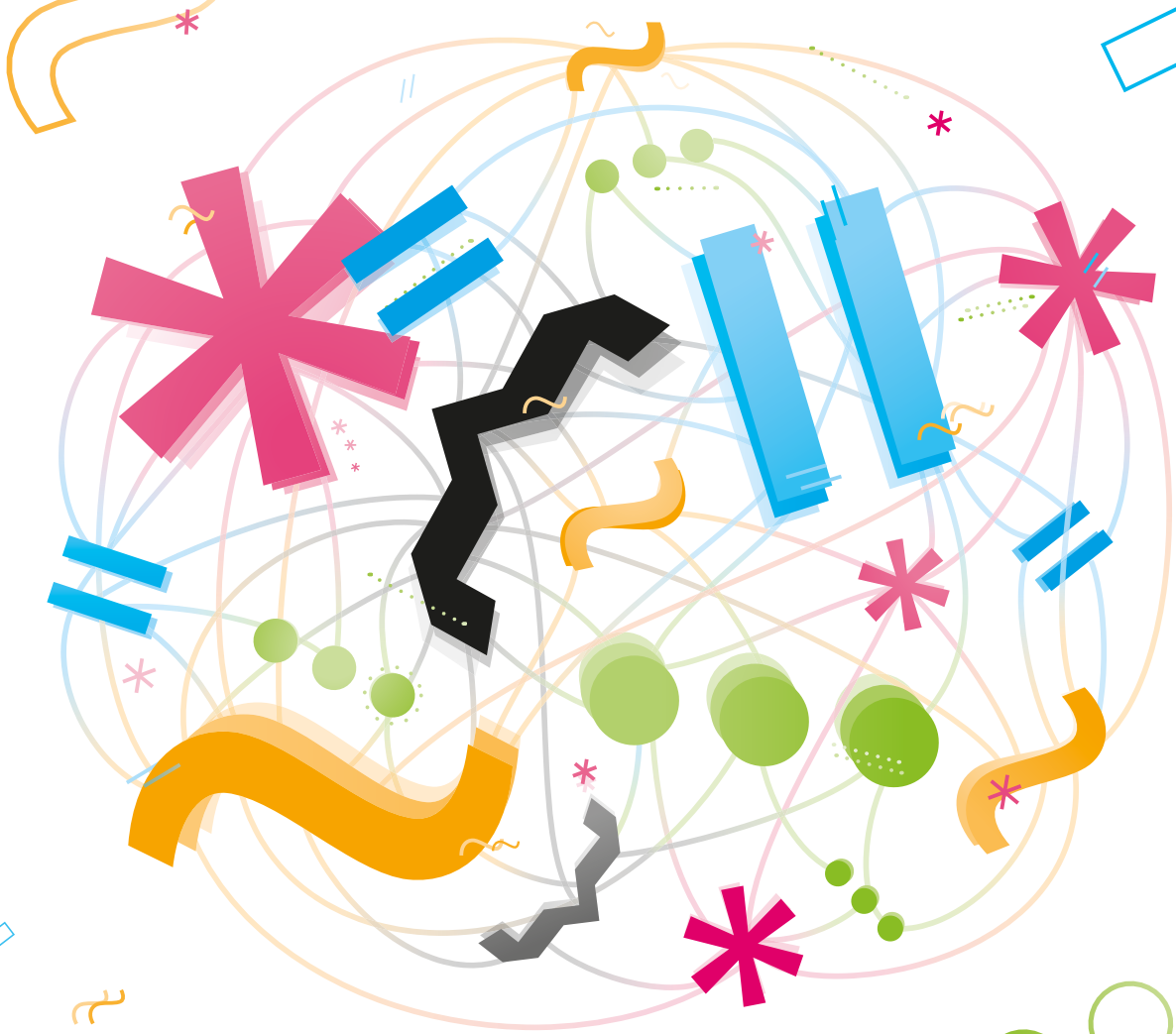
Co-funded by the
Erasmus+ Programme
of the European Union

M03 Assessment of Feasibility

Study material



University of Hradec Králové

TECHNICAL UNIVERSITY OF KOŠICE

UNIVERSIDAD DE GRANADA

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Introduction

With the spread of the internet and the better access of the population to high-level studies, there are more researchers than ever. Nevertheless, not all the research carried out is appropriate for being commercialized or to get profit from it. Some of them are theoretical or need practical applications in order for society to get benefit from them. Therefore, it is important to be able to analyze research results in order to establish if some research results are prepared for transfer or more work or another approach should be followed. This step is critical since putting into the market a research result that is not prepared will end up in the loss of the money that has been invested. This module will teach the most important criteria and steps to be carried out in order to determine if some research is prepared for commercialization and transfer. This module is a critical one since it allows researchers to learn how to plan their research to be usable in real life.

Keywords

- Feasibility study, proof of concept, transfer technology, scientific project, financial plan of the project, cost benefit analysis, sustainable period of the project, proof of concept.

A feasibility study

A feasibility study (sustainability, technical-economic study) provides all the data and information needed for an investment decision. The structure of this study corresponds to the preliminary feasibility study, but it differs in the accuracy of the output parameters. The processing of the outputs is carried out repeatedly until the optimal parameters of the project can be reached using this procedure. The study is supplemented by risk analysis and sensitivity analysis. It should be emphasized that the reason for carrying out a feasibility study is to determine whether the project is viable. Thus, even the conclusion not recommending further continuation of the project is a great benefit for us, as it saved us funds that would not be returned after implementation.

Feasibility study structure

MARKET ANALYSIS AND MARKETING STRATEGY

Market analysis is a key activity for determining project focus, production program, required technology and location selection. The results of the market analysis form the basis for processing other chapters of the feasibility study. This implies the necessity of communication between team members processing individual parts of the document. A summary of the results of marketing research makes it possible to identify market opportunities and risks of a business project. This represents the basic starting point for designing the project strategy.

MARKETING RESEARCH (MARKET AND DEMAND ANALYSIS)

The purpose of marketing research is to obtain, analyze and evaluate information about the market and its surroundings. It includes factors such as demand and competition, customer needs and behavior, competing products and marketing tools. After obtaining and evaluating marketing information, for the needs of the technical-economic study, the following is also needed: determine the target market of the project, including a description and analysis of its structure, customer analysis defining market segments, market competition, analysis of distribution channels, field analysis determining the future development of demand – the most important and the most difficult point.

PROJECT STRATEGY

After processing the marketing research, all the materials are available for processing the project strategy. Project objectives characterize the basic direction of the project (what the project aims to achieve), while the strategy determines the means and activities needed to achieve the project's objectives. Geographic strategy represents expected market share from the point of view of distinguishing the link between the product and the market marketing strategy and helps to choose a whole project strategy.

Marketing mix

The basic components are:

a) product – determining the width and depth of the assortment, product design, packaging method, etc.

b) price – price policy, price elasticity

c) sales support – a rough outline of suitable forms of support will pass

d) distribution – logistical aspects of distribution.

PROJECT MARKETING COSTS AND REVENUES

In this case, we are talking about the marketing costs and the expected revenues that are associated with the project. Project revenue estimation is, however, an iterative process where optimal plant capacity, technology, technically feasible production program and marketing strategies must also be taken into account.

A feasibility study, sometimes also referred to as a technical-economic study, is a document that describes the investment plan in summary and from all implementation-relevant points of view. Its purpose is to evaluate all implementation alternatives and assess the feasibility of a given investment project, as well as to provide all the basis for the investment decision itself. In principle, the feasibility study should be as comprehensive and coherent a description of the project as possible. For this reason, it is logically one of the main information sources for project evaluation, whatever the structure of the criteria. At a general level, the content of the feasibility Study can be defined using the following thematic blocks:

- Technical and technological solutions
- Project organization and management, including personnel solutions
- Questions of demand for the service and product and its supply, substitutes for the service or product provided, product, price, promotion, distribution, etc.
- Effect on the environment
- Other essential characteristics of the project and its surroundings (legal solution, political support, ...)
- Financial plan (analysis) of the project
- Analysis of socio-economic benefits and costs of the project (qualitative assessment, quantitative assessment, CEA, CBA)
- Risk management (analysis and solution of risk).

In most cases, the feasibility study is required as part of the annex to the application for support from EU structural funds through individual operational programs. But there is no need to perceive it only as a mandatory supplement. The feasibility study contains systematically arranged information needed for the overall evaluation of the project. It summarily describes the investment plan from all points of view relevant to implementation. It has the task of evaluating various alternatives, assessing the feasibility of a given investment project

and providing the basis for a decision. It is a tool for assessing project proposals, especially from an economic and technical point of view. The goal of the feasibility study is therefore to verify whether the best possible option has been chosen, whether the necessary financial resources for the implementation of the project have been well estimated, whether the long-term sustainability of the investment has been demonstrated and risks have been identified.

The feasibility study should evaluate the project in the following areas based on various criteria:

- technical solution of the project
- market analysis
- financial analysis
- economic analysis
- analysis of the project's impact on the environment
- analysis of the impact of the project on human resources and relevant target groups.

Each analytical result should contain possible risks and, if possible, also a proposal for their elimination or reduction. Processing the study is based on the data of the already processed project or business plan and other information sources (technical project, construction and project documentation, EIA study, and others). The feasibility study requires the involvement of experts from the fields of law, the environment, economics, financial analysis, marketing, quality management, and others depending on the focus of the project. One of the basic conditions for selecting projects for grant allocation is the condition that the study must be prepared at a professional level and must contain all the required information and parts, including annexes and additions. The scope of the study is not mandatory.

The feasibility study is a tool for justifying the project proposal, especially from an economic and technical point of view.

Its aim is to verify whether:

- the best possible option was selected
- the necessary funds for the implementation of the project were accurately estimated
- the long-term sustainability of the investment has been demonstrated
- risks have been identified.

In some cases, even before a full-scale feasibility study is developed, it is appropriate to develop a preliminary feasibility study. A preliminary feasibility study differs from a feasibility study by the level of detail and provides only framework data at lower costs and in a shorter time frame, or focuses only on a certain area. Rather, it has the character of an ideological intention, which is very valuable for the framework formation of the basic direction of the project, and its creation will save a lot of effort in creating a full-fledged study.

The feasibility study of a scientific research project

A research project is **a scientific endeavor to answer a research question**. Research projects may include:

- Case series
- Case control study
- Cohort study
- Randomized, controlled trial
- Survey
- Secondary data analysis such as decision analysis, cost effectiveness analysis or meta-analysis.

From a feasibility study perspective, the goal of risk management is to increase the project's chance of success. It is important to eliminate those risks that threaten the success of the project and can lead to the financial instability of the company. Risk analysis should not be taken as just another section of feasibility study. It should consider the risks in all parts of this study, from the beginning of project preparation until the final decision on its acceptance or rejection. Identification of risk factors is demanding and mostly takes place on the basis of knowledge, experience, and intuition of workers participating in the project. Workers' experiences with others projects implemented in the past are of great importance. For long-term investment projects that are financially demanding, the risk area is particularly important.

The 3 parts of feasibility study:

- Technology Considerations
- Product or Service Marketplace
- Identification of Specific Market.

Types of feasibility studies:

- Technical feasibility
- Economic feasibility
- Operational feasibility
- Legal feasibility
- Schedule feasibility
- Project scope
- Current analysis
- Requirements.

Figure 1: Factors of feasibility study
Source: https://wasserdreinull.de/en/our-offers/testcenter-and-servicelab/feasibility-studies/

A very suitable form for verifying the feasibility is the proof of concept. See more information in the following chapter.

A feasibility study helps answer the following questions:

- Is the project feasible?
- Can it be done?
- Does it make sense?
- Should we proceed with the proposed project idea?

A feasibility study should be conducted to determine the viability of an idea BEFORE proceeding with the development of a business.

This activity takes place during the project initiation phase and is conducted before the project is implemented.

The study needs inputs from many professional disciplines from various areas of the study.

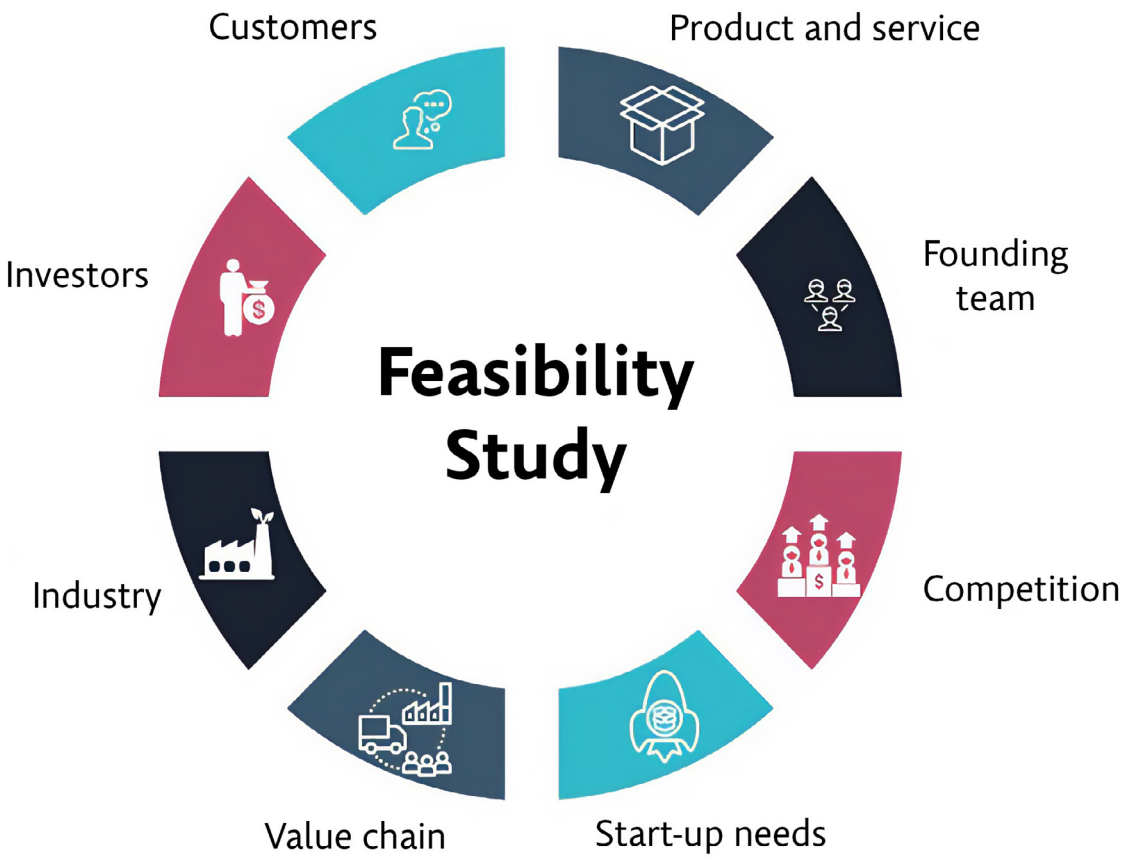

Figure 2: Feasibility study chain
Source: http://espigaexports.com/feasibility.html

The proof of concept

Proof of concept (PoC) – translated as "concept verification". This term is used in the field of software development to pre-test a design in order to test or demonstrate the logic used and the feasibility of the design. Basically, it can be a test implementation of a specific software design. The term is also used in connection with startups, where a business idea is first tried on a small scale and if it turns out to be successful, then it is probably worth working on it further.

Proof of concept meaning from Wikipedia:

Proof of concept (PoC), also known as proof of principle, is a realization of a particular method or idea to demonstrate its feasibility or a demonstration in principle to verify that some concept or theory has practical potential. A proof of concept is usually small and may or may not be complete.

These collaborative trials aim to test the feasibility of business concepts and proposals to solve business problems and accelerate business innovation goals.

The main purpose of conducting a proof of concept is to verify that the product concept has a real chance to survive in the market. The output of a PoC is basically a "yes" or "no" answer, and this is the very reason why many entrepreneurs are reluctant to start it – they are afraid

that their beloved product idea could end before it started. But such fears are very dangerous. Remember, failure never comes too soon! You can have an amazing startup idea in your head and your partners, colleagues and acquaintances can praise it to the skies. But if you avoid that key PoC "look in the mirror", you can never be sure that your app idea is technically feasible and well received by the market.

Here's a list of five proof of concept steps that all research projects should take:

- Prove the need
- Connect problems and solutions
- Get feedback on practical benefits
- Cover the practicalities
- Learn and prepare for prototyping.

Step 1: Prove the need

Do people really need your product? Why? Before you start thinking about the details of your solution, you should first invest your time and energy in thoroughly researching the specific problems of your target group, or different segments of it. Identify the problem you want to solve. Think about what group of people are affected by this problem. Define the problems that people are facing and think honestly if this is really something that needs to be solved.

Step 2: Connect problems and solutions

Brainstorm with your team on possible approaches to solving the problems you identified in the previous step. When you come up with several proposed solutions for each problem, think about their technological feasibility, the unique value they are supposed to bring, the necessary costs and the time required. The result of this step should be a list of problems linked to a list of best solutions, all of which are feasible and useful enough to be worth including in the final product.

Step 3: Get feedback on practical benefits

Go back to your target audience and walk through the solutions you came up with to verify that they actually deliver the desired value. Is this really an effective solution to the given problems? Are your solutions practical, useful and convenient? Test your assumptions thoroughly and try not to be swayed by your own enthusiasm for your solution. If your draft turns out to be unhelpful to the bull´s eye, take a step back.

Step 4: Cover the practicalities

Before proceeding further, you need to carefully consider the technical feasibility and financial sustainability of your solutions. Think about the capabilities and capacities that will be needed, the source of income, the pricing policy and the promotion of the final product. Try to get to the bottom of all obstacles before taking the next step.

Step 5: Learn and prepare for prototyping

The main purpose of doing a proof of concept is to get useful feedback and learn as much as possible for the next expensive phases of UI&UX design and product development.

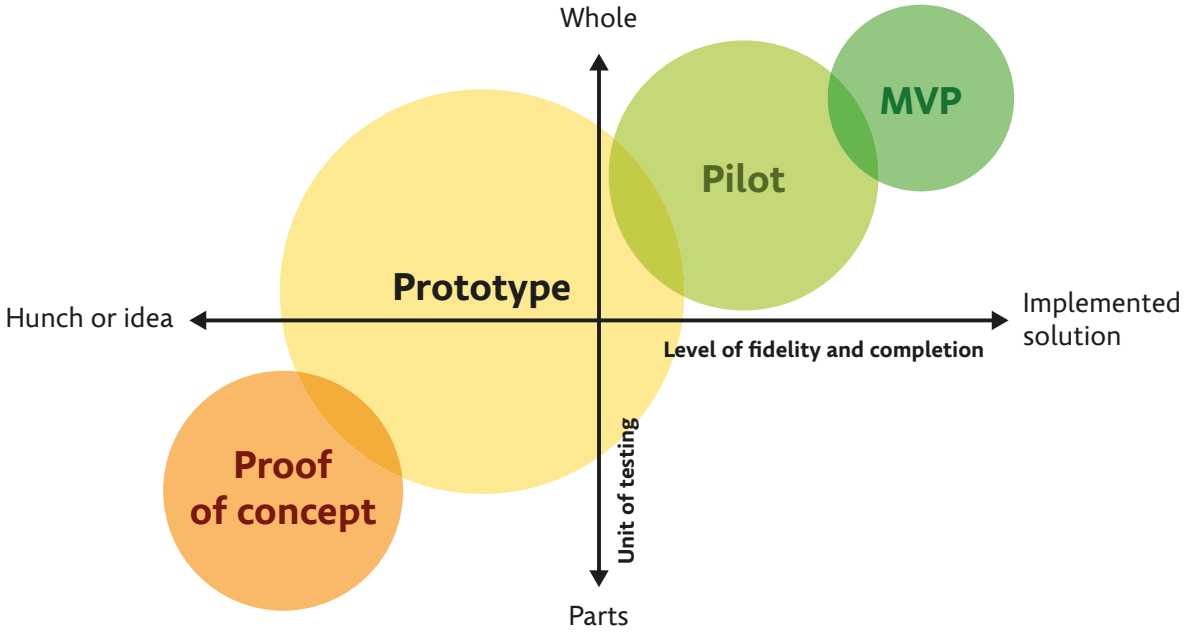

Figure 3: State of change from proof of concept stage to implementation

Source: https://states-of-change.org/stories/proof-of-concept-prototype-pilot-mvp-whats-in-a-name

Developing a prototype and a pilot product is expensive in most cases. This is why a proof of concept is extremely useful for start-ups, especially if you're strapped for cash and not in a rush to start manufacturing. A proof of concept can also be a solid base for investor pitches – if you can show how the PoC test results are closely connected to end-product performance.

Collaborating with a product development partner on your project can also substantially lower your risks as many of the feasibility and viability concerns will be addressed by an experienced team of engineers working closely with you and your suppliers.

The financial plan is part of the business plan and is a key prerequisite for systematic business management. It should ideally be drawn up at regular intervals. It is divided into a long-term financial plan (for several years ahead) and a short-term financial plan (for the next 12 months). After reading the following lines, you should have a basic idea of how such a plan is put together. Above all, every financial plan should be based on a certain strategy of the company, should follow the company's goals and should result in the processing of three basic financial statements, the balance sheet, the profit, and loss statement, and the cash flow plan.

One of the most important parts of a financial plan is setting financial goals. The correct setting of these goals is a prerequisite for the correct elaboration of sub-plans, from which a comprehensive financial plan is then compiled.

Financial goals should include the following areas:

Investments – a part of the investment and depreciation plan, which should be drawn up first, as well as the plan for financing investment needs, which deals with the method of financing the company's investments and is presented, for example, to a bank or an investor.

Sales – a very important part of financial goals. We should estimate revenue based on revenue from past periods and take into account industry trends, market conditions or technological developments.

Costs – we get the total costs by summing the sub-costs that we have determined in the employee needs plan (mainly wage costs), marketing plan, operating cost plan, plan for financing investment needs, depreciation plan, etc. By combining planned sales and planned costs, we get a planned profit statement and losses.

Profit – is the primary financial goal and adjusting it in the financial plan often results in changes to the sub-plans as well.

Working capital management – important for managing cash flow for building the balance sheet.

From the PoC perspective of the selected investment opportunity, it is important for us to see three things: a clearly defined use case (for what and how the given solution can be used), business case (value proposition for the customer – how much time and money will be saved) and thirdly, it is a clearly demonstrated product-market-fit. It depends on the specific business model, but in general, we are interested in: the number of customers/users, their growth on a monthly basis, high churn rate, and testimonials. At the same time, as part of the investment process, we hold reference meetings with selected customers and partners. There it is primarily about verifying the business case. Unconfirmed product-market-fit and a vaguely defined business case are also the most common reasons that discourage us from investing.

PoC at UHK

In 2019, UHK succeeded in applying for financial support from the Technology Agency of the Czech Republic in the GAMA2 project to support the increase in the application potential of research and development results – proof of concept, the aim of which is to support systems for the transfer of new knowledge of science and research (hereinafter referred to as "R&D") financed by public resources in research organizations and their successful application in practice. The solution of the project is an essential part of the systematic implementation of technology and R&D knowledge transfer at UHK. The project clearly fulfills its goals by actively supporting the system of commercialization and use of results that were created or are being created at UHK workplaces, and which have a high potential for practical application, in new or improved products and services.

Conclusion

Feasibility studies can **identify the logistical, financial, and market challenges of a proposed project** by evaluating: what is the estimated fund of the project, when the potential business will offer a return on investment, the market for the proposed product or service.

Proof of concept activities: these are activities carried out with a result of UHK research and development, which lead to practical, at least partial, verification of the contribution and practical function of the result of research and development, or which lead to an increase in the quality and thus also the value of the information about the given result of research and development. This usually involves the production of a functional sample, or its partial development, verification of some production principles and possibilities of production, the performance of certified and independent measurements and tests, and testing functional samples in practice or simulated operation.

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