

EXAM

Product Planning – Needs and Opportunities

Course code: PPU085

Wednesday 2020-01-15 at 14.00-18.00

Examiner: Professor Johan Malmqvist.

Questions: Professor Johan Malmqvist, 031 – 772 1382, johan.malmqvist@chalmers.se. Prof Malmqvist will visit the exam room at approximately 14.30 and 15.45.

Department: Industrial and Materials Science.

Solutions: Will be posted on the course’s Canvas page on Thursday 2020-01-16.

Results: Will be announced no later than Wednesday 2020-02-05.

Exam review: The exam review will take place on Tuesday 2020-02-10 between 11.30-13.30. The location is the conference room Fabriken in the Department of Industrial and Materials Science, M building, 5th floor.

Grades: The maximum score on the exam is 20 points. 8 points are required for passing the exam and a “3” grade. For grades “4” and “5”, 12 and 16 points are required, respectively.

Tools

The exam is run in the Inspira digital exam system. In addition, pen, paper and dictionaries are permitted.

NB! Solutions should be documented with text and drawings. Equations should be motivated. Also partially solved problems will be assessed. If some details are missing in the problem statement, introduce suitable parameters and assume, if necessary (reasonable) numbers.

1 Patent 1 (1 p)

The *ornamental design* of Coca-Cola bottle is a _____ patent.

- d) utility
- e) plant
- f) design
- g) trade secret



Solution

- c) The *ornamental design* of Coca-Cola bottle is a design patent.

2 Patent 2 (1 p)

A *patent* is:

- a) an exclusive right granted by a government to an investor to exclude others from using an invention
- b) an exclusive right granted by the government to use a specific name or symbol in association with a class of products or services
- c) information used in a trade or business that offers its owner a competitive advantage and that can be kept secret
- d) a temporary monopoly granted by a government to an investor to exclude others from using an invention
- e) an exclusive right granted by a government to copy and distribute an original work.

Source: Mousumi Roy (University of Connecticut)

Solution

- d) A *patent* is: a temporary monopoly granted by a government to an investor to exclude others from using an invention

3 Business development (2 p)

- a) In a business model canvas, what are three components of the **value proposition** for an intended new product? (1 p)
- b) For some product of your liking, exemplify the three components. (1 p)

Solution

- a) The three components are the **gains** that it offers, the **pains** that it avoids and the **jobs** that the **product** or **service** offers the customer.
- b) Consider, for example a washer-dryer in comparison with a regular washing machine, or even washing by hand.

The **jobs** that the washer-dryer does are to wash and dry clothes. The other solutions can also carry out those jobs, but:

The **gains** of the washer-dryer are that it **quickly** and with **high cleaning quality** cleans and dries clothes.

The **pains** that it avoids are the needs to **hang up** wet clothes to dry and the **room space** needed for that, or even the **physical exhaustion** associated with hand-washing.

4 Product planning tools (2 p)

The table below identifies some reasons why product development projects may fail. For each of the reasons, identify a tool (or a combination of tools) introduced in the course that, if applied, may counteract the particular risk for failure and explain how.

Failure reason	Tool(s) + explanation
Nothing new and beneficial is offered by the product	
Poor timing, the product is launched too late or too early	

Solution

Failure reason	Tool(s) + explanation
Nothing new and beneficial is offered by the product	<ul style="list-style-type: none">• Benchmarking, quantified comparison with existing designs• Patent analysis, which determines the uniqueness of a technical solution
Poor timing, the product is launched too late or too early	<ul style="list-style-type: none">• Technology roadmaps, which indicate in time when in time a particular technology is expected to be introduced into the market• S-curves, which predict the evolution of a particular technology, and when it might surpass competing technologies

5 Technology assessment (3 p)

- a) What is meant by and what are the purposes of **tactical** vs **strategic** technology assessment? (1 p)
- b) What are suitable methods for **tactical** technology assessment and what are their respective advantages and disadvantages? (2 p)

Solution

- a) **Tactical** technological assessment investigate the **current** (near-term) state of technologies or products. The aims are to compare and position product versus its competitors and/or set targets for future development.

Strategic technological assessment looks into the future (long-term) evolution of a technology, which the aims of predicting the evolution and planning development efforts.

- b) Tools for tactical technology assessment include SWOT analysis, product benchmarking, patent benchmarking, and technical (target-setting, trade-off) models.

Some advantages and disadvantages of each of these tools are indicated in the table below:

Tool	Advantages	Disadvantages
SWOT analysis	<ul style="list-style-type: none"> • Easy to create • Quick to create • Can be applied to novel designs 	<ul style="list-style-type: none"> • Lacks systematic approach • Qualitative
Product benchmarking	<ul style="list-style-type: none"> • Quantitative • Supports positioning & visualisation • Systematic 	<ul style="list-style-type: none"> • Identifies differences in performance, cost etc, but not the underlying causality • Difficult to apply to very novel designs
Patent benchmarking	<ul style="list-style-type: none"> • Systematic • Helps identify no-go solutions (protected by active patents) • Helps identify possibly useful solutions (no longer active patents) 	<ul style="list-style-type: none"> • Expensive, time-consuming search • Requires expertise • Qualitative
Technical models	<ul style="list-style-type: none"> • Trade-offs can be studied • Precise guidance for decision-making 	<ul style="list-style-type: none"> • May be difficult and time-consuming to create accurate parametric models • Design must be relatively detailed

6 Questionnaire (3 p)

Create a small questionnaire that can be used to elicit customer needs for an industrial robot, exemplified below. Your survey should include at least six questions/statements with appropriate answer categories, and include all basic question types (demographic, behavioural, rating).



https://www.alibaba.com/product-detail/Nannchang-Competitive-price-robot-arm-6_60526698811.html

Solution

Examples for survey questions for industrial robots:

Categorization	<ul style="list-style-type: none"> • How many industrial robots do you have in your production currently? • What business are you in <automotive, machinery, ...> • In what countries are your factories located < Sweden, Norway, ... France, ,,,, China, ..., USA, ..., Brazil, ...> (multiple selection possible) • What is the turnover of your company? < < 10 MSEK, 10-100 MSEK, 101-500 MSEK, > 500 MSEK) • How many employees do you have < < 10, 10-100, 101-500, > 500 > • What brands of industrials robots do you current use? < ABB, Fanuc, Kuka, Motoman, other > • What models of industrial robots do you use? < ABB-IRB1100, ABB-IRB120, ..., Fanuc-XXX, ..., other >
Descriptive	<ul style="list-style-type: none"> • What processes are your industrial robots applied for < welding, painting, gluing, inspection, packaging, pick & place, screw joint assembly, ... > • What are the typical weights of the tools and parts that your robots handle < < 1 kg, 1-10 kg. 10.1-100 kg, > 100 kg >

	<ul style="list-style-type: none"> • What are the maximum dimensions of your work cells < < 0.5 m, 0.5-1 m, 1.01 – 2 m, > 2 m > • What number of operations per minute are required < < 3, 3-5, 5.01-12, > 12 >
Rating	<ul style="list-style-type: none"> • How satisfied are you with our robots' precision <not at all ... very satisfied> • How satisfied are you with our robots' cost level <not at all ... very satisfied> • How satisfied are you with our robots' energy efficiency <not at all ... very satisfied> • How likely are you to buy the same brand and model of industrial robots in your next procurement ? < <not at all likely ... very likely>

7 Stakeholder needs and solution contributions (4 p)

With continued global warming, forest fires are expected to grow in frequency and scale. Society has a need of a broad understanding of **who** might be effected, **when**, and **how**, as well as of what **countermeasures** are available or might be developed.

Your task is first to describe the “lifecycle” of a forest fire, that is outlining what typically happens before, during and after the fire. The time perspective of the “lifecycle” is thus many years or decades. Then identify the involved stakeholders. Some of them have needs for protection, while others might be able to offer solutions (countermeasures) to the problem. Finally, for each stakeholder identify at least one specific need or solution. Note that solutions may be technology-based, but can also be services, policies etc.

Solution

Prior to the fire:

Many stakeholders (marked in bold) are involved in the process: causing, counteracting or being affected.

- **Legislators** are, guided by the information that they have on short-term and long-term effects of climate change and forest fires, establishing emission regulations (setting caps) as well as creating incentives for industry and individuals to develop and buy fossil-free alternatives.
- **Forest owners** are planning the seeding and nurturing of the forests in order to reduce the spread of forest fires, through the cleaning of sly (bushes), creating tree-free “streets” in the forests, as well as accessible water damms/lake.
- **House owners** develop an awareness of the risks as well as knowledge of what to do when a forest fire threatens their home.
- **Fire departments** are building capabilities to monitor and fight forest fires, by acquiring the appropriate technology and training in its use.
- **Polluting** are adapting their processes to new regulations and incentives.
- **Tech companines** are developing software and hardware equipment for monitoring and fighting forest fires.
- **Insurance companies** are developing and selling insurances that, in the event of a forest fire, can finacially compensate forest and house owners for their losses and help them seed new trees or re-construct their houses.

During the fire:

- The **Fire department** monitors the forest fire dynamics (spread, intensity) and fights the forest with the technology and people at its disposal. The **Fire departments** further informs the public (**house owners**) of the situation and recommends appropriate actions, such as how to protect your home or even evacuate it.
- **House owners** monitor the situations and take action according to recommendations from the Fire department.
- **Hospitals** treat firefighters and possibly public individuals for burn and smoke injuries.

After the fire:

- **Insurance companies** assess damages and pay out compensation. Subsequently, the insurance fees may be revised.
- **Forest owners** use their insurance money to fund re-seeding of their forests and cultivate their growth.
- **House owners** use their insurance money to repair or even re-build their homes.
- **Fire departments** evaluate the efficiency of their actions and technology. Modifications are made to be better prepared for the next fire.

Stakeholder needs and countermeasures

The table below notes the stakeholders and their needs/solutions. Note that many needs are in terms of knowledge or information rather than material.

Stakeholder	Need/countermeasure
Legislator	<ul style="list-style-type: none">• Predict temperature increase and relation to forest fire (need)• Knowledge of financial and human cost of forest fire (need)• Regulations and incentives (countermeasure)
Forest owner	<ul style="list-style-type: none">• Knowledge of forest-growing practices that minimize risk for eruption and spread of forest fires
House owner	<ul style="list-style-type: none">• Knowledge of what to do when a forest fire happens (need)
Fire department	<ul style="list-style-type: none">• Monitor and predict forest fire spread and intensity (need)• Extinguish fire in remote areas, far from water access (need)
Insurance companies	<ul style="list-style-type: none">• Assess risk for and predict consequence of forest fires (need)• Insurance (countermeasure)
Polluting industries	<ul style="list-style-type: none">• Knowledge of forthcoming regulations and incentives (need)• Fossil-free technology that replaces their current (need)
Tech companies	<ul style="list-style-type: none">• Forest fire monitoring equipment (countermeasure)• Fire extinguishing equipment (countermeasure)• Water transportation equipment (countermeasure)
Hospitals	<ul style="list-style-type: none">• Procedures and equipment for treating burn and smoke injuries (need)

8 Course learning outcomes (4 p)

- (a) Account for in text and graphics for what you know about the following course learning outcome: (3 p)

“Explain what is meant by market segmentation and describe aspects by which a market can be segmented. Carry out a segmentation of the market for a defined product (area)”

- (b) Reflect on how these aspects were considered in your project. If they were not relevant or not possible to address, explain why. (1 p)

Solution

As this question can be answered in multiple ways and formats, a detailed solution will not be presented.