

Sustainable Precision Agriculture:
Research and Knowledge for Learning
how to be an agri-Entrepreneur



Handbook for BUSINESS MODEL CANVAS in the field of SUSTAINABLE PRECISION AGRICULTURE



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1. Introduction: Content and Aim of this Vademecum

This document has two main purposes:

- to create a new educational tool addressed to students with a special focus on Smart Agriculture;
- to collect and present a panel of **21 business models of successful companies operating in the field of agriculture** in south Europe, that can be considered as best practices in the field of Precision Agriculture (PA).

The aim is to design the guidelines for future Agripreneurs 4.0 and consultants who will be able to analyse business cases in order to facilitate the adoption of PA techniques and tools in SMEs in European agriculture.

This Vademecum includes three main chapters:

- introducing the Business Model Canvas (BMC) methodology and tools and how to use it to assess a Business (chapter 2 “Business Model Canvas: Methodology and Tools”);
- 21 successful business models, in the field of smart agriculture, collected by the partners of the Sparkle Consortium in four different countries of South Europe (chapter 3 “Practical examples: Sparkle’s BMC collection”);
- the assessment of the effectiveness of the BMC methodology from the point of view of interviewed entrepreneurs and of the Sparkle’s consultants involved in the first pilot experience (chapter 4 “Lesson Learnt”).

Last part (“Annexes”) includes the practical tools to implement a BMC assessment, that means:

- Business Model Canvas: Key Questions Check List
- an IMPACT analysis specifically modified to investigate barriers, drivers, benefit and impact related - from the entrepreneur’s point of view - to the introduction of PA within the production system of his/her company.

Please note that **Business Model Canvas poster** and **Precision Agriculture IMPACT ANALYSIS** are available on Sparkle Google Drive, we invite you to download Sparkle tools from <http://tiny.cc/quam6y>

2. Business Model Canvas: Methodology and Tools

The **Business Model Canvas**, designed by A. Osterwalder, Y. Pigneur & others, is a strategic management and entrepreneurial template, based on lean startup, enabling both new and existing enterprises visually represent their business to focus on operational as well as strategic management and marketing plan.

It allows the entrepreneur to describe, design and innovate his/her business model, sharing it with management and partners.

The template consists of nine steps needed to create a business model using the Business Model Canvas.

A business model is defined as:

- A plan for the successful operation of a business, identifying sources of revenue, the target customer base, products, and details of financing.

Essentially, it tells us how the key drivers of a business fit together.

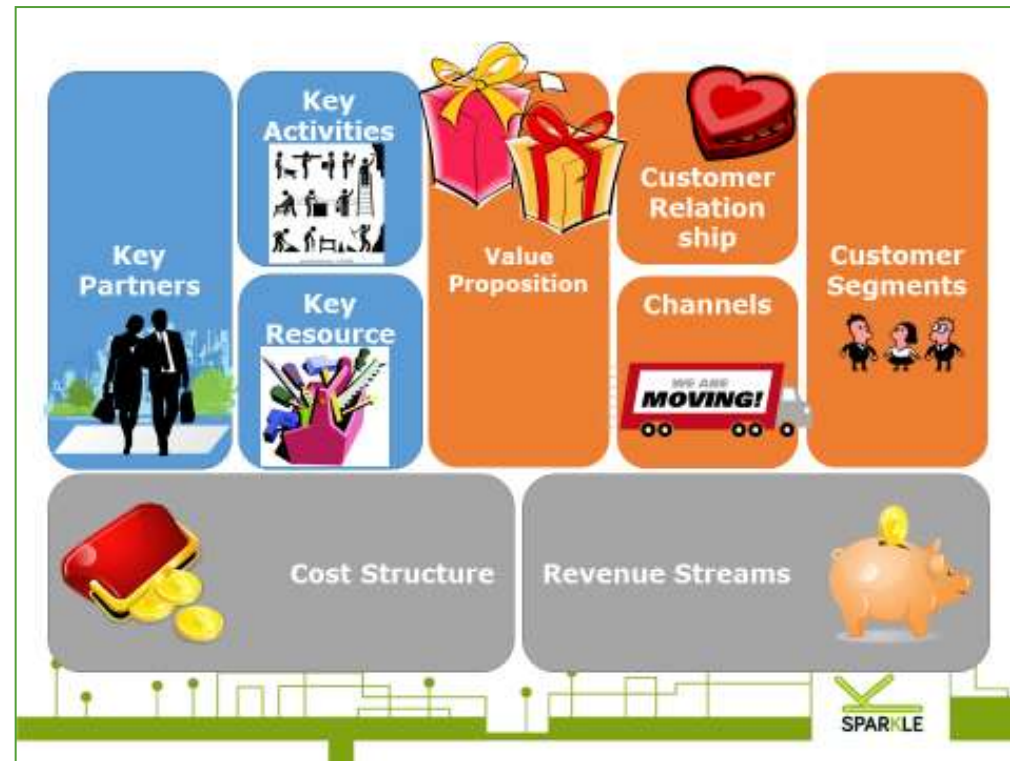
The Business Model Canvas rapidly spread and is widely used because it gives a way to create a pretty clear business model using just a single sheet of paper. And what is great about it is it can be used to describe any company – from the largest company in the world to a startup with just one employee

Advantages of the Business Model Canvas:

- **Easy to understand:** Because the canvas on just a single page is very visual.
- **Focused:** It removes any redundant information that might have been present in a traditional business model.
- **Flexible:** It's quick and easy to make changes to the model and sketch out different ideas.
- **Customer Focused:** the canvas forces first of all to consider the **value** the business is providing to the customers, and only then what it takes to deliver that value.
- **Shows Connections:** The single page graphical nature of the canvas shows how the different parts of the model interrelate to each other.
- **Easy to Communicate:** Because the canvas is so easy to understand. It can be easily shared and explained.

Using the Business Model Canvas

The first thing to notice is that there are nine elements or building blocks, which make up the canvas:



Each building block of the canvas tries to answer the following questions:

1. **Customer Segments:** Who are our customers?
2. **Value Proposition:** Why do customers buy from us? What is the gain we provide or the need we satisfy?
3. **Channels:** How are our products and services delivered to the market?
4. **Customer Relationships:** How do we get, keep, and grow our customers?
5. **Revenue Streams:** How does our business earn money?
6. **Key Resources:** What unique strategic resources does your business have or need?

7. **Key Activities:** What unique strategic activities does our business perform to deliver your value proposition?
8. **Key Partnerships:** What non-key activities can we outsource to enable us to focus more on our key activities?
9. **Cost Structures:** What are the major costs incurred by our business?

Left/Right Split

We can say that those elements on the left-hand side of the canvas represent costs to the business, whereas elements on the right-hand side generate revenue for the business.

However, the Business Model Canvas comes to life when you see it in action.

Let us look at three different examples of the Business Model Canvas so you can see just how useful it can be.

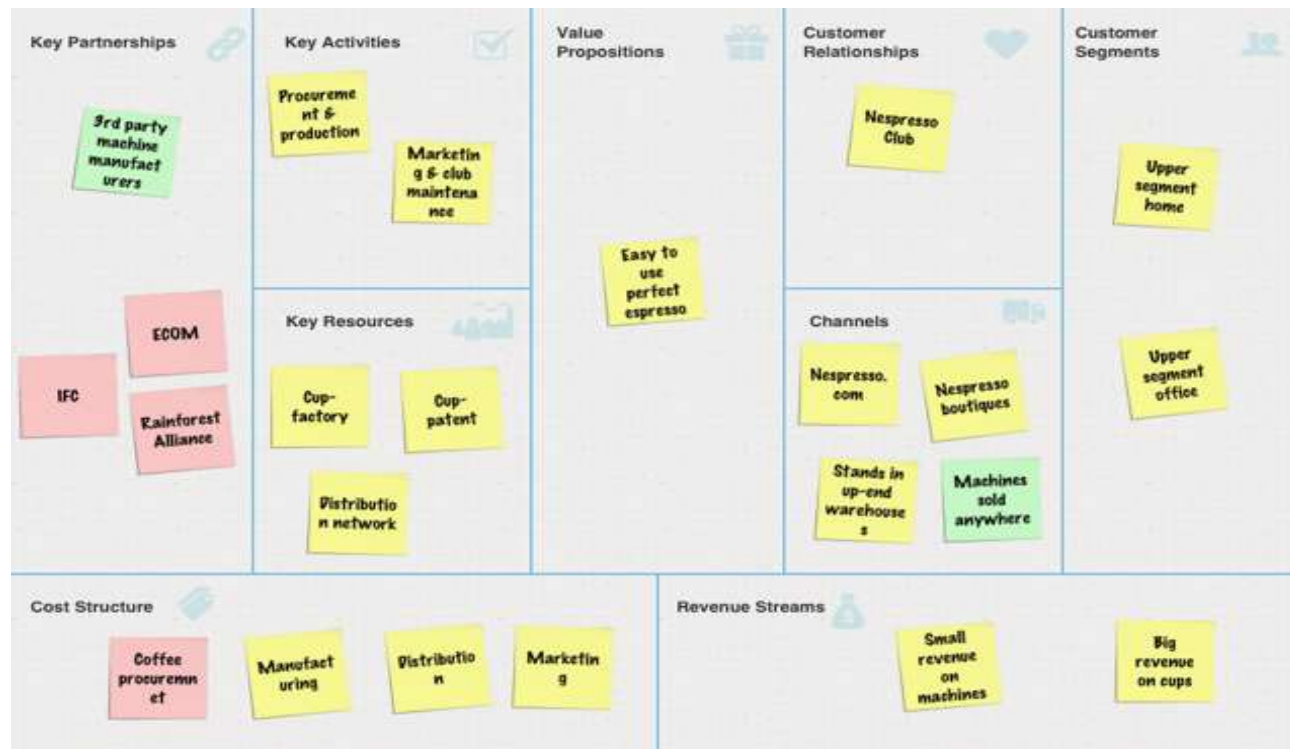
Nespresso

The first and most famous example is the Nespresso case of business model innovation. Nespresso is a machine-and-pod coffee concept for making espresso, developed by the food multinational Nestlé. By fitting an aluminum coffee pod into the machine, perfect espresso can be made at the push of a button.

Specifically, what makes the Nespresso case appealing is that the model:

- attracts clients through an upper segment marketing strategy, with George Clooney at the helm creating that “club” feeling
- ties customers directly to Nespresso through direct sales systems for the cups that go into the machine, both online (10 million online subscribers) and through boutiques (over 200 worldwide). This keeps margins close and warm for the company.
- Outsources production of the coffee machines to 3rd party manufacturers under “at cost” technology licensing. At the same time these manufacturers function as part of the distribution channel, as customers buying the machines are also tied to using the cups
- safeguards the major revenue stream through the cups with patents, and through Nespresso’s own high-tech processing facilities, which put coffee in the cups and seal them

When the Nespresso business model is drawn out on the business model canvas, the overview looks more or less like this:



PICTURE 1: SOURCE [HTTPS://VALUECHAINGENERATION.FILES.WORDPRESS.COM/2011/12/NESPRESSOMARKET.PNG](https://valuechaingeneration.files.wordpress.com/2011/12/nESPRESSOMARKET.PNG)

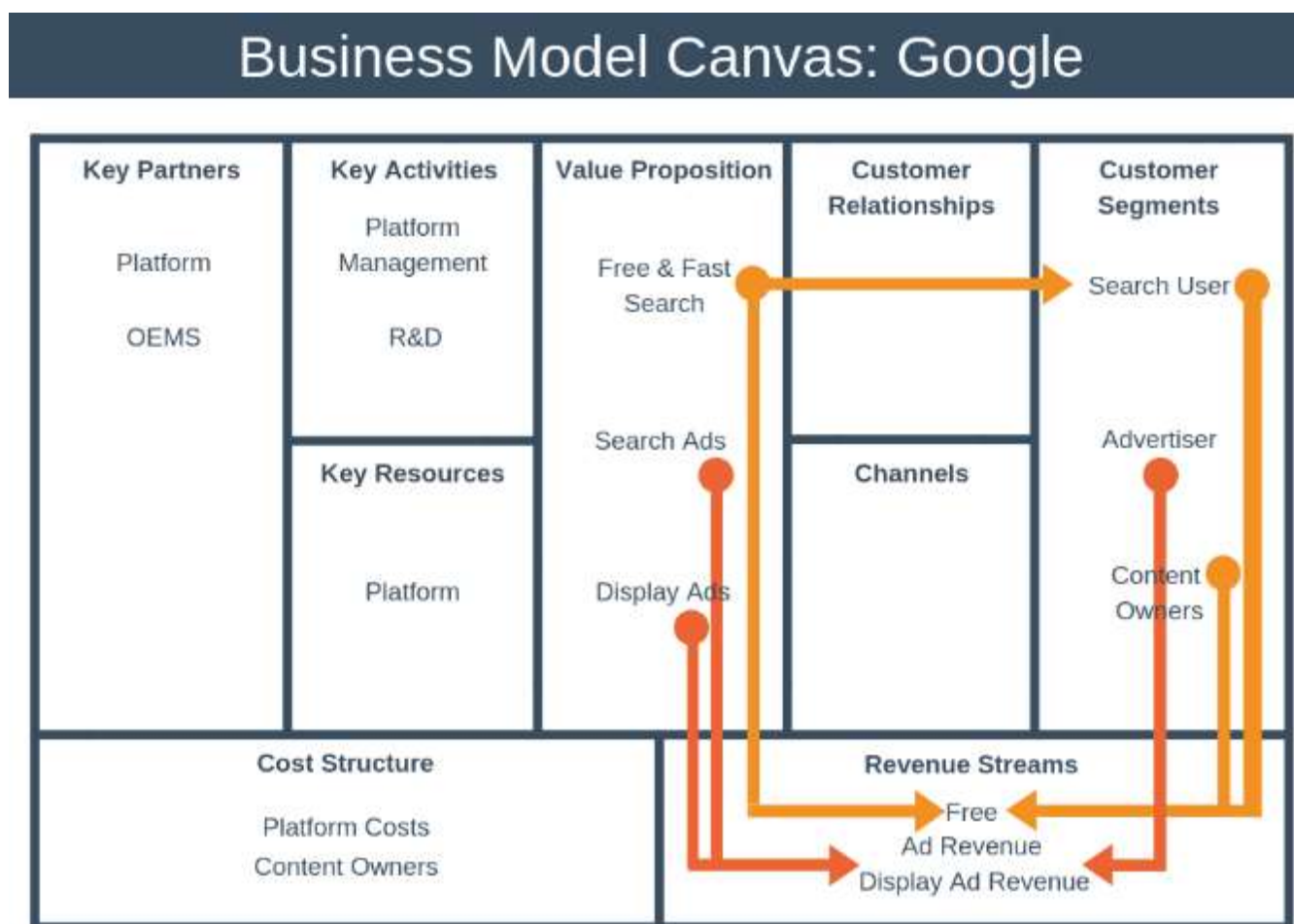
Check the Video of A. Osterwalder explaining the “NESPRESSO” Business Model Canvas: https://youtu.be/_UECTWQCYxQ

Google

Google's business model is multi-sided. This means that it brings together two distinct but related customers.

In Google's case, its customers are its **search users** and its **advertisers**. The platform is only of interest to advertisers because search users are also present. Conversely, search users would not be able to use the platform free of charge were it not for advertisers.

The Business Model Canvas for Google is shown below:



PICTURE 2: SOURCE [HTTPS://WWW.STRATEGYZER.COM/](https://www.strategyzer.com/)

As you can see the diagram gives you an immediate understanding of the key parts of Google's business model.

We can see that:

- Google makes money from the advertiser customer segment, whose ads appear either in search results or on web pages.
- This money subsidizes a free offering to the other two customer segments: search users and content owners.

Google's business model has a network element to it. That is, the more ads it displays to web searchers the more advertisers it attracts. And the more advertisers it attracts the more content owners it attracts.

Google's Key Resource is its search platform including google.com, Adsense (for content owners) and Adwords (for advertisers).

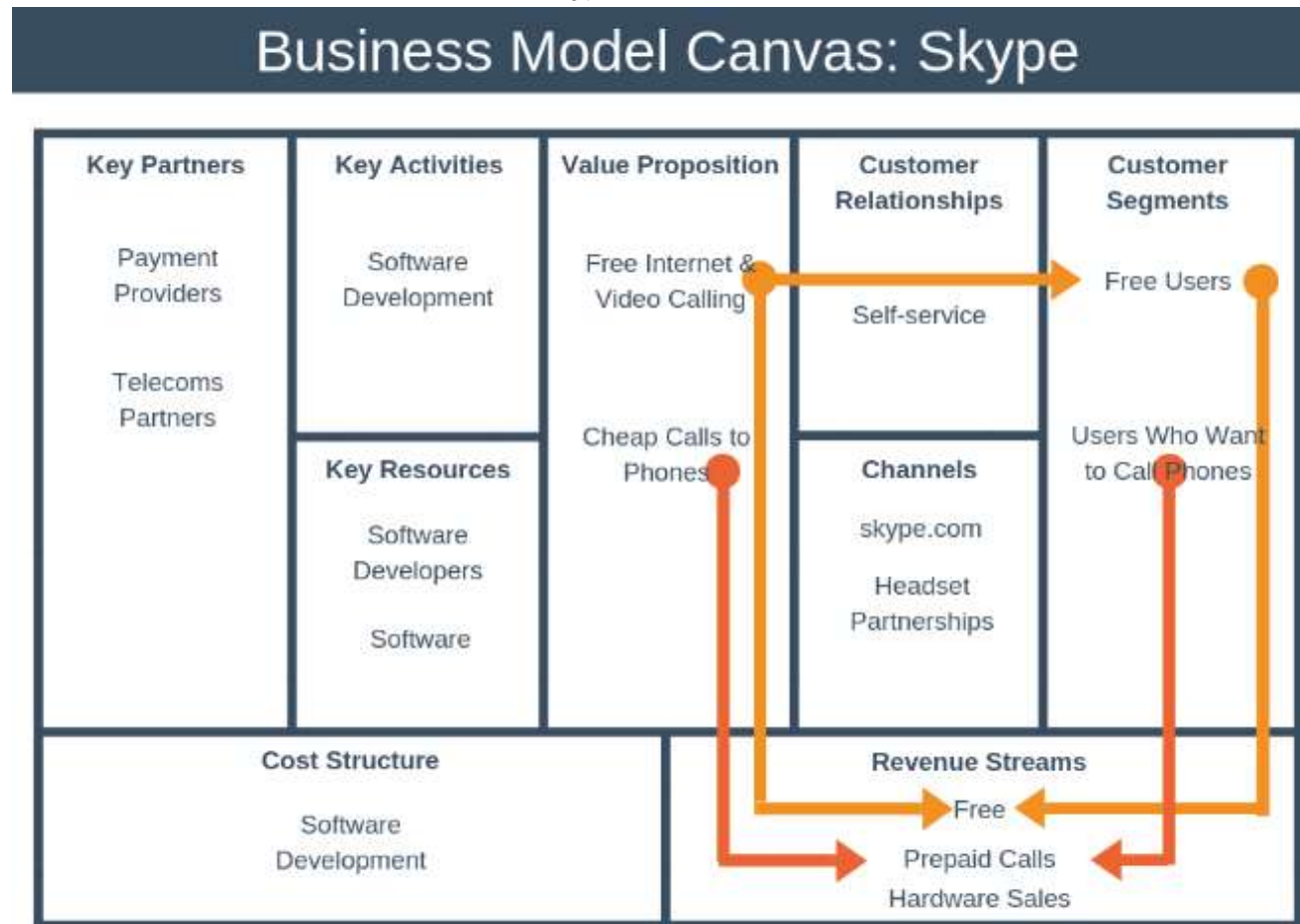
The key strategic activities that Google must perform are managing the existing platform including its infrastructure.

Google's key partners are obviously the content owners from whom a large part of its revenues is generated. OEMs (Original Equipment Manufacturers) also form a key partner.

OEMs are companies who produce mobile handsets to whom Google provides its Android operating system to for free. In return, when users of these handsets search the internet they use the Google search engine by default, thus bring more users into the ecosystem and generating even more revenue.

Skype

In the diagram below you can see the Business Model Canvas for Skype:



PICTURE 3: SOURCE [HTTPS://WWW.STRATEGYZER.COM/](https://www.strategyzer.com/)

From the Business Model Canvas we can see that Skype has two key value propositions:

- The ability to make calls over the Internet, including video calls, for free.
- The ability to make calls to phones cheaply.

Skype operates a *freemium* business model, meaning the majority of Skype's users (the Free Users customer segment) use the service for free to make

calls over the internet, with just 10% of users signing up to the prepaid service.

We can see from the customer relationship building block that customers typically have a help themselves relationship with Skype. Typically, this will be by using their support website.

The channels Skype uses to reach its customers are its website, skype.com, and partnerships with headset brands.

Looking at key partnerships, key activities, and key resources together, the main thing to notice is that Skype is able to support its business model of offering cheap and free calls because it doesn't have to maintain its own telecoms network like a traditional telecoms' provider. Skype doesn't need that much infrastructure at all, just backend software and the servers hosting user accounts.

Business Model Canvas and Precision Agriculture

From this short list we understand that even if the BMC is widely used in business analysis, it is not yet being used when analysing farms and agriculture. Yet, we know that thanks to its visual approach and flexibility, it can be applied to all kinds of businesses and in all sectors.

Here we have the possibility to apply the model to businesses in the agriculture sector and test the performance in explaining how the different elements fit together and in planning future management.

To learn more:

- **A Handbook for Visionaries, Game Changers, and Challengers**
A. Osterwalder, Y. Pigneur, ed. Wiley 2010
<https://strategyzer.com/>
- <https://strategyzer.com/canvas/business-model-canvas>
- <http://www.businessmodelgeneration.com/book>
- <https://canvanizer.com/> (BMC co-designing and sharing platform)

NOTE

All tools in this Vademecum are in the English version. As farmers may not feel comfortable with English, you should always use the versions translated in your language.

2.a Guidelines for Interviewer: How to Design a BMC

The process of designing the Business Model Canvas is a “contact sport”, combining the analytical process of the business with a more physical activity of writing, sticking, moving around post-it and paper sheets. Thinking, writing, standing, sticking, stepping back for a look, changing the order of paper sheets, all this helps developing and sharing the train of concepts in the mind of the entrepreneur and of the management.

Materials

- One BMC large poster printed (140cm by 100cm)
- Post-it of at least 2 different colors; one for the activities of the business and one specifically for the Precision Agriculture activities.
- Felt-pens
- A copy of the guide lines and list of questions
- A copy of the IMPACT ANALYSIS template
- A tape-recorder

“Designing” a Canvas is not “interviewing” the entrepreneur and the business management, but to make an analysis of the business formula, and to help the entrepreneur fill in the 9 blocks of the template through key questions.

The visualization of BMC, during its completion and in its final version, allows the sharing of analysis and the validation of the graphic representation of the business formula of the company.

Using the BMC methodology to guide an entrepreneur in analyzing the business model of his/her company or start up is co-designing the entrepreneurial formula by using questions, examples, interaction and, above all, active listening!

Thus, the analysis must be done together with the entrepreneur, possibly at his company.

Filling out the BMC tool from remote, for instance by email or by phone, would bring to a depletion of data which can be collected only by filling it out together with the entrepreneur and by interacting with questions and validating in real time the Canvas obtained.

Hence, the analysis should be done in cooperation, interaction and exchange with the farmer using a Canvas model, printed on paper and hung on the wall. On this BMC poster answers, contributions and considerations that might arise from the exchange with the entrepreneur will be written down using

post-it notes.

The consultant will lead in the compilation of the 9 blocks using the list of key questions that follows (page 13).

The ideal team for the BMC analysis should be composed of 2 resources: one researcher who interacts with the entrepreneur, while the other one writes down the answers on the post-it notes and attaches them on the poster. Both note down, separately, all considerations and significant answers which have not enough place on the post-it notes, but can be written in the meeting report.

The list of key questions is only for reference, both researchers should be acquainted with the methodology to guide the thinking but ready to follow the train of thoughts of the entrepreneur, underlining the connections and.

Each BMC analysis requires **at least 1 working hour with each entrepreneur.**

Hence, we ask you to take into account for **1,5/2 hours commitment** with each company.

It is fundamental to remember that we are asking for the entrepreneurs' precious time. Therefore, we have to make our best to combine the necessary time for an effective BMC assessment with the availability and the time of the entrepreneurs involved.

NOTE

The first aim of this analysis is to design the entrepreneur formula of the company.

Hence, the invitation for the entrepreneur is to describe with your help their own personal business formula as it is today, without thinking in particular about PA.

Once you will have filled out the BMC in all its sections, you will focus on the role of PA in this business model. Hence, you will ask the entrepreneur to consider how PA interpolates in the company system, where PA is placed in the BMC, in relation to which section.

For a better Canvas visualization, we suggest to use post-it notes of a color for designing the business formula, proceeding then to use post-it notes of another color to collect considerations and answers concerning the use of PA in the company system.

Preparation of the BMC analysis and necessary tools

- verify the entrepreneur's availability through a personal and direct telephone call; then send a brief e-mail as reminder (date, time and approximate duration of the activity, name of the consultants);
- make clear that it's not a structured closed interview, but a 360-degree laboratory for the analysis of their business model, therefore if they need to involve other associates or partners, who deal with the different stage of production, they can do it;
- the entrepreneurs do not like to receive information material on BMC or in-depth links before the meeting; it will be possible eventually to send links or material afterward in case of interest;
- for each company print the following materials (download from goo.gl/4ybWfA)
 - a BMC in poster format AO (size 84 cm x 120 cm)
 - a Precision Agriculture IMPACT analysis matrix in A4 format
- bring
 - paper tape to hung the BMC poster on the wall;
 - post-it notes in two colors (one for filling out the BMC, the second color to note down considerations about PA);
 - markers for writing on the post-it notes;
 - a notebook to write down everything does not fit on post-it notes
 - camera/tablet/Smartphone to take pictures and videos during the work with the entrepreneur. It is necessary to take at least **one or two pictures of the BMC completed** at the end of the interview.

Meeting Plan:

- start the meeting by explaining how the BMC session works: clear the aim, the proposed methodology and the necessary time;
- hung the BMC poster on the wall, explain it to the entrepreneur (what is a BMC, what is it for, show quickly the 9 sections);
- give them a few minutes for considerations and/or clarifying questions;
- **before starting with BMC analysis, collect all data concerning the company profile (see Note below)**
- start the BMC analysis using the "Key Questions Check List" to guide the entrepreneur and post-it notes for writing down contributions and considerations;
- keep the BMC poster of each company, with the post-it sticky notes on it and the completed PA IMPACT ANALYSIS template;
- Write down date, place, name of the consultant, duration of the activity.

NOTE

- 1) The logical BMC sequence, which leads the compilation from a section to another, is indicated in the “Key Questions Check List”. However, in real life the discussion can be very rich and fast, and it’s not always possible to follow a strict logic of completion. We suggest to listen and possibly collect all contributions of the entrepreneur although they come in a confused way. Do not stop them, listen actively doing some follow-up questions when necessary.
- 2) **Data concerning the company profile are fundamental** to complete the analysis of Business Model Canvas.

Hence, we recommend you to start the BCM session taking note of all the necessary data:

1. Company name, headquarters/address and starting date
2. Type of crops and extension in hectares
3. Number of employees
4. Type of PA investments, clarifying
 - when and why they introduced it?
 - what problems they wanted to solve with it?
 - how did they learn about it?
 - who guided or supported them in finding the best PA solution?
 - did they get any specific training?
 - did they get any public grant/funding for implementing the PA?
5. Name of the entrepreneur and of the other people eventually involved for the BMC analysis, their role in the company
6. Contact person and contact details (email, skype, telephone)

2.b Business Model Canvas: “Key Questions Check List”

The “Key Questions Check List” shows the logical BMC sequence, which leads the compilation from a section to another.

In the following list, we report the questions, reflections and examples suggested for each BMC section to help the interviewer interact with the farmer, to facilitate his/her exchange with the entrepreneur and collect as many contributions as possible.

It's important to remember that this is only a logical framework to compile the BMC but it's possible, at the same time, that the exchange with the entrepreneur is richer than what is proposed in the list. Therefore, we suggest to listen actively and collect possibly all contributions of the entrepreneur although they come in a confused way, without following this logical structure.

Value Proposition

The Value Proposition is the core of the Canvas, and it stands right in the middle of it. It corresponds to the “mission”: the reason why this business exists. We ask the entrepreneurs both the products and services their business provides, their farm produces, and the intrinsic worth for the customer, the advantage they receive from it.

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure			Revenue Streams	

What value do we deliver to the customer?
 Which one of our customer's problems are we helping to solve?
 What bundles of products and services are we offering to each Customer Segment?
 Which customer needs are we satisfying?

Characteristics of the Product/Service

- Is it a new product for this market?
- Can improve the performance for the clients?
- Is it customized on the client's needs?

- Is it basic and simply “Getting the Job Done”?
- Is it characterized by an innovative Design?
- Is it a Brand bringing Status to customers?
- Is it convenient? (Price)
- Can help saving money, time? Cost Reduction
- Can reduce the risk for clients? Can it protect the client?
- Is it easily accessible? Easy to use? Convenient?

Customer Segments

The BMC focuses on the relationship between the business and its clients. Here we ask the entrepreneurs to list the different segments of their market.

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

For whom are we creating value?

Who are our most important customers?

- *Mass Market*
- *Niche Market*
- *Segmented*
- *Diversified*
- *Multi-sided Platform*

Distribution Channels

Here we ask the entrepreneurs how they stay connected with their clients. Where do they sell their products and services?

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

Through which Channels do our Customer Segments want to be reached?

How are we reaching them now?

Which ones work best?

Which ones are most cost-efficient?

How are we integrating them with customer routines?

When addressing the issue, we must be aware of the different phases in staying in touch with the clients.

Channel Phases

1. Awareness: how/where/when does the client get to know about our product/service?
2. Evaluation: how do clients make up their mind? Who do they listen to?
3. Purchase: how do they buy? how do they pay?
4. Delivery: where do they prefer to buy? Retail, Great Distribution, Online?
5. After sales: how do we assist clients after sales?

Customer Relationship

In this section we ask the entrepreneurs how they get, keep, grow their customers.

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

What type of relationship does each of our Customer Segments expect us to establish and maintain with them?
 Which ones have we established?
 How are they integrated with the rest of our business model?
 How costly are they?

Examples

- Personal assistance
- Dedicated Personal Assistance
- Self-Service
- Automated Services
- Communities
- Co-creation

Revenue Streams

Summing up the right-hand side of the Canvas, corresponding to the marketing plan of the business, we have the corresponding block of “Revenue Streams”. The purpose of this section is to check where the business is actually producing revenues, what products, what services.

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure			Revenue Streams	

For what value are our customers really willing to pay?
 For what do they currently pay?
 How are they currently paying?
 How would they prefer to pay?
 How much does each Revenue Stream contribute to overall revenues?

Key Activities

Passing to the left-hand side of the Canvas we start analysing the “HOW” of the business: the things to be done, the tools to be used, the people to involve. Here we ask the entrepreneurs to tell us what he considers to be the strategic activities to perform to develop the business. Notice that here is where, on average, most entrepreneurs introduce Precision Agriculture in their model.

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure			Revenue Streams	

What Key Activities do our Value Propositions require? Our Distribution Channels? Customer Relationships? Revenue streams?

Categories

- *Production*
- *Problem Solving*
- *Research & Development*
- *Platform/Network*

Key Resources

“Key activities” necessitate corresponding key resources. Here we can test the coherence of the model and we have to look for elements of PA agriculture, strictly linked to the above “Key Activities” block.

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

What Key Resources do our Value Propositions require?
Our Distribution Channels? Customer Relationships?
Revenue Streams?

Types of Resources

- Physical (premises, equipment, technology, raw materials)
- Intellectual (brand patents, copyrights, data)
- Human
- Financial

Key Partners

Here we ask the entrepreneurs what non-key activities they outsource to be able to focus more on key activities.

Notice that here we should find the educational system supporting PA introduction: universities, research centres, consultancy firms, providers etc.

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

Who are our Key Partners?
Who are our key suppliers?
Which Key Resources are we acquiring from partners?
Which Key Activities do partners perform?

Motivations for Partnerships

- Optimisation and economy
- Reduction of risk and uncertainty
- Acquisition of particular resources and activities

Cost Structure

Summing up, the left-hand side of the Canvas corresponds to the structure of the business, which represents the investments, the costs involved.

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

What are the most important costs inherent in our business model?

Which Key Resources are most expensive?

Which Key Activities are most expensive?

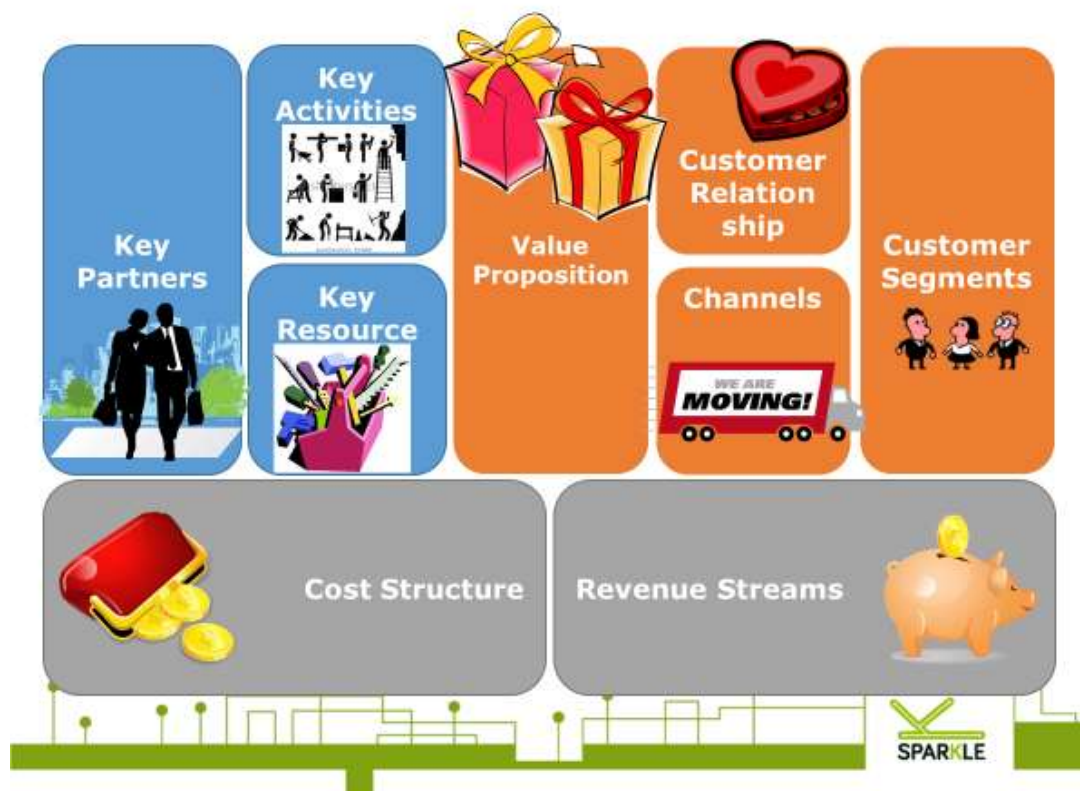
Is your business more...

Cost Driven: leanest cost structure, low price value proposition, maximum automation, extensive outsourcing

Value Drive: focused on value creation, premium value proposition

Sample Characteristics

- Fixed Costs
- salaries,
- rents,
- utilities
- Variable costs
- Economies of scale
- Economies of scope (a proportionate saving gained by producing two or more distinct goods, when the cost of doing so is less than that of producing each separately)



2.c Expected Outputs

The expected outputs are:

- a shared and validated Business Model Canvas of the company in paper version (keep the filled in BMC poster as part of the final report);
- a short report of the BMC laboratory, written following the “Business Model Canvas: “Key Questions Check List””
- a completed PA IMPACT analysis;
- Pictures: at least 1 picture of each completed BMC, possibly pictures of the farmers with his/her BMC, of the farm or/and PA sample

3. Practical examples: Sparkle's BMC collection

Within Sparkle project, the Consortium tested the BMC analysis on a panel of 21 study cases¹ that can be considered as best practices in the field of Smart Agriculture in South Europe.

This group of 21 companies is very rich and includes both micro family businesses and large companies, at the same time it includes agricultural production companies and companies that provide customized PA services and solutions.

Furthermore, the farms involved in the survey belong to different crop sectors and to different geographical areas of South Europe: **Greece, Italy, Spain and Portugal.**

The collection wants to show how to use BMC methodology to analyze the entrepreneurial formula of farms that have successfully adopted PA solution. The final aim is to create a new tool for future “agronomist 4.0” to analyze and support companies that could invest in PA in order to grow economically and, at the same time, decrease the environmental impact.

¹ Only our partners' BMC will be dealt with here, whereas the whole documentation is available on SPARKLE website: <http://sparkle-project.eu/resources/>

3.a GREECE

Greece

HIPPOCRATES FARM – REZOS BRANDS

INFO COMPANY

HIPPOCRATES FARM – REZOS BRANDS

Address: Central Greece [Patras Industrial Area, 25200, Patras, Greece]

Founding date: 2010-2011

Extension: Remote sensing

Crops: FRUITS / Sea buckthorn

Number of employees: 2 (seasonal 15)

Contact

Name: Konstantinos Panagiotou

Telephone: +30 6944866030

Email: konstantinpanagiotou@yahoo.com

Website: <https://hippocrates-farm.com>

Social: <https://www.facebook.com/HippocratesFarmGreece/>

Date of the interview: 29.11.2018

Name of the interviewed person (specifying his/her role in the company): Konstantinos Panagiotou (farmer/owner)

Name of the interviewer: Maria Partalidou [assistant: Dimitra Lazaridou]

INFO PA introduced

What kind of PA innovation was introduced in the company?

PA irrigation System using sensors. Data from sensors are transmitted via Wi-Fi in real-time to a mobile phone based on IOS/Android. In the light of obtained data, the seasonal precision irrigation system was created depending on the amount of water required by the plants at each stage of their growth stage. The required energy of the system was provided by solar energy.

When? 2010-2011

Why? What was the motivation/problem to solve?

The motivation was to introduce new cultivation methods and innovative processes that can upgrade the quality and nutritional characteristics of our beneficial crops, through intensive R&D. Another major driver was the promotion of cultural food heritage, promotion of healthy living and healthy entrepreneurship. Two problems that PA is trying to solve are the need to take care of assets and especially water and of course have a quality higher crop yield.

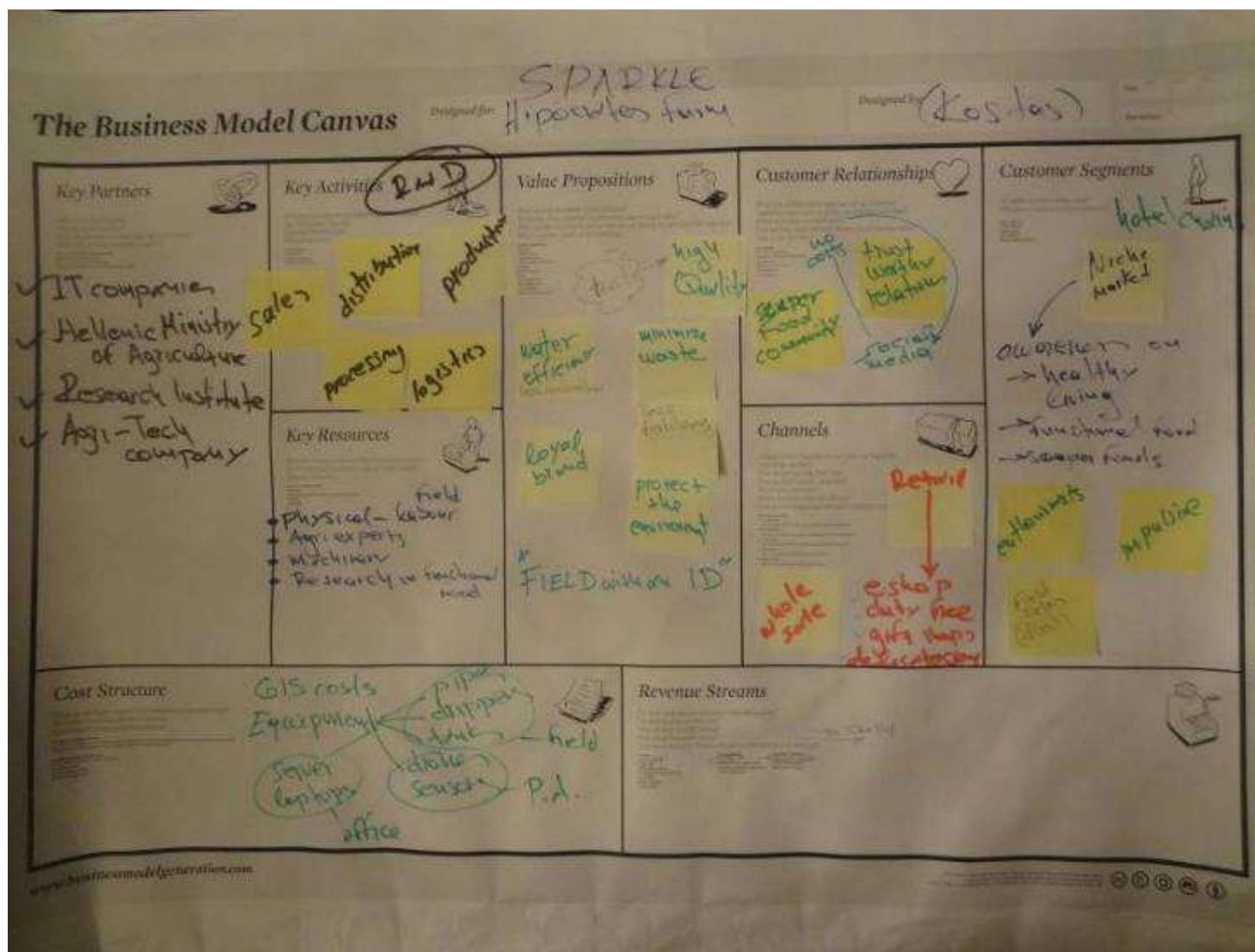
How did you learn about these new technological solutions?

From other farmers outside Greece (networks of peers) that have already adopted PA.

Have you been supported / assisted / trained by someone?for the PA?

We were assisted by the project KATANA in terms of facilitating in th production of our first functional food via PA. Other partners such as :

- University Aristotle of Thessaloniki
- Hellenic Agricultural Organization – DEMETER,
- Agroapps
- Institute of BioSense



BMC - report

Value Proposition

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

The fruit is an absolute power house of nutrients

- absolutely naturally/ organic farming
- functional food products
- the production is a trusted source of high quality food
- less water usage than traditional agriculture
- waste reduction
- positive environmental impact
- loyalty with customers

Customer Segments

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Customers with a healthier approach in life
- Potential customers that need to build awareness on functional food
- Impulsive customers
- Protection of the environment enthusiasts
- Field sales agent (having an ID for your field, rises its value)

Distribution Channels

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Retail: hotels, e-shop, duty free shops, gift shops, shops with superfoods
- Wholesale

Customer Relationship

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Customer analytics for customized products
- Super food community development
- Social media

Revenue Streams

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Cash
- Price list
- Asset sale

Key Activities

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Sales
- Logistics
- Distribution
- Processing
- Marketing
- R&D in functional food

Key Resources

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Researchers
- Agri-experts
- Field –farm labour
- Machinery

Key Partners

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Research Institutes
- Ministry of Agriculture
- Agri-Tech companies
- IT companies

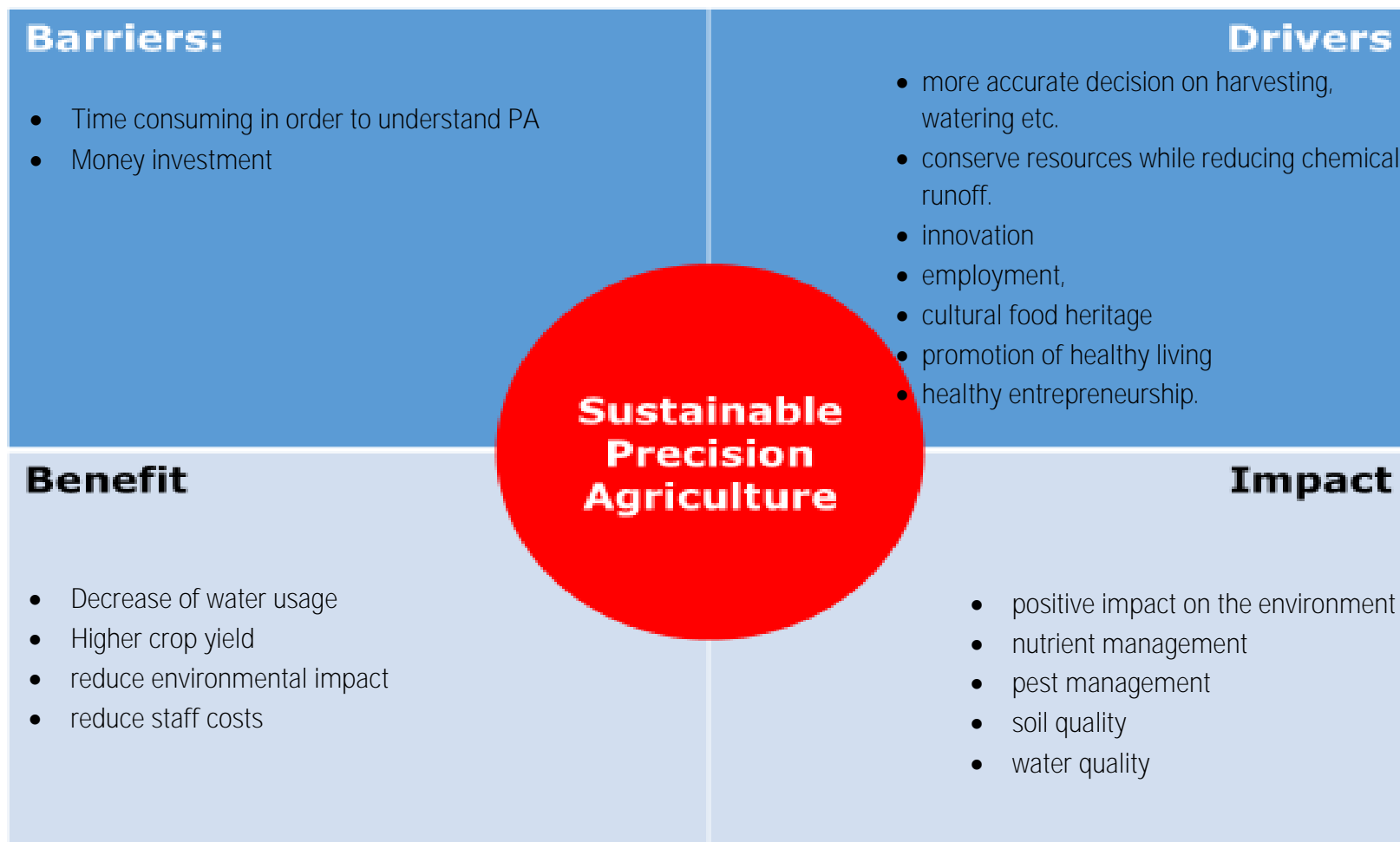
Cost Structure

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- GIS
- Equipment (pipes, drippers, water tanks, drones, sensors, server, laptops)
- Marketing promotion



IMPACT ANALISYS



3.b ITALY

Italy

MARCHESI MAZZEI SPA AGRICOLA

INFO COMPANY

MARCHESI MAZZEI SPA AGRICOLA

Address: Estate Castello di Fonterutoli
Via Ottone III di Sassonia n°5, Loc. Fonterutoli
I-53011 Castellina in Chianti (SI)

Founding date: 1435

Extension: Estate Castello di Fonterutoli 640 Hectares

Crops: Vineyards, Olive Oil, Lavender (Essential Oils), woodland

Number of employees: 50 full time for Tenuta Castello di Fonterutoli. 110 employees with seasonal workers. Other 16/20 employees in the Guest department

Contact

Name: Gionata Pulignani

Office: +39.0577.73.57.30 - Mobile: +39.335.82.63.536

E-mail: g.pulignani@mazzei.it

WebSite: <https://www.mazzei.it/en/>

Social <https://www.facebook.com/marchesimazzei/>
<https://www.instagram.com/marchesimazzei/>
<https://www.youtube.com/channel/UCPdIctC3kGcHrYOJYYpwkCg>

Date of the interview: 20/09/2018

Name of the interviewed person (specifying his/her role in the company):

Gionata Pulignani, technical director - Sergio Corridori, administrative director

Name of the interviewer: Euroteam Progetti

INFO PA introduced

What kind of PA innovation was introduced in the company?

In 2006, Marchesi Mazzei developed a product traceability software from the vineyard, to the winemaking, up to the bottling. Since 2008 they have developed a plan to analyse the vigor index with the purpose of creating a vigor mapping.

In 2010 they started a project to develop a new telemetry application that Marchesi Mazzei developed in collaboration with Professor Marco Vieri of the University of Florence, Bibbiani Macchine Agricole (Monteriggioni, SI) and Soft 2000 (Florence), and which could become a marketable product.

A final project in chronological order, which takes place in collaboration with Syngenta and the University of Florence, is underway to develop a model that allows adapting the dose rate sprayer to the real development of canopy.

They plan to continue with vigor mapping and telemetry together with a Spanish partner. The objective is to extend the telemetry to the entire fleet of tractors for variable rate seeding and nutrition.

Finally they intend to acquire the FSSC Certification (Food Safety System Certification) 22,000 requested by importers.

Why? What was the motivation / problem to solve?

- Guarantee the traceability imposed by current regulations
- Standardize and minimize system errors
- Collect reliable certified data for process management to improve product quality.

How did you learn about these new technological solutions?

Thanks to research centres, partner universities and network of providers.

Have you been supported / assisted / trained by someone?

Yes, by partner network, research centres and universities, suppliers

Il Business Model Canvas

Progettato per:

Progettato da:

11

Discussion



BMC - report

Value Proposition

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Wine (90%), 20 labels marketed
- Oil (10%)
- Lavender and essential oils
- Wine Tours and wine tasting
- Hospitality: B&B and tavern
- Identity
- Sustainability
- Quality
- Brand equity

Marchesi Mazzei SPA is the agricultural company that owns the 3 estates:

- Castello di Fonterutoli, Siena, Tuscany
- Belguardo, Maremma, Tuscany
- Zisola, Noto, Sicily

In 2017 Marchesi Mazzei produced 1.400.000 bottles in all 3 estates. For over six hundred years the Mazzei family has been producing wines. In all properties, the harvest is done exclusively by hand.

Marchesi Mazzei offers: transparency, authenticity, honesty. Visits to the vineyard and tastings let you know the company live in a total and immersive experience.

The value offered goes beyond the sale of products and includes enjoying the environment, history and tradition.



Customer Segments

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Marchesi Mazzei sells its products mainly in Europe (35%), the rest is sold on other markets, especially the USA and Japan
- 80% of the product is exported

There are approximately two types of customers:

- product connoisseur, Europe, USA, Japan
- Aspirational Brand, does not know the product, seeks a status benefit.
- 40% of the production goes to large-scale distribution
- 60% of production concerns labels for the HORECA system

Recently the company has invested in hospitality, addressing a high-end tourist segment that in addition to wine is interested in other assets of the company: tradition, history and territory.

Distribution Channels

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

Product Ambassadors: network of wine bars, restaurants, small quality shops - HORECA

- large-scale distribution
- Importers for the markets of Germany, Austria and Switzerland
- Exporters for the most distant markets: USA, Canada and Japan, for which the scores of sector magazines are essential
- Network of representatives agents for ITALY

The digital communication system takes place through the site and social networks: Facebook, Instagram and YouTube. The communication channel of wine bloggers was not interesting because it proposes a generalist and not always transparent communication.

Customer Relationship

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Social Media Marketing
- Newsletter
- B&B, Tavern, *Società Orchestrale*
- Wine Club/ Ambassadors
- Wine Tours and Tasting
- Events
- P.R.

The relationship with the customer communicates the lifestyle and philosophy of the company through the below-the-line channels: transparent, sustainable, enthusiastic

Revenue Streams

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- 90% wine sales
- 10% oil sales
- Wine Tours and Tasting
- Hospitality

In 2017 Marchesi Mazzei had a turnover of 13.3 million euros.

The sales margin to the final consumer is higher than in the horeca and large-scale distribution system

Key Activities

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Planning
- Viticulture
- Winemaking – innovation in the process
- Marketing
- Selling

Research for production innovation for a standardization and optimization of the system.
A careful financial and warehouse management is very important.
An efficient sales network for both large-scale distribution and Horeca products.

An increasingly optimization of the production / marketing chain.

Communication: it is very important to communicate with customers who cannot make a direct experience of the product in the company.

Communication: institutional communication must be resolved, at local, regional and national level.

Key Resources

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Uniqueness of the territory
- Brand: identity and history
- Wine Cellar
- Competent and motivated human resources
- The necessary financial means to make investments in PA too.
- Availability of customized equipment for harvesting, winemaking and bottling.
- Human resources are a critical success factor, in addition to technical skills, which should increasingly integrate different fields there are passion and curiosity for the job too

Key Partners

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Ambassadors
- Restaurants
- Wineshops
- Large-distribution supermarkets
- Importers
- Suppliers

Companies: BASF, Bibbiani Macchine Agricole, Bucher Vaslin, CBC Bioguard Europe, Claas, Oenodev, Soft 2000, Syngenta.

Research centres: CRA Entomology of Firenze, Horta Srl, University of Florence, University of Pisa.

It would be desirable to improve the collaboration by the administrators, with whom to share a project for the territory.

Cost Structure

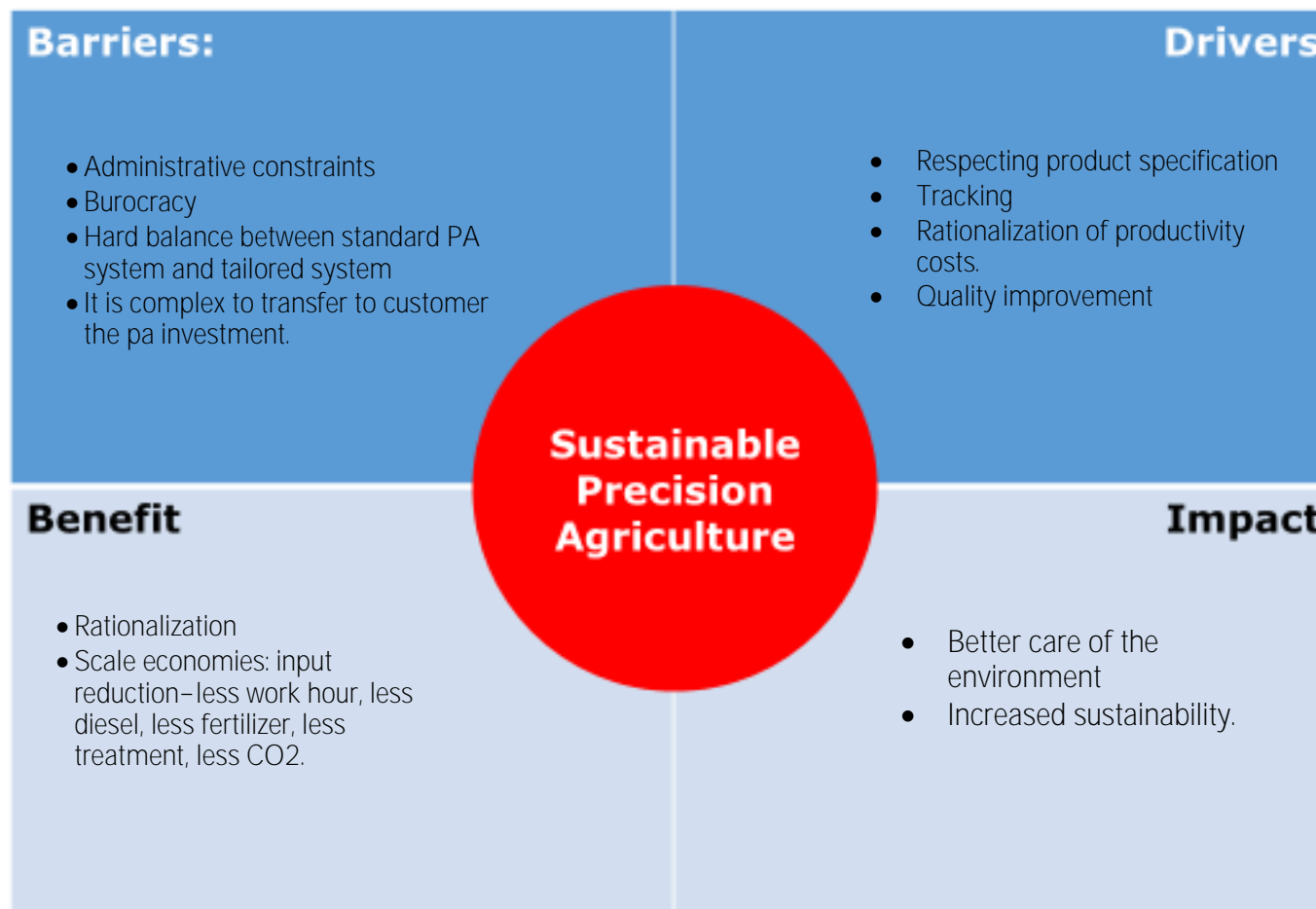
Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Selling
- Equipment
- Packaging and Label
- Certification fees
- Transport
- Wine Growing

All PA projects have been self-financed by the company, without resorting to public or private funding.

For this reason, it would be useful to have more flexible financial instruments, both public and private, to support the farm's liquidity.

IMPACT ANALYSIS



3.c PORTUGAL

Portugal

QUINTA DA CHOLDA

INFO COMPANY

QUINTA DA CHOLDA SA

Address: Quinta da Cholda, 2150-066 Azinhaga do Ribatejo, Golegã

Founding date: 1987

Extension: 500 ha for corn and 1700 ha for forest

Crops: Corn and forest

Number of employees: 10 permanents

Contact

Name: João Coimbra

Email: geralcholda@gmail.com

WebSite: quintadacholda.pt

Social: www.milhoamarelo.com

milhoamarelo.blogspot.pt

www.youtube.com/user/jcoimbra1

Date of the interview: 2 October 2018

Name of the interviewed person (specifying his/her role in the company): João Coimbra, administrator and Nuno Tomé, technician

Name of the interviewer: Manuela Correia and Luís Paixão

INFO PA introduced

What kind of PA innovation was introduced in the company? (see WP1 Questionnaire for farmers Part I – I.2)

Variable Rate Technology (VRT).

When? 2016.

Why? What was the motivation / problem to solve?

To spread nutrients in a non-uniform way.

How did you learn about these new technological solutions?

From literature and internet.

Have you been supported / assisted / trained by someone?

No, they learned by themselves.



BMC - report

Value Proposition

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Corn.
- Forestry products.
- Electricity.

Quinta da Cholda produces high quality corn. Forest products are eucalypt wood and cork. Electricity is produced through solar energy.

In the scope of Precision Agriculture (PA), Quinta da Cholda produces information and knowledge, mostly for internal use

Customer Segments

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Corn is for agri-food industry (livestock and human). The customer is a distribution company that also exports. Since this is high quality grain, they are starting to reach baby-food market.
- Forestry products are for paper industry (eucalypts) and for stoppers since the cork is of high quality.
- Energy market has only one purchaser in Portugal

The application of PA technology doesn't bring advantages for selling corn, but it can bring, in the future, a preference advantage. Buyers may prefer a producer that applies PA methods rather than others who don't.

Quinta da Cholda provides information to several service supplier enterprises and exchanges it with services or discounts.

Distribution Channels

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- There is a partnership with corn customer. This company also provides technical support to corn production and evaluates quality along the campaign.
- Customers are responsible for transporting corn production.
- The transport of forest products is carried out by service providers.
- Customers were reached by personal contact and right now Quinta da Cholda doesn't need new customers

Customer Relationship

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- For corn and forestry products, there is a personal relationship with the customers.
- The energy market has a more impersonal relationship.

Revenue Streams

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- The corn maximum price is set by the market and the quality doesn't make a great difference. The payment is deferred.
- European Union and national funding are important incomes.
- Corn and forestry products prices are set by the market each year. The energy price is fixed and set by a period of 15 years.
- Scientific partnerships in research projects are an income.
- Profits can be increased by PA, because it can raise productivity and reduce costs.

Income is variable each year, due to cork production. However, about 64% of the company income comes from corn, 9% from cork, 10% from eucalypt and 17% from energy. The farm has another small incomes

Key Activities

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- For corn, cultural operations and resources acquisition are the key activities.
- For forest, the main activities are operations to reduce fire risk and waiting time since plantation until trees to grow.
- For energy production the key activities are related with the initial investment in equipment and in maintenance. Besides, you can only sell energy if you buy it

Using PA changed the whole production process.

Key Resources

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Physical key resources are land (the most important), water supplies like dams, water holes, water distribution network and permanent cultures.
- Financial key resource is the capability to invest.
- Human resources are a capital gain to this enterprise and a very important asset because they have the training and they are permanent workers.
- Another key resource is the right to receive funding, which is given for owning land, even if it is rented.
- With PA techniques Quinta da Cholda can gather and analyse data, establish information networks and collect information to build models that may be, in the future a key resource.

Key Partners

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- Suppliers also are partners and they exchange services by knowledge and data.
- Forestry products buyers are also important partners.
- The company buying corn is a partner both as a customer and as a supplier.
- Technical support is acquired to partners, for corn production.
- Another key partner is an enterprise that deals with government issues and has a connection to a NGO for environmental questions.
- The company that supplies energy equipment is also a partner, providing equipment in exchange for support to project elaboration.

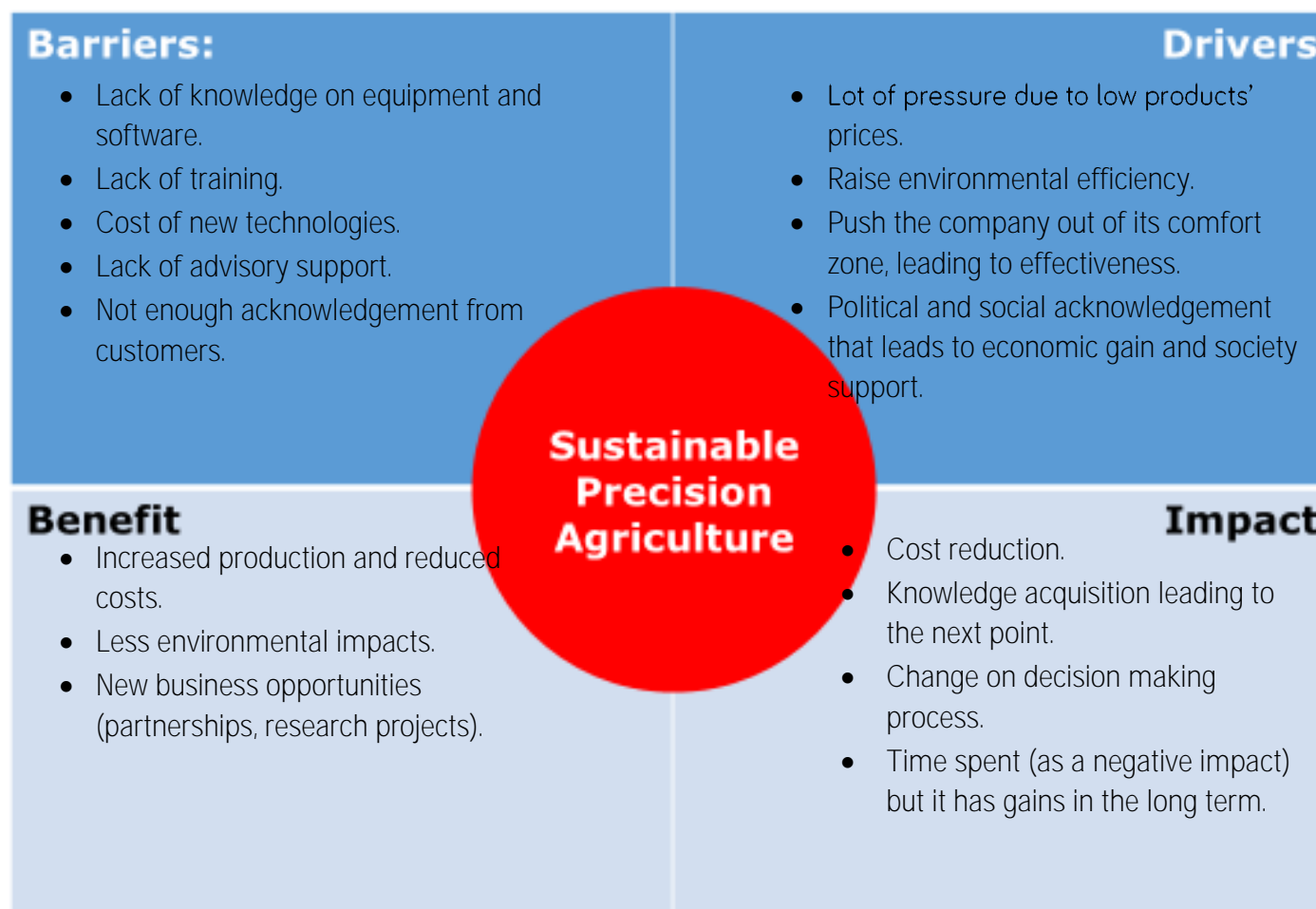
- A consulting company in PA gives technical support and receives new clients recommended by Quinta da Cholda.
- The company that performs the cultural operations and gives informatics support is another key partner.
- Quinta da Cholda also provides consulting services through international partnerships, using data they collect

Cost Structure

Key Partners	Key Activities	Value Proposition	Customer Relationship	Customer Segments
	Key Resources		Channels	
Cost structure		Revenue Streams		

- From the most to the least important costs, we have raw materials, external services and human resources.
- The company is cost driven, but they are trying to add value through the production of corn for human food and popcorn.
- The highest is depreciation cost because equipment is a big investment.
- They have economy of scale because sowing large areas reduces costs.
- PA equipment is more expensive (about 10% more) than conventional equipment, human resources must have training to use it and more time is spent on management tasks. So, PA raises costs.

IMPACT ANALISYS





4. Lesson learnt

4.a Key Factors Facilitating PA Adoption (IMPACT Analysis)

The entrepreneurs involved in the Sparkle's pilot test have been asked to identify the key factors that can motivate and facilitate or, on the opposite side, hinder the adoption of PA solution.

To collect their contributions, we used an IMPACT ANALYSIS matrix, specifically modified to investigate **barriers, drivers, benefit and impact** related - from the entrepreneur's point of view - to the introduction of PA within the production system of the company.

Here is a synthesis of what entrepreneurs from different countries told us.

GREECE

BARRIERS	DRIVERS
<p>LACK OF KNOWLEDGE/SUPPORT FROM EXPERTS</p> <ul style="list-style-type: none"> • Lack of experience in IT technology plus hard to deepen in IT fields of knowledge • Inadequate technological background i.e remote sensing • Lack of expertise / training in PA • Time consuming to understand PA <p>HIGH COSTS</p> <ul style="list-style-type: none"> • Cost of PA • Money Investments • High cost in case of wrong decisions 	<p>IMPROVEMENT OF THE BUSINESS PERFORMANCE</p> <ul style="list-style-type: none"> • Creating standard decision making mechanisms • Find a way to take decisions (best time to harvest a quality product) • More accurate decision on harvesting, watering etc • Composing a method to control quantity and (mostly) quality of final product • Standard quality (premium quality) • Minimize food loss • Minimize costs

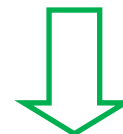
<ul style="list-style-type: none"> • High costs of the PA equipment -that is why we established a farmer's group <p>LACK OF A SPECIFIC NETWORK</p> <ul style="list-style-type: none"> • Reestablishing agreements with local providers • if you don't have the network to support you (and fill in the knowledge gaps) this might be a disaster <p>RESISTANCE TO CHANGE</p> <ul style="list-style-type: none"> • Difficulty in adapting new way of thinking 	<ul style="list-style-type: none"> • Low prices that we used to have (due to the previous-the low quality) <ul style="list-style-type: none"> • Predict oregano growth patterns • Range of products expansion <p>ENVIRONMENTAL PROTECTION</p> <ul style="list-style-type: none"> • Conserve resources while reducing chemical runoff • Safeguard a living standard for the small farmer/small family farm • Promotion of healthy living • Healthy entrepreneurship <ul style="list-style-type: none"> • Innovation • Employment • Cultural food heritage
<p>BENEFITS</p>	<p>IMPACT</p>
<p>HIGHER PRODUCTIVITY</p> <ul style="list-style-type: none"> • Higher field performance (productivity/economy) • Optimal harvest time • Higher crop yield • Real-time monitoring of cultivation • Better quality product <p>HIGHER PROFITABILITY</p> <ul style="list-style-type: none"> • Higher negotiation margins • Higher yields of quality product • Make decisions easier –effectively • Branding <p>DECREASE OF COSTS</p> <ul style="list-style-type: none"> • Lower costs 	<p>ENVIRONMENTAL PROTECTION</p> <ul style="list-style-type: none"> • Environmental protection (reduce of unnecessary spraying & less irrigation and fertilizers) • Protect the environment with less inputs / Environmental friendly farming practices • Positive impact on the environment • Protect the environment with less inputs / Environmental friendly farming practices <ul style="list-style-type: none"> • Food safety • Minimize food loss (an economic and a social problem) • Nutrient and pest management

- Cost controlling
- Prevent food loss
- Reduce staff costs

LOW ENVIRONMENTAL IMPACT

- Decrease of water usage
- Reduce environmental impact

- Soil quality
- Water quality



- Reducing cost of farming
- High quality and competitive final products

ITALY

BARRIERS	DRIVERS
<ul style="list-style-type: none"> • It is complex to transfer to customer the PA investment <p>LACK OF KNOWLEDGE/SUPPORT FROM EXPERTS</p> <ul style="list-style-type: none"> • Lack of support to farmers and in particular lack of experts and trainers to assist in implementing PA in the farm • Lack of poorly trained resources <p>HIGH COSTS</p> <ul style="list-style-type: none"> • High technology costs (not justified, moreover) <p>LACK OF A SPECIFIC NETWORK</p> <ul style="list-style-type: none"> • Difficulty to find innovative technologies and machinery • Not yet ripe solutions • No suppliers of mechanical innovative custom made products • Lack of and/or difficulty in finding service providers on the market: especially in the South of Tuscany • Hard balance between standard PA system and tailored system <ul style="list-style-type: none"> • Administrative constraints • Bureaucracy 	<p>PERSONAL ATTITUDE/KNOWLEDGE</p> <ul style="list-style-type: none"> • Passion for new technologies and innovation • Pride and personal satisfaction in being appreciated for our production system by the University <p>ECOSYSTEM PUBLIC/PRIVATE</p> <ul style="list-style-type: none"> • State aids allow breaking down costs of PA innovation still very high • Research partners such as University <p>IMPROVEMENT OF THE BUSINESS PERFORMANCE</p> <ul style="list-style-type: none"> • Need to equalize the years 'quality to improve mid and long term quality • Respecting product specification • Tracking • Rationalization of productivity costs • Quality improvement <p>FORMAL NETWORK OF MSMEs</p>

RESISTANCE TO CHANGE <ul style="list-style-type: none">• Innovation culture is still not widespread among entrepreneurs• Small company size and parcels of land	<ul style="list-style-type: none">• Formal network agreement in order to share first of all the high costs of investments but also knowledge and common benefits ENVIRONMENTAL PROTECTION <ul style="list-style-type: none">• Environmental sustainability: keeping land and company safe, even for future generation
BENEFITS	IMPACT

HIGHER PRODUCTIVITY/ PROFITABILITY

- Rationalization
- Work rationalization: PA force to clean up the production system Equalize product quality in the mid-term. (Of different years)
- Increase in business productivity
- Rationalization of work

INCREASE OF LIFE QUALITY FOR FARMERS/EMPLOYEES

- Increase in workers' health and comfort

DECREASE OF COSTS

- Variable costs decrease
- Scale economies: input reduction–less work hour, less diesel, less fertilizer, less treatment, less CO2

LOW ENVIRONMENTAL IMPACT

- Fertilizer optimization

ECONOMICAL GROWTH OF LOCAL AGRICULTURE

- Changing in agripreneurs mind-set

ENVIRONMENTAL PROTECTION

- Maintenance and safety of the environment
- Optimizing nutrient in organic productions increase quality and quantity production (yield more similar to conventional production)
- Better care of the environment
- Increased sustainability

SPAIN

BARRIERS	DRIVERS
<p>LACK OF A SPECIFIC SUPPORT FROM PROVIDER</p> <ul style="list-style-type: none"> Technologies are not user-friendly Provider of PA equipment are not aware of the potential of their own machinery, you need to learn its possibilities after buying No explanation provided with machinery No knowledge of English Manufacturers do not give enough support after sales Their application accuracy is 24x24m, so the trendy drone technologies don't give them any more information than they can take from the (free) satellite images The different treatment prescriptions in the software appear as rectangles, even though the fertilizer is applied with spinning disks, so circular. Triangle areas would already be an improvement from the squared areas they use now Farmers in the coop are not allowed to buy or sell anything other than to/from their own coop. The only exception are things that are not available in the coop, such as e.g. ecological seedlings Upgrading machinery with additional sensors/equipment can only be done to machinery that is already electric. 80-90% of the farmers in Spain still work with purely mechanical machinery <p>LACK OF EXPERTS/CONSULTANTS</p>	<ul style="list-style-type: none"> A driver would be acting on market trends, being versatile Open markets (international) push margins down Employing technology Professionalization of human resources, with experts in new technologies can drive the change <p>NETWORK OF MSMEs</p> <ul style="list-style-type: none"> In the last 2 years even the smallest farms have adopted GPS technologies, even part-time farmers are now using it. A CUMA is a group of farmers or coops sharing their machinery They're currently using satellite images in QGIS and send it to AgLeader software for actuation They combine soil analysis data of 15-20 different farmers in the area, 3 fields per farmer, to detect trends in the soil in their region. <p>IMPROVEMENT OF THE BUSINESS PERFORMANCE</p> <ul style="list-style-type: none"> Precision Agriculture technologies can help in cutting costs

<ul style="list-style-type: none"> • Finding good personnel is difficult, keeping them on even more so • The playing field in the south of Europe is missing consultancies, which would be their direct link to the farmers • Not enough knowledge / advice about PA available • He wants to expand the area of spraying services, but not clear how to do it <p>HIGH COSTS</p> <ul style="list-style-type: none"> • Overhead costs for office spaces and warehousing and company cars • Costs (fuel, mainly) are increasing • Production costs are high • Prices of agricultural commodities are low and decreasing • Local production supported mainly by EU subsidies <p>RESISTANCE TO CHANGE</p> <ul style="list-style-type: none"> • He uses some PA technology, but is afraid of using other (i.e.drones) • He has not seen yet other farmers using VRT in a profitable way 	
BENEFITS	IMPACT
<p>HIGHER PRODUCTIVITY/ PROFITABILITY</p> <ul style="list-style-type: none"> • Higher productions • Better commercial margin • Divide tasks • Decentralise all the different aspects of farming, someone concerns themselves with market rates 	<p>ECONOMICAL GROWTH OF LOCAL AGRICULTURE</p> <ul style="list-style-type: none"> • Sharing (regional) knowledge • Sharing data across the region • A high level of insight in their own fields/crops, as well as in their region

and pricing while another buys seeds or manages staff etc.

- Absorb shocks from the market, by fixing prices at the beginning of the year
- Better management of local infestation of weeds (each area is different)
- Reduce the dependence on subsidies

DECREASE OF COSTS

- Reduction in spraying costs: agrochemical, time, fuel...)
- Less usage of agricultural inputs
- Less productive costs
- Reduction of usage of fuel and time

INCREASE OF LIFE QUALITY FOR FARMERS

- Happy farmers!!
- They see the benefit in terms of ease of usage and reduction in costs

LOW ENVIRONMENTAL IMPACT

- Better use of resources
- Compliance with environmental legislation
- Lower environmental impact

- Sharing knowledge on machinery and software with each other makes them a more helpful source than any machinery manufacturer could ever be
- Modernization
- Benefits of new technologies will help the farmers, maybe more than they realize
- Modernize Spanish farming practices
- Only farmers with modernized production will survive in mid term

ENVIRONMENTAL PROTECTION

- Approximately reduction of 40 kg/ha of nitrogen fertilizer

PORTUGAL

BARRIERS	DRIVERS
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- Technology is not completely trustable
- Not enough acknowledgement from customers

VOLATILITY AND UNPREDICTABILITY OF AGRICULTURE

- The inability to replicate processes and the waiting to complete the crop cycle
- Operational constraints, for example, heterogeneity of production causing trouble on harvesting operations

LACK OF KNOWLEDGE

- Knowledge - Technology
- Technology can be a barrier in the sense that sometimes small problems constrain production
- Human resources are a barrier because it's difficult to find workers with training to operate precision agriculture equipment
- Lack of training
- Lack of knowledge on equipment and software.
- Specialized human resources

LACK OF EXPERTS SUPPORT

- Knowledge - Technology
- Lack of advisor support
- Local and agronomic knowledge
- Services suppliers for applications and systems that are reliable and adapted
- Establishment of a good connection between measurements and why it is like that; the

IMPROVEMENT OF THE BUSINESS PERFORMANCE

- Push the company out of its comfort zone, leading to effectiveness
- Less risk
- Reduction of monitoring costs
- Diverse monitoring capability
- Efficiency of production factors
- More income
- Lot of pressure due to low products' prices

MORE AWARE AND SATISFIED ENTREPRENEURS

- More knowledge
- Knowledge acquisition
- The ability to global monitoring
- Diverse monitoring capability
- Self-esteem for seeing gains
- The desire to evolve, because PA isn't always equal to produce more
- Political and social acknowledgement that leads to economic gain and society support
- The self-will to do better
- The enthusiasm of seeing that PA works and has advantages
- The ability to perform cultural operations that would be impossible without PA

ENVIRONMENTAL PROTECTION

- Be able to adapt to climate changes, production processes and to ease decision making

measurement interpretation often as to rely on third parties

- Lack of service providers and technical support in the region

HIGH COSTS

- Financial resources
- Cost of new technologies
- Time spent

- Raise environmental efficiency
- Better for the environment

BENEFITS	IMPACT
<p>ECONOMIC, THE MOST IMPORTANT ENVIRONMENTAL SOCIAL</p> <p>HIGHER PRODUCTIVITY</p> <ul style="list-style-type: none"> • Less dependence of daylight and climate • Increased production <p>HIGHER PROFITABILITY</p> <ul style="list-style-type: none"> • Cost reduction and higher profit • Increased production and reduced costs • Efficiency • New business opportunities (partnerships, research projects) • Better planning, through access to historical data • Increase in the difference between costs and revenues • Increased competitiveness <p>DECREASE OF COSTS</p> <ul style="list-style-type: none"> • Cost reduction • Saving working hours and production costs • Availability to do other tasks while the equipment's work <p>LOW ENVIRONMENTAL IMPACT</p> <ul style="list-style-type: none"> • Decreases the environmental impact • Less environmental impacts 	<p>ECONOMICAL ENVIRONMENTAL SOCIAL</p> <ul style="list-style-type: none"> • Changes the way of seeing and doing agriculture; has an impact in the process and on knowledge about this activity • Qualitative, for example because there is a reduction on pesticides and herbicides application • Social, because other farmers became motivated to use PA when they see it works • Knowledge acquisition leading to the next point • Changes the way of seeing and doing agriculture; has an impact in the process and on knowledge about this activity • Change on decision making process • Time spent (as a negative impact) but it has gains in the long term

4.b Analysis of experience assessment questionnaires (point of view of interviewed entrepreneurs)

The Sparkle's pilot test has been a good opportunity not only to assess the effectiveness of the Business Model Canvas analysis in the Smart Agriculture Sector but also to measure the level of diffusion/knowledge and satisfaction about this tool within the group of interviewed entrepreneurs.

In order to make this assessment session, we asked the interviewed farmers to complete a short questionnaire to evaluate the experience, leaving them the freedom to answer all or part of the questions.

We collected 16 questionnaires even if in some cases not all questions were answered. This evaluation therefore has a limited value from a scientific point of view. However, we believe that it is very important to try to understand if this methodology can be effectively used with farmers and, even more important to collect their suggestions to improve the methodology in the agriculture sector.

1) Did you know the Business Model Canvas?	Yes	7	39%
	No	11	61%
2) Had you ever used it before?	Yes	4	22%
	No	14	78%

If so, in which occasion have you used it?

- I practiced BMC within KATANA project
- Tested within Sparkle project
- When starting the company and in projects
- At classes in the University

3) How did you feel doing this exercise? (un/comfortable, engaged,)	comfortable	9	82%
	uncomfortable	2	18%

Positive comments

- Very exciting, it's rather a good opportunity to see - on a piece of paper - my whole business (as I quoted)
- Very exciting, a good opportunity
- Interesting
- Well, it's an intuitive method
- Very well!
- Very interesting, with the possibility of expressing one's own different opinions and impressions
- Well, at a synthetic and general level
- I found the analysis process extremely interesting
- Comfortable, I enjoyed it
- Very comfortable

Negative comments

- Very difficult, with “strange” questions that never thought before. The farmer had problems with the Canvas methodology as every question had to be elaborated and translated into his business. The majority of the questions were not relevant to him
- Comfortable and uncomfortable at the same time, wondering if the interview had any use

3.1) You filled it in	By yourself	12	67%
-----------------------	-------------	----	-----

	Together with other colleagues	6	33%
--	--------------------------------	---	-----

3.1a) In case you did it by yourself:

Did you wish you could have the support of other colleagues?	Yes	8	73%
	No	3	27%

If YES, with which role/task in the business?

- A partner in the Company who is also an expert (and also wife of the farmer)
- Cluster's manager
- President
- Colleagues from the department of marketing and administration
- My partner in charge of marketing and administration
- My partners and expert technicians
- Agronomists
- Informatics
- Communications' specialist
- Managing partner
- Technicians for each activity area

3.1b) In case you did it together with other colleagues, what roles/tasks do they hold in the business?

- Technician
- Director of production
- Administration manager
- Administrator and Technician

Did you need to collect information from other colleagues, with other skills/competencies?	Yes	1	33%
	No	2	67%

If YES, which?

- Administration staff

4) How can we improve the process of delivering the Canvas methodology?

- Offering training on the methodology
- No suggestions, it was perfect
- Involving different actors (companies, research centers...)
- With more experience
- To adapt the canvas to agriculture business
- Giving some feedback from my model, highlighting the business strengths and weaknesses and also some information about other models

Is there any information you wished you had received before the interview?	Yes	3	18%
	No	13	76%
	Maybe	1	6%

Comments

- Yes, share the experience with companies that have already used it
- Yes, general information about this method
- Yes, define exactly the final purpose
- No, it's the BMC results I wish to see

Would you have preferred to receive the Canvas in advance to study it with more attention?	Yes	2	13%
	No	12	80%
	Maybe	1	7%

How do you evaluate the explanatory presentation of the Canvas?	Insufficient	1	5%
	Adequate	17	95%
	Verbose	0	0%

How do you evaluate the time available for the completing of the Canvas?	Insufficient	3	19%
	Adequate	13	81%
	Too long	0	0%

If you answered insufficient or too long, what would you consider an “adequate” time for completing the Canvas?

- The questions were quite large in number. Each box of the canvas – if you had time – could take a whole day of discussions
- The questions were quite large in number
- “Insufficient” because it was the first time we used this methodology, we needed more time
- The whole procedure was rather difficult (out of scope). The questions were quite large in number

5) How do you evaluate the tool and the exercise of analysis of the Business Model Canvas, as a whole?

Positive comments

- The tool is overall evaluated as helpful and more interesting from other mainstream and more quantitative indicators/tools the farmer already knew
- The questions were quite good and interesting. Overall, the tool was evaluated as very helpful and very interesting
- *“...Composing the BMC helped me answering questions that I have never thought about before like: who are my clients, do I want these clients, what kind of clientele do I want, can I satisfy their expectations, am I selling as high as I can etc. Therefore, I was able to see weaknesses and comparative advantages. For the first time I felt as a businessman in agriculture and not as a farmer who wants to do business”*
- Useful, especially in case of analysis of the company organization
- Useful to trace the logical process towards objectives

- Extremely interesting and useful
- Useful
- Positive
- Very positive for the possibility of involving more sectors and corporate roles at the same time
- Very good
- Very interesting and applicable to companies
- Good framework
- It was good, that's why I want the results
- It's best for startup companies, but reflection is always a good thing to do
- The canvas model is important because it can serve as an important internal management tool

Negative comments

- The tool is smart but not really helpful to my business
- Useful but rather in details, and not applicable for small farms. The questions were quite large in number, and not always with an answer
- I would rather evaluate it when I will have some output

Would you use it again in your business?	Yes	12	100%
	No	0	0%

“YES” comments:

- They often use it

- But only if I was starting a new business
- Yes, in another company

4.c Focus group of experience assessment
(from the point of view of involved consultants/interviewer)

+ What worked?	△ What could be improved?
<ul style="list-style-type: none"> • Methodology: physical framework • The tool to be used has been explained and it's very easy • Staff: at least 3 persons • Advanced farmers like talking to technicians who know PA • Interesting, a good analysis of the farm • Good opportunity to see the reality • Farmers like to see their BMC at the end • It's an opportunity for farmers to talk/share their true problems and needs • Network of trust farm entrepreneurs • Previous visit of the company business • A visit of the farm is very welcome • Importance of the environment for the interviews (where farmers feel comfortable) • Friendly environment (trust) 	<ul style="list-style-type: none"> • Possibly involve different figures in the company (administration, ownership, production) not only person involved in PA • More figures as experts, someone entrepreneurship, research on PA and farmers • Need more people from the business • Possibly involve in the staff some students to focus learning points • Prepare correct standard communication (by email) to clearly explain the project and time needed • Record the BMC session • GDPR agree needed • It would be advisable to have more information before the interview in the farm • Probably the duration of the interview is too long • Farmers don't feel like business men • Farmers don't see the need of filling in a BMC (what for?). Results maybe incomplete • BMC looks intimidating or difficult • Understand how they feel themselves • Questionnaire more easy for small farmer • Too many details, good for us but... • Instead of questionnaire co-work with farmers and other actors of the chain • Maybe some "numbers" (economical) are necessary • Present some results to the farmers. • Synthesis of the interviews

? Questions	! Ideas
<ul style="list-style-type: none"> • What happen when there are more partners? • Can we let them do it themselves? • “Too much technology and advice” • Companies have tech but they need the knowledge for using it • Question to add “are you ready to introduce innovation in processes” • Difficult to convince farmers to do it, some questions don’t make sense for farmers (commodities, rigid structure, exit prices...) • Farmers sometimes didn’t know the financial numbers, it can be complicated and maybe need advice for accounting • The focus should be only on “activities” • In general farmers don’t want to share all details about their companies • People don’t like to confess their failures • Finding farmers willing to sit down with us was difficult 	<ul style="list-style-type: none"> • A women’s point of view • We tried to record the interviews but it was “intimidating • “Hide” the BMC: go with 2 people, one does the natural interview, while the other summarizes the responses in the form of a BMC “privately” • Some farmers were not talkative • Open questions or Yes/No? • Report are difficult to complete sometimes • Adapting the BMC to farm business in order to focus a little bit and to save time in the end form report • Social network Instagram! • More oriented to PA • Webinar on students seminar • Keychain! Some Sparkle gift is needed

4.d Conclusions

Comparing the 4 national IMPACT ANALYSIS matrixes, we can highlight common trends and specific issues that characterise the factors facilitating or hindering PA adoption.

In the 4 countries **barriers** are recurrent and common, summarised in:

- Lack of knowledge among farmers, workers and even among experts
- High investment costs
- Lack of a supporting network

As to the **drivers**, the common elements are improvement of the business performance, reduction of costs, and a more environmentally sustainable agriculture.

Among the **benefits** all farmers agree on:

- Higher quality productivity
- Higher profitability
- Improved costs control
- Lower environmental costs

In Spain, farmers also added “increase in the quality of the life of the farmers”.

The **expected impact** in all countries boils down to the development of local agriculture, a more sustainable agriculture and increased environmental protection, economic development favouring a social development.

The reports indicate that there is a substantial common attitude towards PA in the perception of the four national samples.

More striking differences concern the extension of the farm, where big players are more keen on investing in PA, while small farmers tend to be more cautious.

The same pattern divides the farmers according to their crops. For a Brunello winegrower, a product characterised by high price margins, PA is vital primarily for Quality Improvement and traceability, complying the regulations of the consortium. For cereal crops, priority consists in using PA to reduce costs to compete with the dumping prices of imports from non-European countries.

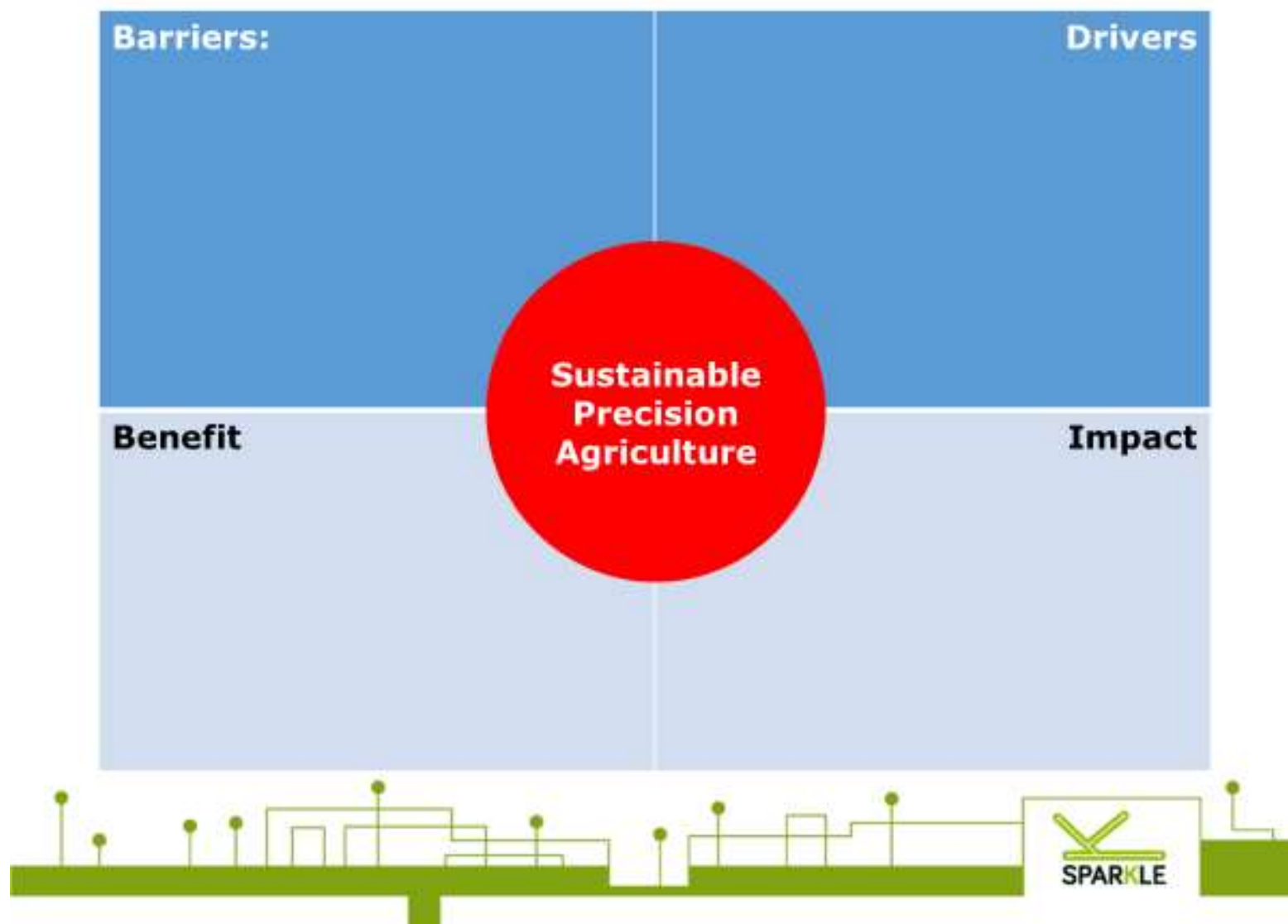
One last feature that seems to be shared by South Europe farmers, is the need to work in networks (public, private, sectorial or cross-sectoral) connecting different “stakeholders” – farmers, universities, administrators, distributors - in order to be able to face the investment. Last but not least, to be able to “communicate to the buyer the VALUE PROPOSITION of PA”, as a new, more sustainable agriculture. Both big players and small farmer are aware of the importance of collaborating to overcome these barriers.

Most interesting though, apart from the technical and economic factors taken into consideration, the report highlights the “**human factor**”. The passion of the farmer for agriculture, the personal satisfaction they get out of constant improvement in their profession. This last element is key to motivate farmers to start introducing PA in their practice.

The “human factor” is also inescapable when playing against. Farmers **resist to change** because they do not trust the innovation, because they are afraid they will not be able to manage it, because they do not speak “English”, simply because the mass of small farmers are “late adopters” of new technology and need to see other bigger players introduce it and “obtain measurable, consistent results” before they invest in it. To overcome the lack of trust it is

necessary to increase the number of pilot projects, scale the number of quality comparable data, disseminate and diffuse information among farmers, select testimonials and model examples able to influence the mass of small and medium farmers.

Annex a) - PA IMPACT analysis



Annex b) - More about the methodology: presentation Business Model Canvas (slides Pisa International Meeting, June 2018)



The slide features a green header with a circuit-like pattern of lines and dots. Below this, the SPARKLE logo is displayed, consisting of a stylized green 'Y' shape above the word 'SPARKLE' in bold black letters. The main title 'Business Model Canvas' is centered in a large, bold, black font. Below the title, a bullet point states '• A tool for business strategy design'. At the bottom, there is a row of logos for various partners: University of Florence, University of Padua, Uoévera, ERREQUADRO, agrosap, CSIC, ValueD, NEA ZEE, and RETOS. To the left of these logos is the European Union flag and the text 'Co-funded by the Erasmus+ Programme of the European Union'. To the right is a disclaimer: 'The European Commission support for the production of this publication does not constitute endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.'

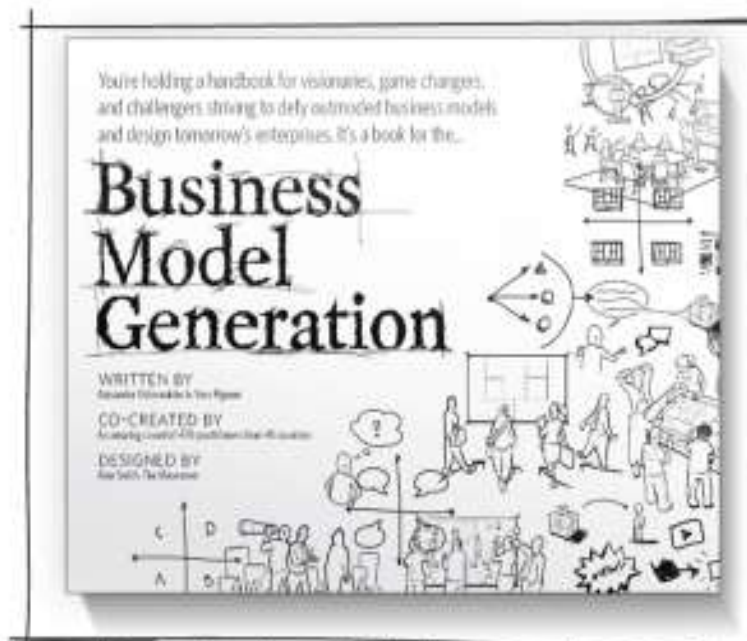
SPARKLE

Business Model Canvas

- A tool for business strategy design

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

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- **A Handbook for Visionaries, Game Changers, and Challengers**
- Alexander Osterwalder, Yves Pigneur

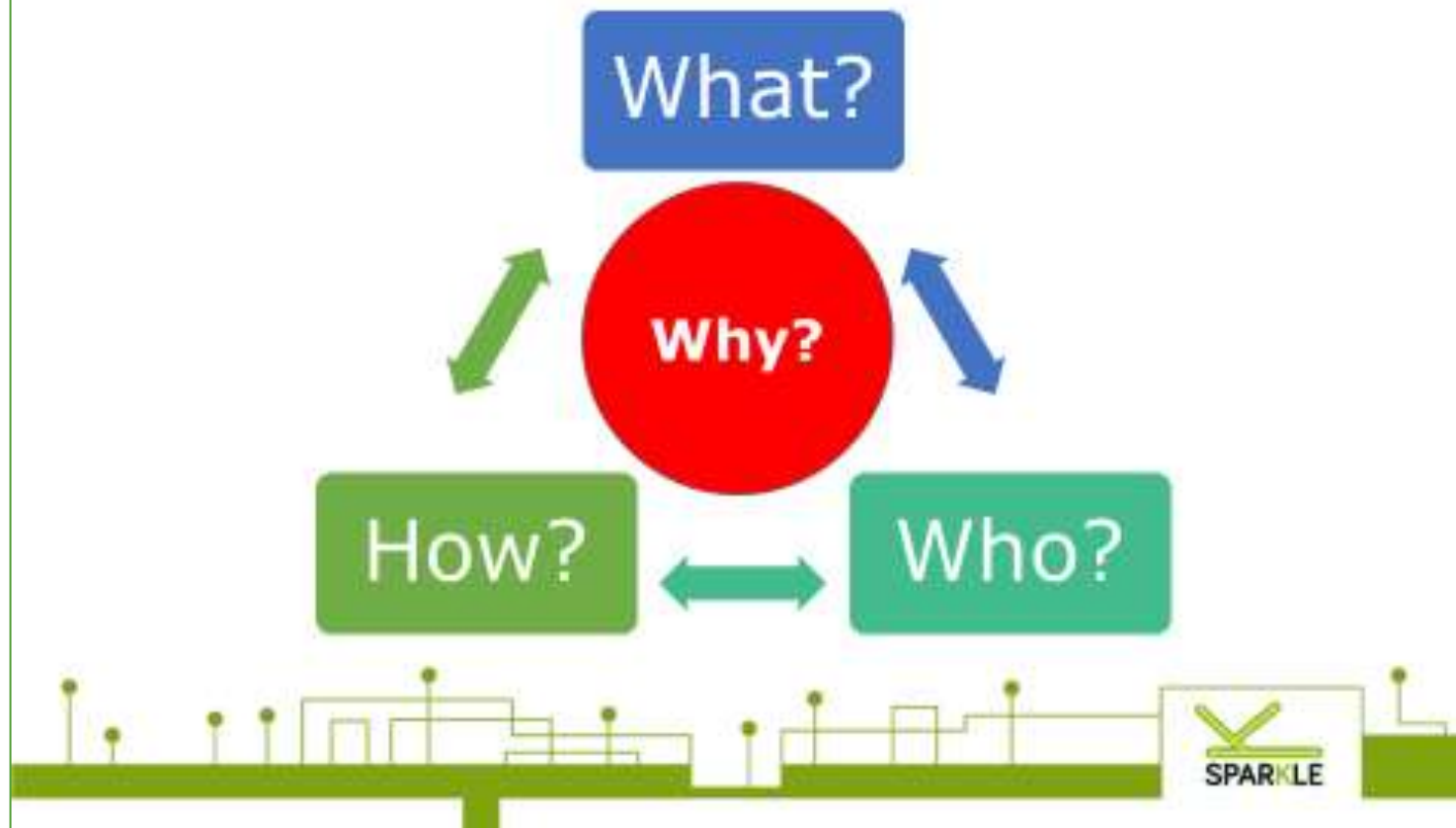


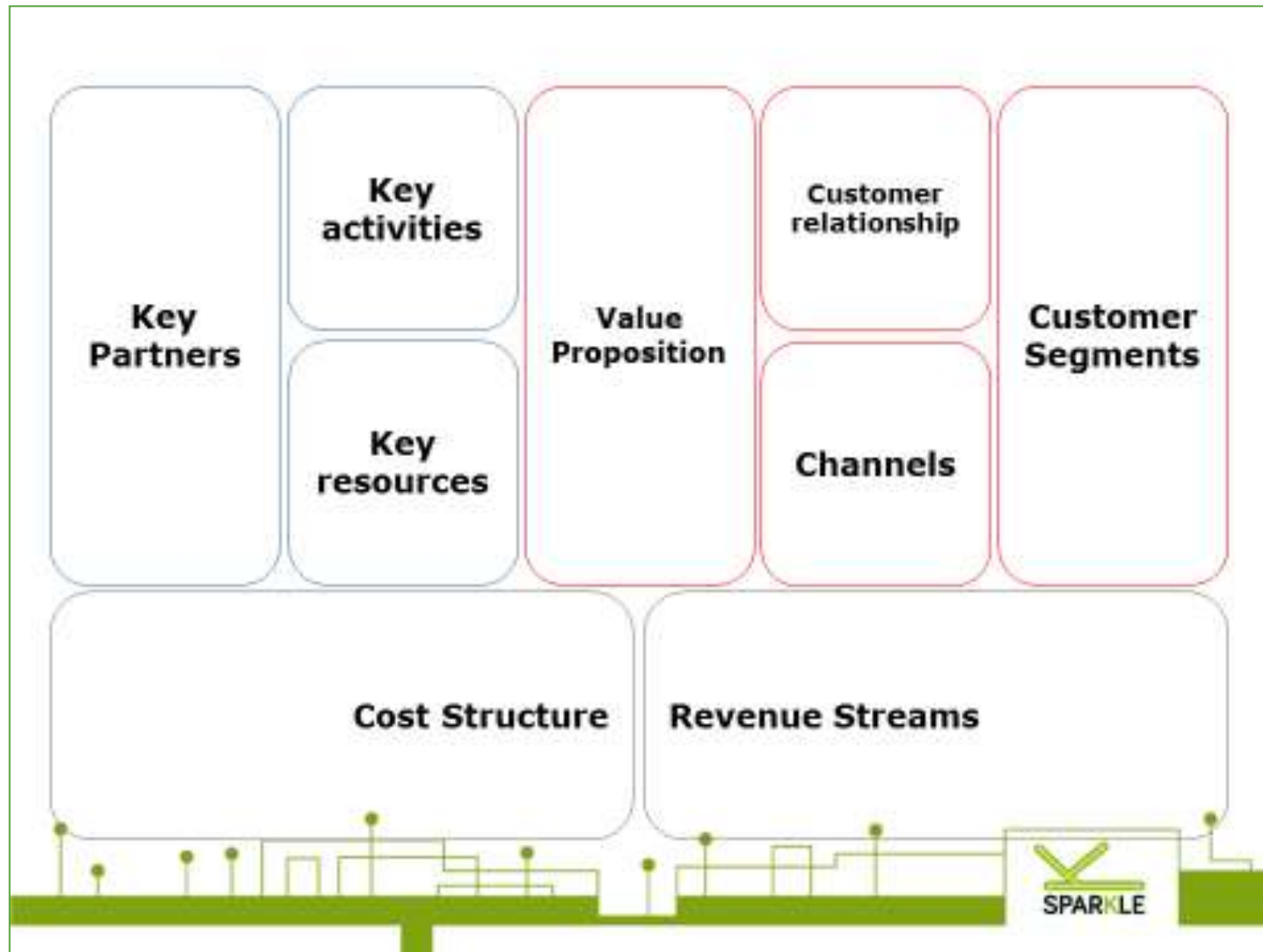
The Mission of The Enterprise

- Provide a **solution** for the **needs/problems** of the client
- Create **added value/ advantages** for the client



The Entrepreneurial Formula





The image shows a business model canvas template. It consists of a central column with three rounded rectangular boxes. The middle box is red and contains the text "Value Proposition" in red. Above this box are two gift icons: a pink one with a yellow bow and a yellow one with a red bow. To the left of the central column are two blue-outlined rounded rectangular boxes, and to the right are two red-outlined rounded rectangular boxes. Below these are two large blue-outlined rounded rectangular boxes. At the bottom of the canvas is a green base with a stylized city skyline. On the right side of the base is a logo that says "SPARKLE" with a yellow checkmark icon above it.

Value Proposition

- What value do we deliver to the customer?
- Which one of our customer's problems are we helping to solve?
- What bundles of products and services are we offering to each Customer Segment?
- Which customer needs are we satisfying?

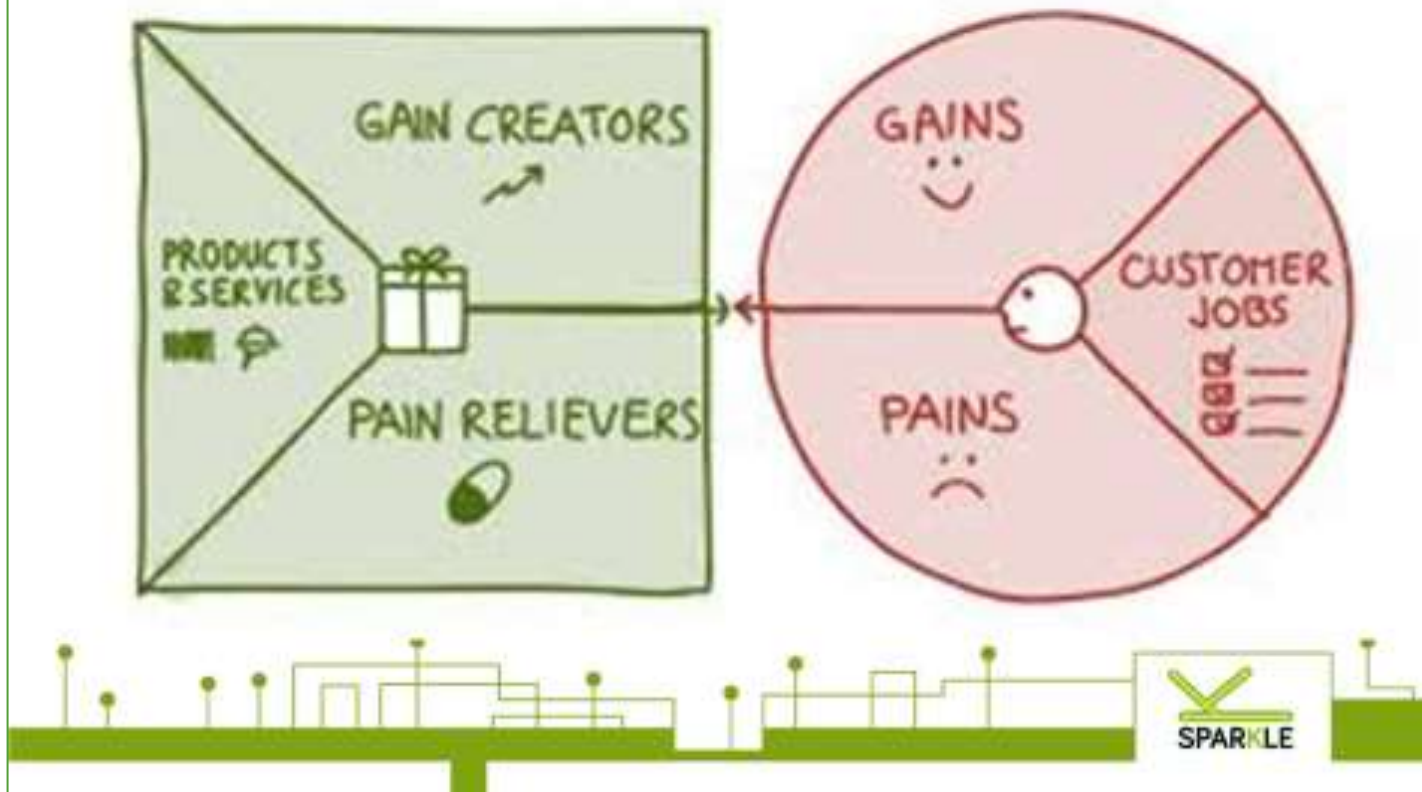


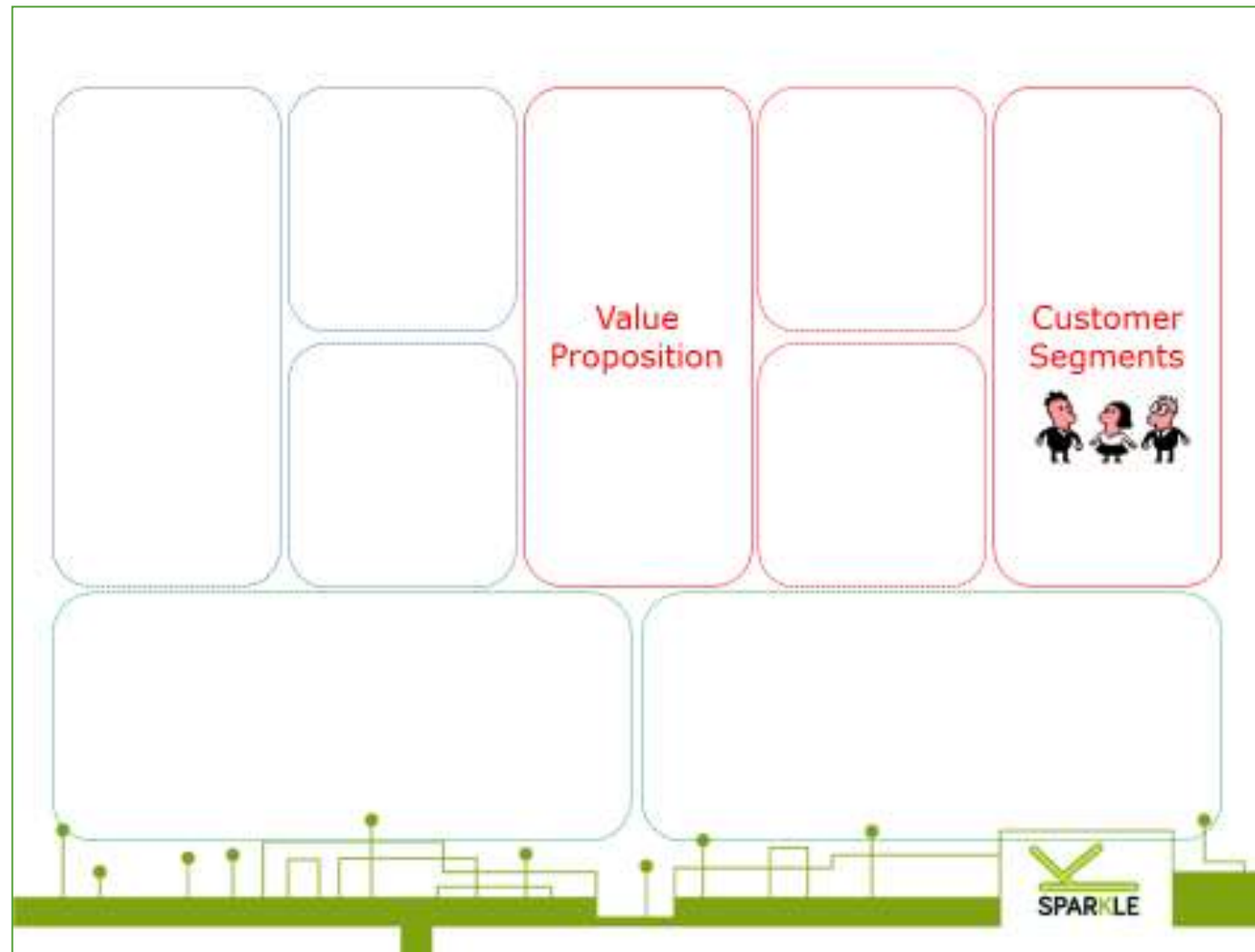
Characteristics of the Product/Service

- Newness
- Performance
- Customization
- "Getting the Job Done"
- Design
- Brand/Status
- Price
- Cost Reduction
- Risk Reduction
- Accessibility
- Convenience/Usability



Value Proposition Canvas

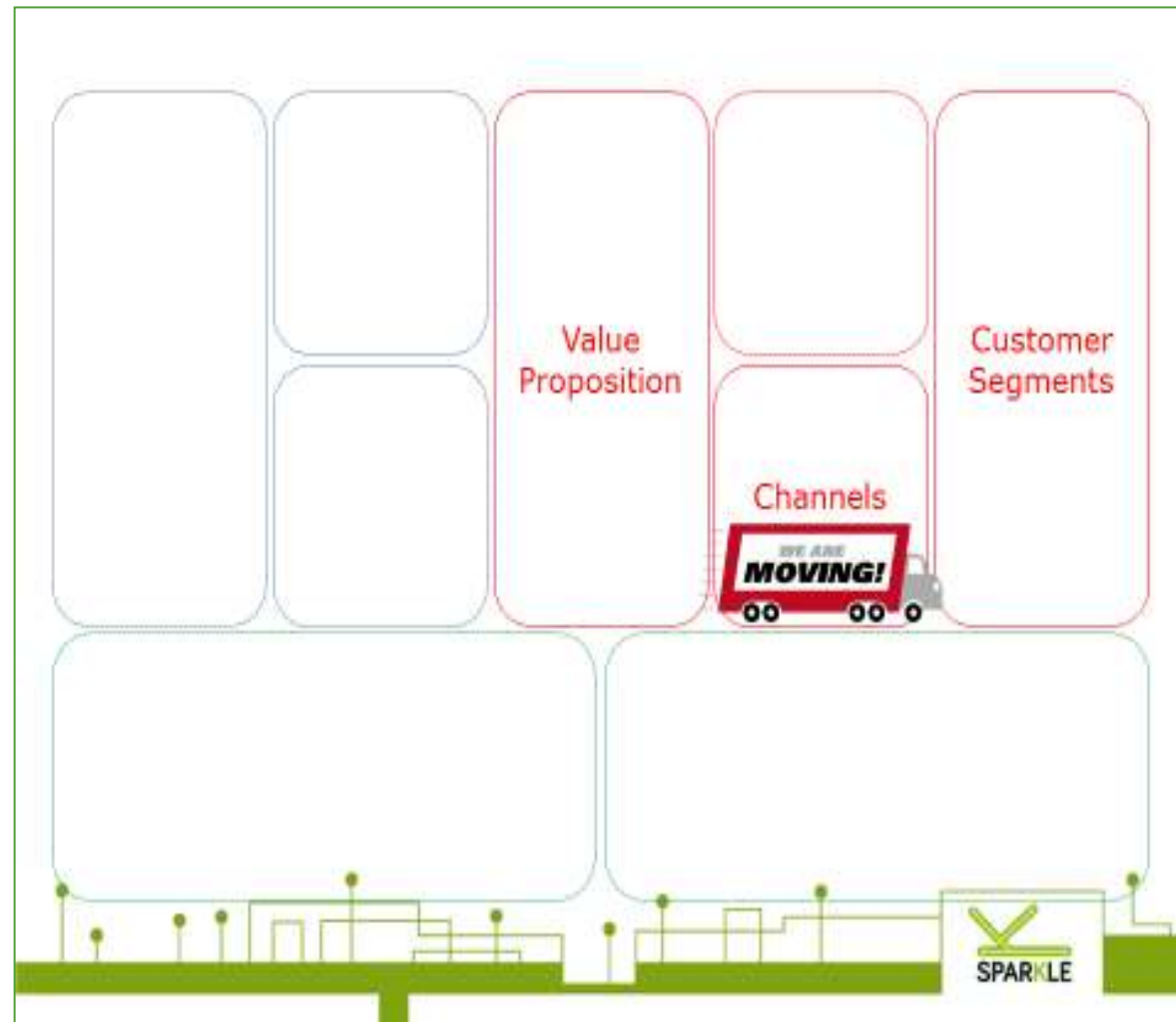




Customer Segments

- For whom are we creating value?
- Who are our most important customers?
 - *Mass Market*
 - *Niche Market*
 - *Segmented*
 - *Diversified*
 - *Multi-sided Platform*





(Distribution) Channels

- Through which Channels do our Customer Segments want to be reached?
- How are we reaching them now?
- How are our Channels integrated?
- Which ones work best?
- Which ones are most cost-efficient?
- How are we integrating them with customer routines?



Channel Phases

1. Awareness

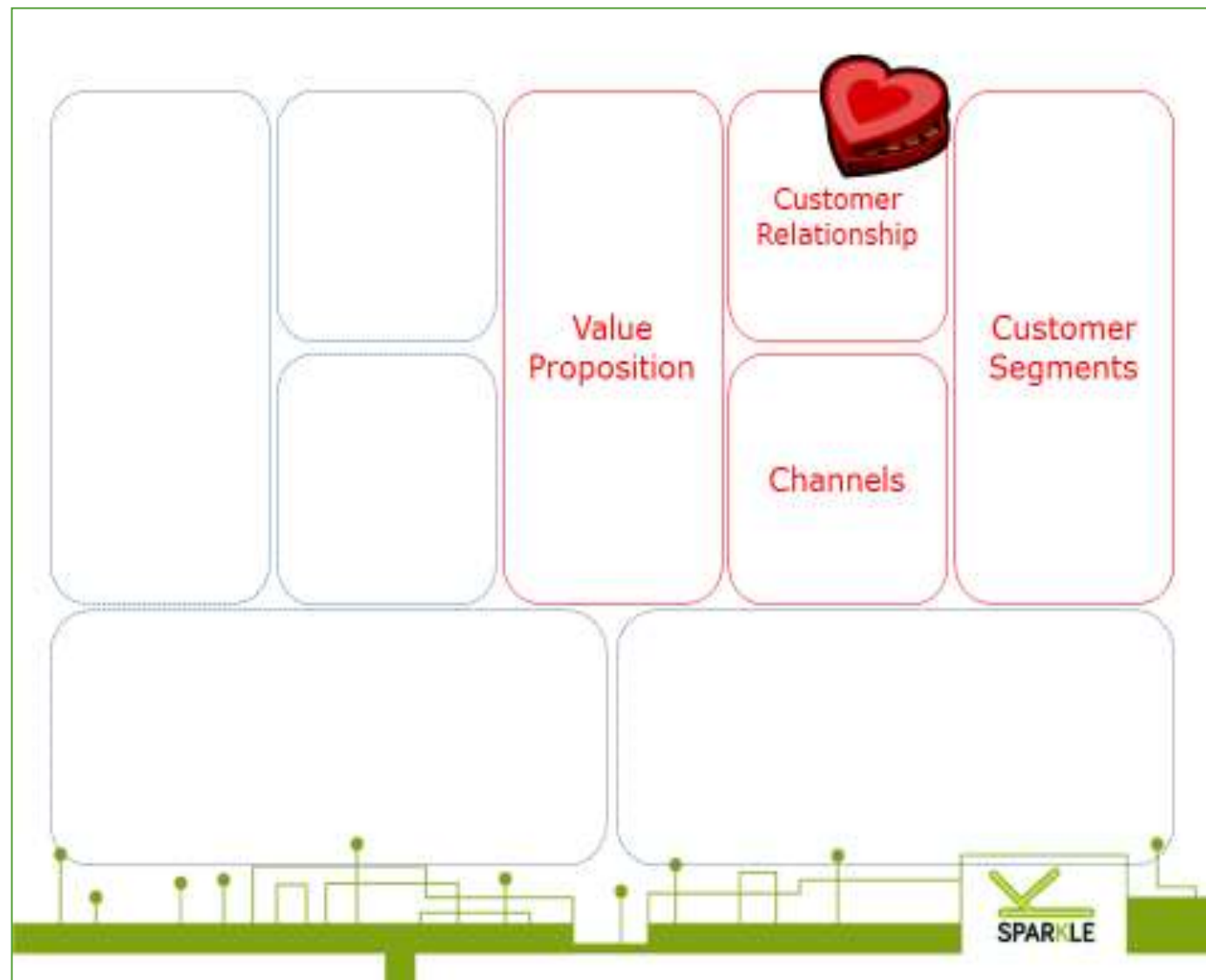
2. Evaluation

3. Purchase

4. Delivery

5. After sales





Customer Relationship

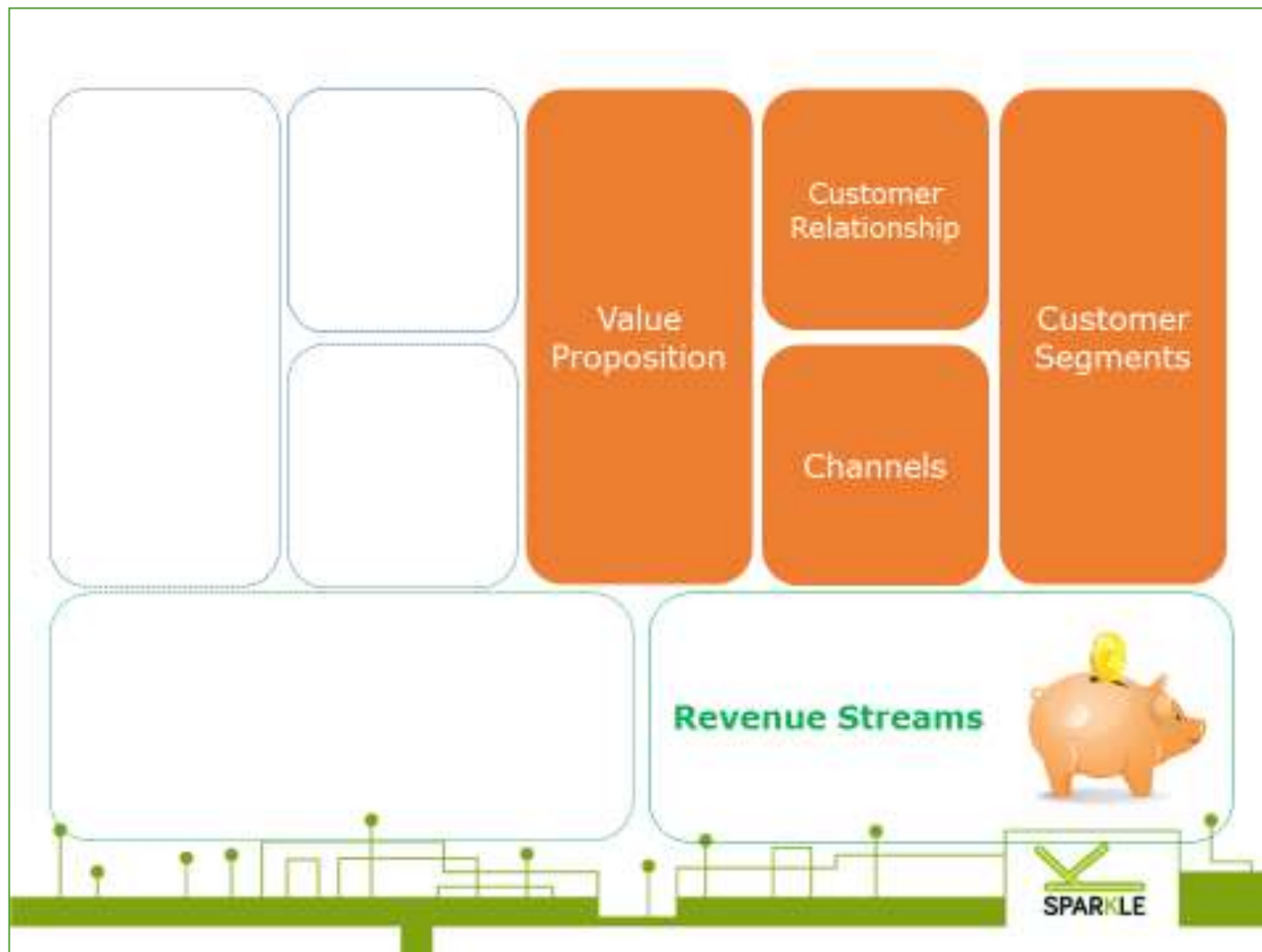
- What type of relationship does each of our Customer Segments expect us to establish and maintain with them?
- Which ones have we established?
- How are they integrated with the rest of our business model?
- How costly are they?



Examples

- Personal assistance
- Dedicated Personal Assistance
 - Self-Service
- Automated Services
 - Communities
 - Co-creation





Revenue Streams

- For what value are our customers really willing to pay?
- For what do they currently pay?
- How are they currently paying?
- How would they prefer to pay?
- How much does each Revenue Stream contribute to overall revenues?



Revenue Streams

- **types:**

- *Asset sale*
- *Usage fee*
- *Subscription Fees*
- *Lending/Renting/Leasing*
- *Licensing*
- *Brokerage fees*
- *Advertising*

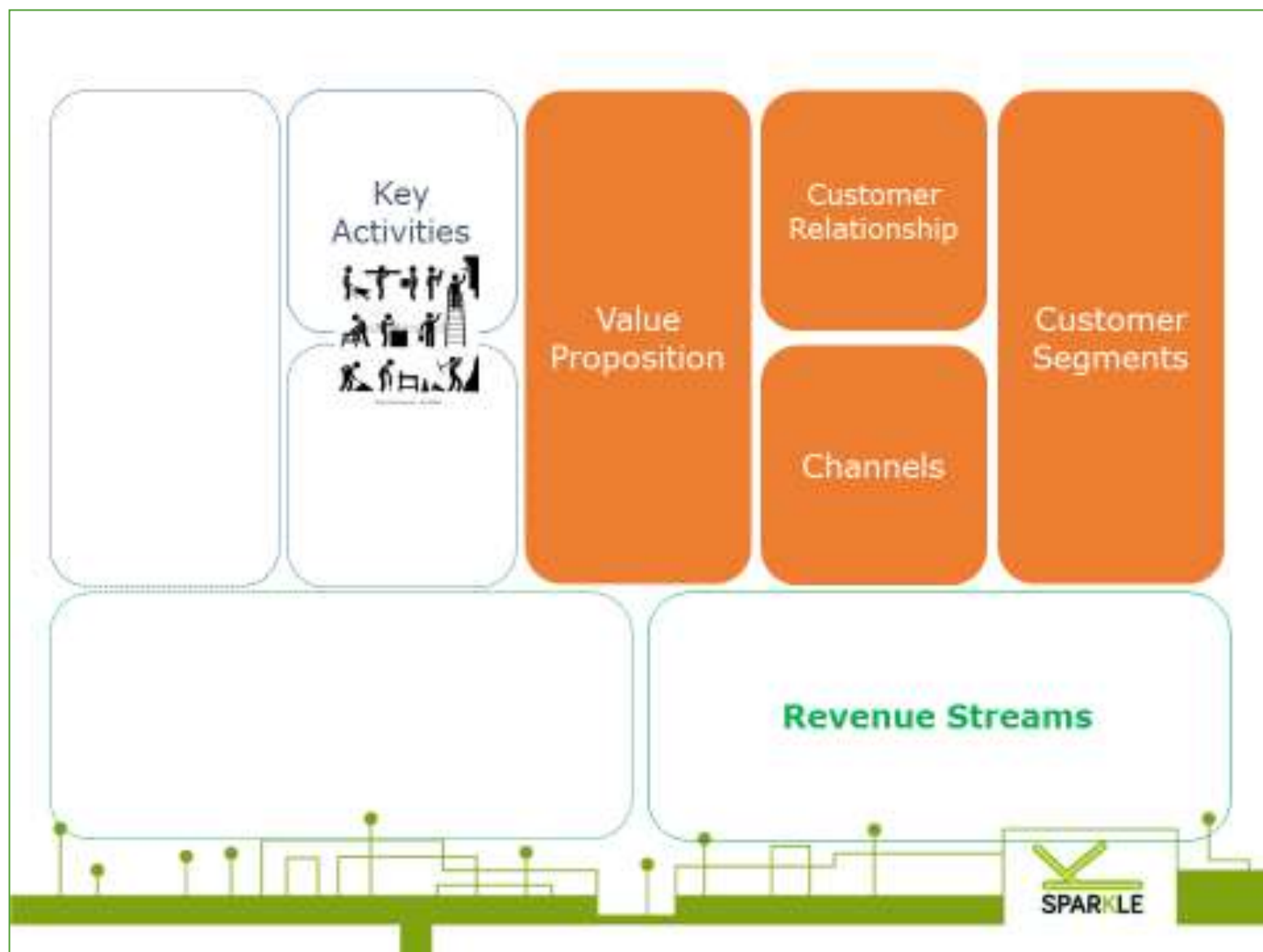
- **fixed pricing**

- *List Price*
- *Product feature dependent*
- *Customer segment dependent*
- *Volume dependent*

- **dynamic pricing**

- *Negotiation (bargaining)*
- *Yield Management*
- *Real-time-Market*





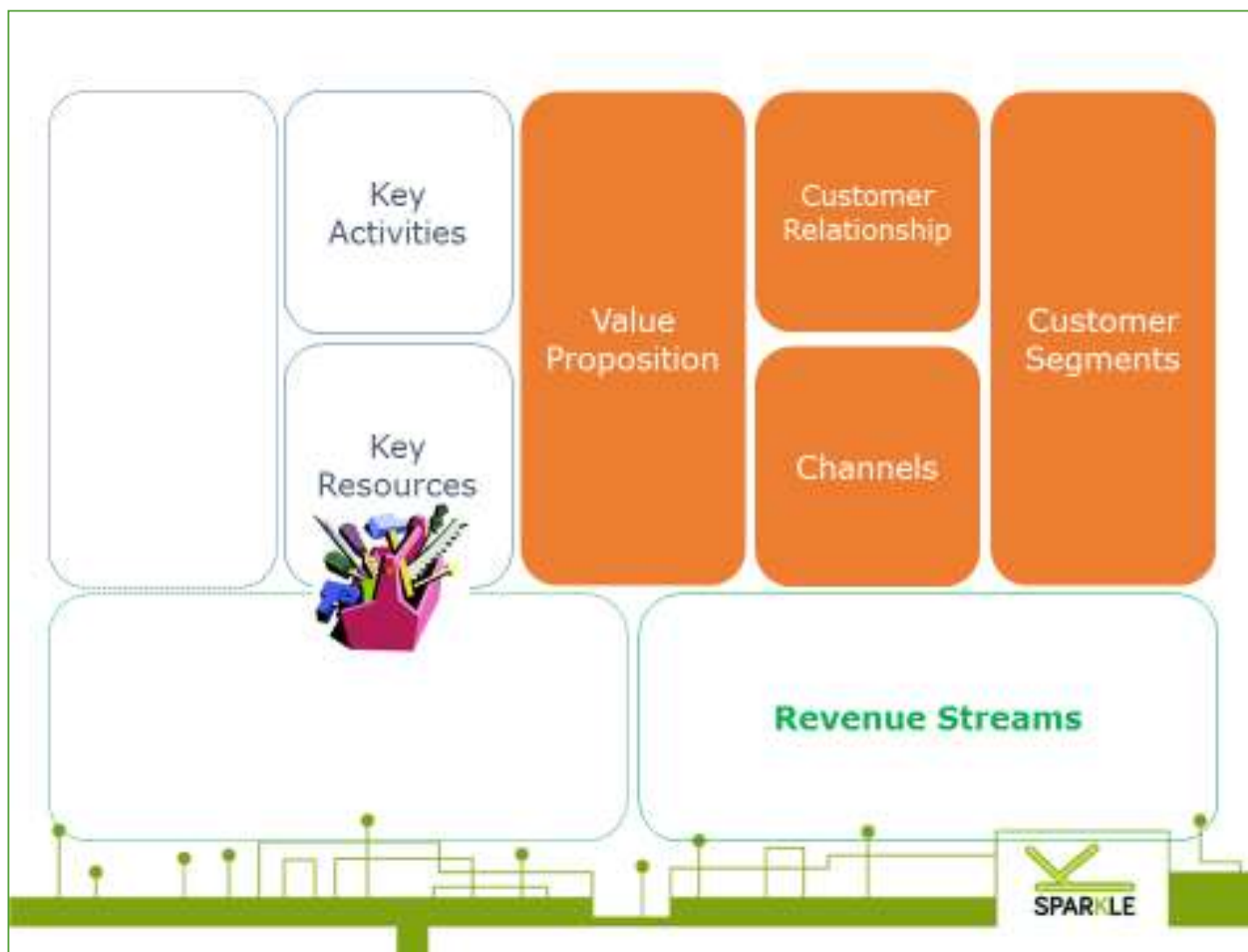
Key Activities

- What Key Activities do our Value Propositions require?
- Our Distribution Channels?
- Customer Relationships?
- Revenue streams?

Categories

- *Production*
- *Problem Solving*
- *Platform/Network*





Key Resources

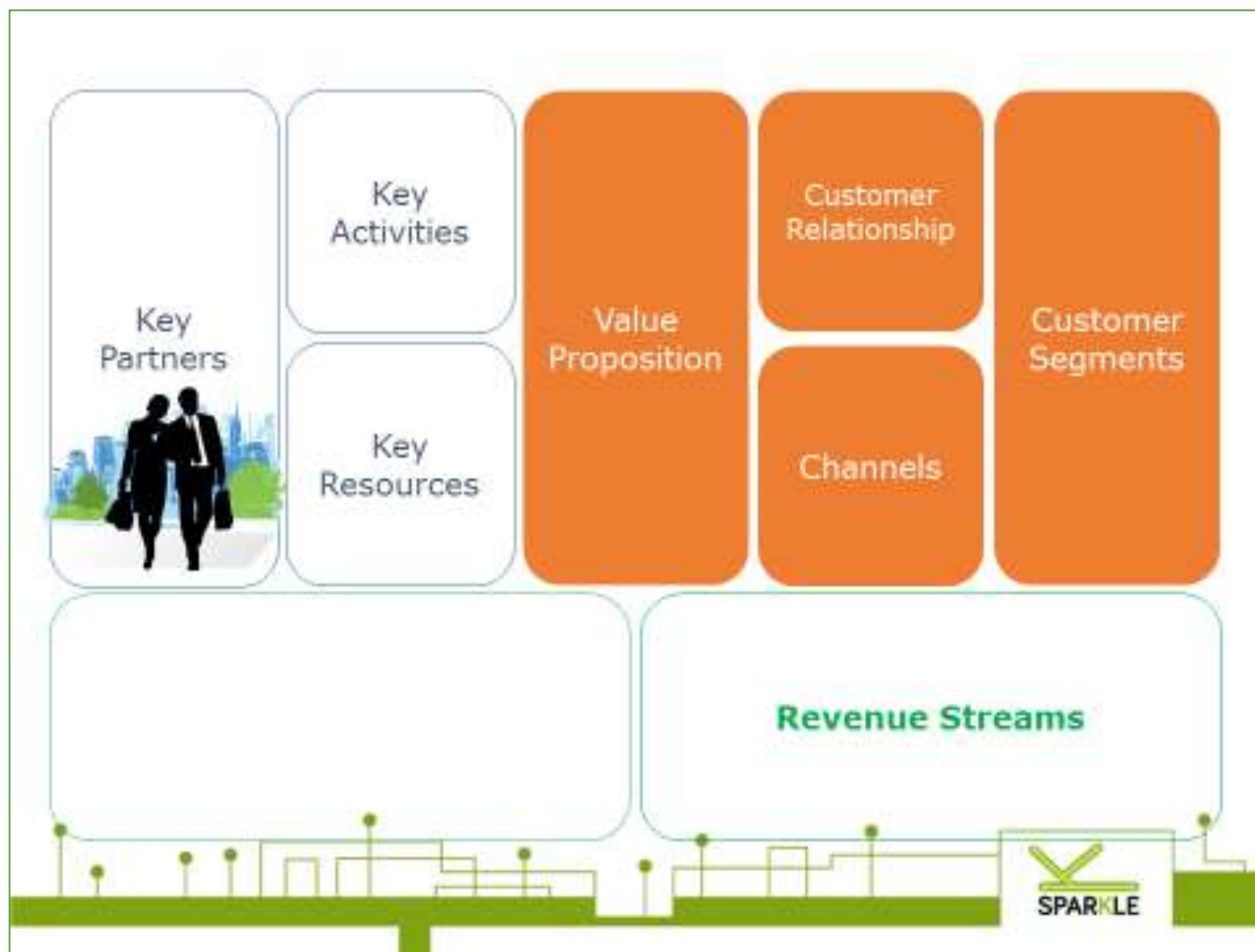
- What Key Resources do our Value Propositions require?
- Our Distribution Channels? Customer Relationships?
- Revenue Streams?



Types of Resources

- Physical
- Intellectual (brand patents, copyrights, data)
- Human
- Financial





Key Partners

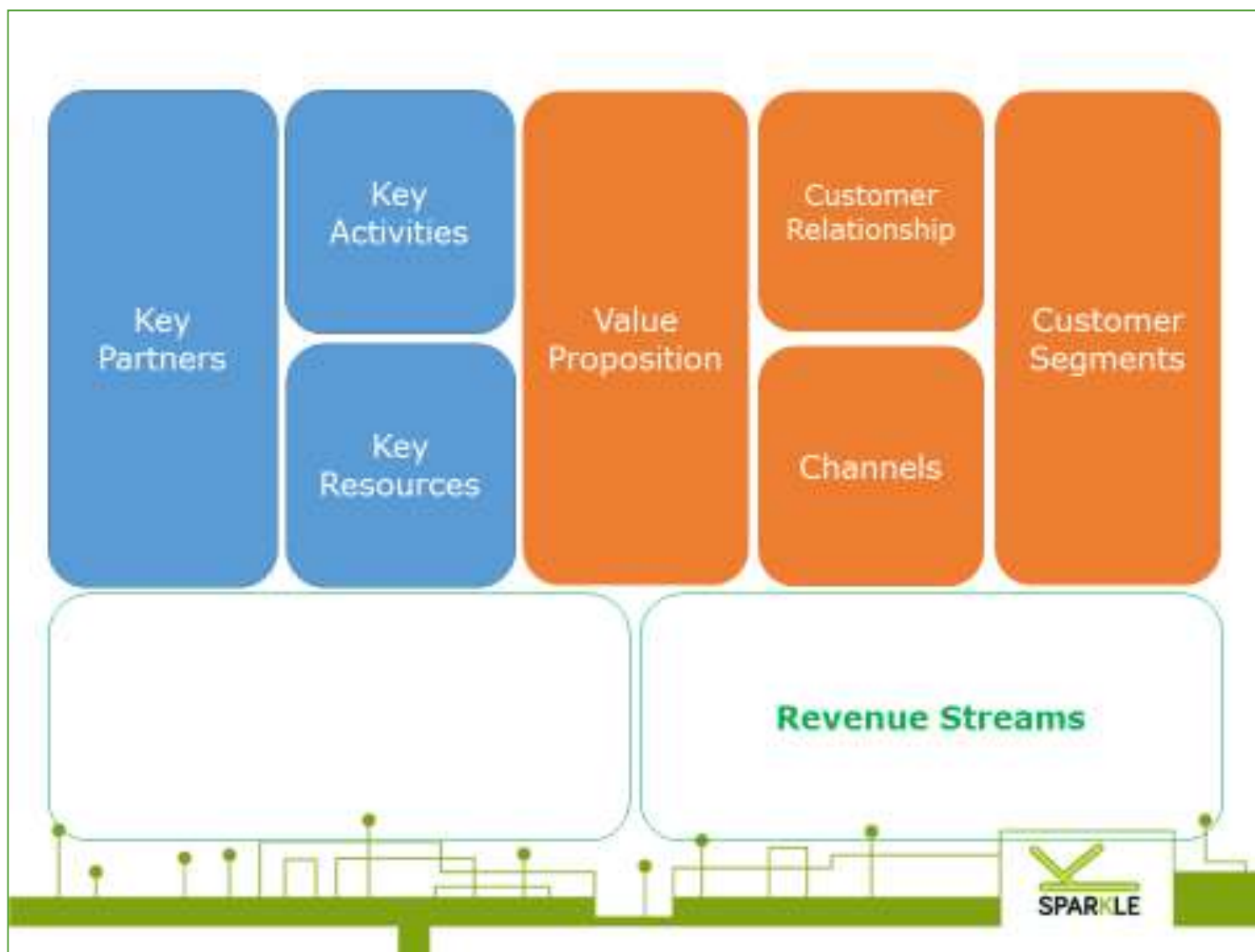
- Who are our Key Partners?
- Who are our key suppliers?
- Which Key Resources are we acquiring from partners?
- Which Key Activities do partners perform?

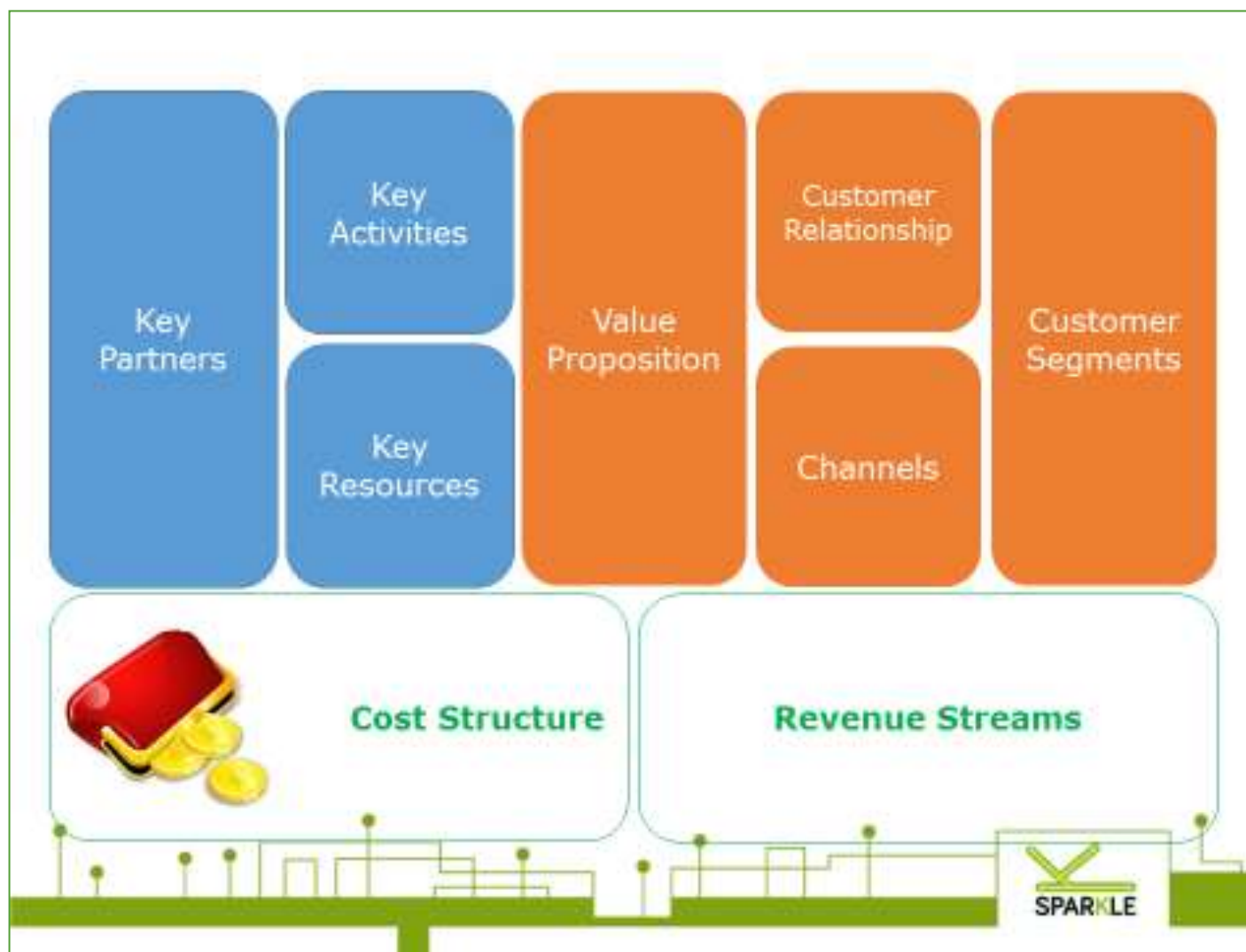


Motivations for Partnerships

- Optimisation and economy
- Reduction of risk and uncertainty
- Acquisition of particular resources and activities







Cost Structure

- What are the most important costs inherent in our business model?
- Which Key Resources are most expensive?
- Which Key Activities are most expensive?



Is your business more...

- **Cost Driven**

- leanest cost structure, low price value proposition, maximum automation, extensive outsourcing

- **Value Driven**

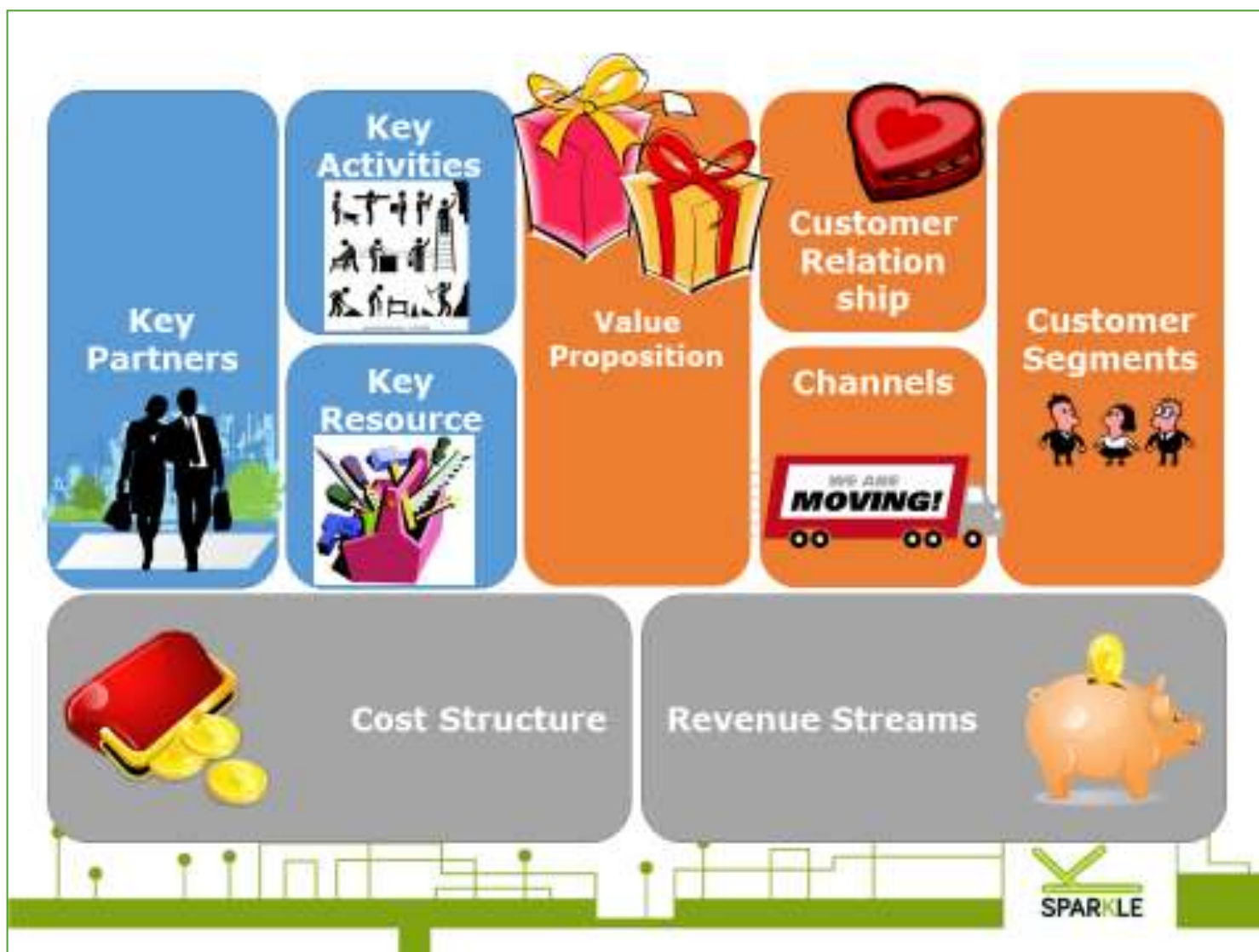
- focused on value creation, premium value proposition

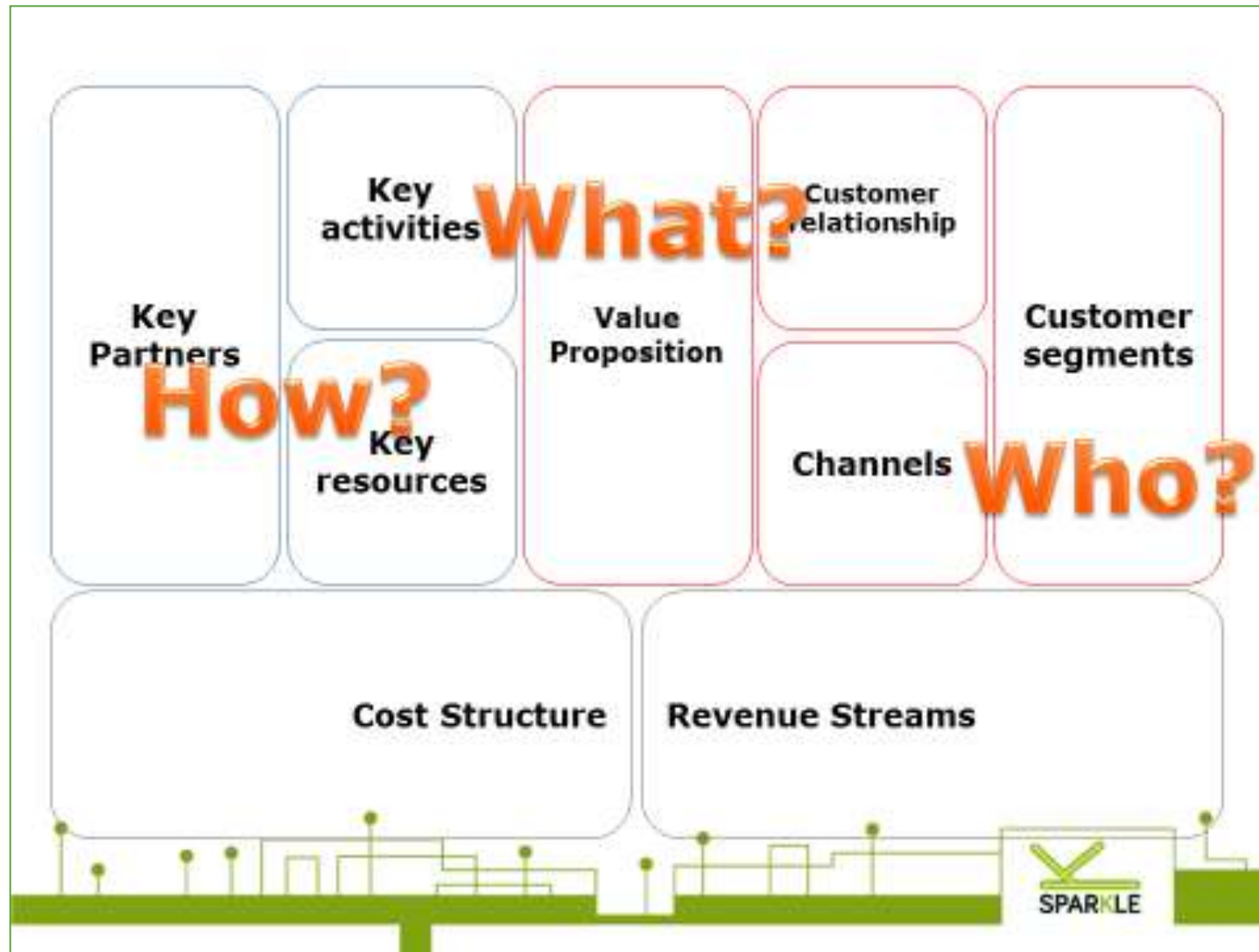


Sample Characteristics

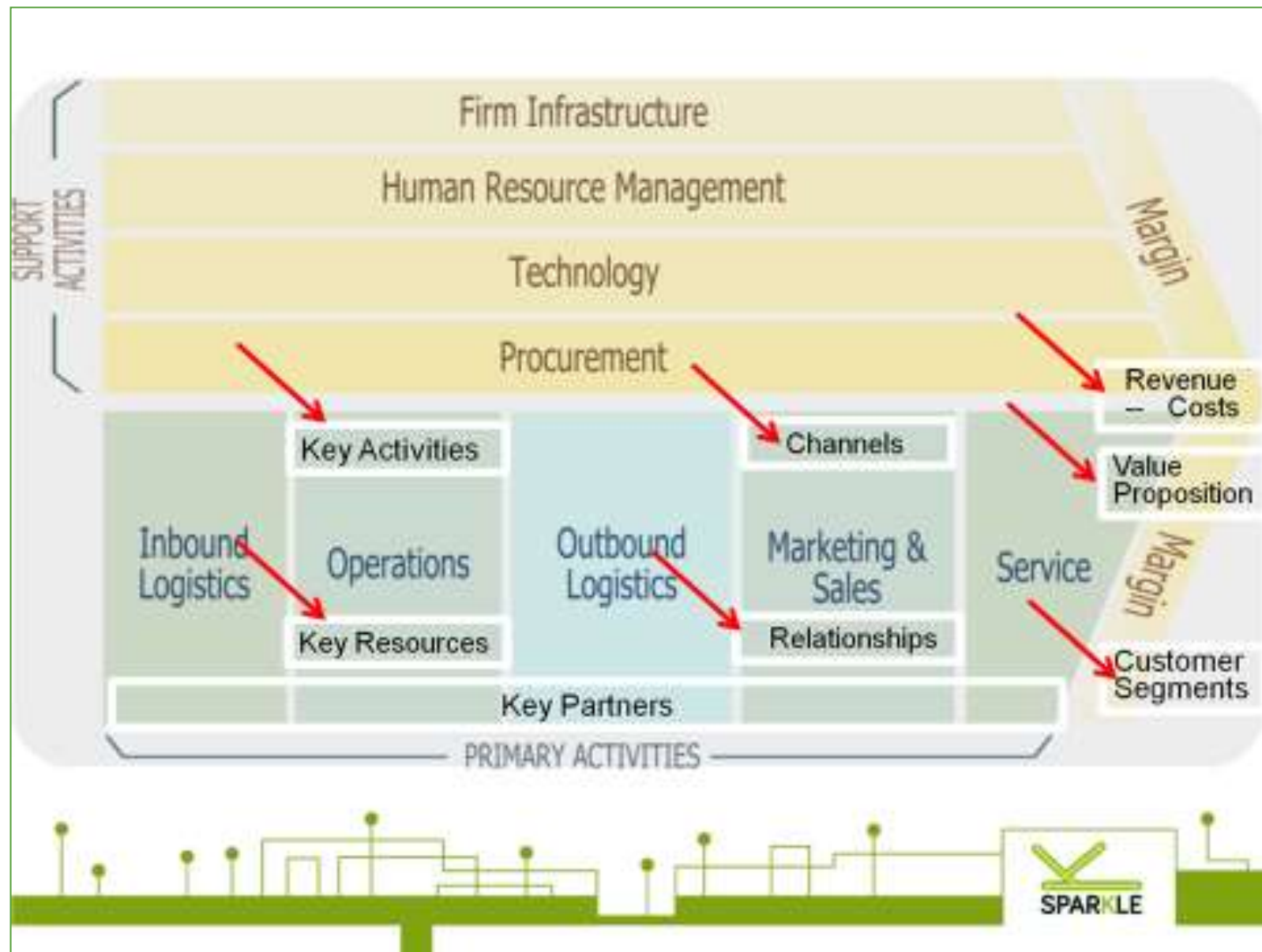
- Fixed Costs
 - salaries,
 - rents,
 - utilities
- Variable costs
- Economies of scale
- Economies of scope











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- <http://www.businessmodelgeneration.com/book>
- <https://canvanizer.com/> (BMC co-designing and sharing platform)

