Ing. Petr Mikuš, Ph.D.

### Content of the lecture

- What? General definition of innovation
- 2. Who? Josef Alois Schumpeter
- 3. What kind? Typology of innovation
- 4. Where? Position in the company
- 5. Why? The source and motives of innovation
- 6. How? Management of the innovation process
- 7. How 2nd? Tools and conditions for the creation of business innovations

### What are innovations?

Everything that is created by humans was once an innovation... it is everything that surrounds us, everything was once for the first time... a product of scientific and technical development.

It was usually not just invented, but led to sustaining the market or livelihood. These are one of the main drivers of innovation.

**Innovation - What?** 

Innovation is a multi-step process in which organizations transform ideas into new / improved products, services or processes in order to successfully advance, compete and differentiate themselves in their market.

DOI: 10.1108/00251740910984578

Innovation is the production or adoption, assimilation and use of novelty with added value in the economic and social sphere; renewal and expansion of products, services and markets; development of new production methods; and the introduction of new management systems. It is both a process and an outcome.

OECD

An innovation is a new or improved product or process (or combination thereof) that is significantly different from the unit's previous products or processes and that has been made available to potential users (product) or put into operation by the unit (process).

OSLO Manual 2018 (4 th edition)

Or the definition according to ISO 56000:2020 - Innovation management new or changed entity, realization or redistribution of value

Note 1: Novelty and value are relative and determined by the perception of the organization and relevant stakeholders.

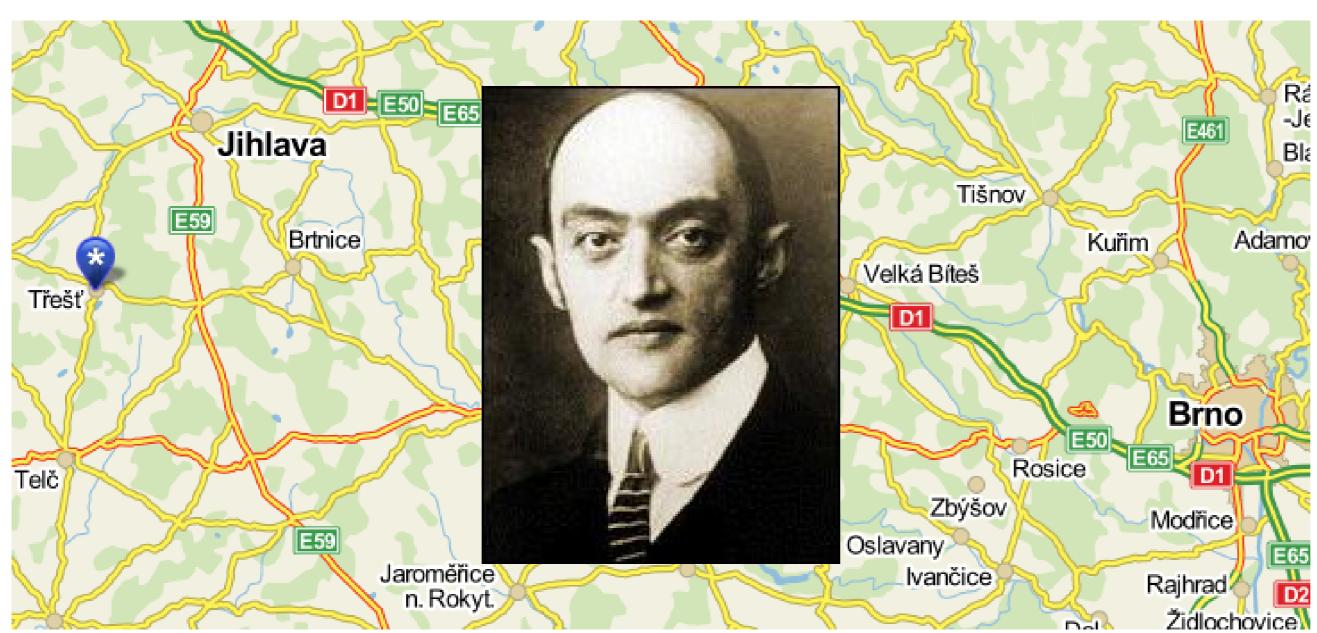
Note 2: An innovation can be a product, service, process, model, method, etc.

Note 3: Innovation is an outcome. The word "innovation" sometimes refers to activities or processes leading to or aimed at innovation. When 'innovation' is used in this sense, it should always be used with some form of qualifier, eg 'Innovation activities'.

Innovation - What?

## WHO? Joseph A. Schumpeter

Josef Alois Schumpeter (February 8, 1883, Třešť - January 8, 1950, Taconic, USA) was an academic economist and political scientist. He also served as Minister of Finance of Austria and President of a private bank.



innovation = the driving force of business activity

- new combinations of production factors
- the main means that sets the capitalist machine in motion a

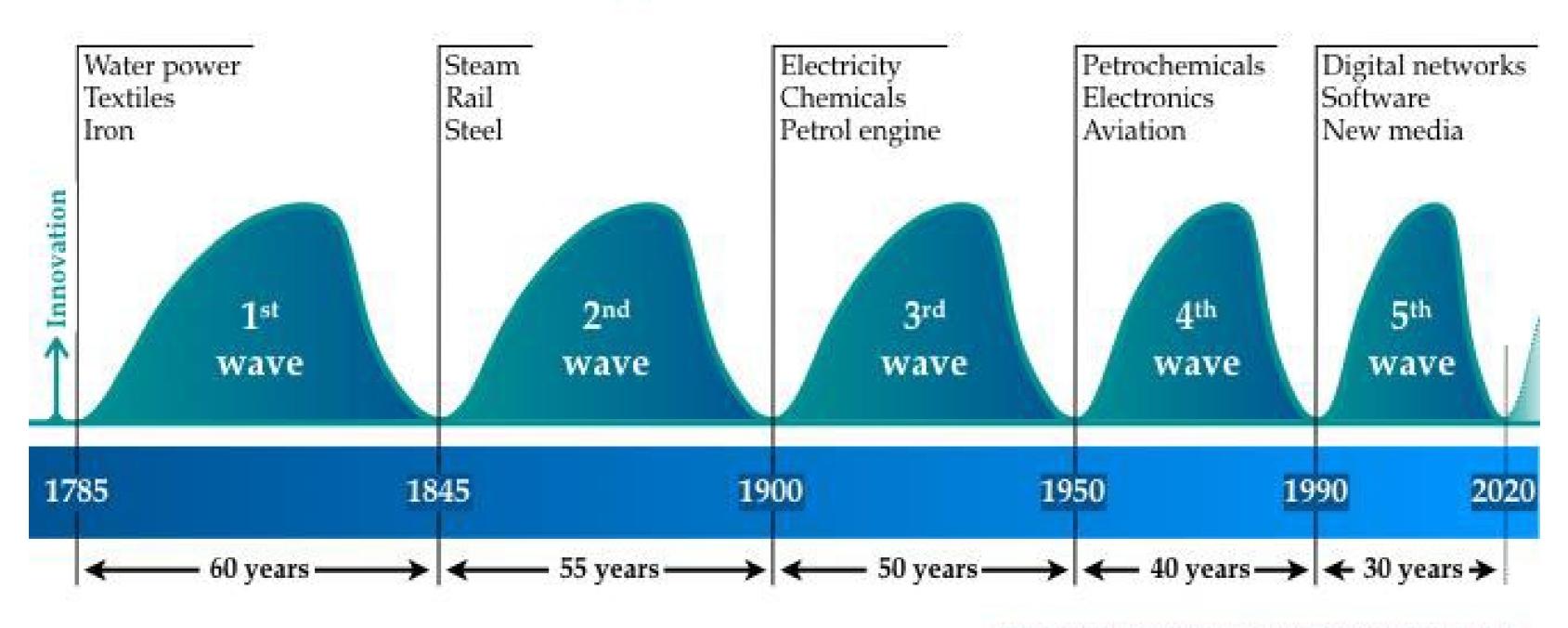
is a source of acquisition

- new products, (products)
- new markets and (products)
- forms of industrial organization.
   (process)

Rooseweltova 6/462, 589 01, Třešť

## Technological cycles – Kondratev cycles

#### Schumpeterian Waves Accelerate



http://www.understandinginnovation.wordpress.com

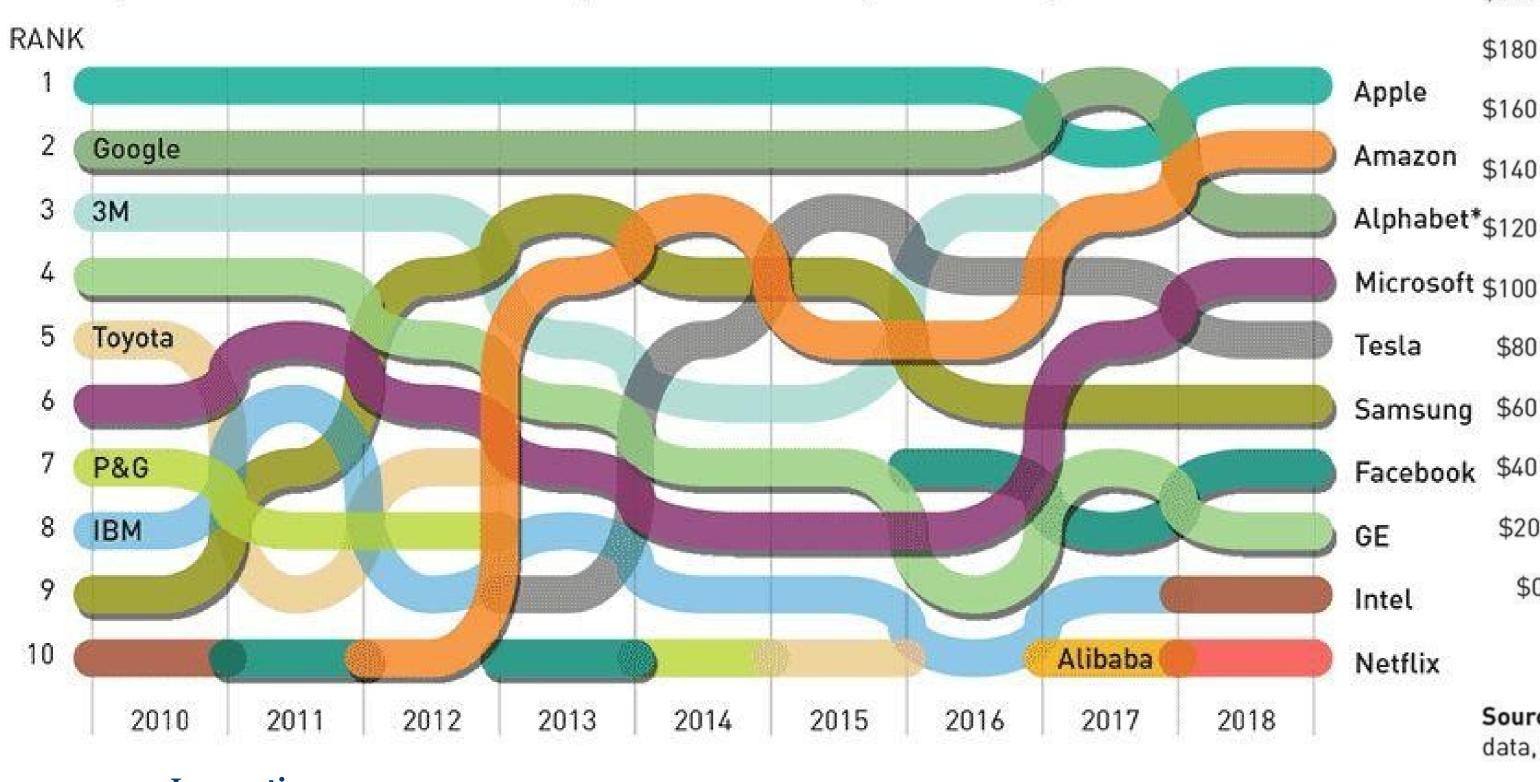
## Kondratev period:

- Industrial Revolution (1771)
- The Age of Railways and Steam (1829)
- The Age of Heavy Engineering and Steel (1875)
- The Age of the Automobile, Electricity and Mass Production (1908)
- The Information and Telecommunications Age (1971)
- •Healthcare (2005) was a premise now more AI, automation

## Which companies?

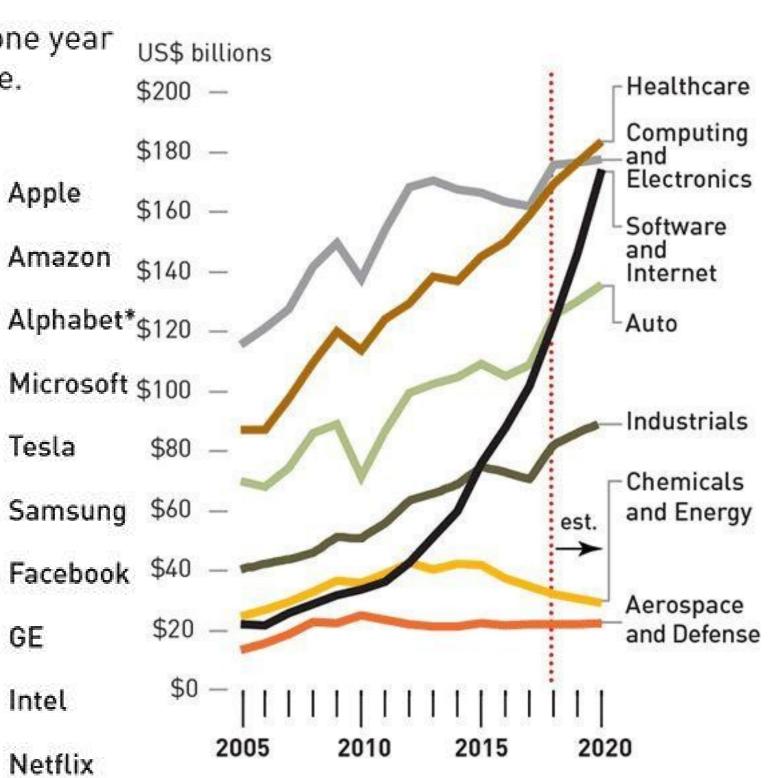
#### The 10 Most Innovative Companies

Apple was selected by survey respondents as the world's most innovative company again, one year after Alphabet had been voted to the top of the list. Netflix joined the top 10 for the first time.



#### R&D Spending by Industry

Companies in the healthcare and software and Internet sectors demonstrated sustained growth in R&D spending, which has been increasing for years in both cases.



Source: Capital IQ data, Thomson Reuters Eikon data, Strategy& analysis

<sup>\*</sup> In 2015, Google announced a corporate restructuring forming an umbrella company called Alphabet Source: Strategy& analysis

# Breakdown of innovations from a qualitative point of view

- Disruptive if you can combine the previously uncombinable...
- https://www.youtube.com/watch?v=TIO2gcs1YvM
- Radical Revolutionary revolutionary (discontinuous) changes. if you know who you are playing against...(ISBN 978-80-869-4610-8)
- Gradual Partial evolutionary (incremental) changes if you don't know who you're playing against but you know where you're going (ISBN 978-80-7400-198-7)

## Disruptive innovation

- Completely new discoveries, but especially their applications!
- Disruptive technology is the term of American professor Clayton M. Christensen.
   Disruption generally means to tear, crack, or break apart. Disruptive is usually translated as revolutionary.
- In general, disruptive technologies fundamentally outperform and displace existing technologies. So it is not a gradual, evolutionary change, but a radical change. From a process perspective, this is a revolutionary process change (according to Tom Davenport).
- Clayton Christensen later moved from the term "disruptive technology" to the term "disruptive innovation". By this, he wanted to indicate that it is not so much the technologies themselves that are revolutionary, as the revolutionary way of their implementation in the organization (either in production or support processes).

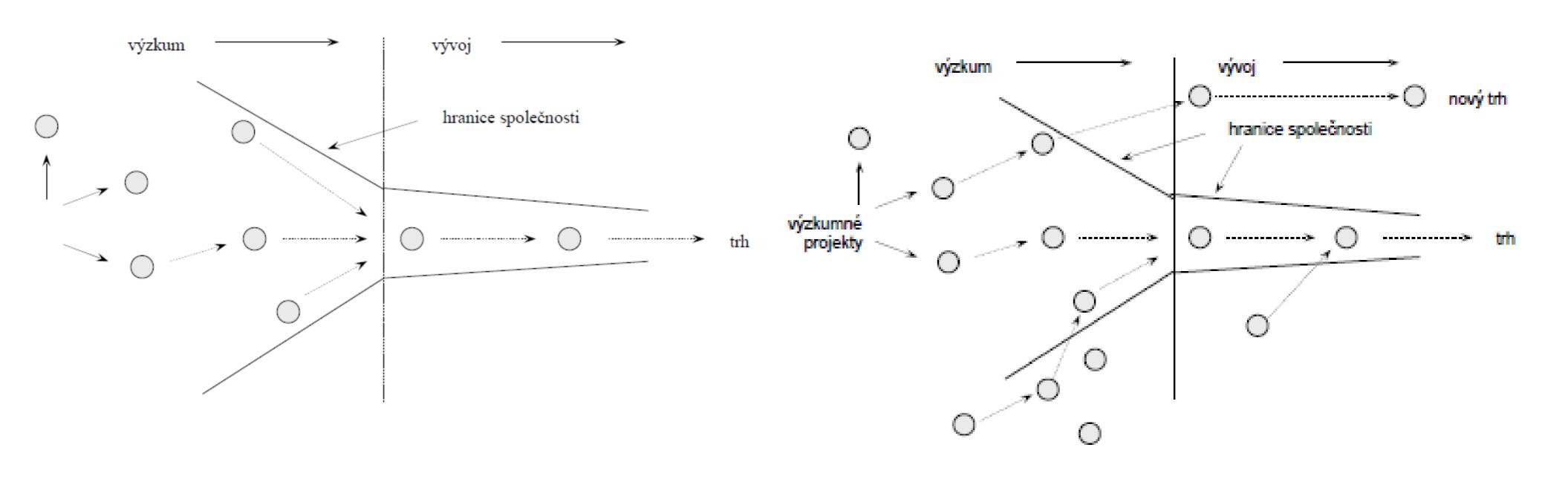
## Order of innova

|  | Order of innovation   | Description according to Valenta - 0-85860-11-2  |
|--|---|--|
|  | - n   | degeneration, nothing is preserved, loss of properties changes, wear and tear                              |
|  | 0   | regeneration, the object itself is preserved, properties are restored, maintenance                         |
| 1  |   |  |
| change of quantum, all properties a  |   | change of quantum, all properties are preserved, frequency of factors is changed, labor is added           |
|  | 2   | intensity, quality and connection are maintained, speed of operations changes, accelerated belt movement   |
|  | 3   | reorganization, qualitative characteristics, the division of activity will change, transfers of operations |
| qualitative adaptation, quantity remains, links to other factors char construction |   | qualitative adaptation, quantity remains, links to other factors change, technological construction        |
|  |   |  |
|  | 5 variant, the design solution remains, partial quality changes, faster machine |  |
| 7 type, the principle of technology remains, the design concept, the jet cond      |   | generation, the design concept remains, the design solution changes, the machine with electronics          |
|  |   | type, the principle of technology remains, the design concept, the jet condition changes                   |
|  |   | genus, belonging to the tribe remains, the principle of technology changes, the hovercraft                 |
|  | 9   | tribe, nothing is preserved, the approach to nature changes, genetic manipulation                          |

## Order of innova

| Order of innovation | Designation                                | What is preserved         | What is changing         | Example                     |  |  |  |
|---------------------|--|---------------------------|--------------------------|-----------------------------|--|--|--|
| Minus n             | Degeneration                               | Nothing                   | Loss of properties       | Wear and tear               |  |  |  |
| 0                   | Regeneration                               | Object                    | Property recovery        | Maintenance, repairs        |  |  |  |
|                     | RATIONALIZATION                            |                           |                          |                             |  |  |  |
| 1                   | Change in quant                            | All properties            | Frequency of factors     | Additional workforce        |  |  |  |
| 2                   | Intensity                                  | Qualities and connections | Speed of operations      | Increased belt displacement |  |  |  |
| 3                   | Reorganization                             | Qualitative properties    | Division of activities   | Transfers of operations     |  |  |  |
| 4                   | Qualitative adaptation                     | Quality for users         | Link to other factors    | Technological construction  |  |  |  |
|                     | QUALITATIVE INNOVATION                     |                           |                          |                             |  |  |  |
| 5                   | Variant                                    | Constructional solutions  | Partial quality          | A faster machine            |  |  |  |
| 6                   | Generation                                 | Construction concept      | Constructional solutions | Machine with electronics    |  |  |  |
| 7                   | Species                                    | Principle of technology   | Construction concept     | Jet state                   |  |  |  |
| 8                   | Genus                                      | Belonging to a tribe      | Principle of technology  | Nonwoven                    |  |  |  |
|                     | TECHNOLOGICAL REVOLUTION - MICROTECHNOLOGY |                           |                          |                             |  |  |  |
| 9                   | Strain                                     | Nothing                   | Access to nature         | Gene manipulation           |  |  |  |

## Closed vs. Open innovation



## Closed vs. Open innovation

Own R&D staff

Profitability is synonymous with product discovery, development and sales.

Our own innovation is available on the market under our name

Whoever innovates first wins, whoever innovates the most is even better;)

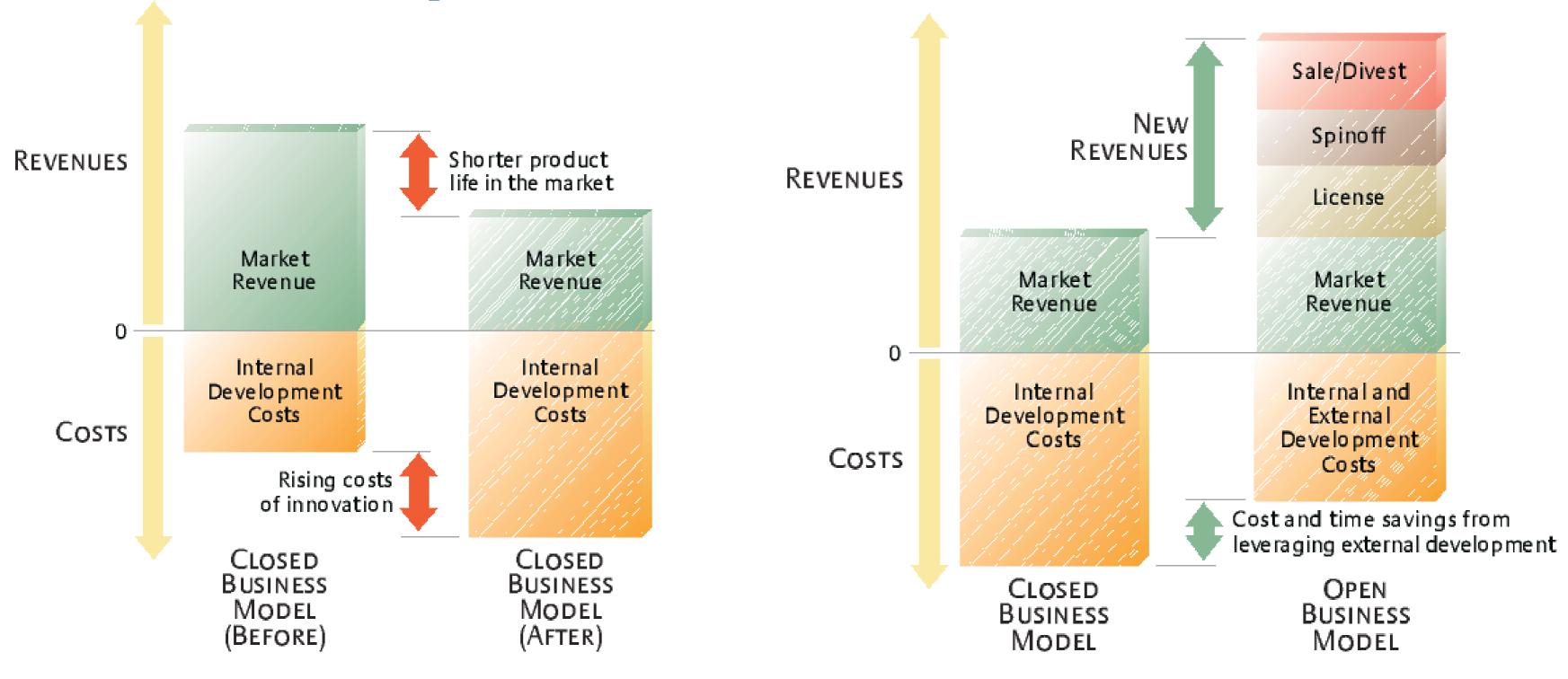
Absolute control of intellectual property, no one else can profit from it.

Cooperation with people outside our R&D

Synergistic effect of interdisciplinary cooperation (CEITEC, HUMELAB, MU and the private sector – contract research)

We profit from ideas used outside our company (licensing, sale of intellectual property, etc.)

### Closed vs. Open innovation



https://sloanreview.mit.edu/article/why-companies-should-have-open-business-models/

## Closed vs. Open innovation - what if?

Our developers leave and start their own business...

XEROX PARC - Palo Alto Research Center, founded by XEROX in 1970 R&D center for the development of new technologies for XEROX If XEROX didn't like any of the new technologies, it gracefully let the developer leave...

### **XEROX PARC**













3C0M

Macintosh



# **Breakdown of innovations - substantive point of view**

From the point of view of the company, innovations can be categorized as follows (OSLO manual):

- Innovation in the field of business processes product
- Innovation in the field of production and services process
- Organizational innovation (process)
- Marketing Innovation (Process)
  - Innovation of the position (FORD luxury estate to ordinary estate)
  - Paradigm innovation (low-cost airlines, ordinary product to designer)

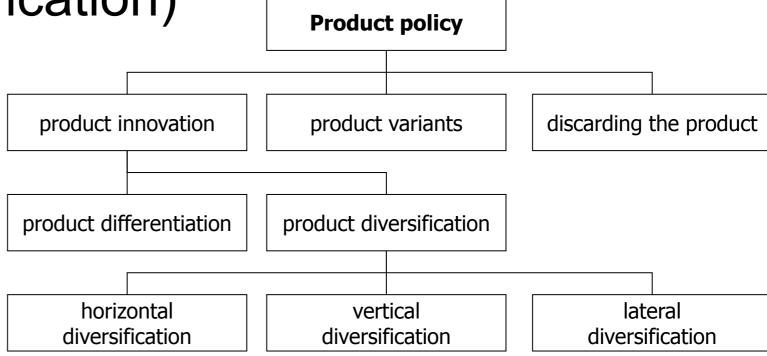
### **Product innovation**

focused on creating completely new products

- based on new design concepts and principles (differentiation)
- satisfying completely new needs (diversification)

The goal is:

- replacement of obsolete products
- striving to maintain market share
- gaining new markets



### **Product innovation**

#### Innovation:

- product differentiation = supplementing the product line with a new product
- product diversification = introduction of a new product line
  - horizontal product introduction at the same production level
  - vertical a product corresponding to a subsequent or previous stage of production
  - lateral products of a completely different type

# Innovation of new product introduction strategy

#### New product introduction strategy:

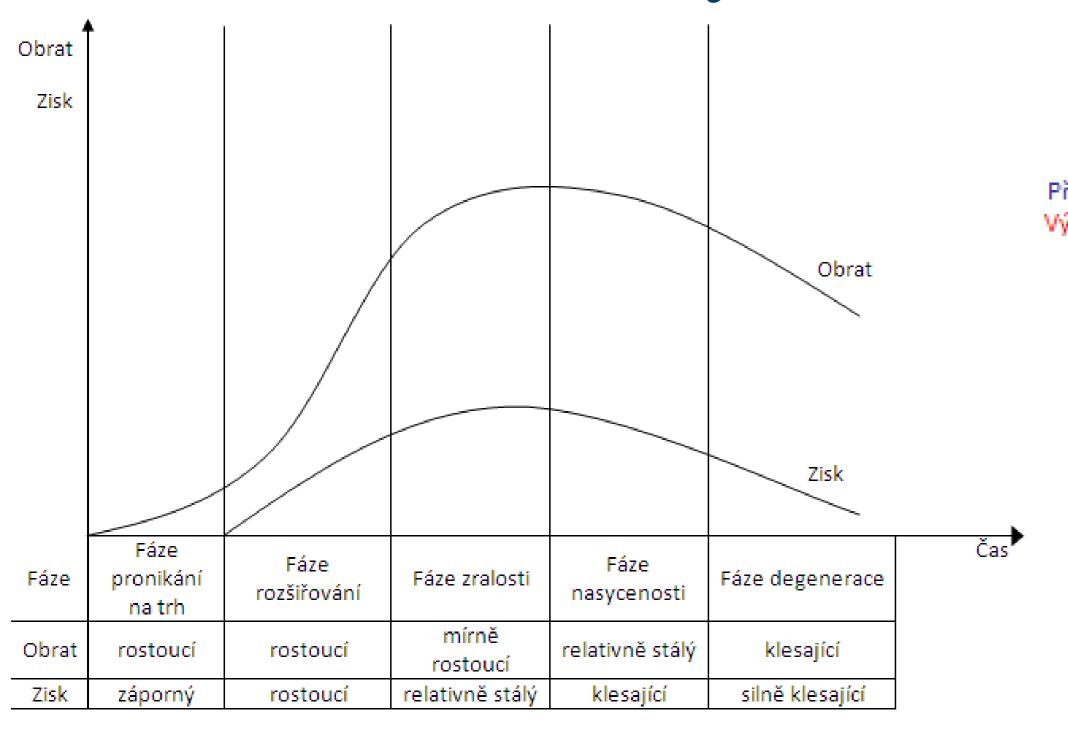
- copycat strategy (clone, problematic, reverse engineering)
- innovation option (own research, creation of a patent)
- purchase option (license, acquisition, patent purchase)

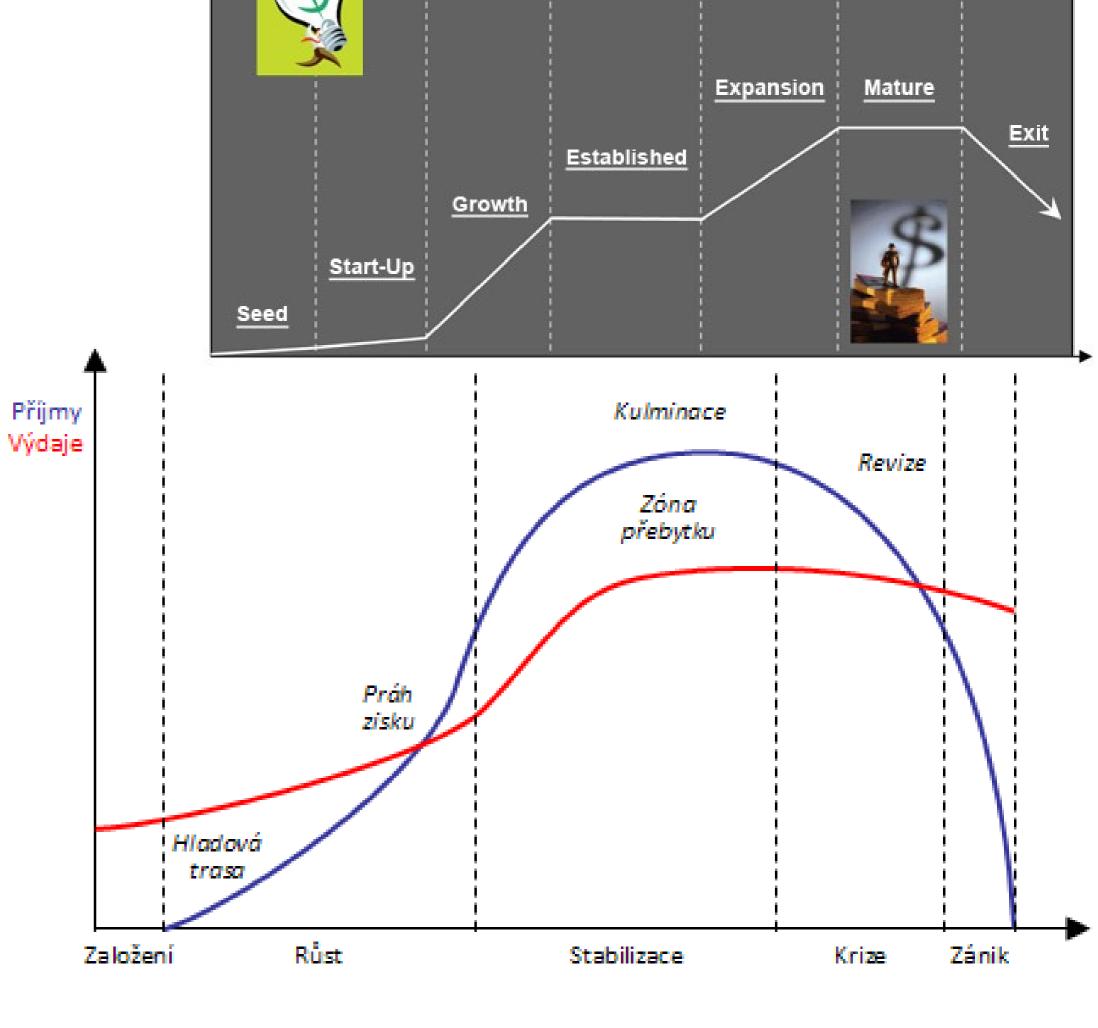
Innovation - What and how?

## Product innovation and link to the life cycle

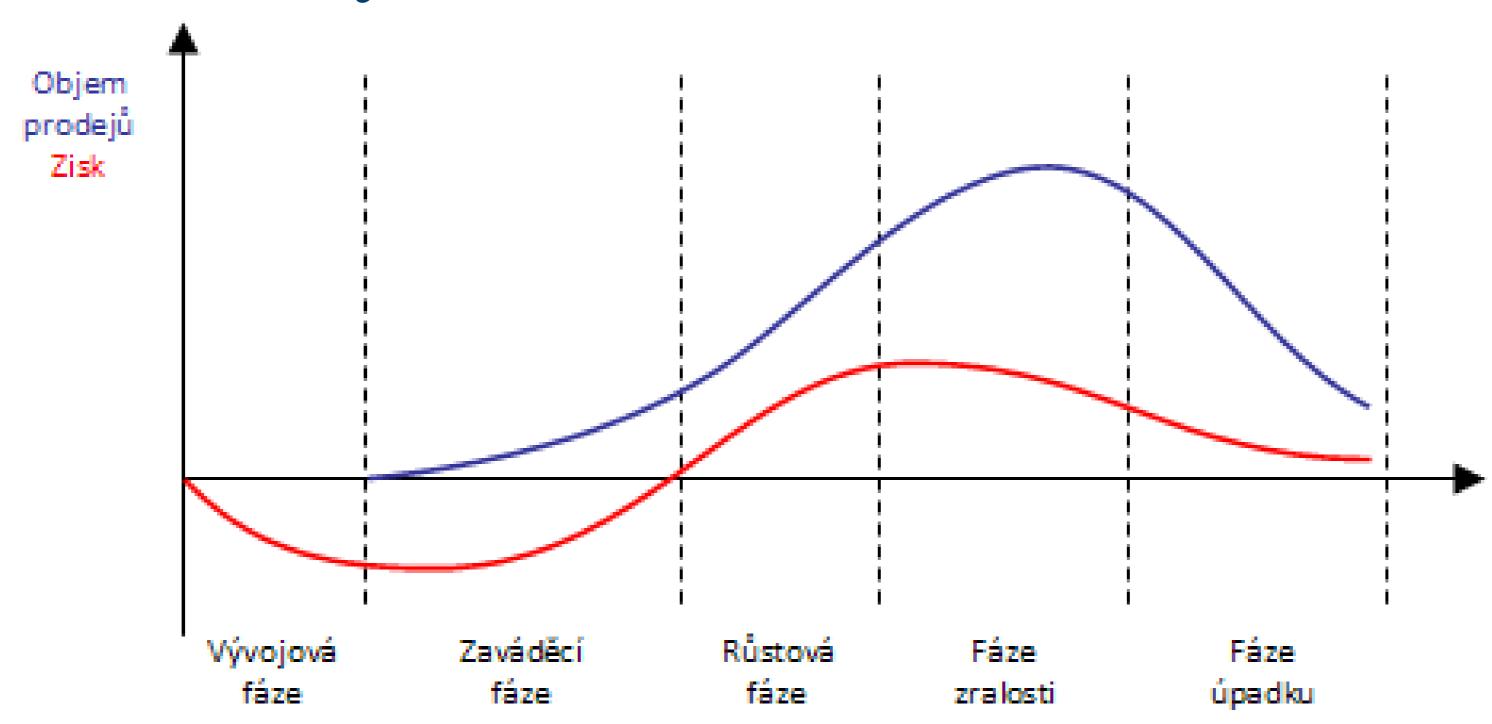
- product innovations precede the introduction of the product into production and are connected
- with the penetration phase
- product variants are put into production in the maturity phase
- disposal of the product closes the life cycle and is approached normally
- in the stage of degeneration

## Business life cycle

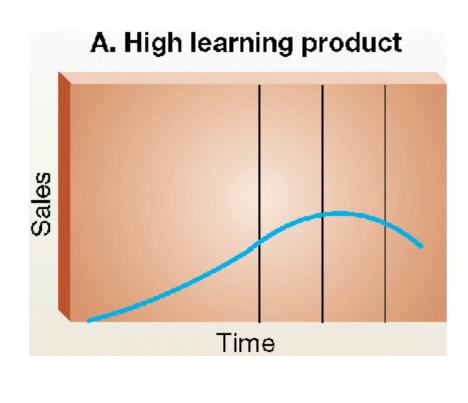


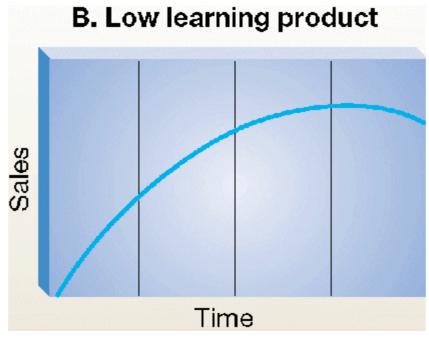


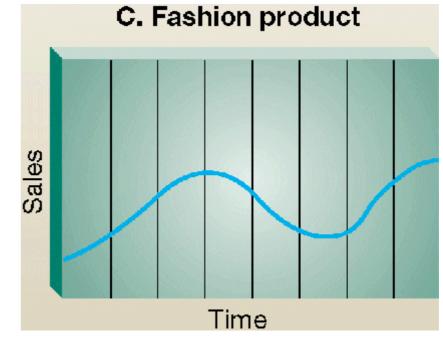
## Product life cycle

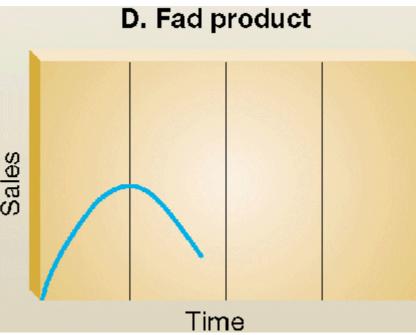


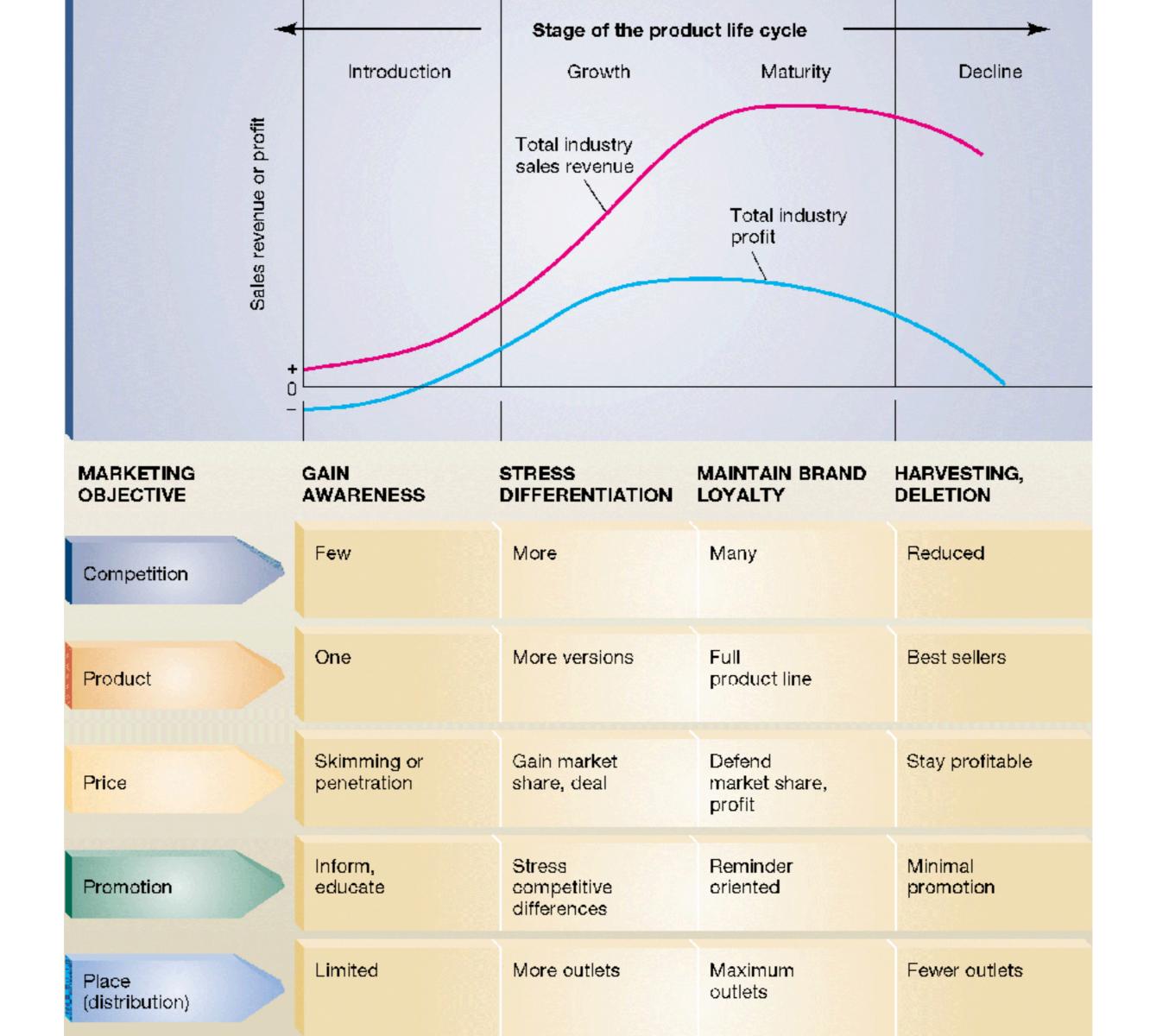
## Product life cycle



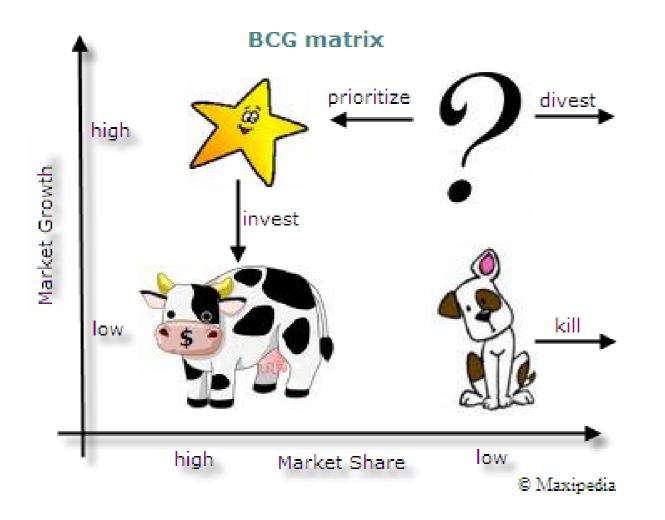






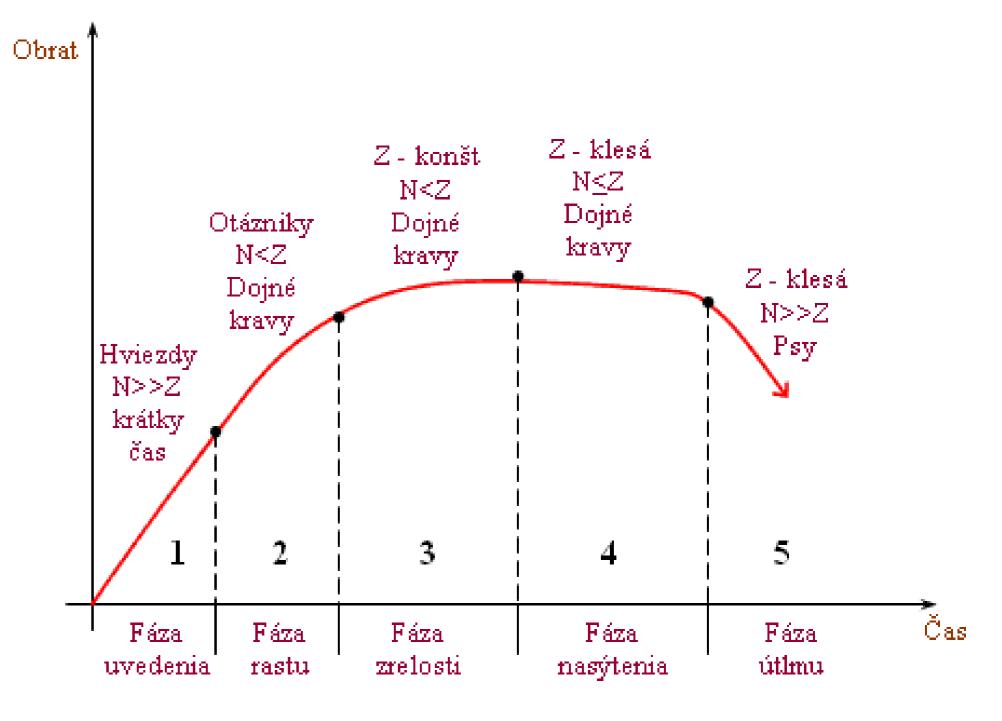


**BCG** 



Relative Market Share

|             |      | High      | Low               |
|-------------|------|-----------|-------------------|
| Growth Rate | High | Stars     | Question<br>Marks |
| Market Gr   | Low  | Cash Cows | Dogs              |

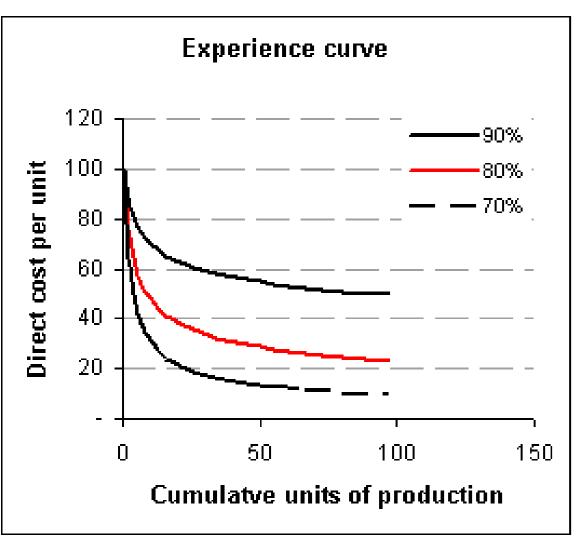


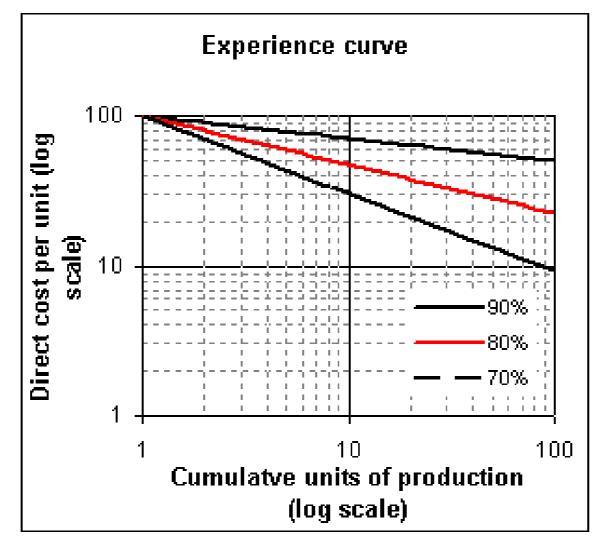
### **Process innovation**

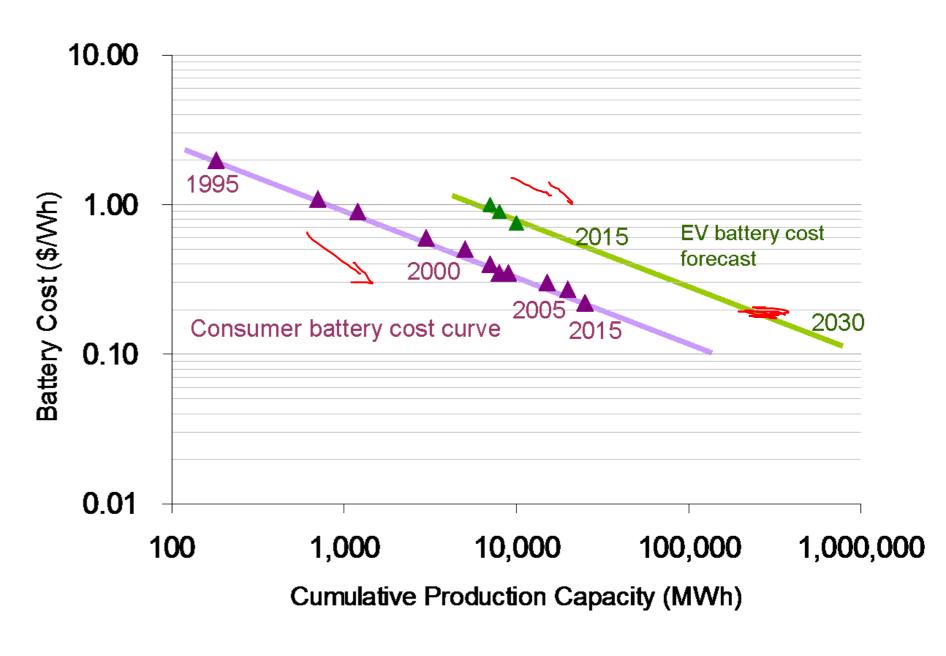
#### The goal is:

- Cost reduction:
  - material consumption
  - labor costs
  - reducing energy consumption
  - waste
- improvement of working conditions
- reducing the burden on the environment

### **Process innovation**







https://www.bain.com/insights/tipping-points-when-to-bet-on-new-technologies/

# Organizational innovation (management and administration)

You will find these innovations in the first parts of management textbooks as a historical development...

For example, driving schools

Organizational charts and structure

Bureaucracy

## Marketing innovation

News in the field of communication, branding...

- Influenced by technology
- Affected by the problem
- Influenced by company policy
- Influenced by the market
- Etc...









1940



1950



1962



1973



1991



1998



2005



2008



2008







LOGO EVOLUTION BY **BRAND NEW** 



JEPSI: OLA



1950





PEPSI







During this period, there are dozens of logo variations as the logo is drawn differently for labels, print ads and packaging.



1950s - 1960s ("Fishtail" logo)



1960s (wave is introduced)



**Coke** Coke





2000s

2005

2008

) pepsi





# Breakdown of innovations by business area — management level

| Úroveň   | Úkoly                   |
|--|-------------------------|
|  | koncepce výrobek - trh  |
| strategické plánování výroby<br>(hledání konkurenční výhody) | koncepce zdrojů         |
|  | konkurenční pozice      |
|  | výrobní program         |
| taktické plánování výroby<br>(obsah koncepce)                | kapacity (stroje, lidé) |
|  | organizace              |
|  | zajištění zdrojů        |
| perativní plánování výroby<br>realizace)                     | lhůty a kapacity        |
|  | sledování a evidence    |

Innovation Where?

# Strategic production management, process and product innovation

production program - participation in decision-making on the fundamental directions of the development of the production program, joint decision-making on large-volume orders,

capacities and equipment - fundamental directions of development and rationalization, reconstruction, volume and dislocation of resources (investments),

production planning and management - concepts and methods of production planning and management, concept of using information technologies in production management,

quality management - the concept of production quality management (for example, the decision on accreditation according to ISO), long-term development trends and measures in the field of production quality,

inventory management - method of securing, deciding on key suppliers, volume and dislocation, rationalization,

workforce - increasing qualifications, motivation, wage policy, relations with trade unions,

organization - organizational structure, centralization and decentralization of management, type of production organization, roles, powers, responsibilities,

integration - system of internal economic management, relations with customers, suppliers, etc.

Innovation Where?

# Tactical production management, process and product innovation

Závisí na přijaté strategii konkurenční výhody – typicky náklady × diferenciace Rozhodnutí se týkají

- Výrobku realizace výrobkové politiky (diverzifikace, inovace, diferenciace, variace, eliminace)
- Vybavení výrobního systému
- Organizace výrobního procesu

Výsledkem taktického řízení – základní určení výrobního programu

Innovation Where?

### Innovation as a competitive advantage

Why does the company innovate? The purpose is to:

- improve manufactured products and provided services (product innovation),
- make the used production (technological), management and administrative procedures cheaper and more productive (process innovation).

Innovation - Why?

# Acting in the position of the company

| Mechanism of innovation                         | Strategic advantage  | examples   |
|---|--|--|
| product novelty                                 | the ability to offer something first                                 | fountain pen, camera dishwasher,<br>wlkman                                     |
| novelty of the process                          | a way to offer a product in a way that others cannot                 | special production procedures, distribution procedures, cryptocurrency payment |
| complexity                                      | the ability to offer something that others find difficult to pass up | rolls royce, aircraft engines i.e.<br>demanding products                       |
| legislative protection of intellectual property | license, fees  | medicines  |
| expansion of competitive factors                | price, quality, selection  | cars, clothes  |
| timing  | first mover advantage  | Seznam.cz, atlas.cz, Google, Facebook  |

#### Forced and voluntary innovations

- Above all, legislation and requirements
- Current emission of cars, factories (permits)
- Prohibition of leaded petrol, other plastics

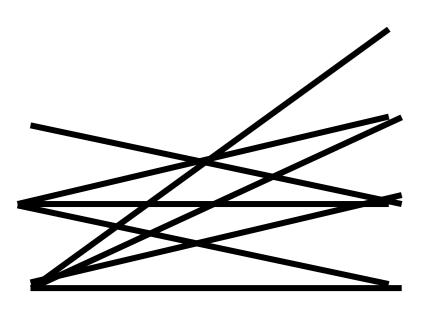
Voluntaries are driven by demand and the market

#### A source of innovation

overlooked

ignored

forgotten



connections

thoughts

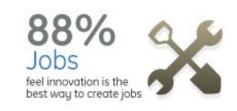
imaginations

opinions

# What is the impact of innovation?















#### What drives Innovation?







Protection agree that when the protection of

effective then innovation can occur

the copyright and patent are

believe that innovation will occur when private investors are supportive of companies that need funds to innovate

#### Budget 48% Allocation

believe that when government and public officials set aside an adequate share of their budget to support innovative companies. innovation can brew

think innovation can occur when governmental support for innovation is efficiently organized and coordinated

Data collected from an independent survey of 1,000 senior business executives across 12 countries on the state and perception of innovation

**Innovation - Why?** 

41

# Business economy - innovation

# Innovation management

### Introducing innovations - risks

A business cannot do without innovation. They are needed from the point of view of the future growth of the company (voluntary and involuntary innovation), but at the same time

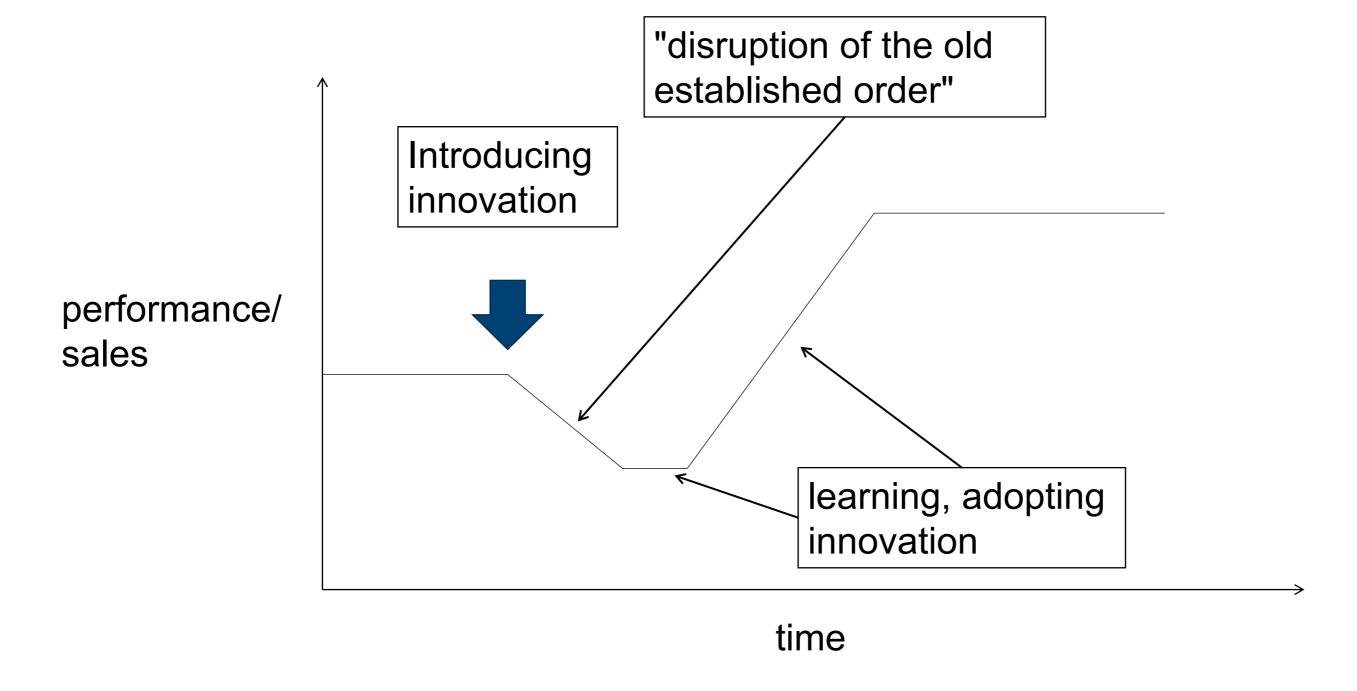
difficult to implement

A learning curve

- costly
- time consuming

**Innovation - How?** 

## Introducing innovations - risks



Innovation - How?

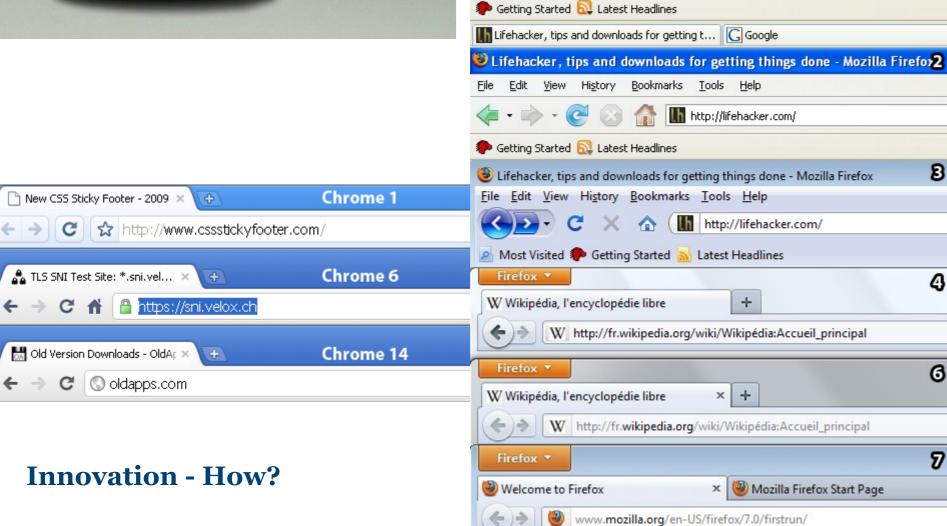
44

#### Failed innovation









File Edit View Go Bookmarks Tools Help

🔷 🕶 - 😂 🔘 🏠 🏠 http://www.gutenberg.org/wiki/Main\_Page



Beta before. Beta now. Beta later.

Beautyproving/because floodwards resulte

theBetaMakers

"TV Diges and Visito Regions."

#### Failed innovation

Process innovations concerned, for example, Vltava stores, Mall, cz and thus gave rise to ALZA.cz

Blockbuster ...a video rental store

Innovation - How?

### Innovation management - in general

Reactive – You react late to the competition/industry trend Risks and benefits?

Proactive - you react ahead of time - your business is a leader Risks and benefits?

# Tools for introducing innovations in the enterprise

Communication - between employees, with employees, across the entire company, the HR department must be involved

Business portals – tools for data exchange (failure of Česká pošta email)

Meetings – Innovation circles, informal meetings, sharing problems

Boxes - if too demanding, create a space for anonymous and nonanonymous suggestions

Innovation - How?

# The stage of innovation from the point of view of the management process

- 1. Research internal and external environment, signals, threats, opportunities...
- 2. Choice deciding which signal the company will respond to
- 3. Implementation transferring the potential from a new idea to an internal or external market
- 4. the gain of knowledge resources for the development of innovation research, development, technology transfer, clusters...
- 5. project implementation in conditions of deterministic (certainty, alternative), stochastic (risk, probability), game models
- 6. bringing the innovation to market
- 7. maintaining innovation in the market
- 8. feedback, learning
- 9. variation

Innovation - How?

#### Innovation - market test, MVP

Kickstarter, starter, indiegogo...D Day,.... JICs and incubators

Lean Startup - Lean Canvas, pivoting

Small business vs. Startup

Innovation potential of SMEs?

#### 7 steps to successful innovation (1-3)

- 1. Formulating a strong vision the vision will help prove that the innovation makes sense, and it will at the same time motivate others to support the innovator. The vision should be described simply and understandably. It includes a justification of the benefit of the innovation and a proposal for a milestone for the implementation of the innovation.
- 2. Stakeholder identification determining the people who will be affected by the innovation. It is not only employees, but also suppliers, customers, etc.
- 3. Getting support for the project Innovation is rarely the product of an exceptional intellect individual, therefore the support of other people is needed. There is a need for technical, political, financial and
- other forms of support so that the innovation can take place.

**Innovation - How?** 

#### 7 steps to successful innovation (4-5)

- 4. Preparation of the business case when creating the basis, it is important to clearly define the goals of the project, its benefits for customers and the organization, important time points of implementation, possible obstacles, costs and other resources associated with implementation.
- 5. Talk to stakeholders create awareness of the innovation, arouse stakeholder interest and desire by demonstrating its benefits and ask participants for help in implementing the innovation (or the AIDA principle Awareness, Interest, Desire, Action).

Innovation - How?

#### 7 steps to successful innovation (6-7)

- 6. Expect resistance inevitably, some stakeholders will oppose the idea. It is very likely that during the presentation of the idea, there will be opposing arguments about technical infeasibility, excessive costs, high risk, lack of acceptance by the market, etc. In these cases, it is important to find the cause of the resistance and determine the importance of the argument. Subsequently, a suitable method must be chosen to reduce the resistance as much as possible. Persuasion using demonstrable facts, involvement of a person in project activities, but also negotiation of cooperation conditions or, in the worst case, a directive instruction, can be used.
- 7. Maintain enthusiasm for the cause no innovation happens overnight and you need to devote time to it. It is important to maintain optimism and faith in the success of the innovation. This confirms Joseph Schumpeter's statement: "Successful innovation is not the intellect, but the will."

Innovation - How?

**53** 

### **Tools and Terms**

Innovation

#### Legal protection of innovations

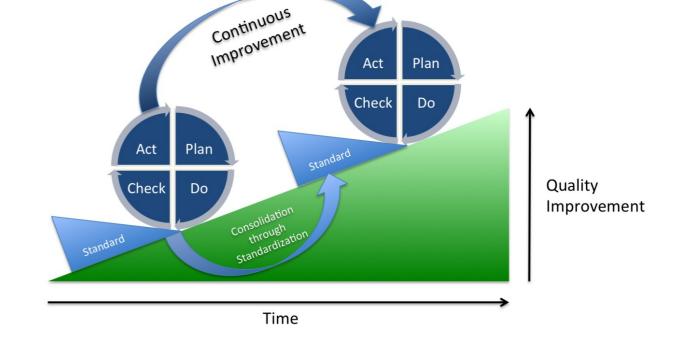
Innovations can be protected - patent protection

https://upv.gov.cz/prumyslova-prava

Do not confuse copyright and economic rights

Newly, your applications are not tracked...you have to track them yourself 😊

### PDCA – Demming cycle



**Plan** Review current performance and assess potential problems or process limitations. Collect data on the main problems and focus on the root causes of the problems. Suggest possible solutions and plan the implementation of the most suitable solution.

Implementation Implementation of the intended solution.

**Control, measurement** Evaluate the test results and assess whether the planned results have been achieved. If there are any problems, focus on the obstacles that prevent improvement.

**Action** Based on the tested solution and evaluation of the achieved value, develop the final solution so that it becomes a permanent and integrated new approach that can be used anywhere.

#### **Ansoff matrix - product**

|                 | Existing product      | New product            |
|-----------------|-----------------------|------------------------|
| Existing market | Market<br>penetration | Product<br>development |
| New market      | Market<br>development | Diversification        |

Market penetration - the company will try to penetrate more with an existing product in an existing market (market segment). The goal is to increase your market share. It is the least risky strategy because the company can use existing resources, processes and capacities.

Market development - involves finding additional market segments or regions. The company uses existing products and if it manages to produce them well, it can be a suitable strategy. It is riskier than the previous strategy.

Product development - the company innovates the product and tries to apply it to existing markets. This strategy is appropriate if the firm is strong in innovation. New product development is riskier than previous strategies.

Diversification - this is the riskiest option of all four. A business must innovate an existing product or develop a new one and succeed with it in a new market.

#### Blue ocean and Red ocean - strategy

Blue Ocean Strategy, translated as blue ocean strategy. It is a method of creating a company's business strategy, which was described in the book of the same name by W. Chan Kim and Renée Mauborgne. The book was first published in 2005. Blue Ocean Strategy is based on the idea that any business can achieve higher profits by creating new demand in a non-competitive market (the so-called blue ocean) much more easily than by competing with competitors in existing markets.

https://www.blueoceanstrategy.com/

### Blue ocean and red ocean - strategy

#### Blue Ocean Strategy

- •A concept created by the pair of professors W. ChanKim and Renné Mauborg in 2005
- •The blue ocean represents a new market space.
- •Some blue oceans can be created outside the boundaries of existing industries, most are found within red oceans.

#### Ed OceanStrategy

- In red oceans, the boundaries of individual sectors are firmly defined, so they are accepted and the competitive rules of the game are also known to all participants.
- •Companies strive to gain a larger market share than their competitors.
- •However, the market space is quickly filled and thus the prospects for profit and growth are reduced. Individual products become interchangeable and the ocean is colored red by competition.

# Finding the problem 5 Why? (WIKI) – process innovation

Asking yourself "5 times why?" it resembles a child's dialogue with a parent.

a round of questions

question: Dad, why isn't the car running?

answer: Because it doesn't have gas.

a round of questions

question: And why doesn't he have gas?

answer: Because I forgot to buy it.

a round of questions

question: And why did you forget to buy it?

answer: Because I didn't know we were running low.

a round of questions

question: And why didn't you know we were running out?

answer: Because it's dark and I can't see the fuel gauge.

a round of questions

question: And why can't you see the fuel gauge?

Answer: Because I didn't replace the broken light bulb in the instrument panel.

#### TOC – process innovation

Assuming that the system objective has been formulated and its measurements defined, the steps are:

- Determine system limitations.
- Decide how to make more and better use of system limitations.
- 3. Subordinate everything else to the above decision.
- 4. Ease system restrictions.

Warning! If the constraint was violated in the previous steps, go back to step 1, but do not let inertia cause the system to be constrained. 978-0-88427-178-9. ISBN

### TQM process and product

TQM (Total Quality Management), usually not translated and the abbreviation TQM is used, is a very complex management method that emphasizes quality management in all dimensions of the organization's life. It thus goes beyond the framework of quality management and becomes a method of strategic management and a managerial philosophy for all the activities of the organization. There are a number of different forms and interpretations of TQM.

- Kaizen the idea that it is necessary to continuously improve processes, clearly describe them, measure them and ensure their repeatability
- Atarimae Hinshitsu the idea that things will work as they are supposed to (the knife will cut)
- That 's it ok ...
- Kansei the idea that researching how a customer uses a product leads to product improvement
- Miryokuteki Hinshitsu the idea that things must have an aesthetic quality (the appearance of a tool
  must bring pleasure and ergonomics to its user)

### KAIZEN – process and product

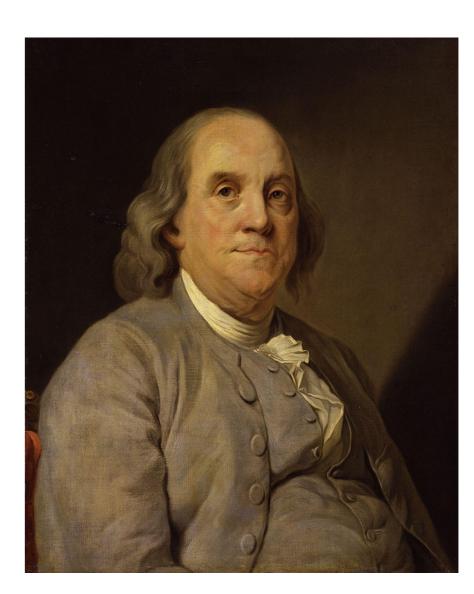
Kaizen is a method of gradual improvement based on the cultural traditions of Japan (the word kaizen itself comes from Japanese). Improvement focuses on the gradual optimization of processes and work procedures, increasing quality and reducing scrap, saving material and time leading to cost reduction or work safety and reducing the incidence of accidents at the workplace.

The essence of the method is the involvement of many workers from a given organizational unit, from rank-and-file to managers. Anyone can participate, everyone can come up with ideas for improvement that are collectively discussed.

#### 5S Process innovation

- The principles described by Benjamin Franklin since 1732 in the story Poor Richard or The Road to Prosperity the core and foundations therefore originated in the USA
- Developed and mainly introduced on a larger scale in Japan after 1945 as Toyota production systems (since 1948)
- Transferred to the whole world as part of globalization
- Named in 1988 as LEAN Production
- Prevention of MUDA (waste)

Cost + Profit = Price changes to: Price - Costs = Profit



#### Waste

#### MUD

Waste...

#### WALL

• Imbalance, unevenness...

#### **WALLS**

Inadequacy...

Odpad - plýtvání - nešetrnost

Prostoje

Nadměrné zásoby

Zbytečná doprava

Zbytečný přesun

Nadprodukce

Defekty/chyby/zmetky

Nevyvážené školení

Nepravidlenost v kvalitě

Výkyvy zásob

Nerovnoměrná poptávka

Nerovnoměrná rychlost (výrobní takt)

Nepravidelný pracovní rytmus

Nerovnoměrná pracovní zátěž

Nerovnoměrnost - nepravidelnost - nestejnoměrnost (MURA)

Přetěžování - přehánění - přílišná obtížnost (MURI)

Hluk

Nedostatek tréninku

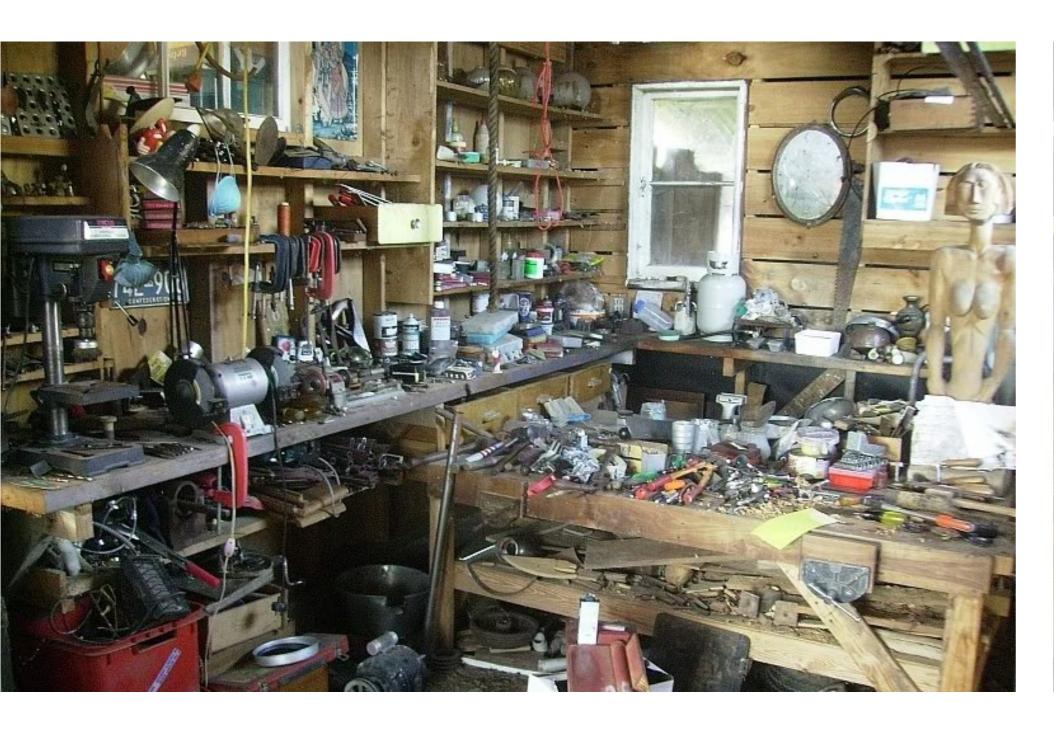
Chybná ergonomie

Zvednání těžkých objektů

Nadměrný stres

Dlouhé trvání práce

Příliš náročné nebo snadné úkoly



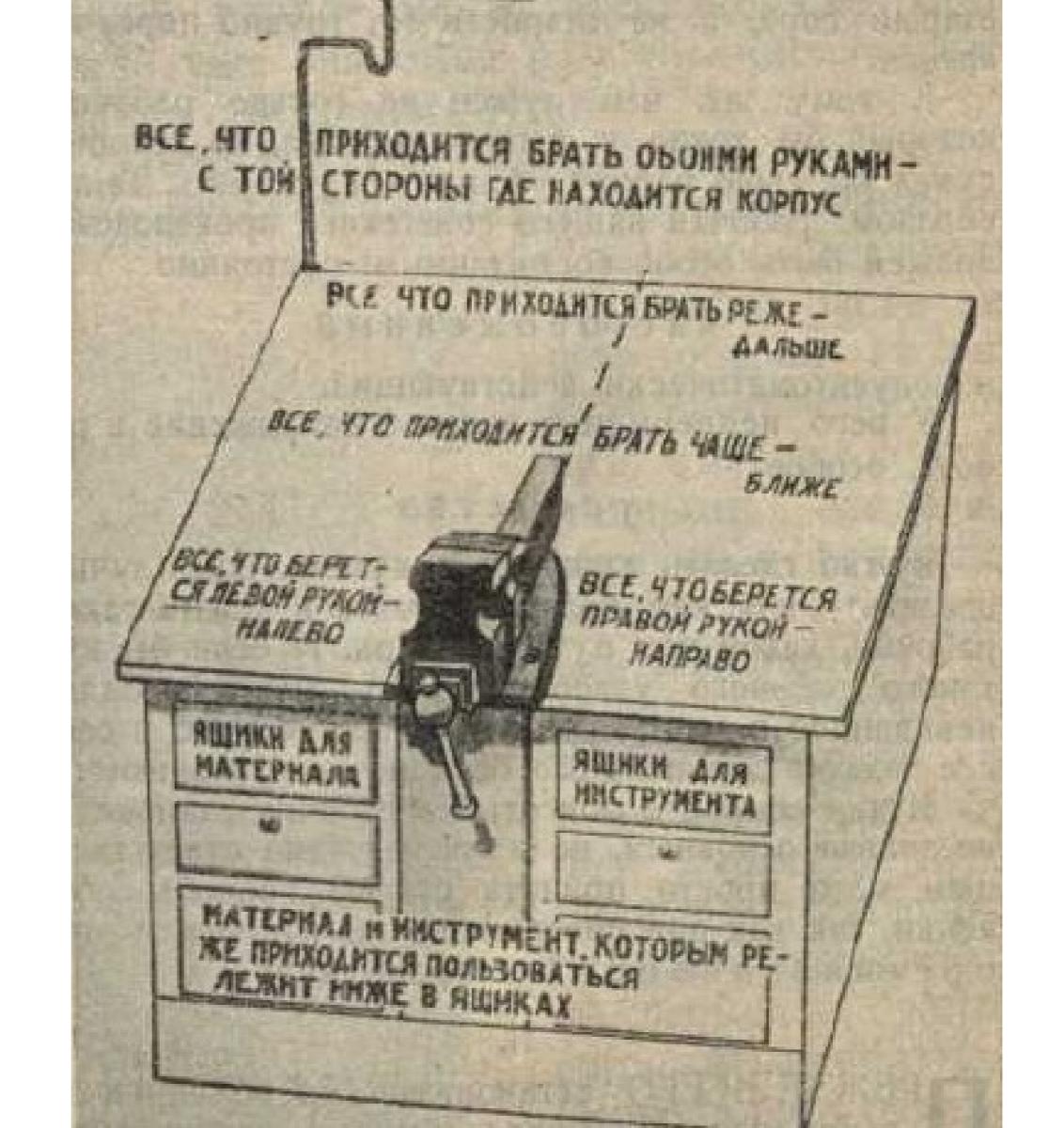




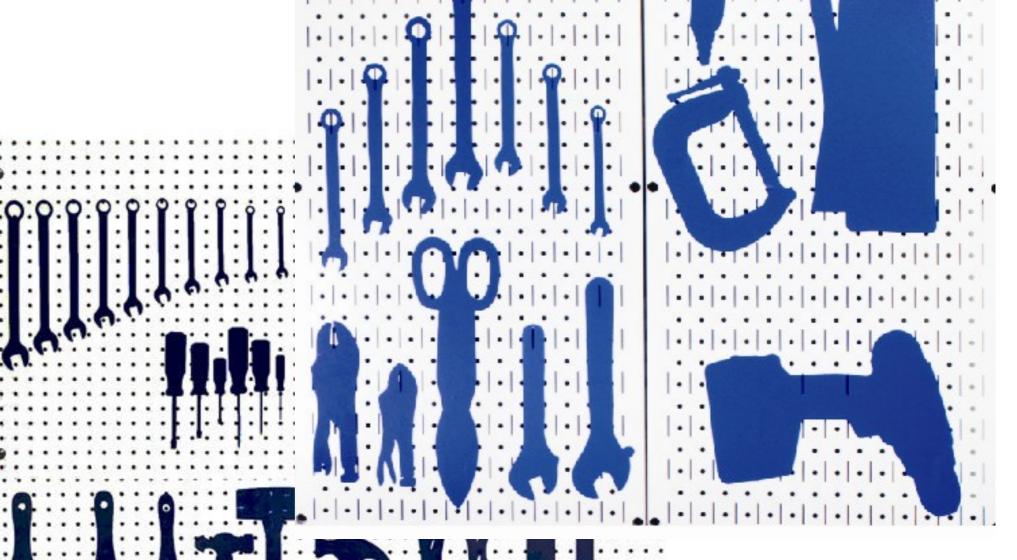




Job deployment history













#### **5S**

Seiri - Divide - Go through and inspect the workplace and sort out unnecessary items.

Seiton – Setřiď - Designation of items used in production with a reasonable number or name.

Seiso - Arrange - Logical arrangement of items used in production as they follow in the sequential production process.

Seiketsu - Document - Document and standardize all procedures.

Shitsuke - Follow - Systematize and follow established procedures and plans.

# innovation

- Pleasant atmosphere it is important to create a creative climate and a pleasant environment, to properly plan the entire meeting
- We focus on quantity the more topics there are, the more likely they will contain a quality solution proposal
- No criticism there are no restrictions, we postpone criticism until later so as not to hinder the flow of ideas and topics
- Any ideas are welcome unleash your imagination, think outside the box of conventions, generate ideas regardless of their reality, logic, reasonableness
- We combine and improve already created ideas "1+1=3", ideas are created through mutual cooperation of the entire team
- Inspire each other mutual encouragement and stimulation of new thoughts and ideas is an important part of brainstorming
- All participants are equal the boss's idea is not better than the junior's idea,
   the goal is any ideas that can inspire or enrich others

# 6 Hats Strategy - General innovation, rather a process

- Information/Impartiality: (White) is only what information is known, what are the facts considered?
- Emotions and feelings: (Red) instinctive emotional reaction or expression of emotions (but without reasoning).
- Negative Reasoning: (Black) logic applied to identify errors or barriers, looking for discrepancies.
- Positive/Optimism: (Yellow) logic applied to determining benefits, seeking approval.
- Creativity: (Green) expressing provocation and inquiry, seeing where ideas lead.
- Thinking: (Blue) thinking about thinking.

Innovation - Tools 73

#### Mind maps

Mental maps (Mind Maps ) are a highly effective analytical technique that can be used especially in problem solving, learning and personal development. It is a graphical treatment of a solved problem or learning material using graphs including all essential aspects and dimensions of the problem and their mutual connections and connections. Maps are created either using colored pencils on paper or using a computer and special software.

Innovation - Tools

#### 5 steps innovation process

Idea generation

Advocacy and screening

Experimentation

Commerzialization

Diffusion and implementation

### Idea generation

#### SCAMPER

"S" substitutes

"C" combine

"A" adapt

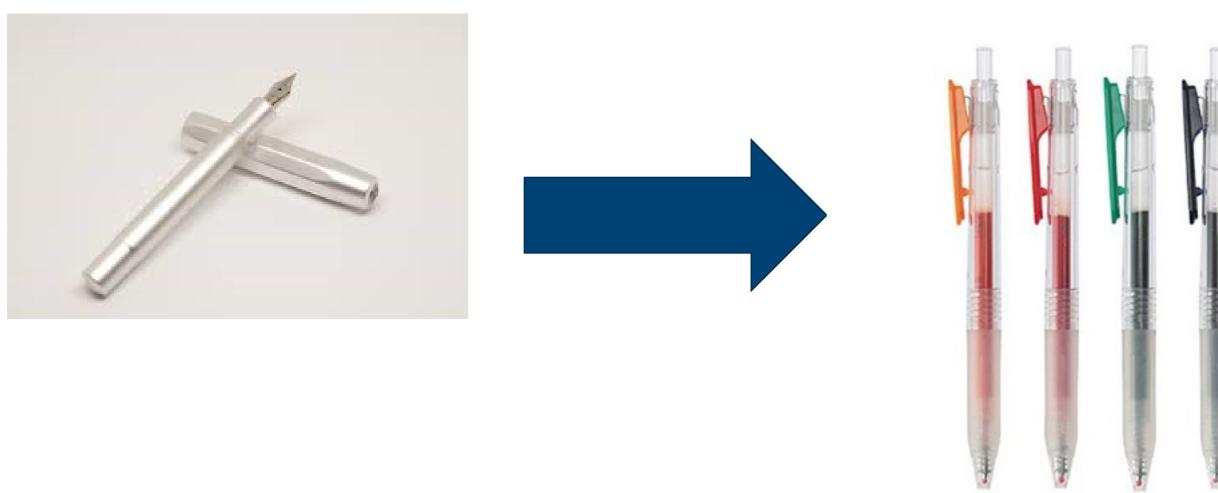
"M" modify

"P" put to other uses

"E" eliminate

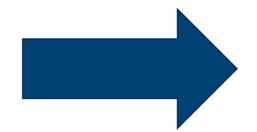
"R" reverse, rearrange

#### Substitute



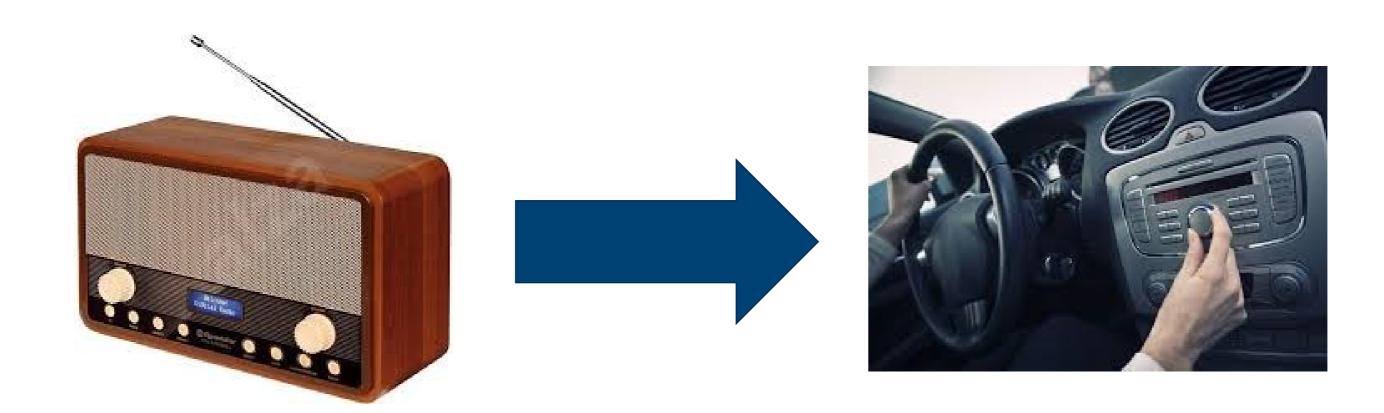
#### Combine







#### Adapt



#### Modify



#### Put to other uses

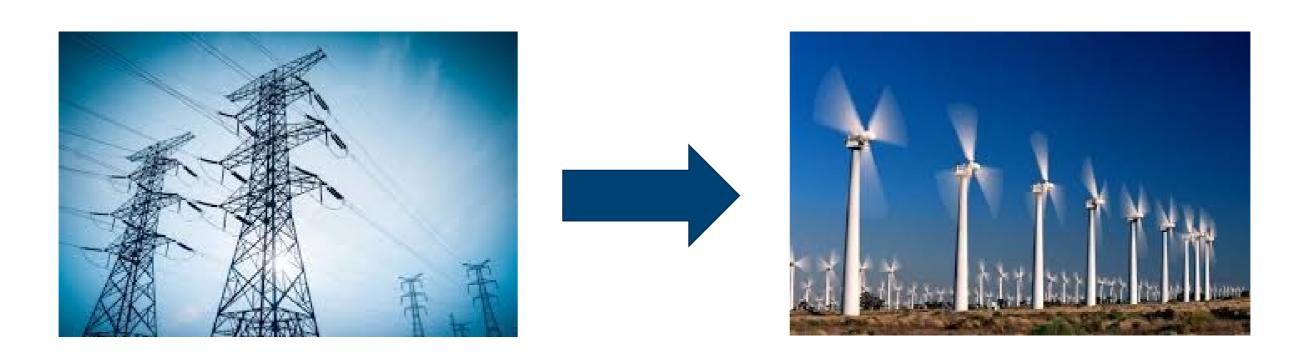


#### Eliminate





#### Reverse, rearrange



#### Side dishes

| <b>Lean Canvas</b><br>Podnikatelský plán na jedné straně papíru<br>Online kurz zdarma na www.leancanvas.cz |  | Projekt:   |  | Autor:   |  |   | Detum:<br>Varze 6 |
|--|--|--|--|--|--|---|-------------------|
| Problém Jaké jeu 1-3 nejpelővéjál problémy velich zákuzntkú?   | Řešení Jaki vlastrostí vašeho produktu řeší probřeny valich zákazníků?   | Unikátní nabídka hodnoty Čím upoutáte pazomosť? V čem jele jisť? Jaká je výsledná hodnote pro zákazníka?  Srozumitelný opis Jak jednoduše opišete vaše řešení pomocí již entekujicích? |  | Neférová výhoda Co vám nemůže nikido snadno zkopínovať nabo sil to koupit? Prod byvás to rešil dělet zrovna vy?  Cesty k zákazníkům Jak se dostanete ke svým zákazníkům? |  | Zákazníci  Kdo jsou veli zákazníci, resp. užívetník?  První vlaštovky  8 kým můžeta začit rejdříve? |                   |
| Existující alternativy Jak zákaznící feli své problémy dnes?   | Indikátory  Co pre visa zmerená dapskéh a jak jej budete měšírž Jaká další člási pou pro vála sel dúžiažítá (sklotičke, atávace, kuajetla, tižby, doparučení)? |  |  |  |  |   |                   |
| Struktura nákladů Ža co budete přatí a kolik? Jaké jsou vede foní a variablel nákledy?                     |  |  | Cenový model Jak nacenthe vide fellení probléms? |  |  |   |                   |

https://sourceforge.net/projects/freemind/files/freemind/1.0.1/FreeMind-Windows-Installer-1.0.1-max-java-installer-embedded.exe/download

http://leantools.info/5sgame/

Innovation 8A

## Thank you for your attention