

EXAM

Product Planning – Needs and Opportunities

Course code: PPU085

Wednesday 2024-01-10 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 rooms at approximately 14.30 and 15.45.

Department: Industrial and Materials Science.

Solutions: Will be posted on the course’s Canvas page on Thursday 2024-01-11.

Note that the posted answers may be copied from the lecture notes or the book, but that does not mean that verbatim answers are required or even expected for full points on an exam question.

Results: Will be announced no later than Wednesday 2024-01-31.

Exam review: In Inspira, you will be able to access your own answers also after the exam. Requests for correction of the marking should be sent by e-mail to Lena Bendrioua (lena.bendrioua@chalmers.se) using the “Request for correction review of grade.pdf” form that is available in Canvas under Templates.

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 and “Chalmers approved calculators” 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.

It is recommended that graphics are drawn using the functionality available in Inspira. However, you may also draw them on paper and hand them into to the exam staff. Ask the exam staff for assistance in the matter.

1 Opportunity identification (2 p)

Identify factors that characterize a good opportunity identification process.

For each factor, suggest approaches that secure that an opportunity identification performs well with respect to the factor.

Solution

A good opportunity identification process

- Generates many new product (market) ideas
- Generates a high variety of product ideas
- Accurately identifies excellent product ideas

Generating (and sensing) many and different product ideas can be achieved by applying combination of multiple idea generation techniques. These can be classified as internal (brainstorming, picking up promising ideas from corporate research labs etc) and external (getting ideas from lead users, competitor products etc).

Identifying excellent ideas can be achieved by applying a three-step idea selection process that includes screening out less promising ideas (for example through web-based surveys or idea pitching workshops), further developing the remaining and then selecting the excellent idea with the support of a systematic evaluation method (for example Real-Win-Worth, best practice scoring, concept scoring etc).

2 Mission statement (2 p)

An important objective for a product development project could be to develop a more sustainable product. How can sustainability objectives be included in the mission statement? Identify under what categories such statements could be placed and provide examples of each.

As a reference, the graphic below shows a table template for a mission statement.

Mission statement for ...	
Product description	
Benefit proposition	
Key business goals	
Primary market	
Secondary market	
Assumptions & constraints	
Stakeholder	

Solution

A mission statement might include sustainability in the, for example:

- Product description – for a product whose purpose is to actively “improves” sustainability, such as a carbon capture system.
- Benefit proposition – for a product whose does its job in a more sustainable way that its’ competitors, such as an electric car.
- Key business goals – for solutions that help establish a brand image as sustainable.
- Assumption & constraints – identify legislation that must be met, such as caps on emissions.

3 Mediating tools (3 p)

Identify at least three *purposes* of using mediating tools in user studies, along with at least one *example* of a mediating tool that might be used for each of the purposes. What are strengths and weaknesses with the use of mediating tools in user studies?

Solution

Some typical purposes of using mediating tools (there can be other purposes as well) along with suitable mediating tools are shown below:

Purpose	Mediating tool(s)
Describe problem	Photograph Video clips
Elicit customer needs	Existing products (observe use)
Generate ideas or concepts	Collages Mood boards
Evaluate design solutions	Sketches Mock ups Prototypes

Strengths: Mediating tools facilitate for the user to react to, evaluate and even suggest improvements to product ideas

Weaknesses: Use of mediating tools may also lead to fixations on a given idea, both from the designer (who has created the mock up etc) and from the user.

3 PEST analysis (3 p)

Outline the steps of a systematic PEST analysis process.

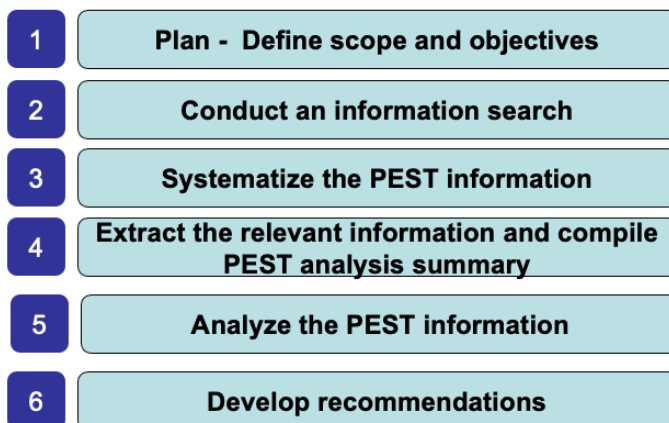
For each step, describe how it was carried out in your project.

In case your report does not include a PEST, then describe the elements of your report that could have been part of a PEST analysis.

(Full marks on this question does not require that you can recall each specific piece of information that you considered in the PEST analysis)

Solution

A step-by-step procedure for a PEST analysis is shown below:



A good answer to this question will:

- State what the scope and objectives were for your PEST analysis
- List the types of factors that were of interest to your team in each box
- How you searched for information about the factors of interest
- What your main findings were (or information)
- How you analysed the findings (for example finding supporting or challenging factors)
- What your recommendations were

4 Questionnaire design and analysis (3 p)

Create a questionnaire that can be used to elicit customer needs for a manual lawnmower, exemplified below.

Your survey should include at least six questions/statements with appropriate answer categories, and include all basic question types (demographic, behavioural, rating).

Then suggest at least two multivariate analyses that can be carried out with the data that you have collected.



Solution

Demographics

- What is your gender? < *male, female, prefer not say* >
- What is your age? < < 30, 30-50, 51-65, > 65 >
- What was the total annual income for your household in 2022 in kSEK? < < 600, 600-1,000, 1000-1,600 > 1,600 >
- The size of the lawn in my residence lawn in m² is < does not have a lawn, < 250, 250-600, 600-1,000 > 1,000 >
 - if answer = does not have a lawn, the exit questionnaire

Behaviour

- How often do you mow your lawn? < *I don't know, once per month, several times per monthly, every week* >
- What is your current brand of lawnmower < *Bosch, Gardena, Husqvarna, Ryobi, ..., other* >

- What is your current model of dishwasher (brand-dependent question) < *Bosch Rotak 660 ProSilence, Bosch CityMower 18V-32, Bosch Rotak 32 Ergo H 1200W, ...*>
- My lawnmower is < manual, wired electric, battery electric, combustion engine >
- When you mow your lawn, do you collect and remove the cut grass from the lawn? < never, sometimes, most of the times, always >

Rating

- My lawnmowers cuts grass with a high level of precision < *strongly disagree, disagree, neutral, agree, strongly agree* >
- The noise level of my lawnmower is acceptable < *strongly disagree, disagree, neutral, agree, strongly agree* >
- My lawnmover is easy to operate < *strongly disagree, disagree, neutral, agree, strongly agree* >
- I am likely to buy the same brand of lawnmower the next time < *strongly disagree, disagree, neutral, agree, strongly agree* >
- ...

Examples of multivariate analyses that can be carried out with data collected with the help of these questions:

- Is there a difference between male and female users with respect to preferences for manual vs wired electric vs battery electric vs combustion lawnmover engines?
- What lawnmower brand is most popular with high-income households (> 1,600 kSEK/year) and low-income households (< 600 kSEK/year)?
- Etc.

5 Product planning (3 p)

A manufacturer of supermarket shopping carts like the one shown below has realized that it needs to upgrade its products. Identify some market and societal trends and technological opportunities that may affect these products and suggest how the shopping carts may be modified to address them.



Source: <http://xxnda111.en.made-in-china.com/productimage/XSUnYrpFYIWR-2f1j00cjqThVmHfZbz/China-Caddie-speciale-Supermar-Shopping-Trolley-spesa-180L.html>

Solution

Societal trends

Aging population – shopping carts could be equipped with **microphones** for contacting staff for assistance or **amplifying glasses** for facilitate reading product information or prices.

Market trends

Individualization – shopping carts with **adjustable handle** or **floor height**. **Structured carts** with sections for different kinds of goods

Technology opportunities

Big data analysis – card reader that reads your loyalty card and points you to **special offers based on you past purchases**. **Dynamic recommendations** based on the contents of your shopping cart (e.g., if you just put a sirloin steak in your carts, maybe you are interest in this new (non-alcoholic ;-)) Shiraz wine. And what about some bearnaise sauce?)

Navigation systems – **gps-like screen** that helps you find the location of a particular goods

Autonomous drive – a **motorized cart** that follows your movements

6 Course learning outcomes (4 p)

Account for in text and graphics for what you know about the following course learning outcome:

“Explain the role, tasks, organization, and deliverables of product planning”.

Solution

As this question can be answered in multiple ways, no detailed solution will be provided here.

However, much of the relevant material can be found in Lectures notes 2 and Ulrich et al., Chapter 4.