as the people who create them—regardless of their job titles.

• Build multiple prototypes. Interactive artifacts can be very complex, so choosing the right focused prototypes to build is an art. Be prepared to throw some prototypes away, and to use different tools for different kinds of prototypes.

• Know your audience. The necessary resolution (rozkład) and fidelity (dokładność) of a prototype may depend most on the nature of its audience.

• Know your prototype; prepare your audience. Be clear about what design questions are being explored with a given prototype—and what are not. Communicating the specific purposes of a prototype to its audience is a critical aspect of its use. Prototypes themselves do not necessarily communicate their purpose.

By focusing on the purpose of the prototype—that is, on what it prototypes—we can make better decisions about the kinds of prototypes to build. With a clear purpose for each prototype, we can better use prototypes to think and communicate about design.

### Chapter 5 – Organization of opportunities

- Exploiting the opportunity, organizing = coordination of people, resources, strategies, competition,

#### 1. Theories of entrepreneurship

*Planning or improvising?*

#### **What is an organisation?**

- An organisation is an incredibly broad concept, and numerous perspectives are used to define an organisation.
- Some of the perspectives of an organisation place weight on formal structures, common rules, administrative procedures, frameworks and goals. Others focus on the more informal, process-oriented, interactive, social and human dimensions in their definition.
- Formal organizations are easy to identify, where informal ones are hard to identify
- Organisations are organized communities consisting of actors, resources, knowledge, and the glue that holds it all together is commonly held and generally accepted opinions and perceptions among stakeholders about why they appear as objective structures, systems, norms and logics. These control the stakeholders' opinions and actions whilst also being shaped by them.
- The individuals interact in the organisation to achieve a common goal.

- In the process of moving from a primitive to an elaborated organisation, individuals come together through a series of processes that establishes: more formalization; more complexity; clarification of objectives
- Entrepreneurial opportunity develops from being attached to the entrepreneur to becoming an accepted social organisation, which also involves other actors in addition to the entrepreneur.

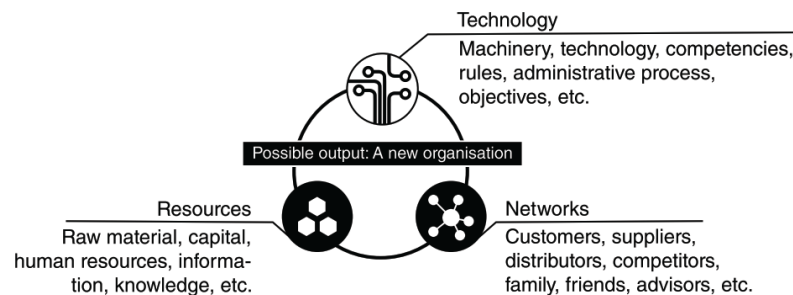
### What does organizing involve?

Organizing as a process that is about creating a new organisation over time, 5 phases:

Idea → opportunity → project → emerging organization → stable organization

- There may be feedback from later phases to earlier ones, development phases may not occur in that order, the process may stop without a new organization being formed

Organizational efforts the entrepreneur must make to realize his or her opportunity in the market →



### Organizing is not always a success

Why is there so much failure in the entrepreneurial process? – barriers in: weak knowledge, opportunity identification, product/service development, the ability to develop systems and structures, problems of legitimacy, barriers in relation to creating relevant networks, the ability to identify and develop an attractive resource base, risk

The barriers, which the in the process towards a ‘stable’ organisation are divided into two main categories:

- 1) personal challenge (getting suitable health insurance, balancing time and lack of mentors)
- 2) social challenges (being taken seriously and receiving support)

### Organizing can be planned

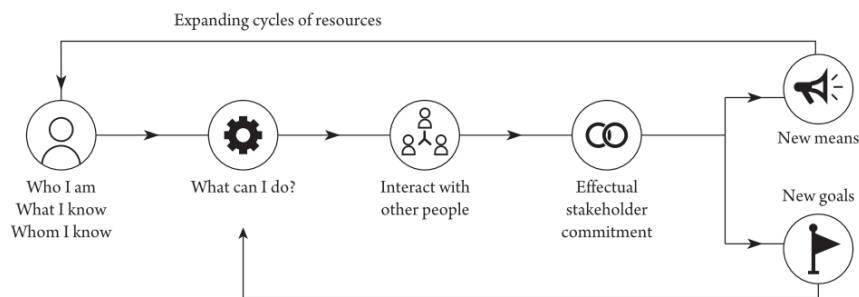
- Planning perspective: manager builds and operates the organizational machine using rational analysis and planning, organizing is intentional, rational and considered, it can be steered towards a specific goal, the perspective assumes that the entrepreneur has a clear picture of the goal (the organization) right from the start
- Causal process: “what must I do to achieve the desired goal – a successful organization?”
- Assumption that environment is stable, because the planned process is expected to be relevant, in terms of environment, at the time of implementation
- Assumption that the future is predictable
- Here entrepreneur must answer questions: what is the goal, vision and mission of the organisation? How will the entrepreneur organize and manage the organisation, number of employees, procedures, management style, structure? How can the entrepreneur achieve organizational ‘lift-off’ in terms of strategy, marketing, growth, internationalization?

### Organizing is all about improvisation

- Predictable environments are rare, entrepreneurs do not have complete information about the future, clear preferences about goals or unlimited resources,



- Organizing process is too complex and unclear, and it will show its true nature through the entrepreneur's actual activities and struggles to understand the goal, gain access to and control resources, establishing an organisation, and even then, the nature of the process will take new forms.
- Make use of what you have when organising instead of starting with the goal. The entrepreneur's starting point should be based on what is sure.
- 'Effectuation' is the term that captures the logic behind the improvisation perspective's approach to organising. According to the effectuation there are questions: What effects can I achieve with the resources I have?'; 'What do I do right here?'
- Entrepreneur's challenge when improvising is: to create the organisation through the exploration of possible combinations and modifications of the available means; involvement of others
- Organising process evolves considering the improvisation perspective. Improvisation is often connected with a random process, but it's possible to identify its characteristics. Entrepreneurs typically have three resources as they enter the organising process 1) 'Who I am' 2) 'What I know' and 3) 'Whom I know'.



Source: Sarasvathy (2008: 101).

	Planning	Improvising
Starting point	The target is given	The means are given
Crucial question	'What can I do in order to achieve the desired effect?'	'What can I do with these means?'
The role of the entrepreneur	A rational architect	An improvising creator and social agent
Crucial activities	Analysis, planning	Small steps, interaction
Predictability of output	High	Low

## 2. Organizing: planning or improvisation?

### Chapter 6 – Nascent entrepreneurship

- nascent entrepreneurship focuses on the process leading up to the startup of a business, process from having an intention to start a business to starting a business

#### 1. Theories of nascent entrepreneurship

*Starting a business: necessity or opportunity?*

#### **Entrepreneurship, self-employment and nascent entrepreneurship**

Two main types of explanation of why some choose to start a business while others choose alternative career paths:

1) person-job fit – idea that people will eventually find a career that fits their desires, ambitions, skills; rational perspective



2) various influences on career decision – behavioral perspective, doesn't focus on providing a guide on how decisions should be taken

Behavioral perspective is dominant in nascent entrepreneurship, different types of impacts: 1) institutional factors (or environmental factors), 2) life events and 3) individual factors. → opportunity-based or/and necessity-based motivation → nascent entrepreneurship

### **Institutional factors influencing nascent entrepreneurship**

- 2 main types of institutions: formal (ministries, laws); informal (culture, social norms)
- Institutions help to influence the attractiveness of self-employment for the individual: administrative barriers, tax benefits, culture that awards high status for being self-employed, religions with high degree of individualism
- Various institutions do not necessarily have the same effect on every individual

### **Individual factors influencing nascent entrepreneurship**

- Gender: women and men are equally likely to start a business, but for different reasons and with different results
- High confidence, they are extroverts, optimistic, risk-takers, have desire for self-fulfillment, autonomy, freedom
- Opportunity costs: when a person has a good education, a good social network, extensive experience and so on – when a person has high human and social capital – that person has a better chance of starting a business successfully. Opportunity costs associated with starting a business are related to when one rejects other alternatives (offer of a job) and the value lost by rejecting that job or other alternatives.
- Majority of businesses are started by groups; the composition of teams depends on mechanisms such as:
  - homophily (people are equal regarding 'ascriptive characteristics' such as gender, age, ethnic background).
  - functionality (people have different skills, knowledge and experience, and personal traits).
  - networks (people already know each other).
  - geography (people living in the same area).

### **Life events influencing nascent entrepreneurship**

2 types: 1) lifecycle - pattern of life over time 2) event – individual events that affect the decision of whether or not to start a business

#### Lifecycle

- periods in person's life where one is more likely to start a business, key transitions in the lives that follow a defined pattern and where one transition affects the next: student-graduation, married-divorced, student-employee
- 2 key mechanisms in the pattern 1) resource accumulation that occurs over time as people get older, this increases the tendency to start a business 2) risk willingness which decrease with age, young people often have less responsibility

#### Events

- Divorce, children moving from home, being suddenly fired

## Hybrid entrepreneurship and freelancers

‘Hybrid entrepreneurship’ – when people are, simultaneously, both employed and self-employed.

Freelancers – formally self-employed but are actually in a form of employment through a contractual relationship with a particular company.

## The start-up process

Business lifecycle models: Greiner:

- growth through creativity (challenge: crisis of leadership);
- growth through direction (challenge: crisis of autonomy);
- growth through delegation (challenge: crisis of control);
- growth through coordination (challenge: crisis of red tape);
- growth through collaboration (challenge: not defined).

Process models: no predetermined and predictable pattern in the development of companies, development as process between creation and discovery; evaluation and organisation of opportunities, where adaptation and complexity play larger role. Examples: effectuation model, model of entrepreneurial process

Conceptualization what characterizes companies during their formation, 4 attributes:

Intent – advertising the business, participating in networks for entrepreneurs

Resources – obtaining funding through banks

Boundary – becoming registered for tax

Exchange – acquisition of phone, mail, address

## Necessity perspective of nascent entrepreneurship

- most start-ups contain both an opportunity and a necessity element, and so the concepts can also be seen as perspectives rather than types of motivation.
- necessity perspective, entrepreneurship is not a free choice but a necessary choice, can have different degrees ranging from being a matter of survival, to being a need to improve living conditions
- the person is involuntarily forced into self-employment

## Opportunity perspective of nascent entrepreneurship

entrepreneurship as an active and conscious choice amongst several other attractive options

reasons why people positively choose to become an entrepreneur: independence, material incentives, social approval status, fulfilment of personal values and norms, self-realization

### 2. Nascent entrepreneurship: necessity based or opportunity based?

	Necessity	Opportunity
Basis of action	Environmentally determined	Deliberate, strategic choice
Motive force	Push	Pull
Motivation	Survival/Better living conditions	Exploit a possibility (self-realisation)
Career possibility	The only choice (last)	One among several
Potential	Low	High

## Lecture 5 article on crowdfunding

	Motivations	Deterrents
Creator	Raise Funds Expand Awareness of Work Form Connections Gain Approval Maintain Control Learn New Fundraising Skills	Inability to Attract Supporters Fear of Public Failure and Exposure Time and Resource Commitment
Supporter	Collect Rewards Help Others Be Part of a Community Support a Cause	Distrust of Creators' Use of Funds

Table II. Design Principles for Motivating Participation in Crowdfunding

Design Principle	Motivation	Example
1 Support resource exchange	Raise Funds (Creators) Gain Approval (Creators) Learn New Skills (Creators) Collect Rewards (Supporters) Support Causes (Supporters) Help Others (Supporters)	Open forums to post and seek production needs
2 Support community before, during, and after	Form Connections (Creators) Gain Approval (Creators) Learn New Skills (Creators) Expand Awareness (Creators) Be Part of a Community (Supporters)	Platform to support creator and supporter meet-ups
3 Provide transparency	Maintain Control (Creators)	Presentation of risks in an easy-to-understand and nonthreatening format

## Chapter 7 – Resources

### 1. Theories of entrepreneurship

Is it better to continue working with the resources they have readily available at any given time or alternatively spend their time and limited resources obtaining or developing new and greater resources to pursue their potential.

*Exploit or explore?*

### **From a market to a resource focus**

Inside-out argument – sustained competitive advantage is best established within the organisation through its unique combination of resources

Outside-in argument - creating sustained competitive advantage comes through better positioning in the market and differentiation from your competitors.

### Resource theory

- the best means by which both entrepreneurs and existing organisations gain sustained competitive advantage is through control of valuable resources
- 2 assumptions: 1) the actors in an industry are heterogeneous, have unequal control over strategic resources 2) resources are not perfectly transferrable between actors, the value of resources depends on the holder's ability to exploit them

### Resource concept

Anything which could be thought of as a strength or weakness of a given firm. More formally, a firm's resources at a given time could be defined as those (tangible and intangible) assets which are tied semi permanently to the firm

### Valuable resources

Resources that are attractive are those that can help to create a barrier relative to a competitor's resource position.

A firm resource must have 4 attributes:

- (a) it must be valuable, in the sense that it exploits opportunities and/or neutralizes threats in the firm's environment, (b) it must be rare among a firm's current and potential competition,
- (c) it must be imperfectly imitable and
- (d) there cannot be strategically equivalent substitutes for this resource that are valuable but neither rare or imperfectly imitable.

### **A three- way split of resources**

Financial – equity and debt

Human – knowledge, skills

Social – benefits from contacts

### **Resource exploitation**

- Efficiency, selection, implementation, execution

### **Resource exploration**

- Resources can't be taken for granted, so an entrepreneur must explore and even create new resources
- Search, variation, risk taking, experimentation, discovery, innovation

### 2. Resources: exploit or explore?

	Exploit	Explore
Resources	Existing resources	New resources
The entrepreneur's role	To use existing resources efficiently	To find and gain control of the new resources
Focus	To improve efficiency	To move
Changeability	Stability	Dynamics
Perspective	Short term	Long term

## Summary 3: Methodology & Techniques: Big Data Analytics

### Previous knowledge (Paper : 'Analysing Data using Linear Models)

A variable has one of four different **levels of measurement**:

1. **Nominal** --> categories without order (e.g. Type of car, gender)
2. **Ordinal** --> ordered categories (e.g. grades, quality rating)
3. **Interval** --> differences between measurements but no true 0 (e.g. temperature)
4. **Ratio** --> differences between measurements, where a true 0 exists (e.g. height, age, spending)

Measures of **central tendency** are:

1. The mean ( $\bar{y} = \frac{\sum_{i=1}^n y_i}{n}$ )
2. The median (the middle number)
3. The mode (the most frequent value)

**Variance** is the expectation of the squared deviation of a random variable from its mean. Informally, it measures how far a set of (random) numbers are spread out from their average value.

A **dependent variable** (or response variable) is the variable being tested and measured in a scientific experiment. The theoretical cause or antecedent is usually taken as the **independent variable** (or predictor variable, or explanatory variable). The dependent variable is usually the most important variable. It is the variable that we'd like to understand better, or perhaps predict better.

### Linear equations and regression

The linear relationship can be formalized using a linear equation. The general form of a linear equation for two variables  $x$  and  $y$  is the following:

$$y = \text{intercept} + \text{slope} \times x$$

Data on two variables may not show a perfect linear relationship, but in many cases, a perfect straight line can be a very reasonable approximation of the data. Another word for a reasonable approximation of the data is a prediction model

The residual (or error) is the difference between a certain data point (the actual value) and what the linear equation predicts. Let's denote the predicted  $y$ -value (the value of  $y$  predicted by the blue line) as  $\hat{y}$  (pronounced as  $y$ -hat), then we can define a residual or error as the discrepancy between the observed  $y$  and  $\hat{y}$ :

$$e = y - \hat{y}$$

### Inference

The standard error for a sample slope depends on many things, but the most important factor is the sample size: e.g. how many bottles there are in each random sample. The larger the sample size, the smaller the standard error, the more certain we are about the population slope. With large sample sizes, your results from a regression analysis become less dependent on chance, become more stable, and therefore more reliable.

In inferential data analysis, one often works with two hypotheses: the null hypothesis and the alternative hypothesis. The null-hypothesis states that the population slope is equal to 0 and

$$H_0 : \beta_{\text{slope}} = 0$$

$$H_A : \beta_{\text{slope}} \neq 0$$

The **p-value** is a probability. It represents the probability of observing certain events, given that the null-hypothesis is true. Fisher saw the p-value as an informal index to be used as a measure of discrepancy between the data and the null-hypothesis: The null-hypothesis is never proved, but is possibly disproved. A slope with a  $p \leq \alpha$  is said to be significant, and a slope with a  $p > \alpha$  is said to be non-significant. If the slope is significant, then one should reject the null-hypothesis and say there is a slope in the population different from zero.

Since data-analysis is about probabilities, there is always a chance that you make the wrong decision: you can wrongfully reject the null-hypothesis, or you can wrongfully fail to reject the null-hypothesis. Pearson and Neyman distinguished between two kinds of error: one could reject the null-hypothesis while it is actually true (error of the first kind, or **type I error**) and one could accept the null-hypothesis while it is not true (error of the second kind, or **type II error**).

Table 4.1: Four different scenarios for hypothesis tests.

	Test conclusion	
	do not reject $H_0$	reject $H_0$
	OK	Type I Error
Truth	$H_0$ true	$H_A$ true
	Type II Error	OK

This probability is actually the complement of  $\beta$ ,  $1 - \beta$ : the probability that we reject the null-hypothesis, given that the alternative hypothesis is true. This  $1 - \beta$  is often called the statistical **power of a null-hypothesis test**.

## Lecture 1

### Introduction big data analytics

There are a couple of reasons why big data analytics is different from the data analysis framework discussed in previous chapters. These relate to

1. **Different types of questions** → with classic data analysis, you have a model with one or more model parameters, for example a regression coefficient, and the question is what the value is of that parameter in the population. Based on sample data, you draw inferences regarding the parameter value in the population. In contrast, typical questions in big data situations are about predictions for future data (e.g., how will the markets respond to the start of the hurricane season), or how to classify certain events
2. **The  $n > p$  problem** → The types of variables you could distil from data is endless, so what to pick? And where to stop? The analyst has to make a choice of what features of the raw data will be used in the analysis. Or, during the analysis itself, an algorithm can be used that picks those features that predict the outcome variable most efficiently. Usually there is a combination of both methods: there is an informed choice of what features in the data are likely to be most informative and an algorithm that selects the most informative features out of this selection. One reason that variable selection is necessary is because statistical methods, like for example linear models, do not work when the number of variable is large relative to the number of cases.

This is known as the  $p > n$  problem, where  $p$  refers to the number of variables and  $n$  to the number of cases.

3. **The problem of overfitting** → maybe you have enough cases to include 1,000 predictor variables in your linear models, and they will run and give meaningful output, but then the model will be too much focused on the data that you have now, so that it will be very bad at predicting or classifying new events correctly. In order to check that you are not overfitting, one generally splits the data into a training data set and a test data set (or validation data set). The training data are used to select the variables and fit the model

#### *Cross-validation*

**Cross-validation** is a form of a resampling method. In resampling methods, different subsets of the training data are used to fit the same model or different models, or different versions of a model. In  $k$ -fold cross-validation, the training data are split randomly into  $k$  groups (folds) of approximately equal size. The model is then fit  $k$  times, each time leaving out the data from one of the  $k$  groups. Each time, predictions are made for the data in the group that is left out of the analysis. And each time we assess how good these predictions are, for example by determining the residuals and computing the mean squared error (MSE). With  $k$  groups, we then have  $k$  MSEs, and we can compute the mean MSE. If we do this cross-validation for several models, we can see which model has the lowest mean MSE. That is the model that on average shows the best prediction. This should not lead to overfitting, because by the random sampling into  $k$  subsamples, we are no longer dependent on one particular subset of the data. Usually, a value of 5 or 10 is used for  $k$ .

#### *Steps in Big Data Analytics*

1. Problem identification
2. Selection of data sources
3. Feature selection
4. Construction of data matrix
5. Training and test (validation) data set
6. Model selection
7. Build the model
8. Validate the model
9. Interpret and evaluate

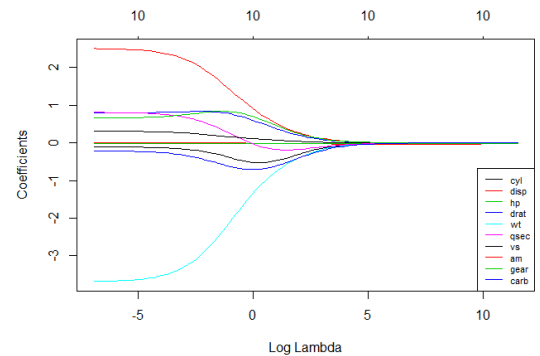
Data are in a relational database, accessible using Structured Query Language (SQL). Because the data are orderly placed on the website, the data can be easily 'scraped'. Unstructured data are e.g. Siri voice commands, emails, videos, social media streams, radio signals.

**Data mining** is finding information, meaning and patterns in a (large) data set. **Text mining** is glean useful information from a large body of natural language text. Big data: a lot of cases and a lot of variables, with usually a lot of messiness (collected in the wild) There will occur problems with:

1. research design
2. validity

### 3. reliability of measures

**The Lasso** is a shrinkage and selection method for linear regression. It minimizes the usual sum of squared errors, with a bound on the sum of the absolute values of the coefficients. The goal of lasso regression is to obtain the subset of predictors that minimizes prediction error for a quantitative response variable. The lasso does this by imposing a constraint on the model parameters that causes regression coefficients for some variables to shrink toward zero.



$$y = b_0 + b_1x_1 + b_2x_2 + \dots + b_kx_k + e$$

$$|b_0| + |b_1| + |b_2| + |b_3| + \dots + |b_k| \leq C$$

If C is large, then you get ordinary regression. If C is small, you get that some of the coefficients become 0, and the rest become somewhat smaller than under ordinary regression (shrunk).

When some of the coefficients become 0, that means the associated variable does not add to the prediction, so it can be left out of the linear equation.

$$y = b_0 + 0x_1 + b_2x_2 = b_0 + b_2x_2$$

## Lecture 2

### Logistics Regression

Instead of predicting probabilities, we could predict odds. The nice property of odds is that they can have very large values, much larger than 1. What are odds again? Odds are a different way of talking about probability. If someone says the odds of heads against tails is 10 to 1, this means that for every 10 heads, there will be 1 tails. In other words, if there were 11 coin tosses, 10 would be heads and 1 would be tails

**In summary: probabilities range from 0 to 1, and odds from 0 to infinity.**

Because odds can never be negative, mathematicians have proposed to use the natural logarithm of the odds as the preferred transformation of probabilities. For example, suppose we have a probability of heads of 0.42. This can be transformed into an odds by noting that in 100 coin tosses, we would expect 42 times heads and 58 times tails. So the odds are 42:58, which is equal to  $42/58 = 0.724$ . The natural logarithm of 0.724 equals -0.323 (use the ln button on your calculator!). If we have a value between 0 and 1 and we take the logarithm of that value, we always get a value smaller than 0.

**A probability is never negative, but the corresponding logarithm of the odds can be negative.**

A logodds of 0 is equal to a probability of 0.5. If a logodds is larger than 0, it means the probability is larger than 0.5, and if a logodds is smaller than 0 (negative), the probability is smaller than 0.5.

Example of children passing the exam, suppose we have the following linear equation for the relationship between age and the logarithm of the odds of passing the exam

$$\text{logodds} = -3.82 + 0.05\text{age}$$



This equation predicts that a child aged 70 months has a logodds of  $-3.82 + 0.05 \times 70 = -0.34$ . In order to transform that logodds back to a probability, we first have to take the exponential of the logodds to get the odds:

$$\text{odds} = \exp(\text{logodds}) = e^{\text{logodds}} = e^{-0.34} = 0.71$$

An odds of 0.71 means that the odds of passing the exam is 0.71 to 1 (0.71:1). So out of  $1 + 0.71 = 1.71$  times, we expect 0.71 successes and 1 failure. The probability of success is therefore

$$\frac{0.71}{1 + 0.71} = 0.42$$

Thus, based on this equation, the expected probability of passing the exam for a child of 70 months equals 42. Formula for relationship between a logodds of  $x$  and the corresponding probability is:

$$p_x = \frac{\exp(x)}{1 + \exp(x)}$$

$$\ln \frac{p_{\text{pass}}}{1 - p_{\text{pass}}} = b_0 + b_1 x \rightarrow$$

either a probability of 0 or 1.

E.g.

$$\text{Log}(\text{train}) = 90.017 - 0.008 \text{income}$$

Table 14.2: glm() output for predicting taking the train from income.

	Estimate	Std. Error	z value	Pr(> z )
(Intercept)	90.017	32.518	2.768	0.006
income	-0.008	0.003	-2.746	0.006

Imagine a traveller with a yearly income of 11,000 Euros. Then the predicted logodds equals  $90.017 - 0.008 \times 11000 = 2.017$ . When we transform this back to a probability, we get  $\exp(2.017) / (1 + \exp(2.017)) = 0.542$ . So this model predicts that for people with a yearly income of 11,000, about 54% of them take the train (if they travel at all, that is!). Now imagine a traveller with a yearly income of 100,000. Then the predicted logodds equals  $90.017 - 0.008 \times 100000 = -799.983$ . When we transform this back to a probability, we get  $\exp(-799.983) / (1 + \exp(-799.983)) = 0$ . So this model predicts that for people with a yearly income of 100,000, close to none of them take the train. Going from 11,000 to 100,000 is a big difference. But the change in probabilities is also huge: it goes down from 0.52 to 0.

## Lecture Slides

**Simple linear regression:** If you take only one predicting variable into account. For example, if the grade on SPSS is a predictor for the grade on IS.

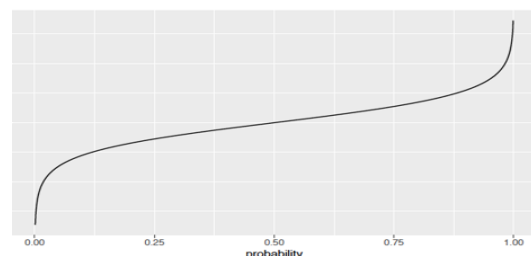


Figure 1: Log Function

Measure	Min	Max	Name
p	0	1	probability
$p/(1-p)$	0	$\infty$	odds
$\text{Log}(p/1-p)$	$-\infty$	$\infty$	<u>logodds</u>

Figure 2: What can we do to model the data?

- What are the odds(Relief|Drug)? Odds (R|D) = 22 : 13 = 1.69
- What are the odds(Relief|Placebo)? Odds (R|P) = 15 : 20 = 0.75

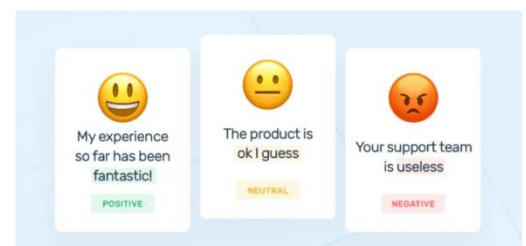
Relief	Drug	Placebo
No	13	20
Yes	22	15
Total	35	35

## Lecture 3

### Text mining

Article : Sentiment Analysis (<https://monkeylearn.com/sentiment-analysis/>)

Sentiment analysis (aka opinion mining or emotion AI) is the automated process of analyzing text data, and classifying it as positive, neutral or negative. This machine learning technique enables businesses to analyze their customers' emotions online, to gain accurate insights about how customers perceive their product, brand or service. Usually, besides identifying the opinion, these systems extract attributes of the expression e.g.:



- *Polarity*: if the speaker express a *positive* or *negative* opinion,
- *Subject*: the thing that is being talked about,
- *Opinion holder*: the person, or entity that expresses the opinion.

Companies use sentiment analysis to automatically analyze survey responses, product reviews, social media comments, and the like to get valuable insights about their brands, product, and services.

Sentiment analysis can be applied at different levels of scope:

- Document level sentiment analysis obtains the sentiment of a complete document or paragraph.
- Sentence level sentiment analysis obtains the sentiment of a single sentence.

- Sub-sentence level sentiment analysis obtains the sentiment of sub-expressions within a sentence.

*Types of sentiment analysis:*

1. **Fine-grained Sentiment Analysis** – being more precise about the level of polarity of the opinion. So consider ; e.g. very positive, positive, neutral, negative, very negative or 1-5 stars systems.
2. **Emotion Detection** – aims at detecting emotions like, happiness, frustration, anger, sadness etc. Many emotion detection systems resort to lexicons (i.e. lists of words and the emotions they convey) or complex machine learning algorithms. One of the downsides of resorting to lexicons is that the way people express their emotions varies a lot and so do the lexical items they use. Some words that would typically express anger like *shit* or *kill* (e.g. *in your product is a piece of shit* or *your customer support is killing me*) might also express happiness (e.g. in texts like *This is the shit* or *You are killing it*).
3. **Aspect based Sentiment Analysis** – looking at specific features. For example ; *"The battery life of this camera is too short."* The sentence is expressing a negative opinion about the camera, but more precisely, about the battery life, which is a particular feature of the camera.
4. **Intent Analysis** - detects what people want to do with a text rather than what people say with that text. E.g. *"I would like to know how to replace the cartridge"* or *"Can you help me fill out this form?"*
5. **Multilingual sentiment analysis** - a lot of preprocessing is needed and that preprocessing makes use of a number of resources. The use of the resources available requires a lot of coding experience and can take long to implement. An alternative to that would be detecting language in texts automatically, then train a custom model for the language of your choice (if texts are not written in English), and finally, perform the analysis.

*Advantages of sentiment analysis are:*

1. Scalability
2. Real-time analysis
3. Consistent criteria

*Sentiment Analysis Algorithms*

There are many methods and algorithms to implement sentiment analysis systems, which can be classified as:

- **Rule-based** systems that perform sentiment analysis based on a set of manually crafted rules.
- **Automatic** systems that rely on machine learning techniques to learn from data.
- **Hybrid** systems that combine both rule based and automatic approaches.

*Precision, recall, and accuracy*

Precision, recall, and accuracy are standard metrics used to evaluate the performance of a classifier.

Precision measures how many texts were predicted correctly as belonging to a given category out of all of the texts that *were predicted (correctly and incorrectly) as belonging to the category*.

Recall measures how many texts were predicted correctly as belonging to a given category out of all the texts that *should have been predicted as belonging to the category*. We also know that the more data we feed our classifiers with, the better recall will be.

Accuracy measures how many texts were predicted correctly (both as belonging to a category and not belonging to the category) *out of all of the texts* in the corpus.

Lecture slides:

Process of text mining and statistical learning:

1. Text pre-processing
2. Feature generation
3. Feature selection
4. Mining
5. Analysis of results

## Lecture 4

### Statistical Learning

#### Article : Introductory Overview Classification and Regression Trees

Regression-type problems are generally those where we attempt to predict the values of a continuous variable from one or more continuous and/or categorical predictor variables. For example, we may want to predict the selling prices of single family homes (a continuous dependent variable) from various other continuous predictors (e.g., square footage) as well as categorical predictors (e.g., style of home, such as ranch, two-story, etc.; zip code or telephone area code where the property is located, etc.

Classification-type problems are generally those where we attempt to predict values of a categorical dependent variable (class, group membership, etc.) from one or more continuous and/or categorical predictor variables.

In most general terms, the purpose of the analyses via tree-building algorithms is to determine a set of *if-then* logical (split) conditions that permit accurate prediction or classification of cases.

#### ADVANTAGES OF CLASSIFICATION AND REGRESSION TREES (C&RT) METHODS

1. SIMPLICITY OF RESULTS
2. TREE METHODS ARE NONPARAMETRIC AND NONLINEAR

This general issue is also discussed in the literature on tree classification and regression methods, as well as neural networks, under the topic of "overlearning" or "overfitting." If not stopped, the tree algorithm will ultimately "extract" all information from the data, including information that is not and cannot be predicted in the population with the current set of predictors, i.e., random or noise variation. The general approach to addressing this issue is first to stop generating new split nodes when subsequent splits only result in very little overall improvement of the prediction.

### Article: Machine Learning Basics

A **supervised machine learning** algorithm (as opposed to an unsupervised machine learning algorithm) is one that relies on labeled input data to learn a function that produces an appropriate output when given new unlabeled data. Supervised machine learning algorithms are used to solve classification or regression problems. A **classification problem** has a discrete value as its output. For example, “likes pineapple on pizza” and “does not like pineapple on pizza” are discrete. A **regression problem** has a real number (a number with a decimal point) as its output. For example, estimating someone’s weight given their height.

An **unsupervised machine learning** algorithm makes use of input data without any labels—in other words, no teacher (label) telling the child (computer) when it is right or when it has made a mistake so that it can self-correct.

Unlike supervised learning that tries to learn a function that will allow us to make predictions given some new unlabeled data, unsupervised learning tries to learn the basic structure of the data to give us more insight into the data.

### Article: A Beginner's Guide to Neural Networks and Deep Learning

Neural networks are a set of algorithms, modeled loosely after the human brain, that are designed to recognize patterns. They interpret sensory data through a kind of machine perception, labeling or clustering raw input. The patterns they recognize are numerical, contained in vectors, into which all real-world data, be it images, sound, text or time series, must be translated. Neural networks help us cluster and classify. You can think of them as a clustering and classification layer on top of the data you store and manage. They help to group unlabeled data according to similarities among the example inputs, and they classify data when they have a labeled dataset to train on.

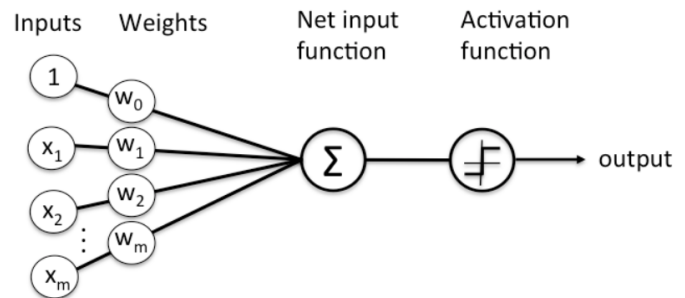
All classification tasks depend upon labeled datasets; that is, humans must transfer their knowledge to the dataset in order for a neural network to learn the correlation between labels and data. This is known as supervised learning.

Clustering or grouping is the detection of similarities. Deep learning does not require labels to detect similarities. Learning without labels is called unsupervised learning. Unlabeled data is the majority of data in the world. One law of machine learning is: the more data an algorithm can train on, the more accurate it will be. Therefore, unsupervised learning has the potential to produce highly accurate models.

- Search: Comparing documents, images or sounds to surface similar items.

- Anomaly detection: The flipside of detecting similarities is detecting anomalies, or unusual behavior. In many cases, unusual behavior correlates highly with things you want to detect and prevent, such as fraud.

Deep learning is the name we use for “stacked neural networks”; that is, networks composed of several layers. The layers are made of *nodes*. A node is just a place where computation happens, loosely patterned on a neuron in the human brain, which fires when it encounters sufficient stimuli.



### Lecture slides

Different levels of big data analytics:

1. Information retrieval
2. Information enrichment
3. Machine learning

Process of text mining and statistical learning:

1. Text pre-processing
2. Feature generation
3. Feature selection
- 4. Mining**
- 5. Analysis of results**

### Step 4: Mining

- Various algorithms to analyze the data
  1. Supervised learning:
    - Classification and regression trees
    - K-nearest neighbor
    - Neural networks
  2. Unsupervised learning
    - Neural nets
    - Clustering algorithms
    - Self organizing maps

In supervised learning, a function  $f$  is sought that predicts the outcome  $y$  based on the input  $x$ .

$$y = F(x)$$

The function F is trained on known cases.

Unsupervised learning is more about recognizing groups of observations x that have more in common with themselves compared to the other observations.

*Two issues in machine learning:*

- Curse of dimensionality --> To train more complex models, exponentially more data is needed.
- Rule of thumb: 50 respondents per combination of categories
- Over-fitting your model --> A model might perfectly describe the data that you use to train it with. However, for future cases, it might be pretty far off. (technically, if the number of variables in your model is as large as the number of observations, you can come to a perfect model). --> K-neighbour example:

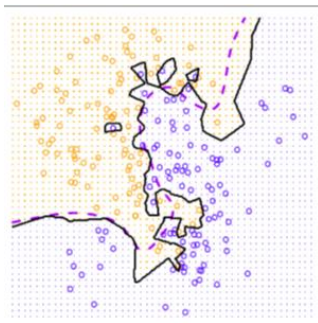


Figure 3: K=1

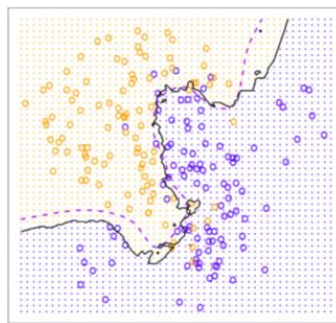


Figure 4: K=10

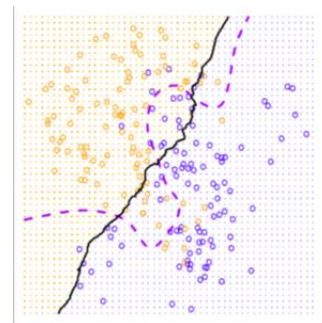


Figure 5: K=100

- When k-nearest neighbour is applied as the machine learning algorithm, the optimal value for k has to be chosen.
  - ➔ K=1: over-fits the data
  - ➔ k=10: more or less OK
  - ➔ K=100: under-fits the data

Because of this, various settings of the algorithm have to be applied. The difference in fit between the training set and the test set is an indication for over-fitting. Usually the k-value with the best fit in the test set is chosen as optimal.

*Step 5: Interpretation*

How to test the quality of the machine learning model ?

- With linear regression, you check R-square
- For logistic regression, you check Nagelkerke's R-square
- For machine learning algorithms, we don't have these measures.

Instead, we use a matrix related to (in)correct decisions. In case of two possible outcomes:

		True value	
		Yes	No
Prediction	Yes	a	b
	No	c	d

- Accuracy =  $\frac{a+d}{a+b+c+d}$  --> How many predictions were correct predictions?
- Sensitivity =  $\frac{a}{a+c}$  --> How many of the YES-es were correctly identified?
- Specificity =  $\frac{d}{b+d}$  --> How many of the NO-es were correctly identified?
- PPV (positive predictive value) =  $\frac{a}{a+b}$  --> How many YES-es were actually a true YES?
- NPV (Negative predictive value) =  $\frac{d}{c+d}$  --> How many of the NOs were actually true NOs?

$$F1 - measure = \frac{2 * Sensitivity * PPV}{Sensitivity + PPV}$$

		True value	
		Yes	No
Prediction	Yes	100	25
	No	50	125

F1 is the harmonic mean of PPV and sensitivity.

Example: ----->

- Accuracy = 225/300 = 0.75
- Sensitivity = 100/150 = 0.66
- Specificity = 125/150 = 0.83
- PPV = 100/125 = 0.80
- NPV = 125/175 = 0.71
- F1 = 0.72

## Relevant R-codes/output and meaning

From the practical (Lecture 5)

Necessary packages:

```
library(tidyverse)
library(tm)
library(rpart)
library(rpart.plot)
library(janitor) # to make nice tables
```

Show the files in each folder to confirm we have the right files:

```
dir(path_real)
dir(path_fake)
```

First create two separate corpora. Next, create one corpus with real and fake news articles combined. Include meta information that indicates which articles are fake and which articles are real.



```

corpus_real <- VCorpus(DirSource(path_real))
corpus_fake <- VCorpus(DirSource(path_fake))

n_real <- length(corpus_real) # number of real news articles
n_fake <- length(corpus_fake) # number of fake news articles

# combine the two corpora into one corpus
corpus <- c(corpus_fake, corpus_real)

# label each document with the 'truth' (fake or real news)
# when a news article is FAKE, we say FAKE = TRUE, otherwise FALSE
meta(corpus, "fake") <- c(rep(TRUE, n_fake),
                          rep(FALSE, n_real))

```

```

## <<VCorpus>>
## Metadata: corpus specific: 0, document level (indexed): 1
## Content: documents: 101

```

➔ This output shows that we have now 1 document with metadata, with 101 documents

### While preparing data:

```

## 1. Change upper case to lower case letters
corpus <- corpus %>%
  tm_map(content_transformer(tolower))

## 2. Stem words in a text document using Porter's stemming algorithm
corpus <- corpus %>%
  tm_map(stemDocument)

## 3. Remove punctuation from the text

```

```

corpus <- corpus %>%
  tm_map(removePunctuation)

## 4. Remove numbers from the text
corpus <- corpus %>%
  tm_map(removeNumbers)

## 5. Remove certain words
corpus <- corpus %>%
  tm_map(removeWords, stopwords("English"))

## 6. Remove too many spaces
corpus <- corpus %>%
  tm_map(stripWhitespace)

```

Let's reduce the number of terms a bit, removing those which are used in less than 20% of the documents.

```

dtm <- dtm %>%
  removeSparseTerms(0.8)

inspect(dtm)

# turn dtm into a data.frame (data matrix)
dtm <- dtm %>%
  as.matrix() %>%
  as.data.frame()

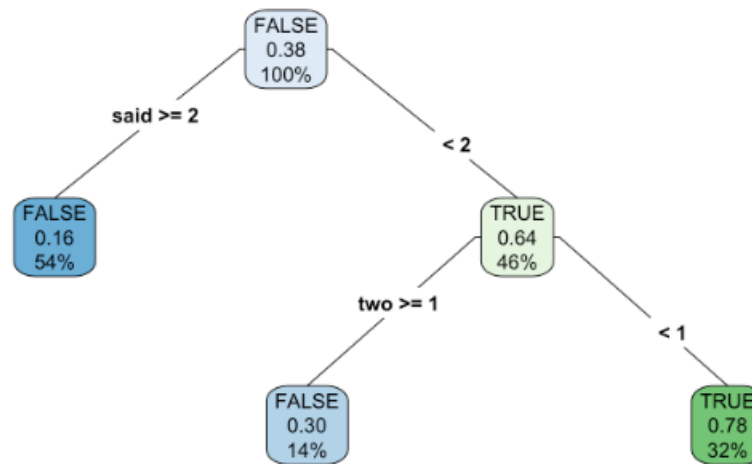
# add a column for the dependent variable (label)
dtm$fake <- meta(corpus)$fake

# select the documents sampled for testing from the combined corpus, and use
all other documents for training.
dtm_test <- dtm[test_indices, ]
dtm_training <- dtm[-test_indices, ]

```

```
# let's visualize these results...
```

```
rpart.plot(tree, type = 4, fallen = F) --> mske a decision tree like this:
```



```
prediction_tree <- predict(tree, newdata = dtm_test, type = "class")
```

```
prediction_tree <- prediction_tree == "TRUE"
```

➔ How well does the model predict whether a news article is fake or real?

```
tibble(predicted = prediction_tree, truth = dtm_test$fake) %>%
```

```
  tabyl(predicted, truth) %>%
```

```
  adorn_title("combined")
```

Outcome:

```
## predicted/truth FALSE TRUE
```

```
##           FALSE    13    7
```

```
##           TRUE     3    7
```

**Go rock your studies**

**GOOD LUCK!**

