Title of the science entrepreneurship project

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Members of team (team name) hereby declare, that the given research project and concept of the business model are the outcome of our own work and research.

(Example) Signatures of team members

John Wayne: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Sasha Cohen: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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# List of abbreviations:

|  |  |
| --- | --- |
| (Example) ACME | Accelerating Capacity for Monitoring and Evaluation |
|  |  |

# List of tables:

|  |  |
| --- | --- |
| (Example) Table 1 | Competitive landscape |
|  |  |

# List of graphs:

(Example) Solubility of NaCl relative to temperature

# List of pictures:

|  |  |
| --- | --- |
| (Example) Picture 1 | RNA molecule |
|  |  |

# Abstract

Write a short abstract of your scientific research and business model in your native language and in English

# Introduction

## Presentation of the problem.

*In the introduction we write which problem / need / opportunity for improvement we are attempting to solve / meet and why we are undertaking the research (which market needs or gaps in the body of knowledge we are filling). In the introduction, we usually define the leading research question that we will be answering with the research project. We only deal with problems / needs / opportunities for improvements that we have identified in the scientific literature (i.e. with a suitable theoretical background and defined empirical methods) and / or in our market research. For example, we find that the market needs a hand cream that is effective enough to solve the problem of cracked skin due to the use of disinfectants, while not causing certain allergies. We have identified this need by reviewing the market. We will only be able to offer the market a cream that has been shown to protect against cracked skin and does not cause specific allergic reactions through scientific research.*

*Appropriate citation of sources is required, APA6 citation standard or another field-specific standard is recommended. To make it easier to edit resources, we can use existing software for organizing and listing resources, such as EndNote, Mendeley, etc.*

# Theoretical background

## Literature review;

## Hypotheses.

*Literature review: in this chapter, it is necessary to thoroughly review the scientific literature, i.e. the work done in our field of research by scientists and researchers before us (Isaac Newton: standing on the shoulders of giants). Articles published in one of the recognized scientific journals and peer-reviewed before publication are considered scientific literature. Scientific literature can be found with the help of Google Scholar, Web of Science, Scopus, and similar search engines, which have access to the largest databases of scientific literature.*

*Research hypotheses: knowledge-based claims that we confirm or reject in our research. We suggest reading the instructions on research questions and hypotheses carefully. They are available at the following link:* [*https://wiki.fvv.um.si/index.php/Raziskovalna\_vpra%C5%A1anja\_in\_hipoteze*](https://wiki.fvv.um.si/index.php/Raziskovalna_vpra%C5%A1anja_in_hipoteze)

# Empirical part

## Research methods;

## Results;

## Confirmation or rejection of hypotheses.

*Research methods: here we describe our empirical research. Describe the sample(s) we have researched, what materials or active ingredients we used, what reagents, what laboratory equipment, what experimental procedures, etc. We describe the types of data we collected and how we collected them. If we have scientifically verified the accuracy and reliability of measurement instruments, we also describe this. Finally, we describe how we collected the data and which statistical methods we used.*

*Results: here we describe the results obtained after the statistical processing of our data. If we have several hypotheses, the results of the measurements for each of them must be given here. With these results, we then reject or confirm individual hypotheses. Very common methods of statistical processing are t-test and ANOVA, especially if we compare two values, for example before and after the experiment. Descriptive statistics, such as arithmetic mean, standard deviation, variance or covariance, correlation, etc. are also common. Microsoft Excel is the most convenient tool for statistical processing, but we will need tools such as SPSS or SAS for more advanced processing, and processing with programming languages ​​such as R or Python for more advanced analyses.*

*Confirmation or rejection of hypotheses: When confirming hypotheses, we must be very careful that our results are statistically significant, i.e. that the probability that we did not come to certain results by chance is greater than 95% (p-value <= 0.05). If the results are not statistically significant, we must reject the given hypothesis.*

*Note: it is quite common in science to reject certain hypotheses. This does not mean that we are not successful in our project, it simply means that we have to keep trying. However, rejected hypotheses can have implications for our business model. Therefore, we need to analyze very carefully what this means and whether we have a commercially interesting and workable solution in which it would be worthwhile to invest time and money.*

# Market analysis

* 1. Alternatives used by customers to solve the problem now;
	2. Who are the customers;
	3. Marketing and sales channels;
	4. Market analysis and segmentation.

*As this is a science entrepreneurship research project, we usually have to conduct a market review before or in parallel with the scientific research, because research can be time-consuming and expensive;* *conduct market research to determine what the actual needs / opportunities are, who our customers are, what features they share, through which channels we reach them, and how large the market is for our product.*

*Existing alternatives: when people perceive a problem, they usually try to solve it. Sometimes they resort to a competing product (say they take Aspirin for headache), and sometimes they use a different solution (walking, drinking water, Chamomile tea…). Both are existing alternative solutions that our potential customers try to solve the perceived problem. However, none of the alternative solutions will satisfactorily solve the problem for a certain group of customers / users and they will look for a different or better solution. These are usually our potential customers / users. By the way, let us not be deterred by the fact that something we would like to develop ‘already exists’. Of course it does! It would be more of a problem if it didn’t exist. Our solution will solve the problem of a special group of customers / users in a special way. It will therefore be of market interest as an improvement on the existing situation.*

*Who are the customers / users: we need to know our potential customers / users very well. We need to know their average age, their gender, education, where they live, what kind of work they do, how much they earn, how big families they have, how much time a day they spend in nature, and so on. Keep in mind that the customers / users of our solution can be individual people (customers) or companies and organizations (hospitals, car or chemical factories, etc.). In both cases, we are dealing with people who are buying our solution. Even the Director of Purchasing in a company is a person with certain traits that we need to know. We can first meet customers / users in online stores, such as Amazon or eBay, where we review comments on certain products that are solving a similar problem as our solution. Then we do interviews with people who work with our potential customers / users, such as a pharmacist in a pharmacy, a salesman in a fertilizer store, or a supplier of some products in several companies. Only then do we conduct interviews with potential buyers - and only then do we go on to do an online survey.*

*The difference between customers and users: customers are the ones who actually buy our product, and users are the ones who use it. Sometimes it's the same person (for example, if you buy a pair of sneakers and then wear them), and sometimes it's completely different people (the company's director approves the purchase of a 3D printer, which is used by the development department). Both are important and we need to know both well (the director is usually interested in the price and how the investment will contribute to better productivity / higher profits, and users will be interested in the usability). To make it easier to write, we write “customers / users” together, but now we know that there can be two different groups of people.*

*Channels to customers / users: this information is needed for direct market research (business or scientific experiments with potential customers / users) as well as for later marketing and sales. Research channels can be various Facebook or Instagram groups, various forums… Marketing and sales channels are also Facebook, Instagram, YouTube, TikTok, specialized fairs, specialized catalogs, AdWords and AdSense via Google, email sales, online stores, physical stores, etc. It is much less common for startups to use marketing channels such as billboards, or TV and newspaper ads. This type of advertising is much less targeted than the ones listed above and is more appropriate for a population that doesn’t use the internet as much.*

*Size and segmentation: before starting to develop an individual solution, it is very important to assess the size of our market (how many potential customers and users there are) and segment it (by country, city; TAM, SAM, SOM). This is an approximate estimate, but it still tells us if our project has any chance of succeeding in the market and that we get an investment or loan to develop a solution - this is very important.*

*We need to assess what our main markets are and how big they are. For example, if we are developing (scientifically supported) natural cosmetics, we estimate that our main markets are the USA, Great Britain, Japan, China, Taiwan and Brazil. But we need to know at the same time that in the U.S., it’s NY and LA, but not, say, Austin, TX; in Brazil, we will be looking for buyers in Rio de Janeiro and Sao Paulo, but not the city of Manaus.*



Picture 1: TAM, SAM, SOM; source: http://tamsamsom.blogspot.com/

*If, on the other hand, we are developing a new type of pesticide, we will find users in St. Louis, Kansas City and Manaus, Brazil. The size of the market is estimated using the constructs TAM, SAM, and SOM, which mean Total Available Market, Serviceable Available Market and Serviceable Obtainable Market (TAM – what is the market for a certain type of solution as a whole; SAM – what is the market share for a specific type of solution, which you are developing, SOM – what share of SAM can actually be obtained). See the picture above for easier understanding.*

# Solution:

## Short description of solution/product/service;

## Unique value proposition;

## KPI (key performance indicators);

## Competitive edge and intellectual property;

## Revenue streams and expenses;

## MVP (Minimum Viable Product) and interactions with customers/ users.

*After reviewing the market and doing the scientific analyses, we finally came to the point where we describe our solution, that is, what exactly we will offer the market.*

*Short description of the solution: we describe our solution. If it is a physical product, then we describe the look, what materials it is made of, and what exactly the buyer / user will be able to do with it (and in what packaging it will be). Examine and describe the complexity of developing and manufacturing the product or offering the service.*

*Unique value proposition: here we describe how our solution will meet the specific needs of our customers / users. The unique value proposition therefore refers to the value that your company promises to customers if they decide to buy their product. For example, if they have a headache, they will not take Aspirin because it is beautiful, white, and round, but because they will stop having a headache and will be able to read or work normally – and perhaps because it helped their friend with their headache. This is the unique value proposition and this is the reason why customers / users will buy / use our solution and not the solution of our competitors. The unique proposition is therefore the feature of our solution in which we are better than the competition for our customers / users. For example, if we make fertilizer for crops packaged in a type of plastic that breaks down in the sun, this will be our value for farmers in the drylands of Australia, but probably not so much for farmers in England. Of course, we cannot just know this, but we must break through to this realization through market testing and scientific experiments. The value proposition must be important enough for customers to be willing to pay for our solution and for users to change their habits because of it – which is often harder to achieve than getting paid.*

*The KPIs (key performance indicators) that we need to anticipate are the following (adopted from the POPRI business competition):*

* *how many potential customers we will attract with our solution (attraction),*
* *how many of these will actually buy our product (activation),*
* *how many customers will make one or more purchases over time (retention),*
* *how many customers will recommend us to their friends, relatives, and acquaintances (recommendations),*
* *how many purchases of our products will there be, expressed in quantity (revenue).*

*The assessment of KPIs is only an assessment, but this assessment must be based on some market research and financial analysis. KPIs should never be taken for granted!*

*Competitive advantage and protection of intellectual property: although the competitive advantage is a feature of our business model that we are yet to develop, it is still right that we think about it now. At this point, we compare ourselves to the competition and determine in what ways we are / will be better than them. Your advantages cannot be easily imitated by the competition.*

*Competitive analysis is defined on the basis of our scientific and market research. The table therefore summarizes the key elements of our product and business model that make up our offered value and compares them with similar elements of our competition's business model. We need to be better than the competition in at least one key element, maybe more. An example of competition analysis can be seen in the figure below. It’s probably perfectly clear which company did the analysis, right?*

*Note: lower price is not necessarily a competitive advantage, as there is always someone who is willing to make a similar solution even more affordable.*



Picture 2: example of competitive landscape; source: [www.cmu.edu](http://www.cmu.edu)

*The protection of intellectual property (patents) is an extremely demanding field and it is not necessary to deal with it excessively here. However, it is right that we think about which parts of our solution would be good to patent in the future.*

*Revenue streams and cost structure: Revenue streams include all the ways we make money. If it is a physical product, it will be revenue from the sales of this product or from subscription to our service (depending on the business model). For the stated price of the product, the customer / user must receive exactly the value proposition for which they have paid. The market price of our product / solution is not the same as the cost of manufacturing it (cost of goods sold (COGS)). Typically, the market price of our product / solution is three to four times higher than COGS, but this depends on the industry. Our revenues are therefore determined on the basis of COGS and the quantity of products sold.*

*Our costs: these will include the cost of product development and production (or service provision), rent, our salaries, electricity, telephone, travel expenses, various risk insurance, etc. Marketing is also a very big expense and usually amounts to about 20-30% of the company's total revenue. Various taxes are not considered costs. The costs in various branches of science entrepreneurship (pharmacy, for example) are enormous. For example, the development of an originator drug can cost several billion euros (including the work of researchers and the cost of research equipment, as well as testing on test specimens and risk insurance). That is why the prices of such drugs can be so high.*

*MVP and feedback with interviews: MVP or the minimum viable product is our solution developed to the extent that we can already sell it to early adapters. However, since there is a very high probability that we will not yet develop our solutions before the ScienceJam competition to the stage where we can sell it, we can use 'fake' products to at least do a 'proof of concept' test. We recommend setting up a 'landing page' (this is possible on Wix, WordPress, GoDaddy, LaunchRock, Google Worksopace, etc.), where we publish a picture of our future product / solution (it can be a computer render), along with key value proposition points and the most likely price. We then collect emails from potential customers / users that site visitors will leave if they are interested in our solution.*

*However, if we have actually developed the solution to the point where we can physically test it (such as soap or skin cream made from natural materials) on users / customers, then we also describe this interaction. However, in no case do we recommend testing any products that could cause injury or ill health to our test specimen!*

# Discussion:

## Comparing our results with those of other researchers;

## Practical and theoretical implications;

## Limitations.

*The discussion is a classic part of the scientific literature. In it, we think about what the results of our research actually mean. In the case of ScienceJam, it is necessary to show unequivocally how scientific research has influenced the development of the business model.*

*Comparing the results with the findings of other researchers: if we have relied on researchers who did similar research before us when setting up our scientific hypotheses, we must now also compare the results of our research with their results. At the same time, it is right that we try to figure out why our results are different from theirs or similar to theirs.*

*Practical implications: It is very important to define the consequences of our findings, i.e. what our results mean for our business model and competitive advantage. It is important to describe in what way the results of scientific research make our solution significantly more competitive or less so? If you are developing a truly disruptive solution, consider what implications this could have for the entire industry. Suppose you have developed a kind of plastic that decomposes in half a year instead of 50 years at an average temperature of 20 degrees Celsius and an average humidity of 80% at the same cost of production as existing types of plastic. What would this mean for your competitors? Also, think about the implications of your findings for the further work of scientific researchers. If the results of your research are different from those of other researchers, scientists will be able to refer to your research in the future.*

*Limitations and next steps: It is extremely important to be aware that our findings are not always and everywhere valid. For this reason, it is necessary to list the greatest limitations of both our scientific and business research (limitations).*

# Conclusion:

## Summary;

## Next steps.

*Summary: the conclusion summarizes the content of the research task and the main contributions to the body of knowledge. We summarize what the most important conclusions for our project are.*

*At this point, it is also necessary to define what our next steps will be, which we will have to take in our project, especially in the form of scientific findings and market research.*

# Bibliography.

*Citation of sources: When citing sources, care should be taken to adhere to one standard, such as APA6 or another standard common to a particular field of science. We recommend using tools such as Mendeley or EndNote to cite sources. Mendeley is free and EndNote is unfortunately not. Below are two examples:*

Preston, R. (2010). Observations in acute care: Evidence based approach to patient safety. British Journal of Nursing 19, 442-447. Retrieved from <http://www.britishjournalofnursing.com>

Beckett, S. T. (2008). The science of chocolate (2nd ed.). Cambridge, United Kingdom: Royal Society of Chemistry.

# Appendices

*If we have any appendices, this is where we put them.*

Note for participants: congratulations on participating in ScienceJam! This is how you enter one of the most demanding fields – entrepreneurship and science. Science entrepreneurship can have both the highest returns and the highest added value for humanity. However: participation and a possible good ranking in the ScienceJam competition is only the first small step on this path. It usually takes many years to actually enter the market with the right product in the field of science entrepreneurship, and huge investments and a lot of acquired knowledge are needed. So – you are well on your way, just keep going!