

THE BUSINESS MODEL PROPOSITION FOR PRODUCT CO-CREATION CENTRES  
(PC3): SCALING UP THE BoP MIND-SET TO SOCIAL ENTREPRENEURIAL SKILLS

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## **ABSTRACT**

*Product Co-creation Centers*, or PC3, is a multidisciplinary project at the University of Twente in The Netherlands researching the development of an economically-sustainable and scalable model to boost development of the Base of the Pyramid (BoP) by systematically providing entrepreneurial and creative people at the BoP with the right competences to start-up their own businesses. This initiative is framed within the values of BoP protocol 3.0, as and such, the aim is developing a scalable instrument to support the people at the BoP to successfully transfer from informal markets to formal markets through the expansion of new entrepreneurships. More concrete, the PC3 project researchers how to stimulate BoP to undergo the processes of opportunity recognition and conceptual product development, both guided by business development methodologies for start-ups. In this paper, we explore the PC3 project itself as a social start-up, which requires a sound strategic plan to engage potential stakeholders in joining the initiative as well as to improve its chances of success. Given that both business model (profit) and social value creation are at the core of this project, we have chosen to experiment in using the Lean Start-up method as guiding framework for conducting our research. In this paper we describe both the process of doing research using a business development approach as well as our obtained results. In this paper, we present the results in the form of a PC3 service description and a description of the developed business model PC3 are based on.

## 1. INTRODUCTION

“Small, medium and micro enterprises represent an important vehicle to address the challenges of job creation, economic growth and equity in our country.” This quote, from Trevor Manuel’s Foreword to the White Paper on National Strategy for the Development and Promotion of Small Business in South Africa, shows the importance of entrepreneurship for developing countries. Sustainable job creation is one of the many issues developing countries face, but essential in order to reduce poverty and increase economic growth.

Although the importance of entrepreneurship for the base of the pyramid (BoP) markets has been recognized by governments and scholars, prior research on companies entering BoP markets and adopting a market-based approach to eradicate poverty is relatively young and hence limited (Zhang and Tong, 2012). Furthermore, the people at the BoP have often been seen as a potential future market but not recognized as a group with the possibility to engage in innovative, entrepreneurial activities. This all leads to a situation in which the people at the BoP often pay a premium on food, health care, and other basic services, hence spending a larger amount of their income on basic needs (Webb, Kistruck et al., 2009). It is estimated that the BoP group represents approximately 4 billion people. The majority of these people live in the least developed and developing countries and are characterized by the lowest income strata. In the literature this group often is referred to as the next 4 billion, showing the potential of the people at the BoP. While this group lives in relative poverty, as a group they have substantial purchasing power of estimated \$5 trillion (Hammond, 2007). However, traditional business models, as often used by Multi-National Companies (MNC), tend to exclude the people at the BoP. As a result of this, people at the BoP mostly rely on informal markets, which are characterized by a lack of efficiency and competition (Hammond 2007). It is estimated that between 30% and 70% of the

labour force in developing countries is employed in informal jobs (Bosch and Esteban-Pretel, 2012).

In 2002, Prahalad and Hart (1999) raised the awareness of Multinational-Corporations (MNC) on the existence of a very large pool of unattended customers among the world's poorest (the BoP) and called for the development of new market based approaches to deal with this global problematic. Since then, several initiatives by both scholars (e.g. the D-Lad at the MIT) and the industry (e.g. Kandachar et al 2011) have taken place. After analysing and distilling the key factors of different BoP approaches, Simanis and Hart (2008) differentiated between two main groups, one termed Protocol BoP 1.0 and the other as Protocol BoP 2.0. Using versions makes reference to how such approaches have evolved in time but still serve the same purpose. Approaches falling within the BoP 1.0 group are characterized by considering the BoP as pure consumers with low incomes requiring special distribution mechanisms of goods and services. On the other hand, approaches classified as BoP Protocol 2.0 are based on the notion of co-creation, in which the development of products and services has to be the result of co-venturing with BoP from the idea development up to the creation of new businesses. More recently, Mezias and Fakhreddin (2012) identified a new group of approaches, and grouped them under the term protocol BoP 3.0. They also coined this approach as "market creation", as BoP are involved as active designer of the value exchange structure, and the community has a strong interaction and engagement to understand the native roles, identities and social structures that shape value in these transactions. Table 1 summarizes the key proposition under this approach.

Table 1: Summary of BoP protocol 3.0 propositions by Mezias and Fakhreddin (2012).

Aspect	Proposition BoP 3.0
Enable Knowledge Sharing	Open, interactive information gathering enhances business model innovation
Clarifying system of meanings	Attention to differences in the meaning of products will enhance selling to the base
	Understanding of how local culture defines the meaning of products enhances business model innovation.
	Joint development of systems of meaning enhances market creation.
Transform roles to link the product and community needs	Ensuring congruence of products with local roles enhances selling to the base
	Extending existing roles to incorporate new products enhances business model innovation
	Creating roles that link the product and community needs enhances market creation
Continuous adaption of product and consumption is important	Redefinition and recombination of products and services to fit existing consumption routines enhances business model innovation.
	Better understanding of consumption infrastructure enhances selling to the base

In line with the propositions stated by Mezas and Fakhreddin (2012), the “Product Co-creation Centres (PC3’s)” project of the University of Twente conducts research in the field of development through the application of co-creation methods, under the criteria of social entrepreneurship and sustainability principles. PC3’s aim at becoming an useful instrument to support the people at the BoP to successfully transfer from informal markets to formal markets

through (social) entrepreneurship. Co-creation is used as an instrument to empower the people at the BoP to create sustainable enterprises. In our vision, the co-creation process is lead simultaneously by a BoP entrepreneur that owns the value generating idea and a non-BoP function developer responsible for organizing the product and business development process. Doing so promotes new ventures rising from the BoP itself striving for: (a) increasing wealth among the people at the BoP, (b) stabilizing their incomes, (c) providing better access to basic needs, and (d) ensuring a positive impact towards the environment and local community. This research is not limited to analysing and understanding BoP to propose mechanisms to improve their situation, but strives for finding a concrete and scalable method that can be applied in different contexts. Therefore, the applicability of our method is at the core of this research and as such requires alternative research approaches that deviate from more scholarly and academic ones. From this perspective, we recognized our work not only as that of researching and developing a new approach, but also as one of lifting a social enterprise that can sustain itself in time as value is being created. From here that we have reformulated our main guiding research question from *“Which factors can be identified as contributors/predictors for an organization to successfully serving the BoP market and how can these be integrated into a business model targeting the BoP market?”* to *“what is an economically sustainable business model that can create social value from the fact that a large group of people in the BoP have entrepreneurial skills and creative power but no means to exploit this and develop their own business or products?”* This paper presents preliminary results of this approach in the form of a description of the PC3 as value proposition and the business model supporting it.

This paper is further organized in 4 sections. Section 2 presents a short description of the Lean Start-up method and how it was used as guiding framework for the research here presented.

Section 3 summarizes different aspects of the customer segments the PC3 is targeting. Section 4 describes the value proposition of PC3s. Section 5 describes the management of the infrastructure required for setting up PC3s. Finally, section 6 provides a small summary of this paper.

## **2. THE LEAN START UP APPROACH AS FRAMEWORK**

The lean start-up method refers to a hypothesis based approach to assess opportunities during the process of starting up a new business. In general, the method consists of three steps repeated cyclically until a satisfactory business model is found, and its core philosophy is based on accelerating the process of failing such that the correct value adding logic is found more rapidly and at the spends of the least resources, thus lean. The first step consists of translating the entrepreneur's vision into a refutable and temporal business model. The Lean Business Canvas (Source [www.businessmodelgeneration.com/canvas](http://www.businessmodelgeneration.com/canvas), canvas concept developed by alexander osterwalder and Yves Pigneur) is often used for this purpose, but other templates might be used as well, depending on the characteristics of the branch. During the second step, this hypothetical model, (e.g. filledin Canvas) is evaluated using a series of minimum viable products. Minimum viable products are simple prototypes containing only the critical features in case of products, or activities in case of services, required to demonstrate to potential customers the offered value in a rigorous way. Finally, the 3th step consists of using the test feedback to decide whether to persevere with their business model, or "pivot" by changing some of the models elements in the search of a better solution. By repeating iterations of these three steps, entrepreneurs are forced to use their resources for finding global optimum business logic rather than locally optimizing a first guess.

As it can be noticed, the two key representations for building up a working business model are the business canvas and the minimum viable product. The following describes how these two were managed in this research.

### **Business model canvas**

Business model canvases are usually structured in four main groups of information –as shown in Figure 1- namely, the product, infrastructure management, customer interface and the financial aspects. Depending on the specifics of the canvas, each group might again be sub-structured differently. The product part refers to the value proposition to be offered. In this research, the product is described by the value proposition, the product features and the unfair advantage. The customer interface describes strategic aspects of the customers being targeted. For this research, the customer interface is modeled by describing the recognized opportunity, the market state and the potential customer segments. Infrastructure management refers to the arrangement of partners, activities and resources that are necessary to create value for the customer. In this research, we describe the key activities, the key partners and the key activities. Finally, financial aspects usually focus on the cost structure and the revenue model. On the one hand the cost structure deals with the representation in money of all the means employed in the business model. On the other hand, revenue model describes the way a company makes money through a variety of revenue flows. Both cost and revenues structures have been omitted in this paper, but are available upon request.

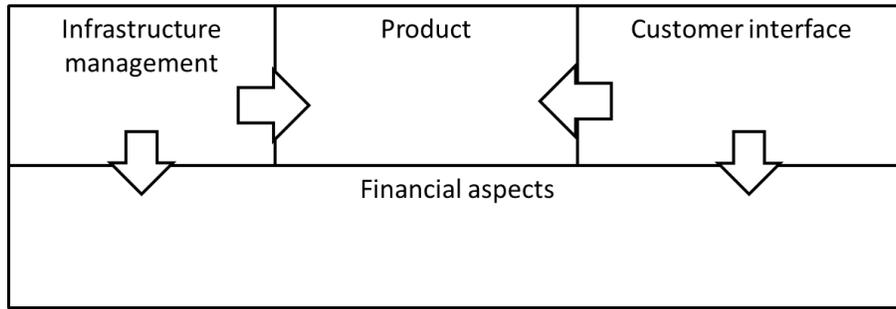


Figure 1: Business model canvas parts

### Minimum viable product

As the goal of PC3 is offering a service to a community, it is difficult to make minimum viable products to test with potential customers. In this research, minimum viable products started as pitch presentations describing the features of the service, and ended up with workshops tested first year bachelor students at the University of Twente. Results have been discussed personally and online with potential customers in the Netherlands, Venezuela, Brazil (two different locations) and Mexico using power point slides. Table 2 shows an analogy used as example to clarify the properties of the PC3 business model in relation to airline one. Each discussion reshaped the business model as it was being developed. However, the authors want to acknowledge the fact that the results are in a preliminary state and require further market validation. Eventually, it will be real investors and a working PC3 the only but most important evidence to test the validity of the model.

Table 2: Analogies as a means to represent a minimum viable product

Aspects	Airline model	PC3 model
Infrastructure	Physical Airplane	Design-business studio, pre-incubator

Stakeholders	Operations managers	Operations manager
	Pilots	Function Developers
	Flight attendants	Technical consultants
	Travelers	BoP innovators (designers/entrepreneurs)
Core function	Move people travelers from one geographical place to another	Moves people from BoP to business incubators
Requirements	One take-off ramp at origin and one take-off ramp at destination	Bop in-situ (social/cultural) center a destination incubator, Coupled technical education center.
Features	Engines and aeronautical devices, Cockpit, Sensors, etc	Design tools, FabLab, business tools, Co-creation method, Measurement instruments
Scope	A maximum number of kilometers to travel	Identification of entrepreneurs, Identification of opportunities, generation of ideas, product development.
Intangible values	Connects people to new people and to new places	Creates local jobs, Integrates BoP into formal economy  Move BoP from poverty to prosperity
Revenue model	Airplane costs, services, upgrades and trainings.	Set-up costs, trainings, servicing.
Life cycle	<ol style="list-style-type: none"> <li>1. Set up specifications</li> <li>2. Plane is manufactured</li> <li>3. Pilots get hired</li> </ol>	<ol style="list-style-type: none"> <li>1. Determine local characteristics</li> <li>2. PC3 equipment is installed</li> <li>3. Function Developers are hired</li> </ol>

	<ul style="list-style-type: none"> <li>4. Pilots get trained</li> <li>5. Flight attendants recruited and trained</li> <li>6. Test flights performed</li> <li>7. Run operations</li> <li>8. Upgrades and Maintenance</li> </ul>	<ul style="list-style-type: none"> <li>4. Function developers are trained</li> <li>5. Technical consultants recruited and trained</li> <li>6. Test projects are performed</li> <li>7. Run operations</li> <li>8. Trainings and feedback</li> </ul>
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### 3. CUSTOMER INTERFACE

#### Opportunity recognition: BoP as Leaders of Wealth Creation

The PC3 research project is based on the following hypothesis: “a large group of people in the BoP have entrepreneurial skills and creative power but no means to exploit this and develop their own products and businesses”. This hypothesis is the starting point for this research, and as such, it represents the opportunity recognition that can be used to create value from. These hypotheses are partially validated by analyzing the results of the Global Entrepreneurship Monitor (GEM) project in their Global Report 2012. Here, it is stated that the entrepreneurial intention in factor-driven economies is around 48% of the population in contrast to 11% in innovation driven economies. They also point out that in the Latin America/Caribbean region, the Middle East/North Africa region (MENA), and Sub-Saharan Africa regions, over three quarters of the respondents considered entrepreneurship to be a good career choice. The highest average Total Entrepreneurial Activity (TEA measures the percentage of adults in an economy who are nascent and new entrepreneurs) rates were found in Sub-Saharan Africa and Latin America/Caribbean, both characterized by being factor-driven economies with a large population living at the BoP. Furthermore, in Latin America and Asia improvement-driven opportunity entrepreneurs were on average of 2 times more likely than necessity-driven ones. In Sub-Saharan Africa this ratio was

1.4. These results indicate that BoP is both entrepreneurial and is opened to recognize opportunities from where to create value.

### **Gap in Entrepreneurial Support: Pre-incubators for the BoP**

Product development serves as a fundamental engine for socio-economic advance, as it requires the expansion of existing knowledge frontiers, the creation of new forms of organization (that serves as supply chain up to the last link of the value chain, e.g. the consumer), and targets the improvement of life standards of communities and individuals (Aghion and Howitt, 1997; Romer, 1990). In general, mechanisms to stimulate product and technology development can be classified as top-down and bottom-up.

Top-down refers to governmental policies leading research and development initiatives in strategic areas (usually large scale projects like energy generation and water supply) in combination with financial support. For example, the four Asian Tigers (Hong Kong, Singapore, South Korea and Taiwan) experienced an exceptionally high speed economic growth after implementing policies focusing on rapid industrialization and exporting products and (financial) services to more rich and industrialized nations. Something similar occurred to the BRICS countries of leading developing economies, which have recently become industrialized nations and are starting to play an important worldwide role as technology suppliers.

Bottom-up refers to policies, either private or public, targeting the promotion of innovations and its transformation into businesses capable of generating value. A common method is the implementation of Business Incubators (BIs). For example, VentureLab Twente offers support to new companies in the Twente area in The Netherlands during their first years of existence and guide them up to the point where they can coexist with the market competition. The relevance of BIs on development is, as pointed out by Tiago Ratinho et al (2011), the effect that they have on

the creation of jobs and wealth. However, one of the problems for people in the BoP is transforming an idea (or group of ideas) into a product or service that serves as base for initiating a new firm. Therefore, BoP requires another type of support to allow for setting the bases for creating new business. This was also explained by Mead (1998) who stated that one of the reasons why many entrepreneurs fail to set up and grow their businesses, and therefore contribute to the local economy is the lack of capital and support. There has to be a shift from supporting small enterprises towards supporting entrepreneurs in their start because this will increase the chances of surviving.

Current business support to BoP is based on providing financial mechanisms to enable scaling up the number of microenterprises. However, microenterprises have a rather low impact on development, as employment generation is kept usually to family atmospheres, there is no or very limited knowledge generated and emerging organizational forms are very simple. Therefore, we can conclude that there is a gap in current institutional support to help BoP in engaging business opportunities as other sectors do. The gap lies between financial support at microbusiness level and incubator support at a more professional level. Therefore, we research the development of PC3s as pre-incubators for BoP (see Figure 2) that increases their chances of becoming Small and Medium Enterprises where BoP's will be enabled to elaborate own business plans which it is an important requirement to identify business partners.

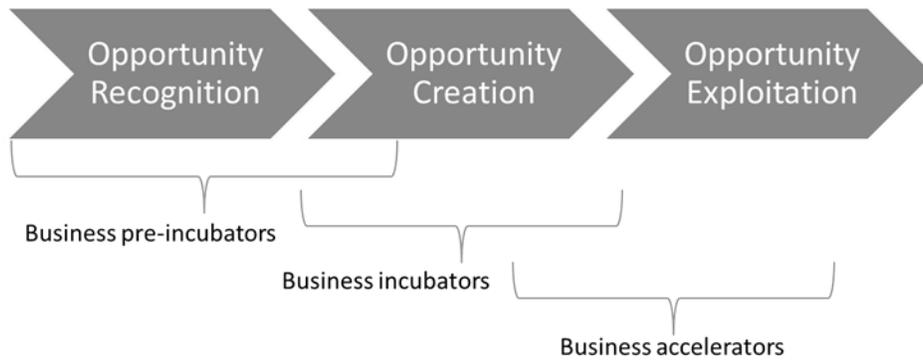


Figure 2: Influence zone of different families of business support.

### Market segmentation

The market segmentation has been done by researching with different organizations their main concerns in relation to the BoP. Although this research is of an empirical character, some interesting distinctions can be made:

1. Corporate partners in the consumer goods branch have as main BoP related question: *we have technology, but do not know which innovations is the BoP market requiring and willing to spend their money on?*
2. Social investment entities (e.g. charity or social responsibility policies) have as main question: *we have money, but where can we invest it such that its impact is sustainable and measurable?*
3. Governmental contacts in developing countries posed rather than a question a desire: *We, as a government agency, want to invest in sustainable development targeting the inclusion of BoP into the regular system.*

Based on this input, the following three market segments have been recognized:

1. Supplier development of corporative entrepreneurship: Supplier development is an approach that large firms use to procure specific capacities to their suppliers to guarantee high quality

and regular supplies. Applying this concept to corporate entrepreneurships would consist of having large firms investing in the installation of PC3s with the aim of obtaining products and service ideas to both develop and supply that market. Consumer goods companies are good examples of potential customers.

2. Philanthropic or charity organizations: Several organizations count with special budgets to make social investments. By investing in PC3s their resources are translated into sustainable development measured with several socio economic indicators.
3. Governmental institutions: Governments looking for social programs can invest in PC3 as a way to engage into market creation and social inclusion. In this case, rather than customers, these organizations would serve as partners in boosting development. Examples of potential partners are Brazilian governmental institutions given the accent the country has set on social inclusion.

#### **4. PRODUCT: PRODUCT CO-CREATION CENTERS**

Product Co-Creation Centers, or PC3s, are specialized support centers where individuals from the Base of the Pyramid (BoP) co-create innovative products and business models with the aim of becoming (social) entrepreneurs. PC3s offer a physical environment where potential (social) entrepreneurs with no required technical or business expertise interact with a panel of experts to co-create products from an initial idea down to a physical prototype with a business plan. This co-creation process results in the professionalization of entrepreneurs and the creation of new product and service ideas with market potential. On the one hand, the expected consequences of leveraging (social) entrepreneurs includes improving BoP capabilities, enable emergence of local economies and empower BoP leadership in wealth creation, raise environmental protection

awareness, promote sustainable consumption models and encourage bottom-up strategies to meet social justice and preservation of the vegetation. On the other hand, direct socio-economic impact of product development by BoP allows for serving unattended needs, establishing new companies and finally supporting MNC market understanding. Ultimately, by integrating Business Incubators (BIs) into a system of PC3, economic growth and social development is stimulated.

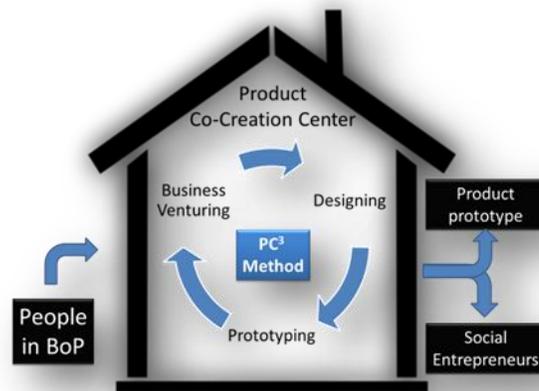


Figure 3: Schematic of a Product Co Creation Center

### Value Proposition

Our value proposition is therefore: the installation of a development engine called PC3, which consist out of the following features:

- The infrastructure: Consists of a set of product development tools (software, rapid prototyping), a project management method and finally a set of trainings and workshops for capacity building.
- The co-creation method: Consists of an innovative and new co-creation method that integrates into BoP idea owners with an external function developer to co-create with BoP users.

- Measurement tools to determine the social, economic and environmental impacts of implementing the PC3, which are useful in deriving new policies.

### **Unfair advantage**

The PC3 formula emerges from the integration of Product Development, Entrepreneurship, Sustainability and Fast Fabrication Labs around the co-creation principle. We cover these expertise areas in our team as follows:

- The [Design, Production and Management department \(OPM\)](#) of the University of Twente provides expertise in product development, co-creation methods and rapid manufacturing techniques. The group specializes in developing design and manufacturing tools for industrial applications.
- The [Innovative Entrepreneurship department \(NIKOS\)](#) of the University of Twente provides expertise in Entrepreneurship. This group has an international successful trajectory in setting up entrepreneurship incubation programs.
- The [Centre for Studies in Technology and Sustainable Development \(CSTM\)](#) provides expertise on technology and sustainable development. CSTM counts with a large and diverse expertise in environmental policy and cleaner production research.

## **5. INFRASTRUCTURE MANAGEMENT**

### **Key Partners**

***The local institutional partners:*** Are local academics and practitioners in the fields of industrial design, engineering, business & administration and sustainability studies that help us determine the best possible way to install a PC3 such that it fits a given local context. The idea is to co-venture with local partners such that cultural aspects and implicit social behavior is well taken into account.

***The Investors:*** Can be governmental institutions, MNCs or Philanthropic organizations. Provide economic resources for the physical implementation of PC3. Investors obtain concrete results of the impact their investments have on the development of a given community. Governmental organizations can use the data for steering policy making. Furthermore, PC3s can serve the function of supplier development for corporate entrepreneurship for MNCs and local business.

***The function developers:*** Are professionals in various fields, as engineering design, industrial design, business and administration. Apply the PC3 method to co-create directly with BoP the ideas and are also in charge of designing the PC3 operations according to local/regional standards.

***The BoP innovators:*** Are people from the BoP with the creativity to identify opportunities for new products and services. PC3s support/guide the product development process of their ideas. Depending on other characteristics, are supported to create their enterprises.

***The market:*** The market of the products developed in PC3s is either BoP or non-BoP. Although special attention is set on development products and services targeting BoP needs, the focus is enabling the flow of economic resources from non-BoP towards BoP.

***The business incubator:*** Represents the landing framework for successful BoP entrepreneurs and product developers to further develop a concrete startup or co-venture with an existing business.

## **Key Activities**

The operations of PC3 are organized at three levels:

**Statement of principles:** PC3 is conceived as a social intervention mechanism, and follows a set of core values: challenging empowerment, social & environmental sustainability, building the market base and building shared commitments.

**Pre-incubator program:** prescribes the services and steps required for installing a PC3. Also defines criteria for identifying entrepreneurs and measuring impact of the intervention.

**Co-creation tools:** guide the synergic interaction between BoP and facilitators and enable the materialization of ideas. Facilitators can choose which combinations of tools –hardware and software- are most adequate to serve a given BoP profile and the type of product being co-created. A design and manufacturing toolkit, a sustainability toolkit and an Entrepreneurship toolkit will be available for this purpose.

Managing operations at these levels is the key for scaling-up the implementation of PC3s.

## **6. CONCLUSIONS AND REFLECTION**

This paper adopted a business model research approach to derive a set of refutable hypothesis to help answering its main question: *what is an economically sustainable business model that can create social value from the fact that a large group of people in the BoP have entrepreneurial skills and creative power but no means to exploit this and develop their own business or products?*”. The following results were found:

1. According to grounded research by the GEM project, there is indeed a large group of BoP individuals with entrepreneurial and creative power.

2. There is a gap in current BoP entrepreneurship support, as initiatives are either stimulating microenterprises with limited development potential or already starting business with a base understanding of their product or services. This gap is identified as no pre-incubation support for the BoP.
3. There is a potential market of both private and public institutions seeking social investments with clear sustainable development impacts.
4. The multidisciplinary approach of PC3s has the potential to engage in market creation with the BoP and collaborate to the process of their sustainable development.

The final conclusion of this research is that using a business model approach to performing research, especially in the field of applied social entrepreneurship, has a large effect on the resulting causal relations determining the sequence and contents of the questions leading a research. For this particular research, this new order allowed quickly aligning the research objectives with the social needs, and finding a logic upon which this research has a reason for existence. Hopefully, this will reflect positively on its future implementation as well.

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