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Expand Reality in-company project – a Proximity Technology Business Model research in support of Healthcare Management.

Mariantonietta Renda

Master (MSc) in International Management

Supervisor:
PhD Renato Telo de Freitas Barbosa Pereira, Assistant Professor
ISCTE Business School

June, 2021

BUSINESS
SCHOOL

Department of Marketing, Strategy and Operations

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"Ar scáth a chéile a mhaireann na daoine"

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Abstract

The in-company project takes place in the 20s pandemic atmosphere, where the Customer-Journey has undergone various modifications, and investigates how the proximity-digital technology, proposed differently after 8 years[1] of existence, could take off yet again in a new industry, in support of the healthcare one.

Accordingly, this prospect of re-proposing proximity technology channels in the market raises a range of challenges to be faced, such as the citizen's scepticism about the probable storage and theft of personal data. Yet, it offers unique stimulating opportunities for the project success, in terms of Customer Service, Administrative and Building Management – multiple types of studies to establish a definitive strategy aimed at disrupting and enhancing the market. For instance, leveraging the new Tech-Customer path may be complex on one hand, but it may also be a source of *new value* development on the other.

Finally, the research will be mean for shaping a strategic Business Model Canvas for *ExpandReality*®. As a result, the Final Research aims to assist the start-up in understanding how the launch of the Beacons-based products and platform can work and be marketed, as well as ensuring an overcome of initial consumer's scepticism. In conclusion the investigation will outbreak in an ultimate Business Model Canvas for the start-up, first analysed by a group of professionals and then re-shaped.

"The innovation and entrepreneurship journey is about turning ideas into value propositions that customers care about and business models that can scale".

(Osterwalder, 2020)

Key Words: Beacons, Distance Proximity Technology, Healthcare, Start-up, Business Model Canvas.

JEL classification: M16 International Business Administration, O32 Management of Technological Innovation and R&D.

1 The proximity technology, within the beacons, was launched for the first time in 2013, but recently re-proposed and advertised by the Governments for safety reasons. E.g. ©Stayaway Covid in Portugal and ©Immuni in Italy.

Resumo

O projeto in-company ocorre na atmosfera pandémica do ano de 2020 e seguintes, em que o "Customer Journey" sofreu algumas alterações, e desta forma investiga como a tecnologia digital de proximidade, proposta de maneira diferente depois de 8 anos[2] de existência, pode desenvolver-se mais uma vez numa nova indústria e numa nova realidade.

Nesse sentido, a possível proposta de canais de tecnologia de proximidade no mercado, levanta alguns desafios. Como por exemplo, o ceticismo do cidadão quanto ao provável armazenamento e roubo de dados pessoais. Ainda assim, oferece possibilidades estimulantes de sucesso do projecto, em apoio ao cliente, gestão administrativa e arquitetónica - diferentes tipos de estudos direcionados no sentido de desenvolver uma estratégia com o objetivo de agitar o mercado e lucrar com ele. Por exemplo, pode ser arriscado explorar o novo caminho do cliente técnico, mas ao mesmo tempo pode ser uma possibilidade de *criação de novo valor*.

Finalmente, a própria pesquisa será um meio para a intenção final de moldar um Modelo de Negócios estratégico para a start-up ExpandReality®. Desta forma, a Pesquisa Final tem como objetivo ajudar os conselheiros a perceber como o lançamento de produtos baseados em Beacons pode funcionar e como estes podem ser comercializados, com um uso seguro dos dados extraídos.. Concluindo a investigação surgirá no formato de um plano de modelo de negócios final para a start-up, primeiramente analisado por um grupo de profissionais e posteriormente reformulado.

"Inovação e empreendedorismo consiste em transformar ideias em propostas de valor com as quais os clientes se preocupam, e modelos de negócios que podem ser escalados".

(Osterwalder, 2020)

Palavras-Chave: Beacons, Distance Proximity Technology, Healthcare, Start-up, Business Model Canvas.

Classificação JEL: M16 International Business Administration, O32 Management of Technological Innovation and R&D.

[2] A tecnologia de proximidade, dentro dos beacons, foi lançada pela primeira vez em 2013, mas recentemente foi reproposta e divulgada pelos Governos por motivos de segurança. Por exemplo. © Stayaway Covid em Portugal e © Immuni em Itália.

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Glossary

Acronyms

5Ss	Sell, Serve, Sizzle, Speak, Save.
B2B	Business to business
B2C	Business to customer
BLE	Bluetooth Low Energy
BT	Beacons Technology
CA	Competitive Advantage
CAGR	Compound annual growth rate
DPT	Digital Proximity Technology
DRM	Digital Rights Management
e-PR	Online Public Relations
GDPR	General Data Protection Regulation
GNSS	Global Navigation Satellite System
GPS	Global Positiong System
IoT	Internet of Things
JIT	Just In Time
KPIs	Key Performance Indicators
NPV	Net Present Value
OT	Operational Technology
PIE	Peak of Inflated Expectations
PKI	Public-Key Infrastructure
PT	Proximity Technology
QR	Quick Response
SEM	Search Engine Marketing
SSL	Secure Sockets Layer protocol
Wi-Fi	Wireless Fidelity

Symbols

®	Registered trademark

Introduction

This chapter explains what the study is about and why it is important to focus on the proximity technology nowadays, how the analysis will be conducted and how the structure will be presented.

Context Research

The research takes the official format of an in-company project, with its ultimate aim being the innovative construction of a Business Model Canvas adapted to the new needs of people, who have seen their own buying habits change after the worldwide's digitalization accelerated and the 2020 pandemic timeframe loomed. Specifically, the unprecedented status quo has sparked interest in investigating what has changed so rapidly about the Customer Journey, as well as *how* and *why* the Digital Marketing domain should adapt to this new facet of the "phygital[3]" world.

The desire to learn more about the new phenomenon in the Digital field gave raise over the collaboration with the Portuguese start-up ExpandReality®, which is already researching *proximity* and *Beacons' technologies*.

In this matter, the support that the start-up is looking for is not related to the software or the product itself but to the marketing and the pilot business strategy to be implemented in the industry.

Why is the research captivating?

In order to join the digitalized world, it is necessary to emphasize that today's businesses must adapt their offerings through *Omni-channel marketing*, which entails presenting an offer through different platforms (physical or digital) in a seamless manner – in order to build a holistic view of the offer anywhere at any time (Kotler, 2019).

At this point, the two notions of understanding the new *Customer Path* towards the final purchase and the *Beacons Technology* analysis opportunity have matched in an interesting dance of theories from various points of view.

[3] "The concept of using technology to bridge the digital world with the physical world with the purpose of providing a unique interactive experience for the use". (Marketing Dictionary, 2020).

For example, the usability of already existing data on the actual number of people using and downloading proximity apps, as well as the number of people who have not used it. The proximity digital technology has recently found space in our community through the Contact Tracing Apps, such as Immuni® in Italy or Stayaway Covid® in Portugal[4], rising debates about data usage and theft. As a result, because the data and technology behind the apps are similar to those used for Beacons, it would be appropriate to study people's attitudes towards those apps in order to assess the potential success of the start-up's product (e.g. digital proximity technology's scepticisms regarding data usage seen as obstacle).

Another intriguing point is the actual need for a similar technology, given that people are currently prohibited from touching any type of equipment outside their own home for safety reasons.

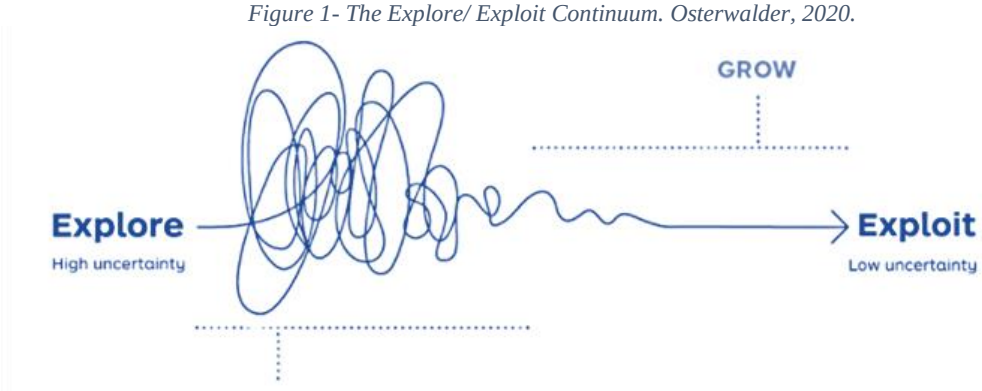
Similarly, the internationality of the case allows the research into knowing how many people or businesses would be willing to use this new technology, or change their habits in light of the new era we are living in.

Finally, the research findings will highlight ®ExpandReality can perceive the opportunity with the right Business Model Canvas strategy by analysing the social barriers and market opportunities of proposing beacons technology internationally.

Definition of the Study

The primary goal of the research is to develop a validated appropriate Business Model Canvas for the start-up, with the objective of answering the question "*How do we maximize opportunities with the best business model design*?". In light of this, Osterwalder's Explore-Exploit workflow can be used to better explain the research:

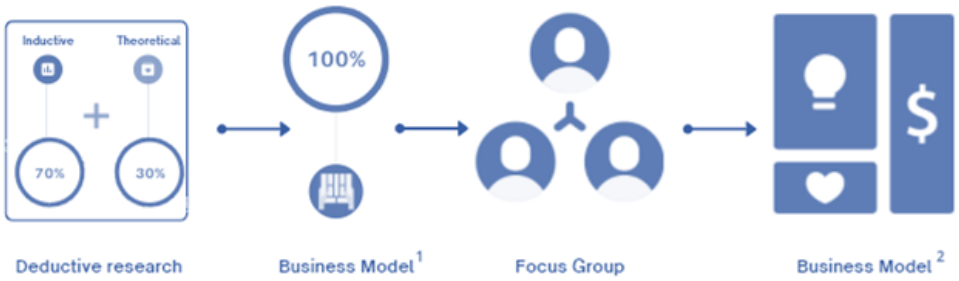
Figure 1- The Explore/ Exploit Continuum. Osterwalder, 2020.



[4] Many others can be found around the world - https://en.wikipedia.org/wiki/COVID-19_apps

Whereas the *Explore stage* emphasizes theories beyond the final Business Model, implying the research itself – moving from *inductive* to *theoretical* reasoning. As a result, it will be possible to move to a *deductive* reasoning, which will result in our first Business Model[1]'s draft, which will then be analysed by a focus group of professionals whose discussions will help to finalize the Business Model[2] for the start-up, which will be then ready to be implemented in the market for the actual trial.

Figure 2 - Inductive / deductive workflow applied to the Thesis Structure.



At the end of this analysis, the start-up will reach the Exploitation stage (Osterwalder, 2020), where the focus is no longer on research but on keeping the Final Business Model[2] up to date, efficient, and growing over time.

The first steps involve the Inductive and Theoretical researches, with deductive reasoning (from general to specific principles) capturing primary and secondary data. The primary qualitative data is developed over the key members of the start-up and an online questionnaire about a personal perspective of possible usability of the Beacons in EU. Secondary data from the industry market, branches, and competitors will be presented as both qualitative and quantitative data in the network. Theoretical research, on the other hand, is related to the data found and to be implemented, with a focus on answering four main questions (Osterwalder, 2020):

- Is there an opportunity in terms of market size, money size, problems/solutions to fit and willingness to pay?
- Can we create value on this market? Value proposition, willingness to pay and pricing and feasibility?
- How can we best create demand and grow? Product/market fit, feasibility, acquisition and retention, profitability…

- How are we scaling our organization to satisfy demand? Revenue (or user) growth …

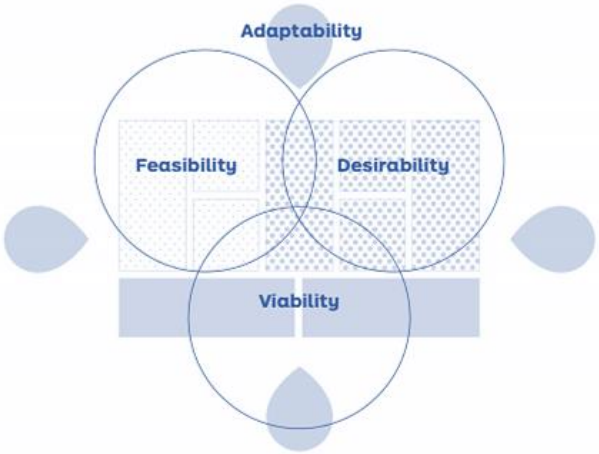
Therefore, it is necessary to enter the first Testing Loop - as Osterwalder (2020) believes, it is important to hypothesize, experiment and finally learn. This is why the first sketch of the Business Model[1] will be tested by a Focus Group, panel of experts, chosen specifically to examine the possible outcomes of the plan, referred to as the Pre Business Model or Business Model[2].

This will enable us to identify all four types of hypotheses that underpin a business idea:

- Desirability, *does the market want this idea?*
- Feasibility, *can we deliver at scale?*
- Viability, *is this idea profitable enough?*
- Adaptability, *can the idea survive and adapt in a changing environment?*

(Osterwalder, 2020).

Figure 3 - Identification of the 4 types of Hypotheses. Osterwalder, Alexander. The Invincible Company (p.80). Wiley



Finally, in the *Learn step*, the Business Model[2] will be adjusted to be presented in the market.

Design of the Study and organizational path

Following the Explore-Exploit ascendant climax structure, after the *introduction*, the thesis presents a *literature review* containing the basic theories and knowledge on the topic (inductive secondary data research), the *methodology* related to the empirical study and data (inductive primary ad theoretical data), *implementation* of the first shaped Business Model sketch (tested with the focus group) and the *conclusion* (final Pre-Business Model adjusted to the professionals' outcome). The study will follow a specific structure, which is divided into five sections and presented as follows.

Literature review

The literature review, specified as second chapter, where the Deductive research and the secondary data take place, is divided into four macro-subgroups: Digital Proximity

Technology and Beacons technology, and the two basic concepts to understand the research itself, the ExpandReality®, and what we already know about the start-up itself, what they have been studying, expectations and the findings related (secondary data), and the business Model Canvas theory and usability.

Methodology

The methodology section, identified as the third chapter, where the Inductive primary data and Theoretical stage are, is divided into five major macro sections, with the first introspective of the Business Model Canvas' blocks:

1) The macro-environment analysis; Data collection from secondary and primary sources with a focus on analysing market opportunities throughout the Gartner Hype cycles, technology analysis during the Covid-19 and the sociological expectations.
2) Creation of value analysis: value proposition, customer segments, customer relationships and channels.
3) Creation of demand and grow analysis: cost structure and revenue streams.
4) Scale of the organization: Key activities, resources and partners.
5) Shape of the Business Model[1] Canvas.

Implementation

This section, identified as the fourth chapter, will present two sections:

1) The first approach to the Deductive research, the foreseen Business Model will be analysed by the Focus Group.
2) The final sketch of the first Business Model[2] Canvas based on the Theoretical and Inductive studies and the Focus Group's perspectives' outcome.

Conclusion and Recommendations

The last and fifth chapter will resume the analysis of the findings, present the final Pre-Business Model for the start-up to implement on the Exploit stage, and summarize the study's limitations within suggestions on the subjects to elaborate on further.

Chapter 1 – Literature review

In the following chapter, there will be a first introduction to some relevant actors to understand the context of start-up's value preposition: Digital Proximity Technology, Beacons Technology and Online Platforms, which will be viewed as a bridge between the start-up and the future customers.

Also, it will be examined the start-up itself as well as its research data and plan history – it will be revealed how the start-up has been growing the idea of their Value to offer to the public, as well as the studies related to that (secondary data). Following that, the Business Model Canvas will be examined to determine why it is critical for the start-up to be tested and implemented.

1.1. Digital Proximity (DPT) and Beacons Technology

The Digital Proximity technology, along with Beacons and online platforms, has been considered as one of the strategical topics to approach as per the recent consideration, or reconsideration due to its capability of sending information through different devices.

Indeed, it has recently been revalued as a type of advertisement to promote a product or service, which has been around since 2008 and is based on wireless, specific-location technologies and devices, such as Bluetooth and mobile phones. In our field, it also allows for the creation of a highly personalized real-time relationship and advertisement content between the customer and the retailer (Leveseque et al., 2015). This technology allows businesses to reach their target customers by simply passing by a strategic physical location and informing them about their product/service or, as previously mentioned, a real-time promotion.

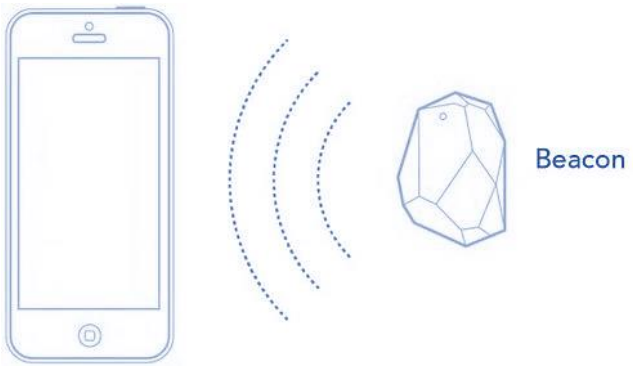
Recently, this technology has been viewed as a point of investment due to its foreseen growth of the market, which is expected to reach up to €44.20 billion in the coming years, whereas in 2015 it was only valued around €8 billion, according to Market for Proximity report (Gajanova et al., 2020).

With the arrival of 2020 and the public-health world's support for the DPT, the DP technology has seen another face of its capabilities, related to the Covid-19. Among these, there are Digital epidemiological surveillance, rapid case identification and interruption of community transmissions (Miller et al., 2020), as well as the boost of a needed review for the ethical, legal and privacy considerations, which paved the way to a new consideration of

privacy and approval of usage of data, while also assisting in the growth of the technology itself and the practices of businesses. Despite this, the subject has sparked a variety of debate about people's willingness to share personal information, particularly if it is not for public health's purposes (Martinez-Martin et al., 2020).

The Beacon, a hardware transmitter and a class of Bluetooth low energy (LE) devices, is an example of a Proximity Technology device. It is a small box, usually shaped like an avocado, that must be physically placed in strategic locations so that it can provide inputs on the mobile phone of a close target customer. The Beacon Market has seen a slight decline in the last period due to Covid-19, but it is also seen as a strategic solution for the post-Covid life – with a forecast reaching a revenue of around €33 million and growing at a CAGR of 71.7 percent between 2019 and 2026. (Abhishek, 2020).

Figure 1.1 - Beacons Technology, mobile's inputs



Newman (2014) summarized one of the first ideas about the beacons technology in the market world: a low-cost device capable of capturing new customers and, as Philip Kotler would say nowadays, reinforcing loyal ones via Bluetooth low energy technology.

> *"Beacons have the potential to transform many industries […] The most immediate impact to be seen by marketers will be in the retail sector, where the benefit of gaining new customer insights from deploying a fleet of BLE beacons in-store is likely to far outweigh the cost."*
>
> *(Newman, 2014)*

In reality, Beacons Technology is not a new innovation: according to a The Guardian article, BT was first introduced for retail purposes in June 2013 by Apple with the iBeacon (despite the fact that the very first study on the subject was in 1994. Atherton, 2019). As a result, a number of Apple iOS devices now have some beacons' software installed, and

Google, within UriBeacon, has been researching the technology protocols just one year after Apple's launch, also making ideal solutions for IoT as it reduces battery consumption of mobile devices by not requiring them to be always connected (Garcìa, 2016).

Following 2013, the DPT was researched, developed and exploited in a variety of areas for different purposes and with different solutions to potential technical and social issues. Filippoupolitis et al. (2017), for example, presented the historical flow of the Beacon account, noting that the BT and the DPT had been compiled in various contexts and proposing the use of Beacons in sectors such as:

- Healthcare support systems;
- Indoor navigation, for example, in universities campuses (Kose Utku, 2020) and smart homes;
- Tourism; museums' activities and touristic information, such as the Louvre Museum (Ubudu, 2016);
- Transportation, particularly in train stations or airports for information related matters. TruBeacon can be used to share information about trips, car parks, help for the blind, vehicle-to-vehicle communication, and even as a payment method (Garcìa, 2016). E.g. Ubudu in Singapore and Hong Kong airports offered the opportunity to participate in real-time games or receive personalized promotions to use in the Airport Duty Free stores (Ubudu, 2016).

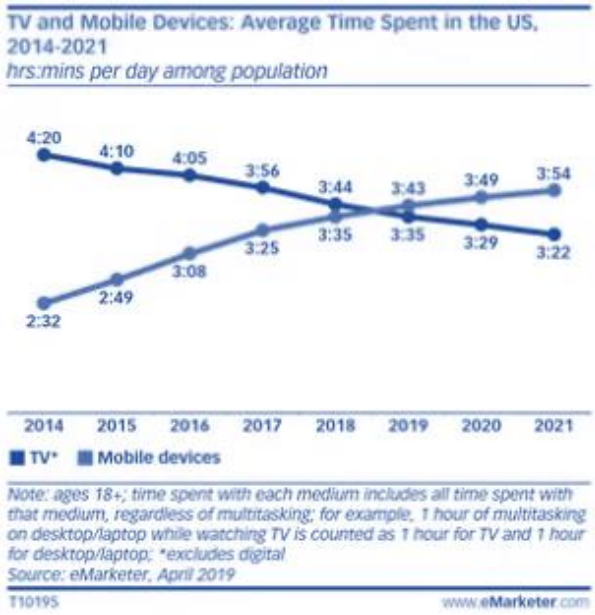
As a result, the reason why Beacons have spread so rapidly to various sectors is most likely due to the complicity of the system itself (GNSS and the device are required), the technology structure (BLE) and the compatibility with other devices, such as Smartphone.

As a matter of fact, the Smartphone is now considered to be an important device for each and every person (Brohi, 2018) along with the Wi-Fi and Battery needs that according to Lindstorm (2019), have been added to the more current Maslow's Hierarchy of Needs, considered to be human primary needs today.

Furthermore, smartphones are used not only for searching and immediately purchasing items, but also in physical stores: 48% of customer's worldwide use smartphones to compare prices and ratings, 41% to look for technological features and 37% to look for coupons or discounts (Kotler, 2019).

Similarly, according to Deloitte (2017), entrepreneurs and marketing managers are increasingly interested in one-to-one technology because it not only means a more personalized deal, but it also creates a sense of urgency for the consumer. In that sense, retailers choose BT because it not only perceives the customer's real-time position, but also defines its preferences based on previous transactions, on which customized pop-up offers are based. However, with regard to the later-discussed issue of privacy, it is also important to remember that the Consumer must grant permission to the App, liberally giving access to its browser preferences.

Figure 1.2 - Time Spent on Mobile Continues trending up eMarketers. Dolan, 2020



1.2. Digital Online Platforms

Ruggieri (2018) introduces how start-ups should move around digital platforms and business models through an investigative study, specifically mentioning that online platforms have the potential to link individuals, organizations, and services with the intention of promoting key market experiences. New business models, such creative start-ups, are thus developed based on the basis of creativity, scalability and partnerships within the community.

According to Nyrop, et al. (2020), the situation post-covid-19 requires companies to rethink their current digital distribution platforms, benefit structures, and consumer services, and it is strongly encouraged to build a digital online portal. The crisis is also creating opportunities for those who invest in online companies to grow as industry leaders. Similarly, the statistics provided by Deloitte (2020), which are linked to the rise in online demand, indicate how everyday activities have an effect on Electronics/compliances/IT (5th category)

and Building Supplies (3rd category) as the products and services with the highest percentage of registered sales creation against expectations/budget prior to the outbreaks (more than 10 percent growth).

> *"Take the opportunity to invest in advanced analytics capability to ensure personal, timely and automated customer interactions and recommendations across devices."*
>
> (Deloitte, 2020)

Digital online platforms in and of itself are essential enablers for companies to exploit distributed expertise, while also creating innovative opportunities for workers to communicate within organizations. (Hossain & Lassen, 2017). Furthermore, the start-up is able to connect to the web as well as the relevant App in order for the Businesses' clients, and according to Sydow (2020), the evidence regarding the worldwide use of smartphones is certainly positive, the main app developments in the past years:

Chart 1.1 - Apps Trends in 2019. AppAnnie
**underlining that creating customer experiences to be online-first is key to profitable success.*

Apps trends in 2019			
204B apps Worldwide downloads	3.7 Hrs. Average time spent per day on mobile	825% Higher average IPO valuation for mobile companies*	100B€ Spent on apps, subscriptions and in-app spending.

1.3. Expand Reality – the start-up

The Portuguese start-up *Expand Reality*, registered as LDA in 2019, through the year 2019 has been working on the development of a digital common platform, to which different brands (B2B) could follow their proximity and beacons technology. Their project has been part of different funding researches such as *Vale Incubação*[5] with the Portuguese group bank Santarém and *Clinica Medis*[6]. Now, it is collaborating in the research through the CEO & Founder Francisco Tàvora Seruya, as part of the ISCTE *Investigation and specification of requirements on business model and marketing strategy considering a sociological approach.*

[5] IAPMEI - https://www.iapmei.pt/PRODUTOS-E-SERVICOS/Incentivos-Financiamento/Sistemas-de-Incentivos/Incentivos-Portugal-2020/Vale-Incubacao.aspx .
[6] Portuguese dental clinic - https://www.clinicamedis.pt/ .

In the early beginning of the project, before Covid-19, the start-up saw the opportunity to develop and exploit the DPT, using those smart solutions in the retail context – engaging They also acknowledged the fact that the initiative's existence was not new, but they realized that by applying the right emphasis to their proposal, it would have been a triumph.

The start-up initial methodology idea

The company intends to enter the market in March 2023 and expects to design and deploy a network that advances the sharing of information in a digital platform and integrate process experience in order to communicate value-added with customers.

To summarize, the purpose of the project was to enhance connectivity in a physical sense through IoT devices, in indoor and urban settings, enabling those that are physically in an average distance to access knowledge that is directed and committed to on-site use (after having duly accepted terms and conditions and cookies). The ultimate (possibly long-term) aim is to enhance the digital communication capabilities of physical stores, cultural facilities, exhibition venues, tourist attractions, and other future locations for the distribution of contextual information – taking e-commerce background details and its same model into the physical context, for example, sharing live promotions or other campaigns.

In this sense, to start, the project was willing to develop a digital community platform where different entities, through a mobile application and authorizing the Bluetooth access on the mobile device, would have been able to map IoT sensors around, promoting the propagation of BLE beacons.

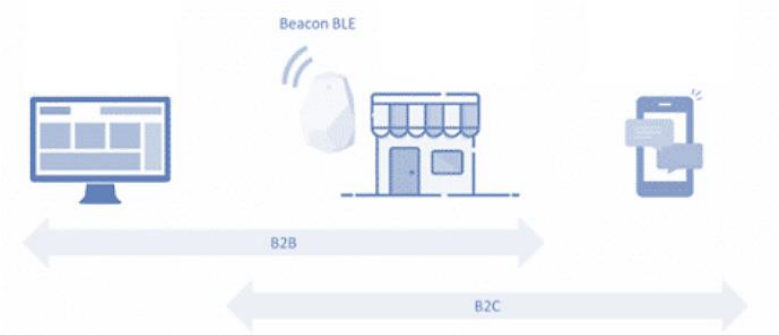
Expand Reality though about MINEW (Annex C) as first approach to the BLE signals the manufacturer of the beacons. The beacon itself was chosen for the first approach to the project because it is a compact divide, has its own autonomy for up to 2 years without the need of power, has almost no maintenance needed and has a very favourable selling price compared to other devices.

The start-up is also willing to focus on Narrowband-IoT, radio frequency technology lasting longer in autonomy and battery. As an example, the coverage area of narrowband IoT is less than a distance of 15 km, whereas Bluetooth BLE is less than a length of 10 m (Nurelmadina et al., 2021).

The first Business Approach was ideated as a B2B market, related to mastering and collecting data and maintenance of an online platform of communication management. This platform would have been mean for the start-up to maintain and master data collected and mean for the companies (customers) to physically attract their own customers throughout the Bluetooth tool and the platform IT communication management.

Therefore, the plan was to initially take part of the B2B marketing line, where the collaboration deal was signed by mail and the initial beacon kit shipped with 2/3 or 5 parts, including the installation guide and the 3 steps to launch an online campaign. It included the design and print of the QRcode on one side of the sensor for ease of warehouse management and control. In this way the customer would only need to scan the QRcode and the sensor will be assigned to the customer in question.

Figure 1.3 - ExpandReality First Business Approach. Proposta di Candidatura Parte B (Anexo Tecnico). ExpandReality



In the other hand, (see Annex B) they have found an idealized potential initial involvement in collaborating with Lidl by putting the IoT BLE sensor in the stores to facilitate a different method of contact such as: engaging with the clients before even joining, informing about the existing catalogue, and advertisements depending on the customer's profile. This will also provide for the tracking of the client's activities inside the shop, the provision of remote assistance (when employees are not present), the development of a Headmap of the most frequented and peak spaces in the store... Similarly, it would have included creating inflow data for the web portal as the exchanged centre and outflow data for Lidl's use and consumer ads.

The key benefit that the start-up is offering is linked to a consolidated framework for Consumer use that functions in both saving data obtained from multiple customers (B2B) and offering the Customers the opportunity to capture more relevant tech-clients through their omni-channel approach.

To complete the start-up report, the concepts just listed will be addressed and checked in the Business Model Canvas development to determine whether the stakeholders, customer segmentations, and so on align strategically to the research's end goal.

1.4. Business Model Canvas

As anticipated, the final objective of the research is the construction of the Business Model, the way a Start-up can then scale its business innovation. According to Osterwalder et al. (2020), the business model is a way of keeping track of innovations, whether you are new in the market or not – it is a distinct window over the value's demands of community, customers and shareholders.

In other words, the business model, first proposed by Osterwalder & Pigneur (2010), assists an organization in defining its commercial plan, whether for joining a new market or innovating a current one to preserve its quality. In our case, we will present a Business Model Canvas to reach in the European market, with an emphasis on Portugal, while addressing nine specific building blocks, corresponding also to challenges, needed improvements and suggested innovations. These nine blocks are:

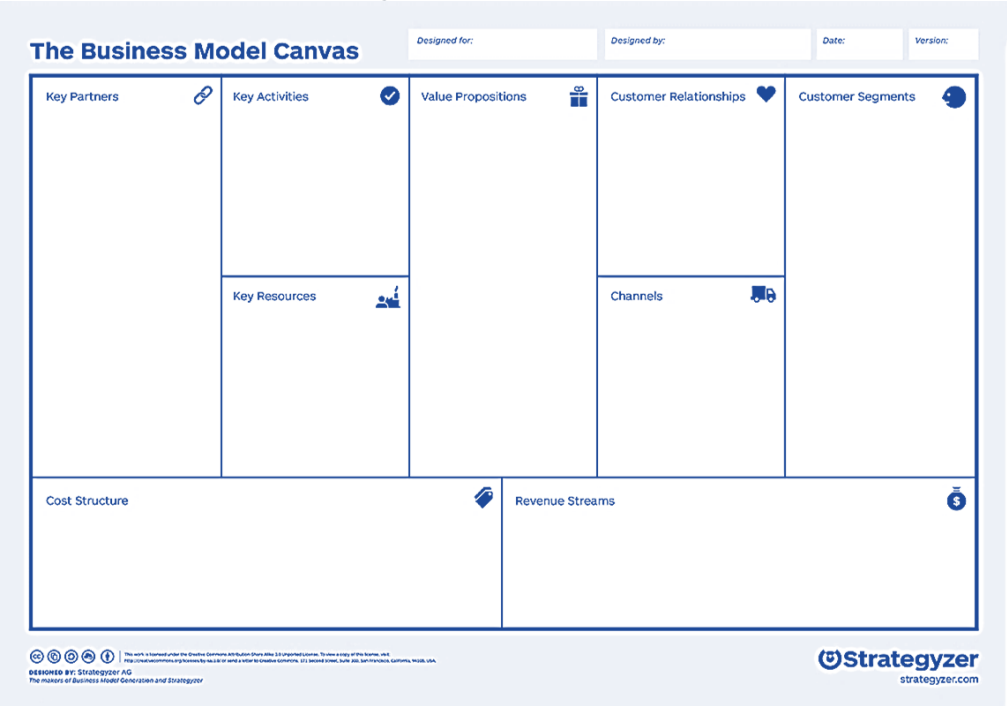
1. Customer segments;
2. Value Propositions for each segment;
3. Channels to each customer;
4. Customer relationships, established;
5. Revenue streams, generated;
6. Key resources, required to create value;
7. Key activities, also required to create value;
8. Key partners;
9. Cost structure;

All the blocks listed are designed as seen in Figure 1.4, where, in addition to matching one box to another, there is reasoning behind why each one is positioned precisely where it is– determining how the crucial drivers of a business are arranged and paired (Ruggieri et al., 2018).

The first one, Customer segmentations, answers to the question of Who/For whom the organization is creating value, including different groups of people or organizations we aim to

reach (Osterwalder, 2020). For each segment, then we have a Value Preposition (2), answering to the question of What, considered within the product or service that we sell to our customers. In between of Customers (1) and Value (2) we have channels (3) and relationships (4), where channels (3) describe the touchpoints between the customer and actual delivering of the value, and where relationships (4) underlines the type of relationship you insure with your customers. As per the Figure 1.4, the logic is that Relationships and Channels are the actual bridge between Customer and Value Preposition.

Figure 1.4- Business Model Canvas



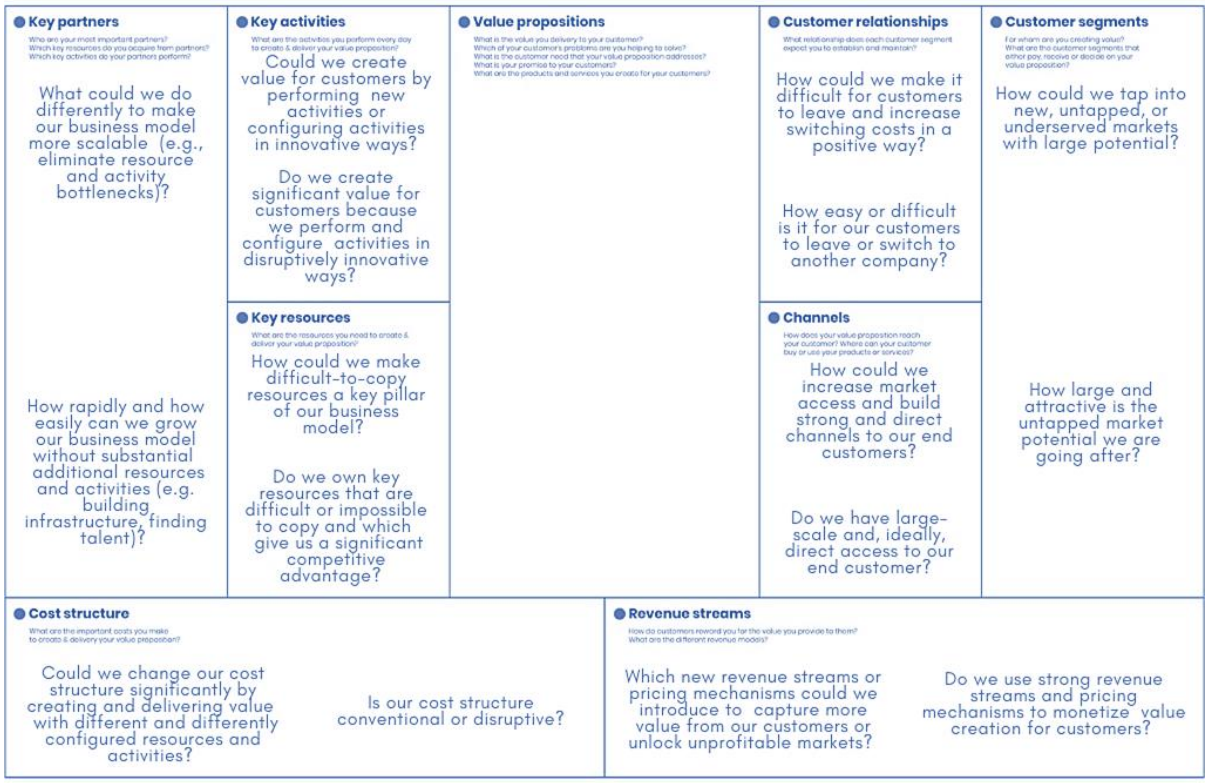
https://.www.strategyzer.com/canvas

Revenue Streams (5) underlines how and which pricing mechanisms has been chosen as revenue system for the organization – in the same way, how the value will be paid from the customers, explaining why the block is under (1) and (2).

Key Resources (6) described the infrastructure to create, deliver and capture value – the essential assets for the business models (physical and immaterial assets). While, Key Activities (7) describe which kind of actions are needed to make the business model works and Key Partners (8) are necessary as you would not have all the resources needed to make your business work, and it is here that the Key Partner enter in action. In other words, Key resources, activities, and partners tell you what is needed to produce the organization's value, and whether part of these are outsourced (Öberg et al., 2018).

Following the ideas of the last blocks (6), (7), (8), we reach Cost Structure (9) that define the types of costs that the organization create, related to the Business Model's keys, which could be fixed, variables, etc. In order to create our Business Model Canvas and then decide which is the best strategy to approach for each block we will follow mainly the guidelines of books *Digital Marketing* by Chaffey Dave and *The Invincible Company* by Osterwalder Alexandre, guiding us through the pattern while analysing and answering some trigger questions related to the different blocks each time:

Figure 1.5 - Trigger Questions for each Business Model's Block. Store Setup. (Startbusinessjourney.com, 2019)



In this way, after having analysed the four key initial questions based on the inductive and theoretical research (is there an opportunity? Can we create value on this market? How can we best create demand and grow? How are we scaling our organization to satisfy demand?) we could move to the practical creation of the Business Model[1], the testing phase and the learning one.

Chapter 2 – Methodology

The third chapter delves into the concepts surrounding the expected results and innovation threats of the final Business Model. Canvas – a structural map that circles around a line of responses to main questions: is there an opportunity in the market? Can we create value for this market? How can we best create demand and grow? How the organization needs to be scaled to satisfy demand? As previously said, Osterwalder (2020) represents such questions as the basis for the development of the Business Model, and the very last three questions are then used to form the Business Model Canvas block by block.

In order to sustain the outcome of the dissertation, primary and secondary data would be analysed in the methodology: qualitative primary data, from key members of the start-up and a direct questionnaire to understand the beliefs over the subject, and secondary data (both qualitative and quantitative) from market's data already accessible.

With the aim of tracing a map of the study on how the Business Model Canvas has been shaped to its final format, the most suitable approach has been planned as follows:

Chart 2.1 - Methodology Plan

Methodology	
1. The macro-environment analysis	Data Collection - Gartner Hype Cycles - DPT during COVID - Retailers perspective (B2B)
2. Creation of Value	Findings preposition - *Value Proposition* - *Customer segments* - *Customer relationships* - *Channels*
3. Creation of demand and grow	Findings preposition - *Cost Structure* - *Revenue Streams*
4. Scale of the start-up itself	Findings preposition - *Key activities* - *Key resources* - *Key partners*
5. Business Model Canvas[1] Preposition	

The opportunity in the market is the subject of analysis in terms of market size, money size, problems and solutions to face and willingness to pay from the customer's market.

Hitherto at this point, why someone should be willing to let someone else read and analyse its own habits? In the history of beacons, various case studies have enabled us to understand the causes and consequences of the value proposition of beacons prior to Covid-19.

On the one hand, the implementation, or cause, was unquestionably needed as support for the SMEs (Adarsh, 2018). When emerging technology arrived in the hands of major retailers and chains in the last decade, they had the financial means to introduce digital e-commerce and absorb the most expensive advanced technologies, although small and medium-sized firms struggled to keep up.[7]. As a result, some small and medium-sized companies have established beacons as a source of cheap technology to meet the new customer's needs and journey. Beacons may have been perceived as a form of cutting-edge strategy to help seal the deprivation of large financial investments for small and medium enterprises. So what about the customers?

In the latest years, some customers have been transparent about their preferences and habits of purchasing through their Fidelity Card, in order to have special discounts and, in some particular cases, by being also part of special events reserved only for the "loyal" customers. E.g. Decathlon and their Sportdays including free sports' events for the owners of their fidelity card (Kotler, 2019). It is also to mention that psychologically, according to Dunque (2017), those types of "rewards" given to as special as a "loyal customer" can develop immediate reactions and a sentiment of strong willingness to buy on the clients.

Hence, not only the *immediate reward* (Dunque, 2017) gives the opportunity to the retailer to attract a customer, but it gives the possibility to gather data. This to pave the way to the concept that it is not only significant to our research to check how the BT could benefit the ExpandReaility's clients, the *value* creation, but which is the gain for the business' own customers, in order to have access to their preferences.

[7] Similarly, the situation has recently repeated with delivery apps during 2020, where chains such as McDonald's and KFC were the first implemented and took the opportunity to profit from the quarantine, while smaller restaurants struggled in surviving or just closed up.

The opportunity is also enhanced from the fact that both the market of proximity technology and beacons are expected to grow reaching respectively a value of 44.20B€, when in 2015 was only 8M€ (Gajanova, 2020) and of 33M€ with a CAGR of around 72% between the years 2019-2026 (Abhishek, 2020).

Likewise, besides bringing together the ideas already collected and reported, the research bases its final outcome on the data available in the market, analysed in the next part, considered as secondary data both qualitative and quantitative - related to the technology growth point of view (Garter's analysis), sociological point of view (DPT data used during the pandemic), value preposition data - and primary data, collected through an online questionnaire, similarly related to the sociological consideration, and the start-up' strategy point of view, previously pointed out generally.

2.1. The macro-environment analysis

The investigation on the Business Model strategy involves also the sociological approach of users to the technology and in this matter, the main concern is related to the possible acceptance and adherence from customers and company to this type of tech-business. For that reason, the social perception of the proximity technology and the platform's value preposition is crucial, as a factor of risk that would put the initial success of the project at its own end. In this sense, this section aims to explore in a careful and thoughtful way the already existing perception of similar technologies in the entry market from possible users.

As well as the opportunities of the period already mentioned in the introduction, we need also to consider the threats. As an example, according to the Business Insider (2020) some Mobile trends of 2020 would have been the increase of the cost for location-based advertising and privacy concerns transforming contextual advertising.

Consequently, in order to narrow the market knowledge already discussed, and before going into the details of data to tracing down the business model, here a visual sum-up of the Opportunities and Threats of the DPT market found so far:

Chart 2.2 - DPT Market's opportunity and threats

Opportunities	Threats
1. IoT devices more and more used for indoor and outdoor activities	1. Ethical concerns
2. Market growth in B€	2. Privacy concerns
3. Customers' new technological needs	3. Barriers at entrance in the market
4. Phygital world growth	4. Shared marked knowledge
5. Public free Wi-Fi forecast	5. Legal Concerns
6. Retailers more captivated by the BT, as cheap and effective	6. Increase of the cost for location-based advertising
7. DPT used in different sectors	7. 7. Cybersecurity.
8. Ease of usability of mobiles	
9. Digital platforms utility and growing usage in B2B.	

In this chapter, it is included the sociological analysis perspective of the technology and the foreseen growth of the DPT during the years, researched from the Gartner Hype Cycles, providing a graphic illustration of technologies' evolution foreseen for year after the research itself, and how they are hypothetically important to answering actual corporate difficulties and using new occasions (Fenn & Bloch, 2018).

2.1.1. Proximity and Beacons technologies' performance over the years

Following the information of technologies' history analysed in the introduction, we can see that the DPT and the BLE technology have been existing and living in the last decade but with the new market needs, also evaluated in the following chapter, it is clear that Expand Reality if introduced in the correct way in the market, could exploit and gain a good deal.

In order to analyse the past broadcast of the technology, it can be useful to look at the Gartner Hype Cycles[8], where the technology has been positioned and the reasons behind the development over the last years (secondary data). Proximity Technology's main features and purposes have been projected recently in the last Gartner's reports and some features have been seen as one of the "future" top trends in the technology field. Starting from the study in 2018, the classification put as one of the Top 10 Strategic Technology Trends for 2019, the Immersive Experience (Chart 2.3).

More recently, the study over 2020 analyse the Multi experience technology as the second trend among the top 10, describing it as a trend that "will become what's called an ambient experience, but currently Multi experience focuses on immersive experiences that use augmented reality (AR), virtual (VR), mixed reality, multichannel human-machine interfaces and sensing technologies" (Gartner, 2019). This trend is described on Chart 2.4 as personification, augmented intelligence, immersive workspace (all in Innovation Trigger[9]).

Lastly, on 2020, the Gartner website broadcasts the technologies performances for 2021, where it looks like the different types of technology previously mentioned, mix up and give a positive forecast opportunity for the BT (see chart 2.5).

In fact, as stated from Stamforn, (2020), among the five emerging trends that will drive technology innovation for the next decade we find: 1) Digital Twin; 2) Multi experience Technologies and 3) Algorithmic trust. The three technologies all together create an environment of opportunities for the Beacons Technology; meaning that, if well played within the Covid-19 opportunities for science and technology, Expand Reality could outbreak in the market.

[8]graphical presentation developed by the firm Gartner to represent the maturity, adoption, and social application of specific technologies. (Wikipedia, 2021)
[9] The very early stage of a new technology.

Chart 2.3 - Gartner Hype Cycle for Emerging Technologies for 2019. Gartner 2018.

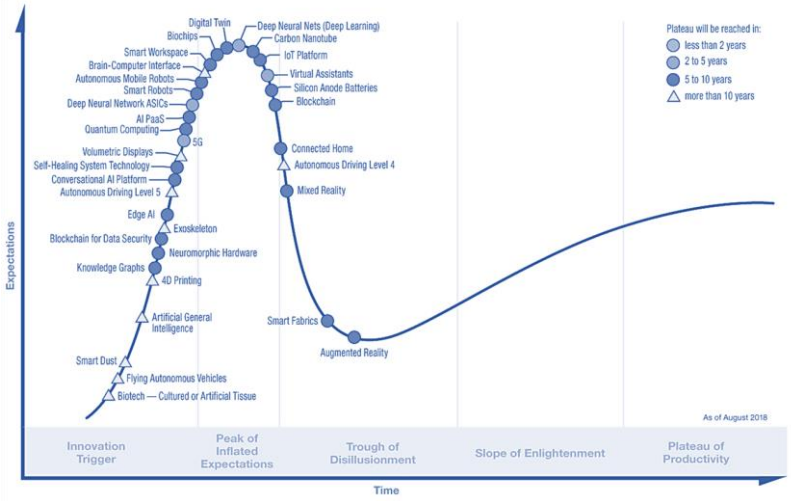


Chart 2.4 - Gartner Hype Cycle for Emerging Technologies for 2020. Gartner 2019.

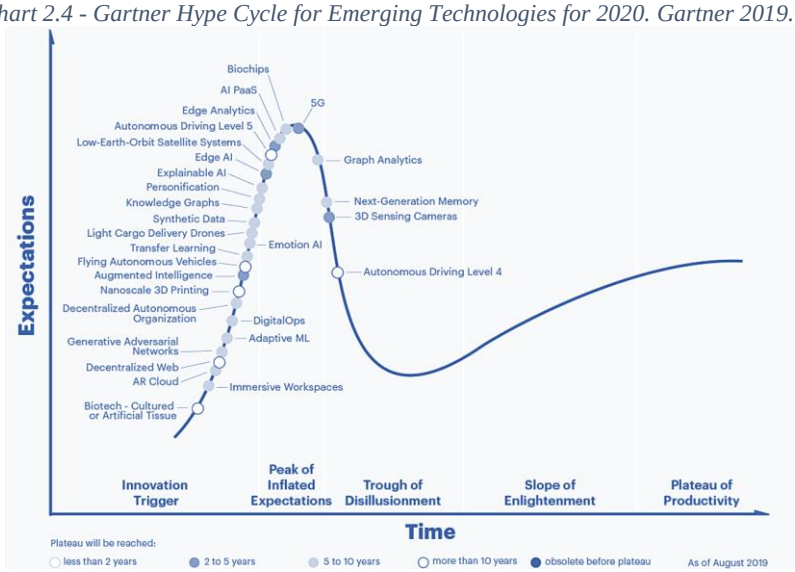
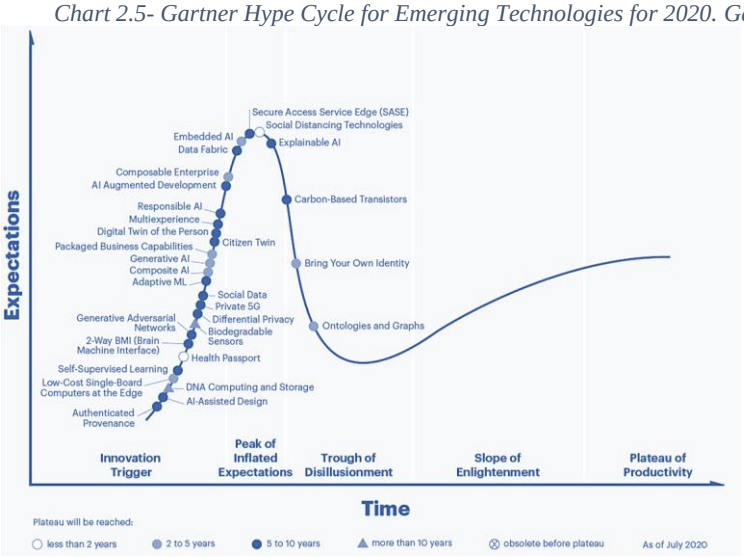


Chart 2.5- Gartner Hype Cycle for Emerging Technologies for 2020. Gartner 2021.

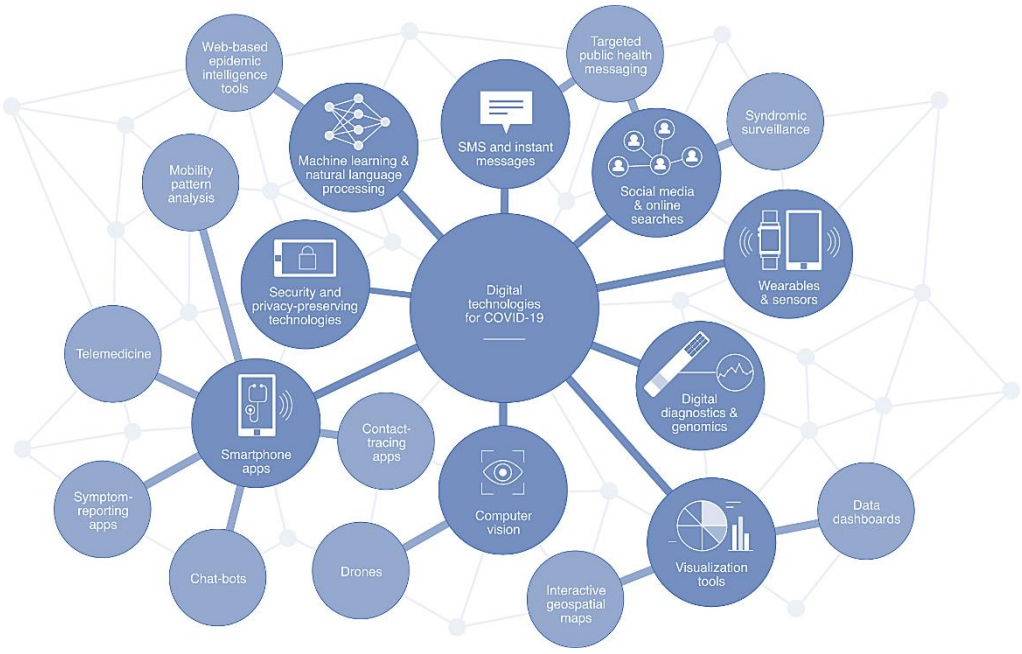


In relation to the last remark presented, Social Distancing Technologies related to the Covid-19 pandemic, are going quickly through the Hype Cycle (already on the Peak of Inflated Expectations) and have a high impact on the other technologies. Together with the importance also broadcasted of the Digital Twin[10], Multi experience and Algorithmic trust technologies, it brings us to the actual situation and the opportunities arisen.

2.1.2. DPT during Covid-19

In order to answer to *why* the research related to the BT and DPT is so much linked to Covid-19 apps' data, could be helpful to look at the figure 2.1, spotting the different technologies linked to the public-health resources over the pandemic, such as Smartphones apps within mobility pattern analysis, telemedicine, chat-bots…

Figure 2.1 - Digital technologies in the public-health response to COVID-19. Nature.com https:...www.nature.com/articles/s41591-020-1011-4/figures/1



According to the article published by Nature Medicine and Jobie Budd et al. (2020), there has been an evolution in mobility data and communication worldwide thanks to the public health activities over the pandemic situation. Meaning that development involved also bigger online databases, connectivity among devices, low-cost resources for advances proposes in tech., language processes (see 2.1. Digital Proximity (DPT) and Beacons Technology) – showing also that big-data and artificial intelligence approaches in the public-health are easier

[10] standing for representing a "double" person in the digital space.

to call for sharing and usage data, especially with the help of researchers trying to approach international consortia (Segal et al., 2020).

However, the contacting-tracing apps differed all over the world, some apps within the GPS and the maps features were used for giving information about the closest hospitals, booking appointments, to request travel permits in the case of an emergency during curfew with Tawakkalna App, for example, in Saudi Arabia, self-assessment tests in India (Alam & Qamar, 2020), report symptoms and book a free test for COVID-19 with NHS in UK and so on (Alanzi, 2020). It is to remark that not all the apps used the GPS information, but only the BLE technology devices. Martin et al. (2020) reported some data regarding the downloads and management of the apps around Europe (up to September 2020):

Chart 2.6 - List of the European deployed mobile app characteristics. Martin, T. 2020

Country	App name	Downloads (Google Play)	Wireless Technology
Germany	Corona-Warn-App	5,000,000+	BLE
Italy	Immuni	1,000,000+	BLE
Finland	Koronavilkku		
France	StopCovid		
Spain	RadarCOVID		
Poland	ProteGO	500,000+	Bluetooth
Portugal	StayAway Covid		
Ireland	COVID Tracker		BLE
Switzerland	SwissCovid		
Austria	Stopp Corona	100,000+	BLE
Czech Republic	eRouska		
Denmark	Smittestop		
Latvia	Apturi Covid		
Netherlands	CoronaMelder		
Norway	Smittestopp		Bluetooth/GPS
Estonia	Hoia	50,000+	BLE
Slovenia	OstaniZdrav		
Bulgaria	ViruSafe	10,000+	GPS
Croatia	Stop COVId-19		BLE
Hungary	VirusRadar		
Slovakia	ZostanZdravy	1,000+	BLE/GPS
Cyprus			GPS/IP addresses/cell towers/Bluetooth

The chart above showing the downloads help us also understand which kind of country or population is also more technological and solution orientated towards the DP technology. In conclusion, besides the size of the country and the different levels of risk each country was facing in 2020 and 2021, we can state that Germany, Italy, Finland, France, Spain, Poland, Portugal, Ireland and Switzerland have been the fastest countries in Europe to adapt to the technology.

Macro-environment analysis

With the aim of stating which value the Business Model add, it is also needed to analyse the external environment to understand what distinguish the start-up from the competitors.

Chart 2.7 - Pestle Analysis

Political Factors	***Economic Factors***
Volatile governmental laws adjustments over the pandemic (-). Free movement of goods in the internal market of the European Union. These implements lower trade barriers with each other, including tariffs, import quotas, and regulations, greater sales, more jobs, and faster economic growth (+). Instability of governments in EU (-). Funding, subsidies and initiatives priority over Pandemic Recovery (+).	Volatile taxation over technological goods. Portugal is one of the lowest operational costs in Western Europe and fiscal tightening will continue to guarantee the sustainability of public finances. The main market-trend-based strategy for the healthcare market is to increase adoption of bundled payments using digital tools (MarketLine, 2020) The healthcare sector will face four different challenges: achieve financial sustainability by reducing the cost to deliver, Care model Innovation, digital transformation and interoperability and future work (ageing population). (Allen, S. 2020) In 2018, healthcare services were the largest segment of the healthcare market, accounting for 79.4% of the total in 2018, followed by pharmaceutical drugs, medical equipment and other segments.
Technological Factors	***Legal Factors***
Huge potential for the Technology	GDPR legislation strict for the working environment

DPT keep being explored and exploited The future of the technology is well-express and positively approached by Gartner Hype Cycle's charts Cybersecurity, as major concern.	outside the healthcare system (momentary accessibility). Personal Data Protection: EU regulation is requiring countries to use techniques like anonymization, pseudonymitication, and encryption protocols. In 2016, a data protection reform was reached where personal data is protected from processing and the free movement, except for the processing by competent authorities for investigation, prevention of offences. Big Data legal framework: since 2018 with the creation of 1 unique field in Eu underlining same rules/conditions would make it easier to share and interpret data between Eu members, specially for start-ups where bureaucracy and costs will be reduced (DataBio, 2017). Contracts law: cancellations, returns, errors in pricing, distance-selling law, international taxation issues where the e-commerce service provider in under a different tax regime to the purchaser (Chaffe, D. 2019).
Social Factors: see following chapter 3.1.3.	**Environmental Factors**: N/A

2.1.3. The public opinion

The research must also comply with the willing and interest of usage from the Business as final customers, users of Expand Reality's platform (B2*B*), and indirect customers (B2B2*C*) of those businesses. In view of that, the research analyses the Retailers' perspective as secondary data and the customers' perspective as primary data throughout an online survey.

This survey took place online via *Google Forms*[11], and was shared on Social Media (as Facebook, Instagram and, where most of the answers arrived from, LinkedIn) and via email in different international work environments (e.g. Siemens SA). It gave the opportunity to answer to close questions and an open one, where to express an own opinion over the DPT (Annex C).

[11] https://forms.gle/6oS3N47sjySMzYE56

With 90 answers given between November 2020 and January 2021, mostly from the top countries showed in Chart 2.6, the answers mainly came from Italy and Portugal, with the purpose of also having two points of view from one of the most impacted country in the world and one that faced the pandemic in a more efficient way. The average age of people answering was 35 and the general outcome will be presented in Chart 2.8.

In order to understand how retailers (B2*B*) and customers (B2B2*C*) perceive artificial intelligence on the path to the Next Normal (Purcărea, 2021) the analysis of different articles and the online survey's results are summed-up as follows:

Chart 2.8 - Direct and Indirect DPT perceptions

Businesses' perspective	***Customers' perspective***
JIT (just-in-time) improvement due to data collection and analyses of preferences (Blay-Palmer, A. et al. 2020)	Half of the sample believes that if the DPT has social and public safety purposes, then no concerns related to collection and sale of personal data or the risk of being tracked down is involved (32 yo average).
Centralization of resources and costs if one same outsourced entity will take care of the analysis of the data (efficient operations).	Still a good percentage of people, might be led to the idea that Contacting Tracing apps can be used for collection, theft data and tracking purposes (average of 36 yo).
Need for an AI strategy and control to guide those kinds of investments (Ganapathy, V., Green, M. et Schottmiller, P. 2020)	The will of buying online instead of buying in physical shops generally has given an impartial outcome. However, people with an average age of 43yo said that they would absolutely not buy online and people with an average age of 33yo said that they would absolutely do it.
Need for adaptation to new hygienic, technological and after Covid-19 change of habits/laws.	The 53% (average of 30yo) confirmed that their purchasing habits have been changing during the pandemic, buying more online.
Innovation and Omni-channel operations' needs.	The 54% (average of 28yo) confirms also that they would be willing to use the PDT in their daily life for shopping, restaurant…
Mandatory digitalization (4.0) to survive the change.	In the last open question of the survey where It was asked to give an opinion on the subject, most of the

	concerns about DPT were related to: the negative connection between Bluetooth and battery's durability, data theft, tricky usage of the technology, fear of data collection… Below is shown a Wordcloud of the most used word in the opinion pool.

Figure 2.2 - Wordcloud of the open opinions over the DPT

Last but not the least, this technology has been adapting lately and is evolving in different ways such as what recently was released by Google, precisely connected to the DPT - an Android app so-called Lookout, which includes supermarkets' product detection and recognition model, allowing to run in real-time entirely on-device. This on-device system enables a spectrum of new in-store experiences, such as the display of detailed product information, customer ratings, product comparisons, smart shopping lists, price tracking etc. (Chen, 2020).

Reached the conclusion that the opportunity has been presented in the market and at the moment, and that the start-up devours the know-how to act in the proper way – how should it be divided and organized? The following chapter presents the first proposed structure of the Business Model Canvas for the start-up starting with the proposition of the new value, the customer segmentation, relationships and the channels of distribution and contact with the customers.

2.2. Creation of Value

From the sources analysed to this point, the idea of building something unique and valuable for the start-up's customers has led to the possibility of collaborating in a first place with the

healthcare sector as well as the smallest local retailers, which are the ones most suffering from the pandemic and where the distance technology appears to be a primary solution. Certainly, it is offered a different approach than the one first ideated by the start-up, willing to interface the market approaching first the food retailers such as Lidl (Annex A); however, this first solution has been put aside as at the moment hospitals and local shops appear as the best choice and neediest of the sectors of help among others: the healthcare sector, for a first income purpose, and smallest retailers, for a social and futuristic purpose.

Now, it is time to design our Business Model and starting by presenting the Value proposed, analysing how we would need to prepare the value proposition itself, the willingness from the customers to pay for our product (customers' satisfaction) and pricing it within its feasibility.

The value proposition and the customer segmentation are strictly linked one by the other as the product must have a unique value from the type of customers we want to be our target. Following this flow, we can state that the value needs to reach an unmet need, doing something unique or inimitably for some set of stakeholders (Montgomtery, 2012).

Let's start with a very simple statement from which the Corporate and Business strategies will be then developed upon the functional strategy level (Da Rosa, 2020).:

"Expand Reality is the partner of choice in the health and local retailers 'sectors, to grasp again an economic independence and evolving in the AI future of work".

2.2.1. The strategy over the value creation

As previously said, the start-up's plan should be to capitalize on recent opportunities in the healthcare sector and local retailers in order to become their preferred DPT provider. But why those sectors should choose Expand Reality over the competition? The strategy is thought upon a first approach for a start-up only in the healthcare sectors, as it cannot be involved anywhere but in the right places over time, and with a basic re-research of operations after 3 years of activity (2025):

Chart 2.9 - Timetable strategy

Period / *Focus*	***2022***	***After $\frac{1}{2}$ ROI***	**2025**	**2026 …**
Target Sector/s	Healthcare Sector	Healthcare Sector Local Retails	Healthcare Sector Local Retails	…
Internal Expertise	Marketing Software Anonymous Data Collection	Marketing Software Anonymous Data Collection	Marketing Software Master Data (Social Resp.)	…
Outsourced Expertise	Beacons Cloud Architecture App design	Beacons Cloud Architecture App design	Beacons Cloud Architecture App design	…
R&D	Data Protection research KPI over the Business Model	Data Protection research KPI over the Business Model	Business Model Revision	…
Service/Product	Centralized platform of digital proximity services	Centralized platform of digital proximity services	Centralized platform Data as source of management knowledge	…
Where	Online in Portugal	Online in Portugal	Online in EU (Portugal, Germany, Italy, Finland, France, Spain, Poland, Ireland[12])	…

[12]Republic of Ireland.

The choice of first being launched only in the healthcare's sector, as mentioned before, is related to Financial Decisions, where the first investment optimistically will offer a ROI greater than the capital costs – in order to find the correct balance between the initial financial capital and the debts. The Healthcare sector, beside the crisis of the specific period, appears also the best opportunity for the start-up to find an initial cash flow. This thought can be explained as follows through the equation of the Net Present Value (Teberga, & Oliva, 2018):

$$NPV = \frac{R_1}{(1+i)^1} + \frac{R_2}{(1+i)^2} + \frac{R_3}{(1+i)^3} + \cdots + \frac{R_n}{(1+i)^n} \quad (1)$$

The same start-up would need to invest and spend the first resources and only after having covered half of the amount of expenses (ROI), actually be launched also in Local Retailers choices.

As shown in Chart 2.9, even though it empathized the start-up willing to embrace both the shared software of the proximity devices, the marketing and the master data expertise, the timetable is presented dividing the different areas to focus on in different periods in order to manage in the most realistic way the lunch and the costs related, organizing properly activities and resources and not neglecting the constant change of AI (*feasibility*, *viability* and *adaptability*. Osterwalder, 2020). In that way, not only it is needed to create but also sustain the competitive advantage, by analysing over the time internal strengths/weakness for a Resource Based Model and External analysis of opportunities and threats (Barney, 1991), narrowing efficiency of existing digital marketing methodologies over time. The sum up, using KPI's for evaluating the performance of the same Business Model, web analysing and 5Ss (Chaffey, 2019).

Figure 2.3 - Innovation Loop. (Chaffey, D. Digital Marketing. Pp.94. 2019).

**The capability to innovate and gain CA within the marketplace, monitoring changes and evaluating alternative strategies*

2.2.2. Value Proposition

The value needs to generate sustainable competitive advantage emerging fundamentally for the customers – it should generate economic performance and not easily imitated by the competitors, all without falling into speculation.

As mentioned above, the first approach would be into healthcare sector where the platform would apply to trace movements where the consumer (B2B2*C*) would give access to the Bluetooth, accepting anonymously Terms and Conditions, and starting the functional journey.

Besides the perspectives already mentioned in chart 2.8, what are specifically the benefits of the final customer/consumer (B2B2*C*)?

Newness[13] *- Risk Reduction – Convenience/Usability*

- Real-time tracing. It will give the opportunity to the patient to be part of a phygital space, where what cannot be physically, can be displayed digitally.
- Finding the correct room they are looking for.
- Checking how many more people are in the space they are willing to go.
- Find functional strategic spots to check in, pay and check-out.
- Being able to apply to security instructions (distance, privacy…).

What are the benefits for the Business (B2*B*)?

Newness[14] *– Getting the job done – Cost reduction*[14]

- Centralizing the phygital resources such as data collection for management purposes, customers' orientation, AI solutions in the same offer.
- Specialized people knowledge and know-how over AI strategies and control to guide those kinds of investments during the time of technologies development.
- Guarantee of being up to date as per competitiveness' network knowledge as the start-up would work in the sector and not only with one partner.

[13] Satisfaction of a new set of needs.
[14] Relieving the customer from the expense and trouble of having to allocate different sources for different purposes.

2.2.3. Customer segments

"*No matter how brilliant the idea is, if your audience's' needs aren't meet you won't keep them as customer*"

(Mulcahy & Salmon, 2017)

Defining the different groups of people/organizations the start-up aims to reach and serve, means also separating in two space-timing the Business Model where first, the Healthcare sectors will be served and secondly, the retail sector.

Niche and Segmented[15] market

Healthcare Persona

Let's think that the product and service is accessible to all the segments in the healthcare sectors, from the pharmacies to the hospitals' managers having small differences in characteristics and needs, requiring and justifying the offer:

- Need to localize the movement of an important amount of customers/patients, mostly arriving for the very first time in the building,
- Need to keep up with AI in the customers' care healthcare sector.
- Need to maintain a storage data for management purposes.
- Need to improve the data collection and analysis of preferences and resources' allocation.
- Need to centralize costs to the same outsourced entity.
- Need to adapt to new hygienic, technological and after Covid-19 habits/laws.
- Need to outsource the R&D of changes in AI.

Hospitals, Pharmacies, clinics, labs, psychiatric facilities, and nursing homes' managers.

Retailing Persona

- Need to maintain a storage data for management purposes.
- Need to improve the data collection and analysis of preferences and resources' allocation.
- Need to centralize costs to the same outsourced entity.

[15] Segments with small differences in terms of needs and problems are exploited simultaneously

- Need to adapt to new hygienic, technological and after Covid-19 habits/laws.
- Need to keep up and outsource the R&D of changes in AI.

Grocery stores, shopping centres, clothing stores …

2.2.4. Customer relationships

In order to both understand the channels and the relationships with the customers, it is needed to analyse the buying process of the customers (Kotler, 2019). Following, the first approach in the market of healthcare.

Chart 2.10 - Impact on the buying process for a new purchase. Chaffey, D. Digital Marketing. p.68

Buying process	***Communication Objective***	***Technique****
Unawareness	Generate Awareness	Strategic communication and brand awareness.
Aware, develop specification	Position Features, benefits and brand	Online: website and platform.
Supplier research	Lead generation	Engage and capture interest: mostly online.
Evaluate and select	Assist purchase decision	Key account Manager
Purchase	Facilitate purchase	Offline and Online
Post-purchase	Support use and retain business	Offline and Online

**To consider that a key manager could be involved in all the steps according to the needs of the customer*

Taking into accounts chart 2.10, the following online and offline approaches are suggested for the healthcare sector (first stage), due to the sector structure and background study:

- Dedicated personal assistance

Due to the public opinion and the nature of the value, this relationship appears as the principal type of relationship ideal for the very first approach in the sector, in contact with specific hospitals, pharmacies etc. It involves dedicating a customer representative specifically to an individual client. Key account managers are the perfect for this type of relationship, with a portfolio of clients.

- Co-creation

As it is the very first approach for the start-up in the healthcare sector, it would be an innovative approach going beyond the traditional customer-vendor relationship to co-create value with customers. It might be positive to listen to specific needs, evolving, personalizing

and growing with the customer itself: engaging customers to assist with the design of new and innovative products.

- Self service

Product knowledge and services also accessible autonomously available online.

2.2.5. Channels

As the channels are the customer touchpoints playing an important role in the customer experience, the selection has been proposed as followed (always considering chart 2.10 and the techniques involved):

- *Awareness*: intermediaries such as PR (and e-PR) and media mentions in specialized magazines, blogs, podcasts, Feeds, Universities and Research units' studies, involvement, events… Online and offline partnerships and public relations.
- *Knowledge of features, benefits and brand*: platform and website.
- *Lead of generation*: Website and micro-targeting and personalization through SEM and media placements on niche sites.
- *Assist purchase*: Key Account Manager (e.g. call-back service hyperlink)
- *Purchase*: Website, platform and Oder Manager.
- *Post-purchase*: Personalized platform and managers' interactions (emails…).

2.3. Creation of demand and grow

Reaching the second part of the Business Model, it is needed to analyse how can be best created demand and grow by underlining Cost and Revenue Streams, at the bottom of the Business Model Canvas.

2.3.1. Cost structure

Starting from the idea to have value-driven costs, where the premium value propositions and a high degree of personalized characterize value the business models the first structure is ideated as:

Chart 2.11 - Fixed and variable costs chart.

Fixed Costs	**Variable Costs**
Salaries	Content creation (website, platform…)
Software and costs	Adv fees (Agencies fees)
Encryption and decryption systems' costs: digital	Beacons' costs (wholesaler, shipping)

certificates, signatures, PKI, SSL.	
DRM.	Sponsorship of site sections or content types in specific websites/magazines (e.g. Siemens Healthcare magazines). Credibility before visibility

2.3.2. Revenue streams

Underlining the methods by which the start-up is suggested to derive incomes.

- Annual subscriptions to companies.
- Individual beacons purchase (asset sale).
- Negotiated deal (possible individual bargaining between Key Managers and customers).
- Subscription access to data content and periodical analysis.
- Pay-per-view (usage fee; one-time view of same data but from non-partners).

2.4. Scale of the start-up itself

Lastly, the structure of the organization is presented to scale how the organization would satisfy the demand through the key activities, key resources and partners.

2.4.1. Key activities

The key activities are in other words the most important actions a company must take to operate successfully. In this case both to answer to two different necessities: problem solving and Platform/Network.

The problem-solving necessity answers to key activities related to new solutions to individual customer problems. Such as knowledge management. On the other hand, Platform and Network underlines networks, matchmaking, platforms, software…

- DPT Maintenance:
  - The DPT development itself in terms of linkage among website, app and platform.
  - the personalized physical customer's building features of distance technology.
- Platforms maintenance
  - clients' accesses and functionalities directly related to data management.
- Data Maintenance
  - Analysis and maintenance of the network's data, also creating periodical analysis.

- R&D
    - Keep innovating and tracing DPT changes to adapt in order to be up to date in terms of AI.

2.4.2. Key resources

The start-up find itself in win-win situations related to the research world specifically due to the relationship with the institution of ISCTE and the know-how mentioned in Annex D. Specifically in terms of resources:

Human resources:

- Experts in the sectors (management, technology architecture, marketing, programming digital engineering …).

Data and insight resources:

- Partners' and customers' network data

Technology resources.

- Know-how management platform

Intellectual resources:

- Partnerships with ISCTE-IUL.

2.4.3. Key partners

Creating partnership can create a lead of possibilities and opportunities of expanding reach, also by exploiting existing organization's collaboration, knowledge and also audience:

Acquisition of particular resources and activities

- AUDAX_ISCTE; as per Annex D, the start-up has been willing to collaborate with ISCTE Business School for development and expertise.
- Specialized business in creation of platforms and apps such as Bending Spoons[16].

Optimization and economy of scale

- Minew, Beacons manufacturer suggested from Google Beacon Platform (see Annex C).

Reduction of risk and uncertainty

- Specialized Healthcare's media: magazines (e.g. Siemens Healthineers), blogs, podcasts…
- Siemens Dynamo[17].

[16] https://bendingspoons.com/

- Key Account Managers already in contact with Hospitals, Pharmacies …

2.5. Business Model Canvas[1]

Chart 2.12 - Business Model Canvas1

	Designed for:	*Designed by:*	*Date:*	*Version:*
Business Model Canvas	Expand Reality	Mariantonietta Renda	28/03/21	1

Key Partners

Optimization and economy
Reduction of risk and uncertainty
Acquisition of particular resources and activities

- *Audax_ISCTE*
- *ISCTE*
- *Minew*
- *Key Account Managers*
- *Siemens Dynamo*
- *Bending Spoons*

Key Activities

Problem - Solving and Platform/Network

- DPT Maintenance
- Platform Maintenance
- Data Maintenance
- R&D

Key Resources

Intellectual – Human Technology – Data

- Experts
- Network
- Know-how
- Partnerships

Value Propositions

Newness – Get the job done – Cost Reduction

B2B

- Help business keep up with the new customer habits' changes.
- Centralized Data Management
- DPT and AI Management

Customer Relationships

- Dedicated Personal Assistance.
- Co-creation
- Self-service

Channels

- PR (e-PR).
- Platform
- Website
- Media Placements (SEM)
- Key Account Managers

Customer Segments

Niche and Segmented markets

1st stage: Healthcare Sector

2nd stage: Local Retailers

Cost Structure Value-Driven

Fixed costs
- Salaries
- Software and Internet costs
- Encryption and decryption systems' costs
- DRM

Variable costs
- Content creation
- Adv fees (sponsorships…)
- Supplier Costs (Beacons)

Revenue Streams

Fixed Pricing
- Subscriptions fees
- Individual beacons purchase (asset sale)
- Pay-Per-View

Dynamic pricing
- Negotiated deals

[17] http://www.siemens-dynamo.com/

Chapter 3 – Implementation

With the first suggested Business Model Canvas, as discussed in the introduction, it is now needed to also validate and analyse it with a specific focus group of professionals. The following research combines Carlsen & Glenton (2011) report, Alexander (2020) guidelines, and, due to the difficulties of meeting in person and virtually with the group, an experimental discussion approach.

The aim of this Focus Group research is to determine whether the Business Model Canvas[1] approaches are appealing to a group of professionals who might represent the final consumer (B2B2*C*) in the healthcare industry, but also give consistent insights from a marketing, administrative, scientific and practical perspective throughout questions and documentation analysis. Unlike the typical marketing focus groups, the one now presented has representatives not only seen as target audience (what instead was presented through the previous online questionnaire in Annex C) for the product/service, but it involves specialists with a deep knowledge of the market from different segments. This gave the opportunity to:

- Gather ideas, considerations and suggestions.
- Highlight perceptions.
- Understanding pros and cons of the Business Model Canva[1].
- Find and develop new strategies and ideas.

  and finally,
- Shape the final Business Model Canva[2].

3.1. The Focus Group's methodology

The discussion was initially designed as an online Zoom call, assisted by the supervision of PhD professor Pereira, R. and led by Renda, M. who was supposed to not giving input of opinions over the conversation but rather managing and controlling it.

The Focus Group discussion should have taken place on Zoom on May 12th at 19:00 (Lisbon, GMT+1) with the involvement of professionals and professors from different fields, instead of having representatives from the same sector or of the same group which could have influenced each other opinion (Morgan, 1997) and it would have had only one sector viewpoint.

Specifically, the participants were:

- *Henrique Martins*, Medical Doctor and University Professor who teaches and conducts research in the fields of digital health, leadership and management education for medical students and health professionals.
- *Giuseppe Maria Gallo*, Data Scientist and Mathematician at Bending Spoons, Europe's biggest mobile apps and platforms developer.
- *Rui Costa*, General Manager at GE Healthcare, a pioneering global medical science, diagnostics, and digital solutions focused on personalized medicine, digitizing healthcare, and digital outcomes for patients in hospitals and private clinics.
- *Giampaolo Viglia*, Professor and Researcher at the Faculty of Business and Law and Research Lead for the Marketing Subject Group and the Editor-in-Chief of *Psychology & Marketing*.

As per annexes E, the presentation of the questions was due in 45 minutes, with 6 questions being presented using the methodology explained by Fern (1982), where data and theoretical saturation outcome need to be extracted from interviewing and analysing each response until the final idea about each topic (and each question in that case) would have been agreed among the most, reaching a semi-common conclusion. However, due to some participants' schedules changes, it was ultimately decided to submit individual questions via email to Dr. Gallo, Prof. Rui and Prof. Viglia and prepare a call conference with Dr. Martins, finally analysing the responses (annexes F), while maintaining the Focus Group's original intent.

To begin, the document shown in Annex G was attached to the invitations in the Zoom Call, and after with the questions sent to the new participants via email, so that the participants had a more complete understanding of the project. The questions shared with the participants were slightly changed from the ones in the PowerPoint presentation (Annex E), as both the timing and the approach changed. However, both the methodologies had the scope to evaluate from a professional point of view the general idea, the customer's values, the struggles the start-up might face in the real industry, and closest to the Business Model Canvas, the customers' channels, customers' relationships, pricing model and partners suggested.

Precisely, the questions presented were:

1. *Did you think this project of integrating distance proximity technology in healthcare facilities for customer service will work or not when you first read about it? What was your first reaction and why?*
2. *What problems do you think this Distance Technology service and product could solve in the healthcare industry, both from a patient and administrative standpoint? What needs could fulfil?*
3. *Which area(s) do you think the start-up should prioritize first, given the challenges it might face? E.g. Data Storage and GDPR, Public Opinion, Healthcare network connections, Data Management Expertise.*
4. *In your experience/opinion, how could the start-up reach out its customers? In terms of incorporating new AI technology into the healthcare sector, which channel is the most effective? Through which relationship(s)?*
5. *What pricing model do you think would fit for the start-up, based on your experience/opinion?*
6. *Some associations and companies are willing to help out start-ups. Do you have in mind any association that could be interested in this project? Or any partner which could be interested in collaborating?*
7. *Do you have any suggestion or consideration about the project you would like to share?*

3.1.1. The Focus Group's feedback analysis

The overall feedback over the first Business Model Canvas[1] gave the possibility to explore the research from different industries perspectives, and it gave interesting insights that wouldn't have come up without their professional knowledge. The participants provided their opinions towards the project itself, and summing them up we can find two different main shared views.

An optimistic one, in which the project idea of combining in person and remotely technology in the general opinion appears to be part of the future of customer service environment; also with few different examples of companies mentioned in the interviews, that have been trying to attempt to draw on the potential of distance technology in healthcare, with some flops and pros. On the other hand, few comments led to the idea that healthcare businesses might also not see immediately some value-added in using beacons technology for price, scepticism and data storage reasons. In this sense, it was also recommended being careful in communicating the project to healthcare's stakeholders.

Secondly, the feedback over the value gave the possibility to explore better in which way proposing the right value to the final consumers (patients) is the very key to make this project work. Without patients finding lots of benefits in the distance technology service, for which they would need to bother in accepting someone else knowing their GPS position, the project might face some difficulties. For this reason, the values that came up from the focus group were related to solve problems, for the patients, for which have currently no simple solutions for the patients and final consumer, such as:

- Streamline processes ("*Convenience*"); the flexibility optimization for waiting times, in which distance technologies will be used to enable patients to make appointments without booking, based on the actual state of the queue, the estimated number of people who will arrive, and the expected time of each appointment, queues for payments…
- Cross-selling products ("*Performance*"); at the same time, some other services in the hospitals might benefit from the GPS app function with exclusive promotions received through their mobile for the intra-building bars, pharmacies, kiosk…
- Building system GPS ("*Getting the job done*"); where to find what (ATM, kiosks …), especially in big hospitals.

Additionally, some priority business areas to focus on were also suggested for the start-up, to overcome some initial disadvantages, boundaries and entry level issues. The most quoted one was related to data acquisition and storage and communication of the service (due to scepticism):

Figure 3.1 - Wordcloud of Focus Group's answers

The following concerning areas were:

- *Funding and financial decisions*; who or which association will pay, how much, the cost of customers' acquisition…

- *Network connection* to the hospitals, to also prototype and test the concept idea in some healthcare facilities (placement and promotion).
- *Consumer scepticism*, that can be overcome sooner or later through promotion and communication.

Thirdly, also a new channel suggestions led to an interesting insight from Mr. Martins. A new channel suggested is the direct contact with the hospitals' board as this type of technologies might involve patients and facilities' managers. As a matter of fact, before Covid-19, Portuguese hospitals' administration association organized meet-up for new innovation initiatives, where suppliers and start-ups could make their presentation in terms of product, and finance the meeting with a small fee.

Fourthly, besides the price models already proposed in Business Model Canvas[1], few prepositions were made:

- A *subscription model with many layers* that adjust to the growth of the single firm, as well as a dynamic pricing mechanism to manage peak times. For cross-selling efforts, for example, the membership price may be imposed based on the assets offered or users who evaluated their facilities (or views for their area of the app).
- *Fixed public contract prices*, specifically for public hospitals, being able to establish a price and charging every year, for example. Considering also the possibility of public tenders.
- *Variable and customized contract's prices*, for private hospitals, might be arranged and adapted in the contract according to hospitals' areas – emergency's room, patients' appointment area, entrance, cross-shop area…
- *Mixed model* based on fixed cost (to cover assets and main implementation & development tasks) and variable cost based on usage.

Fifthly, besides hospitals' boards, few other partners were suggested such as *Centro Medico Santagostino*, which was involved in the first stages of the creation of the Italian contact-tracing app Immuni, and might seem a good option for the second phase of the Business Plan when going internationally, *Business Angels*, *Venture Capital firms*…

3.2. The Business Model Canvas[2]

Taking in consideration our first Business Model Canvas, we will now adjust it accordingly to the feedback received from the Focus Group, adapting the insights with the previous Literature researches and strategy preposition.

Value Proposition[2]

As stated by Martins (2021), in order for the project to work, it is needed that the first very consumers (patients) perceive the need and the convenience of using the app, in a way that makes them realize that it is worth the risk of someone else knowing where I am going.

So, what are specifically the benefits of the final customer/consumer (B2B2*C*)?

Newness- Get the job done – Convenience/Usability

In addition to the first version, the patient might find a way of getting discounts in the shops inside the building (bar, kiosks, pharmacies…) and would also have the possibility to leave complains or praises.

What are the benefits for the Business (B2*B*)?

Performance – Cost & Risk reduction - Convenience

Additionally, to the first version, it is interesting how the cross-selling in infra-structure shops could be sustained from the same app and platform, pop-upping discounts for customers while waiting for their turn, for example. Or, how this intelligent technology might turn into assuring that physical facilities work (building management) and assuring that the service is delivered correctly (administrative management through complaints and praises from the patients).

Customer segments[2]

This segment keeps being of *Niche and Segmented market* where, however, our *Healthcare Persona* become part of Private clinics (suggesting this as first approach, due to Public hospitals boundaries), also willing to improve the infra-structure cross-selling and the administrative, building system and customer service management.

Customer relationships[2]

The first version might have been centred the point – of the first concerns of the start-up if willing to go in the healthcare market is to focus on communication.

- Professional Communication (magazines, partnerships with professional roles).
- Hospitals Meetings for suppliers and start-ups.

Also keeping the first version of relationships as dedicated personal assistance (key account managers' contracts), co-creation (customized per needs or different areas of the hospitals. E.g. emergency room…) and self-service (platform's usage).

Channels[2]

As per the channels, two must be added and most probably also prioritized:

- Board members meeting.
- Meet-up innovation initiatives organized periodically from the Healthcare Administration.
- Potential hospital group, willing to have a proof-of-concept implemented in small scale. Allowing the start-up to implement, learn, adjust and scale-up (Costa, 2021).

Cost structure[2]

The additional costs might involve partnerships and meetings' fees to participate in the healthcare administrative events.

Revenue streams[2]

Underlining additionally the new methods with the new focus:

- Subscription model of several levels and a competitive distribution system for cross-selling.
- *Variable and personalized contract rates*, organized and tailored in the contract based on hospital areas – emergency room, patients' appointment location, entry, cross-shop area...
- *Hybrid model* of fixed costs (to cover infrastructure and primary installation and growth tasks) and variable costs depending on use.

Key activities[2]

The only one that seems more likely to be added among the ones in the first version is:

- Performance Management Maintenance, managing internal KPI, communication efficiencies and strategy workflow.

Key resources[2]

- Data resources:

Partners' and customers' network data.

Data Storage and GDPR professionals (EU Laws…).

- Intellectual resources:

Partnership with one specific customer/hospital as proof-of-concept (e.g. Centro Medico Santagostino or Clinica Medis, already in contact with the start-up).

- Financial resources:

Possibility of receiving investment funding of the project from Rui Costa's group (Annex F).

Key partners[2]

Besides the ones mentioned, can also be involved three different new entities:

- Centro Medico Santagostino or Clinica Medis (for trial proof-of-concept and the transaction ecosystem creation between the Go-to-market environment and the entities).
- Professionals roles involved in communicating new AI in the healthcare sector.
- Rui Costa (Annex F)

On the same way, Bending Spoons, before mentioned in the Business Model Canvas[1], looks like it does not outsource its expertise to other private companies.

After analysing the feedback, it is necessary to modify the Business Model Canvas[2] in its final iteration as well as the Final Timeline Plan, as the result affects the current goals as well as the strategy's updated timeline proposition.

Chart 3.1 - Business Model Canvas[2] (Final Version)

	Designed for:	*Designed by:*	*Date:*	*Version:*
Business Model Canvas	Expand Reality	Mariantonietta Renda	22/05/21	2

Key Partners

Optimization and economy Reduction of risk and uncertainty

Acquisition of particular resources and activities

- *Audax_ISCTE*
- *ISCTE*
- *Minew*
- *Key Account Managers*
- *Siemens Dynamo*
- ~~*Bending Spoons*~~
- *Centro Medico Santagostino*
- *Clinica Medis*
- *Rui Costa's group funding*.

Key Activities

Problem - Solving and Platform/Network

Maintenance of:

- DPT
- Platform
- Data
- R&D
- Performance

Key Resources

Intellectual – Human Technology – Data - Financial

- Experts
- Network
- Know-how
- Partnerships

Value Propositions

Performance Convenience/Usability – Cost & Risk Reduction

B2B

Support in:

- Administrative Management.
- Customer Service Management
- Building Services Management

Customer Relationships

- Dedicated Personal Assistance
- Co-creation
- Self-service

Customer Segments

Niche and Segmented markets

1st stage: Private Healthcare Sector

2nd stage: Local Retailers

Channels

- Professional PR (e-PR).
- Platform
- Media Placements (SEM)
- Key Account Managers

Hospitals' Board Management

Cost Structure Value-Driven

Fixed costs
- Salaries
- Software and Internet costs (e.g. encryption and decryption systems' costs and DRM)

Variable costs
- Hospitals' Administrative fees events
- Partnership's fees with Professional PR
- Content creation
- Adv fees (sponsorships…)
- Supplier Costs (Beacons)

Revenue Streams

Hybrid model

Fixed Pricing
- Subscriptions model
- Individual beacons purchase (asset sale)
- Pay-Per-View

Dynamic pricing
- Contracts with variable and personalized rates

The only changes involved in the Final Timeline are the ones underlines below:

Chart 3.2 - Final Timetable strategy's changes

Period / *Focus*	**2022**	***After $\frac{1}{2}$ ROI***	**2025**	**2026 …**
Target Sector/s	Private Healthcare Sector	Private Healthcare Sector Local Retails	Private Healthcare Sector Local Retails	…
Internal Expertise	Marketing Strategical Communication Software Anonymous Data Collection	Marketing Strategical Communication Software Anonymous Data Collection	Marketing Software Master Data (Social Rep.)	…

Conclusions and Recommendations

It is finally suggested to the Start-up Expand Reality to focus the succeeding researches mainly on Data management and Strategic communication, whichever will be the final industry that they will decide to go-to-market first, as data usage scepticism has been the most common concern both with professionals and in the final consumers, also not underestimating the business network test and the legal entities.

Figure 4.1 - Wordcloud of the open opinions over the DPT (Questionnaire)

Figure 4.2 - Wordcloud of Focus Group's answers

There is no question that Data is the new *oil* for businesses, but it is not easy to strike a balance between privacy and efficiency. Yet, trustworthy AI technology will help to elevate to to higher levels of efficient information ownership; however, a balanced approach between data protection and usage in the market information must be researched more. For that reason, one of the key pillars for the strategy would undoubtedly be OT/IT security, whether with retailers or the healthcare industry.

The study may be applicable in a variety of sectors if we think that digital transformation is now pushing market changes challenging traditional Business Models into becoming Digital ones, such as the one proposed as Business Model Canvas[2] (with subscription fees that generate revenue on a continuous basis, digital platforms…) which might embrace also the future of the Business Model itself, possibly a key component for the start-up strategy itself. For that reason, even though the study might bring a number of the insights and suggestions for the start-up in the healthcare industry, it has also its limitation as the research over data security, storage, EU Privacy laws (mentioned in chapter 3) and GDPR must be amplified and studied deeper from different perspectives.

Similarly, the study gave the possibility to analyse the present status quo of the technology, to understand some trends and impact of Beacons Technology, and it defines a future possible state, specifically in the healthcare industry, but also more generically in DPT business projects. Moreover, it is also recommended to keep studying the subject over the interests and the needs of the business, without leaving the possibility of expanding the same technologies to other sectors, besides the healthcare one.

Furthermore, the main focus specific to this research has been the final intensive customer focus, where this specific digital business model might promise to enhance customer satisfaction, while also offering opportunities for generating steady revenue streams in three of the most central management subjects that are at the moment also studied from international companies keeping track of digitalization and infrastructures changes: Building services management, Customer Service Management and Administrative Management.

For instance, in this regard it was also asked the participants of the Focus Group to give a general suggestion over the project and different thoughts were shared:

- The initial entry through retailing and only in a second moment in the Healthcare one, to reduce the risk of failure (Gallo, 2021);
- The need of starting from the consumer and keep it easy with the user (Viglia, G. 2021)
- The start-up's customers need to be very well-defined as the idea seems a very good one, there is also a possibility (and benefit) of having such system on touristic attractions, museums, etc. (Costa, 2021)
- Be very aware of what value is there for the patient and make sure that they can get value even without people knowing who they are - the problems related to authentication and identification, as sometimes people don't like to be identified. But still they have a need for intra-building guidance. So to concentrate on the anonymity of the final consumers. (Martins, 2021).

Finally, in the hopes that the research will serve as a foundation for future DPT studies, it is hoped that Expand Reality will achieve the greatest possible results for the future growth of the start-up initiative.

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Annexes

Annex A – Expand Reality Letter of Commitment

Letter of Commitment

(©Expand Reality in-company project - A beacons-based Business Model research as part of the international marketing strategy)

This agreement, while not a legally binding document, establishes the commitment of project partners in the student's Final Research that is defined in a mutually binding agreement between the CEO and Founder of Expand Reality, Francisco Tàvora Seruya, and the ISCTE student, Mariantonietta Renda.

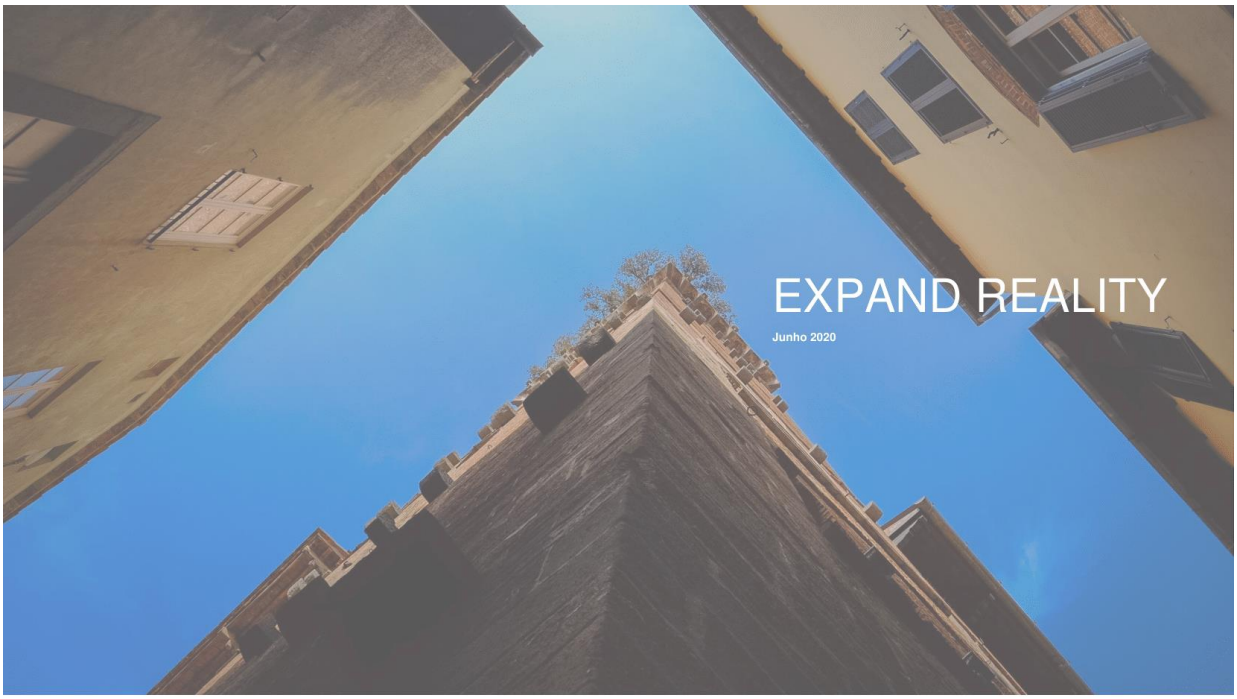
Designated referents who have signed this document commit to fully participate in the following activities of the Project from September 2020 through maximum September 2021:

1. Support the student until the final proclamation, in terms of documentation, queries or other needs related to the Thesis itself, whenever possible.
2. Both parties will give each other the necessary follow-up within the scope of the thesis plan.
3. To not disclose the documentation and/or data handed by both referents to third parties while drafting the thesis itself.

I affirm that Expand Reality understands and is committed to the proposed In-Project research, and that we will be fully engaged in the activities and plans. We will follow through on these commitments, regardless of changes in foreseeable events.

_____	_____ , ISCTE student
(NAME and title)	(NAME and title)
Lisbon, 03/11/2020	Lisbon, 18/10/2020
(Date)	(Date)

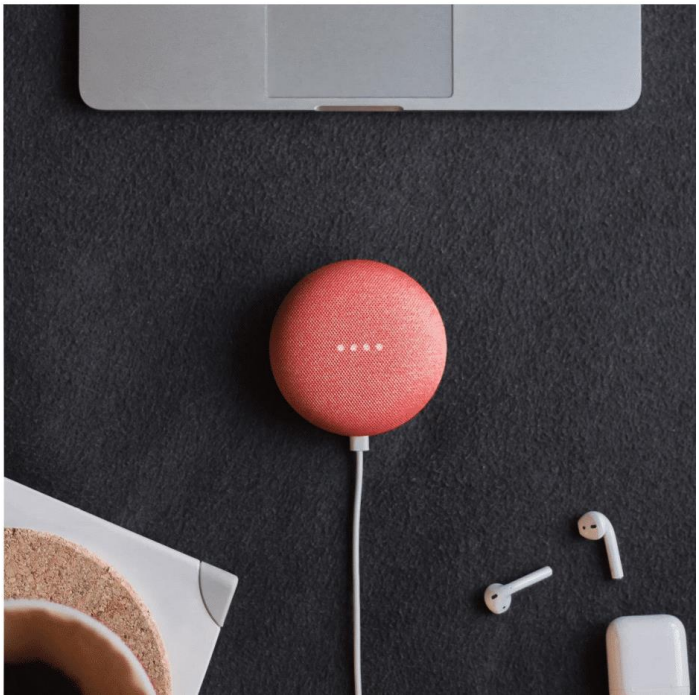
Annex B – Expand Reality PPT Presentation project



EXPAND REALITY

Sumário

- Contexto da Expand Reality;
- Tecnologias envolvidas
- *Customer Journey*
- Use case



EXPAND REALITY, Lda | Junho, 2020

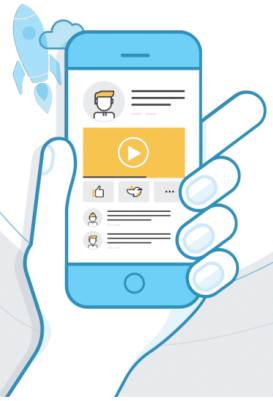
EXPAND REALITY

Abordagem do Negócio

A Expand Reality está a desenvolver uma **plataforma para os consumidores** digitais recolherem conteúdos (campanhas, promoções, outros) em **contexto físico**.

Através da utilização de **sensores IoT** (tais como beacons) e uma **aplicação móvel** pretende-se melhorar a **experiência dos consumidores** com **ações de marketing direcionadas** ao perfil do utilizador.

Pretende-se desenvolver uma plataforma de ***comunicação digital de proximidade*** **direcionada**, **acessível** e **sem barreiras tecnológicas**.

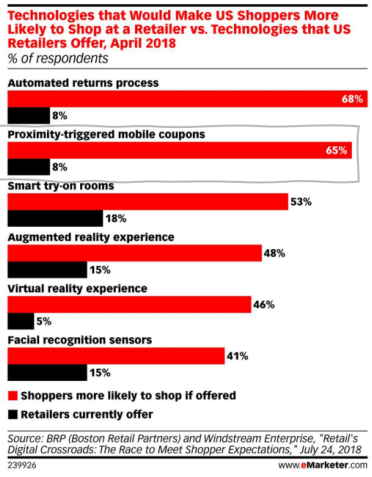


EXPAND REALITY

Oportunidade do Negócio

Estudos da **eMarketer.com** apontam para consumidores altamente recetivos a recolher ofertas e ativações de proximidade durante um percurso em loja física.

Por sua vez o retalho não está a oferecer aos consumidores esta nova abordagem de ativação.



EXPAND REALITY

Posicionamento do Negócio

Neste contexto a Expand Reality pretende criar uma **plataforma capaz de desenvolver sinergias entre o mundo físico e o digital "*phygital*"**.

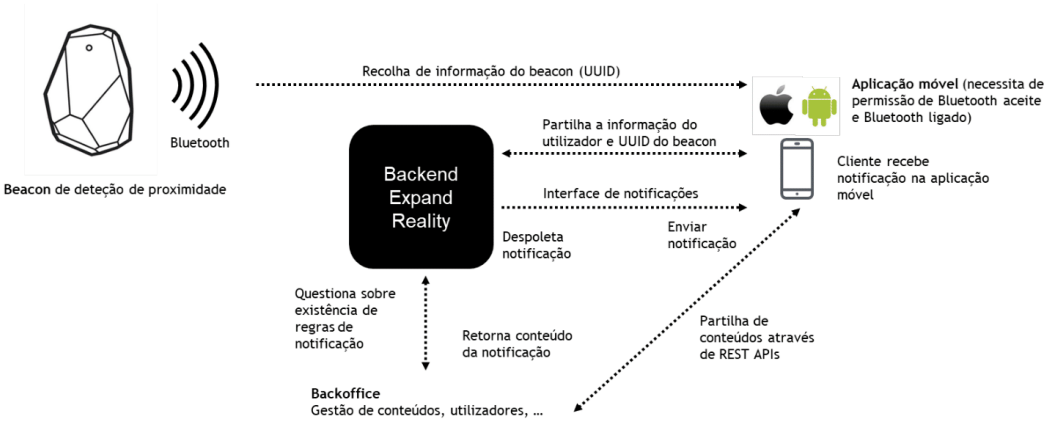
Pretendemos disponibilizar uma **solução** que acomode diferentes dispositivos IoT na promoção do **digital contextual**.

É nosso objetivo marginalizar o formato por forma a **alcançar a maior cota de mercado do retalho**.

Assim, temos como objetivo encontrar o maior número de **lojas *outdoor*** e *indoor (shoppings)*, empresas de serviços, espaços culturais e locais públicos onde de alguma forma possibilita-se a **interação e comunicação local**.

EXPAND REALITY

Arquitetura da solução

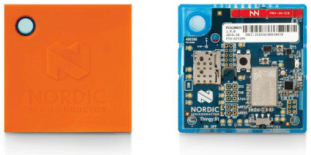


EXPAND REALITY

Os sensores de proximidade

Os tradicionais BLE beacons são sensores com autonomia de 1 a 5 anos que tem a única função de espalhar o sinal BLE em seu redor.

Os novos sensores Narrowband-IoT possibilitam maior autonomia e longevidade aos novos sensores. A conjugação das antenas LTE-M, NB-IoT, GPS, BLE, NFC possibilitam uma maior abertura de comunicar para a cloud e criar novas formas e oportunidades para projetos de proximidade e *user experience*.



LTE-M NB-IoT

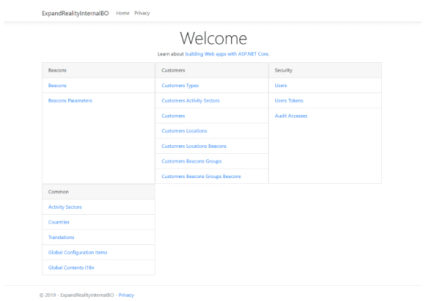
EXPAND REALITY

A solução POC desenvolvida (1/2)

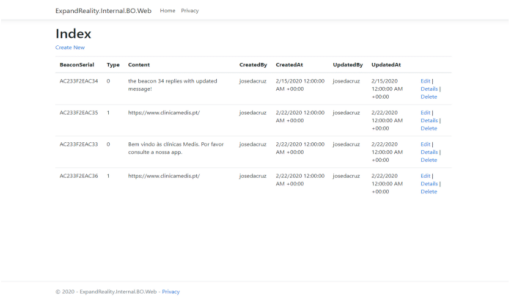
As imagens em baixo apresentadas são ecrãs do **Banckend** de gestão do sistema de beacons e do *core* do negócio. O print sobre o ecrã de Gestão de Conteúdo é a plataforma para criar as mensagens a serem apresentadas na aplicação móvel quando um utilizador alcança o sinal do beacon.

Os backoffices de gestão e backend de controlo do sistema são aplicações web disponíveis na cloud Azure.

Backend Expand Reality



Gestão de Conteúdo



EXPAND REALITY

A solução POC desenvolvida (2/2)

- **Imagem 1** – Mensagem personalizada por ter encontrado 1 *beacon* com mensagem ativa;
- **Imagem 2** - Aplicação móvel com 2 notificações recebidas por ter encontrado 2 beacons diferentes;

As mensagens aqui apresentadas são mensagens técnicas. O texto no campo "text message:" é definido no backoffice de Gestão de Conteúdo conforme apresentado no slide anterior.

Imagem 1

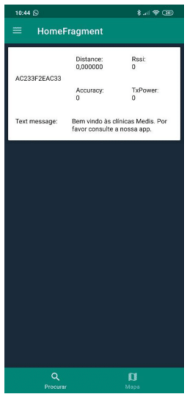
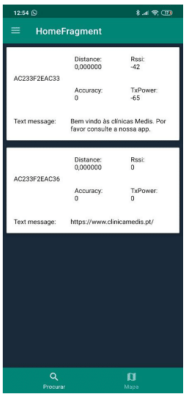


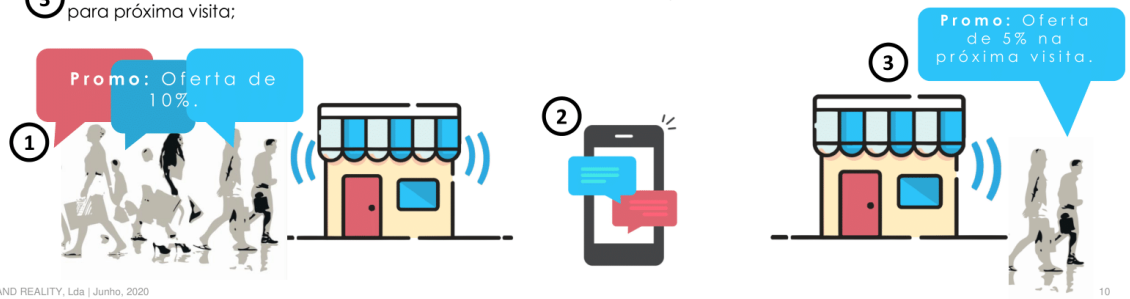
Imagem 2



EXPAND REALITY

Potenciais de aplicação e casos de uso (1/2)

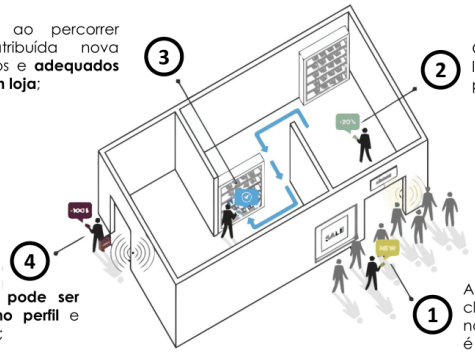
1. *Journey* inicia-se com a aproximação dos clientes na montra da loja (pressupõe-se que os utilizadores da aplicação móvel autorização a comunicação);
2. Os clientes recebem uma notificação no *smartphone* com as condições da oferta e entram na loja;
3. O consumidor ao abandonar o local recebe nova notificação de despedida e nova oferta para próxima visita;



EXPAND REALITY

Potenciais de aplicação e casos de uso (2/2)

O **cliente no interior da loja**, ao percorrer determinado percurso é-lhe atribuída nova **notificação com artigos** relacionados e **adequados ao perfil** e **padrões de navegação em loja**;



O cliente entra na loja para procurar produtos que lhe agradem. Também tem um voucher promocional disponível na aplicação móvel;

O cliente ao abandonar o local **pode ser atribuída novo voucher baseado no perfil** e comportamento identificado em loja;

A ***Journey*** **inicia-se com a aproximação** dos clientes na entrada da loja e receberem uma notificação de promoções no interior (a **notificação** é **baseada no perfil do utilizador** da mobile App);

EXPAND REALITY

Caso de Uso Lidl Portugal *retail store*

Com a colocação de sensores IoT BLE nas lojas promover movas oportunidades de comunicação com os consumidores, tais como:

Comunicar com os clientes antes de entrarem nas lojas Lidl por forma a informar sobre os novos catálogos, promoções ou ofertas específicas para o perfil de cada cliente.

Acompanhamento do cliente durante a visita na loja disponibilizar um atendimento digital personalizado ao consumidor.

Headmap dos locais de maior utilização e pico de frequência das lojas.

Gamificação pelas compras em loja atribuir ao cliente um cartão digital de fidelização com vantagens personalizadas entre outro tipo de ativações.

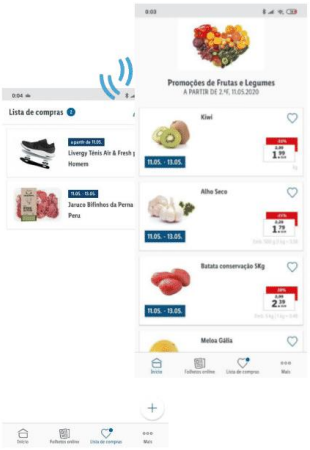
Diversos tipos de interações podem surgir *indoor* bem como **experiências fora das lojas também podem ser promovidas** para captação de clientes.

EXPAND REALITY

Caso de Uso Lidl Portugal *mobile APP*

Disponibilizar na aplicação móvel Lidl um serviço de comunicação aquando em loja Lidl.

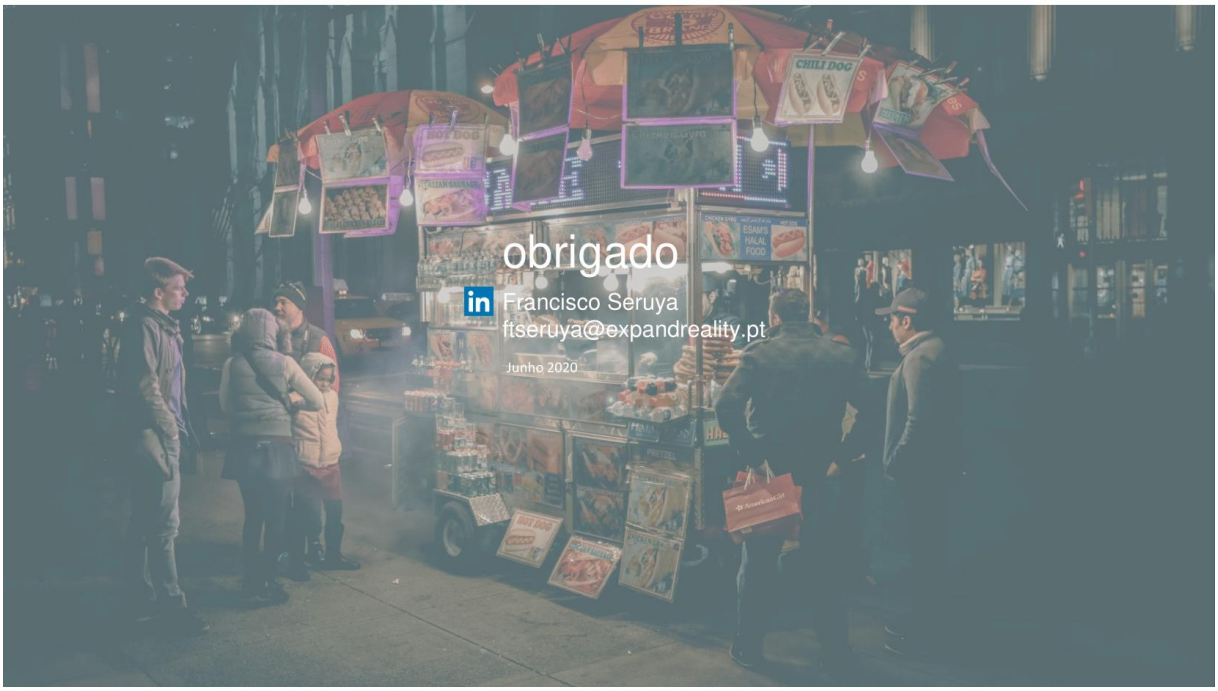
Através de sensores IoT BLE comunicar com a aplicação móvel do consumidor por forma a entregar valor na experiência em loja.



Pelos produtos selecionados na Lista de Compras alertar o utilizador da aplicação quando dentro de uma loja Lidl da localização do seu produto ou relembrando da escolha feita na lista.

Eventos de cross sell sobre a Lista de Compras promovendo a complementaridade do cabaz de compras.

Outras ações podem ser desenvolvidas como indicar o caminho para os produtos em loja.



Annex C – Online Questionnaire

Proximity Technology // Tecnologia di Contatto - 5 minutes questionnaire

ISCTE Business School, Lisbon- Questionnaire with accademic and master thesis' purpose
ISCTE Business School, Lisbona - Questionario con finalità accademiche e tesi magistrale

*Campo obbligatorio

1. In which country were you during the pandemic? // In che paese ti trovavi durante la pandemia? *

2. Age / Età *

Contrassegna solo un ovale.

- 18-23
- 24-30
- 31-39
- 40-55
- 56-74

3. Gender // Sesso *

Contrassegna solo un ovale.

- M
- F
- X

Proximity Technology // Tecnologia di Contatto

Questionnaire with academic and master thesis' purpose // Questionario a fine accademico destinato per tesi magistrale

4. Did you download any Contact Tracing App during the Pandemic? (E.g. Immuni, StayAway Covid, https://en.wikipedia.org/wiki/COVID-19_apps ...) // Hai scaricato Immuni durante la pandemia? *

Contrassegna solo un ovale.

- Yes / Sì
- No / No
- I don't know any / Non so cosa sia

5. What is your biggest concern about the Contact Tracing App? // Cosa ti preoccupa relativamente a questo tipo di App? *

Contrassegna solo un ovale.

- ◯ Collection and sale of my personal data // Raccolta e vendita dei miei dati personali
- ◯ Being always tracked down // Essere rintracciato ovunque io sia
- ◯ Improper use of my personal data // Uso improprio dei miei dati personali
- ◯ None, I believe the app has a social and public safety purpose // Nessuno, credo che l'app abbia un fine sociale e di sicurezza pubblica
- ◯ None of the above

6. Taking in consideration that contact tracing systems uses Bluetooth Low Energy technology and does not collect geolocation data - would you be willing to use this technology in your daily life for shopping purpose? // Considerando che i sistemi di tracciamento dell'app utilizzano la tecnologia Bluetooth e non raccolgono dati di geolocalizzazione, saresti disposto a utilizzare questa tecnologia nella tua vita quotidiana per scopi d'acquisto?

Contrassegna solo un ovale.

	1	2	3	4	5	
Absolutely no // Assolutamente no	◯	◯	◯	◯	◯	Absolutely yes // Assolutamente sì

Proximity Technology // Tecnologia di Contatto

Questionnaire with academic and master thesis' purpose // Questionario a fine accademico destinato per tesi magistrale

7. Do you think your purchasing habits have been changing during the Pandemic (E.g. Buying online more, not touching the product at the supermarket anymore ...) ? // Pensi che le tue abitudini di acquisto siano cambiate (per esempio, fai più acquisti online o al supermercato eviti di toccare troppo i prodotti)? *

Contrassegna solo un ovale.

	1	2	3	4	5	
Not at all, they are still the same // Per nulla, non sono cambiate	◯	◯	◯	◯	◯	Yes, definitely // Sì, del tutto

8. Considering your last answer and watching the video below, do you think would you use the Proximity Technology for your purchases, shopping or simply to go to the restaurant safely - in order to just touch your mobile for different purposes? // Considerando la tua ultima risposta e guardando il video qui sotto, pensi che useresti il tuo cellulare come dispositivo Bluetooth per i tuoi acquisti, per fare la spesa o semplicemente per andare al ristorante in modo sicuro - per toccare unicamente il tuo cellulare per scopi diversi?

Contrassegna solo un ovale.

	1	2	3	4	5	
Absolutely not // Assolutamente no	◯	◯	◯	◯	◯	Definitely yes // Assolutamente sì

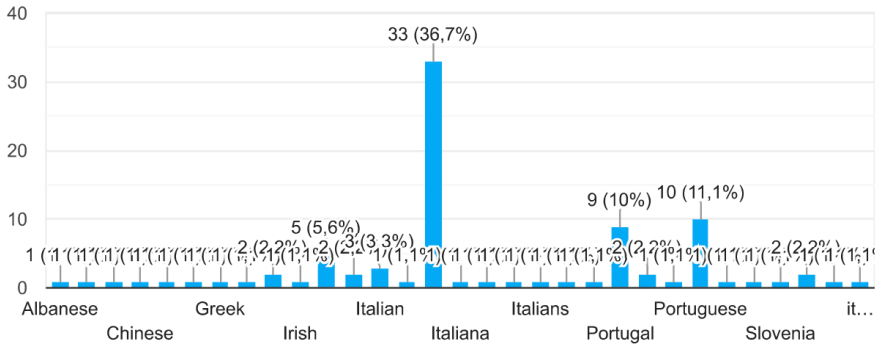
Beacons

 http://youtube.com/watch?v=SrsHBjzt2E8

9. Any opinion or impression about the topic is more than welcome // Qualsiasi opinione al riguardo è ben accolta

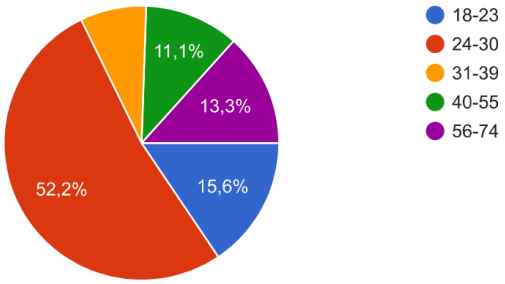
In which country were you during the pandemic? // In che paese ti trovavi durante la pandemia?

90 risposte



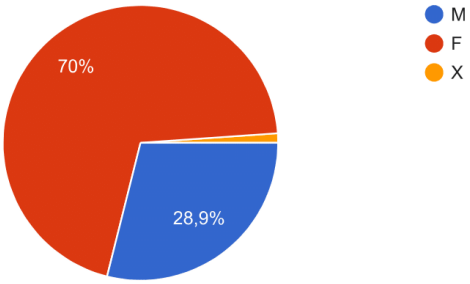
Age / Età

90 risposte



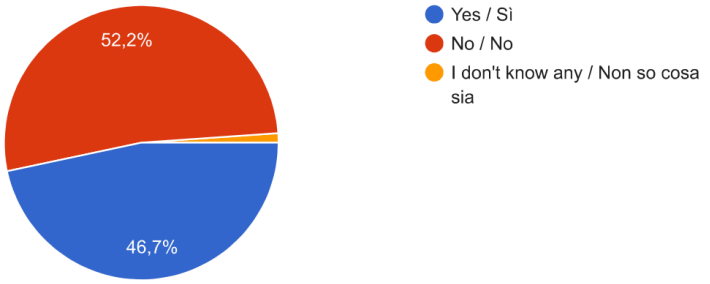
Gender // Sesso

90 risposte



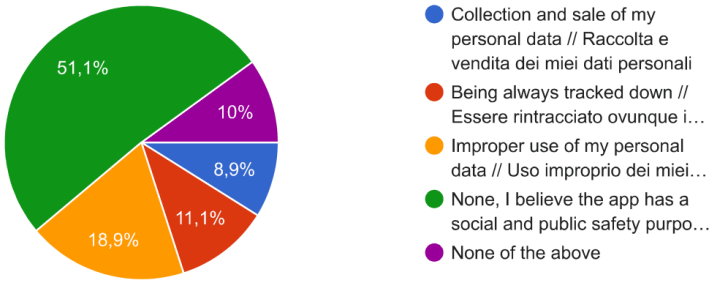
Did you download any Contact Tracing App during the Pandemic? (E.g. Immuni, StayAway Covid, https://en.wikipedia.org/wiki/COVID-19_apps ...) // Hai scaricato Immuni durante la pandemia?

90 risposte



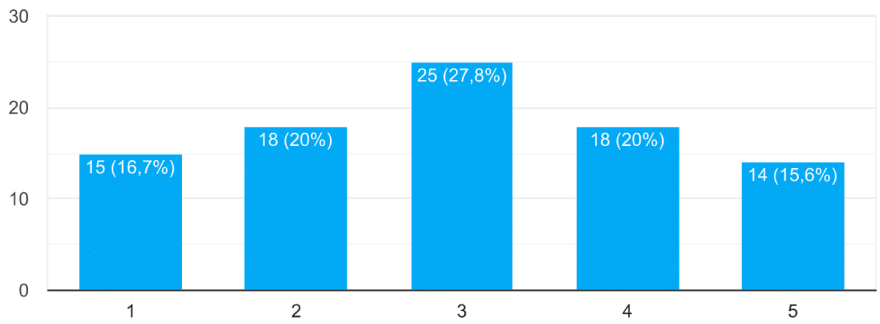
What is your biggest concern about the Contact Tracing App? // Cosa ti preoccupa relativamente a questo tipo di App?

90 risposte



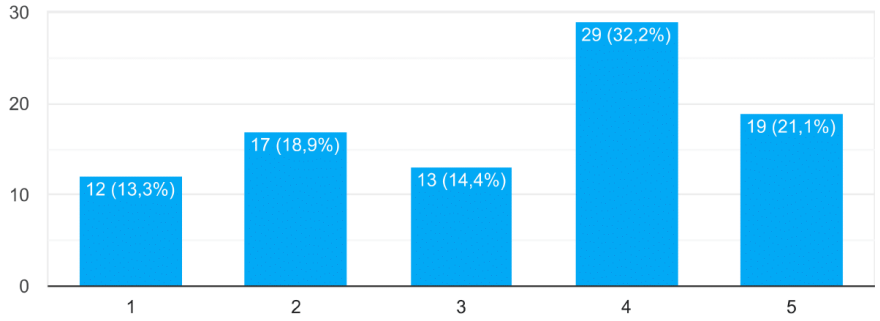
Taking in consideration that contact tracing systems uses Bluetooth Low Energy technology and does not collect geolocation data - would you be willing to use this technology in your daily life for shopping purpose? // Considerando che i sistemi di tracciamento dell'app utilizzano la tecnologia Bluetooth e non raccolgono dati di geolocalizzazione, saresti disposto a utilizzare questa tecnologia nella tua vita quotidiana per scopi d'acquisto?

90 risposte



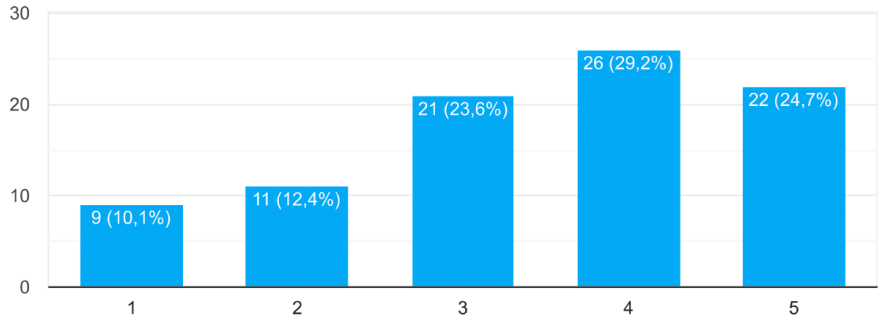
Do you think your purchasing habits have been changing during the Pandemic (E.g. Buying online more, not touching the product at the supermarket anymore ...) ? // Pensi che le tue abitudini di acquisto siano cambiate (per esempio, fai più acquisti online o al supermercato eviti di toccare troppo i prodotti)?

90 risposte



Considering your last answer and watching the video below, do you think would you use the Proximity Technology for your purchases, shopping or simply to go to the restaurant safely - in order to just touch your mobile for different purposes? // Considerando la tua ultima risposta e guardando il video qui sotto, pensi che useresti il tuo cellulare come dispositivo Bluetooth per i tuoi acquisti, per fare la spesa o semplicemente per andare al ristorante in modo sicuro - per toccare unicamente il tuo cellulare per scopi diversi?

89 risposte



Any opinion or impression about the topic is more than welcome ... Qualsiasi opinione al riguardo è ben accolta:

- looks brilliant
- Seems to "stalker". I understand the goal, and would probably use it but it would have to be very clear in the way the product collects data
- Keeping Bluetooth switched on at all times causes excessive energy consumption of

the cell phone battery.

- I would REALLY rather talk to human beings than consign my entire existence to technology.
- Imagine a cybernetic attack. All this vulnerable data, preferences, money, etc...oh my god
- The problem is simple, the use made of it by the multinationals that have upset the social economy.
- Interesting but I'm a little wary when it comes to shopping I'm afraid they might come in or make use of my privacy
- I prefer to continue to have the freedom to search for things when I need them, without the rush of having to find them right away.
- While there would be no issue sharing the data, sometimes it can be a bit overwhelming being constantly targeted at every shop or restaurant you pass by.
- I would love it for restaurant bar porpuses, even if it might actually deprive staff from part of their jobs... Wouldn't really love it in other stores
- New technologies are tricky
- Depends the things I buy to purchase online, other time just go the shop and purchase
- Interesting, as this seems to be practical and easier than scanning with qr code or browsing on the website by browser. However, might also not want to use this quite much as it might drain my battery too much if I leave it idle.
- I do not enjoy using the STAYAWAY COVID app, I do it because the Portuguese government recommended it, but until now I am not very sold on the app's service. My main reason for this is because in my experience its somewhat useless. I do not enjoy having the bluetooth on all the time, and despite that, recently there have been a lot of infections in my hometown and I have had the app on, and been to every supermarket, post office and coffee in my small town and still nothing for a week, despite having hundreds of infected people being diagnosed with covid everyday and without symptoms. I think this is probably because many of the older people that are infected do not know how to use the app, or even a smartphone. Also, its due to the fact that not a lot of people use the app properly, sometimes shutting down the Bluetooth and others, simply not announcing on the app that they are infected. Good luck!
- I hate a life full of devices and technology "waves" floating everywhere. No wonder cancer grows!!
- It seems to have security vulnerabilities since it directs files on the phone
- New technologies are tricky

Annex D - Extract from “Proposta di Candidatura Parte B (Anexo Tecnico)” handed from the Start-up.

O I4EU tem como objetivo desenvolver uma nova plataforma digital B2B (Business to Business) comunitária que tornará possível a comunicação através da proximidade do consumidor B2C (Business to Consumer). O projeto conducente à criação de um novo serviço e processo de comunicação digital. Pretende desenhar e implementar uma plataforma que avance o estado da arte na comunicação de informação no formato digital em locais públicos e acrescentar inteligência de processos para comunicar com valor acrescentado com o consumidor. Em suma é pretendido no projeto, melhorar a comunicação em contexto físico através de dispositivos IoT, em ambientes interiores e urbanos, possibilitando a quem circula numa distância aproximado em metros receber informação direcionada e dedicada ao consumo no local (para tal o consumidor teve de aceitar os termos e condições para a comunicação com o utilizador da plataforma).

O projeto pretende reforçar a capacidade de comunicação digital do comércio físico, organismos de cultura (eg. museus), recintos de eventos, locais de turismo e outros potenciais locais de distribuição de informação contextual. Tendo como ponto de partida o *e-commerce* (comércio eletrónico) que é rico em dados de contexto, é pretendido trazer o mesmo paradigma para o contexto físico. Assim, eg. um comerciante comunicar com o consumidor que estejam no espaço físico e com isto partilhar ativações de loja, promoções ou outras campanhas no momento certo.

Neste sentido o projeto levará ao desenvolvimento de uma plataforma comunitária digital onde diversas entidades participam por igual e disponível em qualquer geografia. Uma plataforma diferenciadora ainda não encontrada em produção.

A plataforma será distribuída aos consumidores no formato de aplicação móvel. Será desenvolvida para os dois principais sistemas *(IOS* e *Android)*. Através da aplicação móvel os utilizadores (caso os utilizadores concordem com os termos e condições do serviço) terão acesso a todas as funcionalidades disponíveis na aplicação de forma gratuita e sem subscrições.

Após o utilizador registar-se na aplicação móvel e ter concordado os termos e condições, autorizado o acesso do *bluetooth* no dispositivo móvel, a aplicação irá iniciar o mapeamento de sensores IoT (internet of things) em redor. Inicialmente o projeto irá promover a disseminação de beacons BLE, posteriormente poderão adicionar-se outros sensores.

Os beacons BLE são equipamentos de pequenas dimensões, aproximadamente 39 x 15.5mm, que tem como única função emitir um sinal bluetooth de baixa energia. O sinal BLE serve diversos tipos de indústrias e dispositivos tais como smartwatch, sensores para as casas inteligentes entre outros periféricos Bluetooth. A Expand Reality tem um fornecedor seleccionado para a entrega dos

sensores. O fabricante dos beacons para o projeto I4UE é a MINEW, fornecedor recomendado pela Google.

Pode ser encontrado no seguinte endereço online:

MINEW

https://developers.google.com/beacons/eddystone#beacon_manufacturers.

O projeto já tem um nível de conhecimento sobre os dispositivos a utilizar do fornecedor tanto que para a gestão dos ativos a Expand Reality tem vindo a desenhar a incorporação nos mesmos, um QRcode impresso a laser numa das faces do sensor para maior facilidade e controlo de gestão de armazém. Desta forma não será necessário organizar manualmente os sensores, o cliente ao receber um dispositivo basta fazer o scan do QRcode e o sensor ficará atribuído ao cliente em causa.

A componente IoT com utilização de beacons é uma das atividades que será alvo de investigação em parceria com o ISCTE-IUL. Por forma a validar o modus operandi dos equipamentos o projeto contempla o teste em laboratório e comportamento das redes BLE (bluetooth low energy). A administração das barreiras físicas que possam surgir. Esta atividade será desenvolvida logo no arranque do projeto na atividade A2.1.

O beacon BLE enquadra-se no projeto enquanto primeiro IoT a integrar a rede. Outros IoT poderão servir o projeto tais como redes LoRa, câmera de mapeamento de fluxos, contadores de pessoas, etiquetas RFID, equipamentos com 5G, etc. O beacon foi selecionado para o projeto por se tratar de um dispositivo de pequenas dimensões, possuir uma autonomia própria até 2 anos sem necessidade de corrente elétrica, manutenção praticamente inexistente e apresentar um preço de mercado muito competitivo face a outros equipamentos. O beacon no projeto pertencerá à linha de comercialização B2B, conforme ilustração 2. Será distribuído aos clientes por via de correio através de um contrato a celebrar com uma entidade de distribuição. O pacote inicial de beacons contará com 2 / 3 ou 5 equipamentos em caixa. Também na caixa irá um guia de fácil instalação e os 3 passos para iniciar uma campanha online.

2.7.1. Expand Reality

A Expand Reality é uma *startup* criada em janeiro de 2019 com o objetivo em desenvolver uma solução para melhorar a experiência dos consumidores com o recurso a sensores IoT. Este caminho iniciou-se quando o sócio-gerente adquiriu através online pelo contacto com um fornecedor Chinês de beacons uma quantidade destes equipamentos e colocou à prova a criatividade de um grupo de pessoas sobre as potencialidades e aplicabilidades.

Após identificado um caminho a seguir, juntaram-se ao projeto um grupo de developers por forma a validar o conceito. Estes também entusiasmados pretenderam iniciar o desenvolvimento de um pequeno conceito demonstrador. De forma a oficializar o projeto criou-se a empresa Expand Reality, Lda com o objetivo de dar nome à iniciativa e justificar o investimento - tempo / monetário.

A Expand Reality tem como ambição desenvolver um grande projeto nacional e internacional. Assim pretende-se iniciar um caminho de investigação com tecnologias inovadoras e disruptivas no mercado por forma a entregar soluções integradas na realidade do nosso dia-a-dia.

A estrutura de sócios da Expand reality conta com perfis de diferentes áreas - gestão de empresas, finanças e advocacia. Assim a Expand Reality o núcleo de conhecimento da empresa é multi orientado a resultados como dominante estratégica de negócio, pronta a desafiar-se no mercado.

Recursos humanos críticos a afetar ao projeto

1. Francisco Seruya (sócio-gerente)

Nasceu em Lisboa em 1986. Licenciado em gestão de empresas pela Universidade Lusíada de Lisboa, em 2010. Mestre em Gestão de empresa com majoração em finanças pela Universidade Lusíada de Lisboa em 2014. Em 2010 esteve a estagiar na Newsourcing, Lda empresa de contabilidade onde desempenhou funções de assistente. Em 2011 mudou-se para Deloitte em Portugal, onde esteve no primeiro ano a executar funções de auditor analista. Posteriormente passou para as áreas relacionadas com sistemas de informação e contou com a presença em diversos projetos de implementação de sistemas ERP. Na Ecoslops Portugal desempenhou funções de coordenador de projetos relacionados com o parque informático da empresa. Foi responsável pela contratação de fornecedores de comunicações e tecnologias. Na Everis Portugal, desempenhou funções de responsável de equipas de desenvolvimento na área de

implementação de projeto tecnológicos, desenvolvimento aplicacional e gestão de clientes. Tem vindo a trabalhar com diferentes setores e clientes nacionais. Mais recentemente tem vindo a executar funções de gestão de projetos e oportunidades com os clientes. Trabalhou com grandes grupos como a seguradora Ageas Portugal, EDP, REN e Vodafone Espanha. Faz parte do grupo internacional de normalização para os temas de Blockchain e é membro convidado para várias mesas redondas sobre o mesmo tema. O perfil completo encontra-se em no CV em anexo.

2. José Cruz (arquiteto tecnológico)

Nasceu em Lisboa em 1972. Completou em 1997 o curso de ciências da computação pela Universidade de Lisboa. Em 2008 terminou a pós graduação em gestão de projetos pelo Instituto Superior de Economia e Gestão (ISEG). Certificado ITIL v2 e diversos outros certificados fazem parte da carreira. É formador na Rumos em diversas tecnologias. É freelancer em diversos clientes como por exemplo para a Presidência da República Portuguesa. Trabalhou na GFI durante bastante anos, tendo passado por inúmeros projetos em diferentes empresas e setores nacionais e internacionais. A nível internacional conta com experiência em projetos com utilização de sensores em ambiente urbano. Mais recentemente é arquiteto das aplicações do banco BNP em Portugal. O perfil completo encontra-se em no CV em anexo.

3. Rita Xara-Brasil (marketing expert)

Nasceu em Lisboa em 1988. Em 2010 pela Universidade Lusíada de Lisboa – Faculdade de Ciências e Economia da Empresa licenciou-se em Marketing e Publicidade. Em 2016 pela Escola Superior de Comunicação Social terminou o Mestrado em Publicidade e Marketing. Em 2014 terminou o European Advertising Certificate (IPA). Até 2016 trabalhou na Ogilvy & Mather onde acompanhou projetos de comunicação de várias marcas como a Lidl, Audi Portugal, petrolífera BP, companhia aérea Emirates Airlines, The Lisbon MBA, e R/com. Em 2016 iniciou funções de Marketing e comunicação na Samsung Electrónica em Portugal. Conta com uma vasta exposição a diferentes funções de marketing - comunicação de marca e produto. O perfil completo encontra-se no CV em anexo.

4. Emanuel Gaspar (programador leader)

Nasceu em Lisboa em 1986. Mestrado em Engenharia Informática e de Computadores pelo Instituto Superior Técnico (IST), Campus Alameda, Lisboa. Programador Informático desde 2007. Até 2009 foi consultor e programador júnior na Capgemini e AGAP2, Portugal. Participou em projectos relevantes na LegisPalop, portal da legislação dos PALOP. Web Developer para a Gecko Agency Ltd, na Escócia até 2017. Desde então é

freelancer em Portugal para clientes internacionais. O perfil completo encontra-se no CV em anexo.

5. Tiago Oliveira Jordão (programador Canais Digitais)

Nasceu em Lisboa em 1985, completou em 2010 o Mestrado em Engenharia Informática no Instituto Superior Técnico. Neste momento é gerente de projetos de TI onde assume funções e competências de gestão de equipas técnicas, estratégia organizacional de enquanto Product Owner e de Governance de arquiteturas de BI na EDP. Durante a carreira, desenvolveu um profundo conhecimento integrado sobre todas as áreas de projeto. Participando em diferentes setores desde os serviços financeiros, bancos, serviços públicos, indústria e saúde. Em projetos de componente de análise de dados, reengenharia de processos, governança de TI e implementação de portais para áreas de canais digitais. Tem desempenhado funções com áreas técnicas e de negócio. Tem certificações em diferentes metodologias e tecnologias. Até ao momento endereçou funções de, tester, programador, líder técnico, arquiteto aplicacional, analista de negócios e gestão de projeto.

2.7.2. ISCTE-IUL

ISCTE-IUL, instituto universitário público de reconhecida qualidade, criado em 1972, é uma universidade orientada para a investigação, com cerca de 9600 estudantes, 390 docentes (ETI) e 390 investigadores a 100%. É um dos mais dinâmicos e inovadores em Portugal que se destaca pela sua elevada taxa de cursos de pós-graduação (quase 50%), forte internacionalização e por ser uma universidade especializada em diversas áreas, tais como, Gestão e Economia, Ciências Sociais e Políticas Públicas, Tecnologias de informação e Arquitetura.

ISCTE-IUL visa, consistentemente, por níveis elevados de excelência, inovação, internacionalização e

empreendedorismo. Tendo em conta o ensino, investigação e serviço à comunidade, ISCTE-IUL é uma instituição universitária que prepara especialistas qualificados, cujas competências culturais, científicas e técnicas, os torna capazes de intervir, não só no desenvolvimento sustentável do país, mas também a nível global. ISCTE-IUL tem vindo a estabelecer cooperação nacional e internacional com um número alargado de universidades e institutos de investigação, bem como organizações do setor público, privado e organizações sem fins lucrativos e, tem participado ainda, em vários projetos financiados internacionais, programas de investigação e redes de cooperação científica.

ISCTE-IUL é uma universidade de investigação com uma abordagem multidisciplinar e interdisciplinar, que inclui oito unidades de investigação, seis laboratórios (Vitruvius

FabLab-IUL - Laboratório de Fabricação Digital, LAPSO - Laboratório de Psicologia Social e das Organizações, Laboratório de Ciências de Comunicação, Laboratório de Imagem, Laboratório de Informática e Laboratório de Telecomunicações), bem como os Departamentos e Escolas que são as principais estruturas organizacionais do Instituto (https://www.iscte-iul.pt/). As unidades de investigação são centros de alta qualidade e mérito nacional e com significativas contribuições de relevância internacional na sua área de investigação. A estratégia para conduzir a investigação de excelência no ISCTE-IUL passa por estabelecer objetivos focados no aumento da investigação de ponta, a internacionalização, a garantia da qualidade na educação e na criação de condições que favoreçam o desenvolvimento de uma cultura organizacional de empreendedorismo, inovação e transferência de conhecimento para a sociedade. O reconhecimento internacional da excelência do ISCTE-IUL em I&D e inovação, nas áreas acima mencionadas, é demonstrado pela forte cooperação com mais de 100 entidades internacionais, executando mais de 200 projetos científicos e publicando 1446 artigos científicos internacionais (em 2018).

ISCTE-IUL tem uma longa tradição de investigação para criar soluções para os problemas sociais, políticos e económicos dos cidadãos portugueses, europeus e internacionais, vasta experiência na gestão de projetos e serviços de processos de qualidade, tendo estruturas centrais de apoio e equipes especializadas que acompanham e apoiam a gestão de projetos e a gestão de processos de qualidade, tais como, o gabinete de apoio à investigação, o gabinete de estudos, avaliação, planeamento e qualidade e os serviços financeiros, que se encontram em articulação com as necessidades dos “stakeholders”. Adicionalmente, as unidades de investigação, que têm autonomia administrativa e financeira, integram equipes altamente especializadas nas áreas de gestão de projetos, propriedade intelectual e processos de qualidade. ISCTE-IUL tem estado envolvido, tanto como instituição coordenadora, como colaboradora, com outras instituições nacionais e internacionais, em vários projetos financiados europeus e internacionais, em programas de investigação e em redes de cooperação científica, com uma vasta experiência na coordenação e gestão de projetos nacionais e internacionais de I&D, incluindo QREN, FCT, 5º e 7º programas-quadro, Horizonte 2020, financiamento privado, etc.

O Centro de Investigação em Ciências da Informação, Tecnologias e Arquitetura (ISTAR-IUL) é uma unidade de investigação de referência na aplicação de abordagens e serviços digitais e computacionais multidisciplinares e transdisciplinares em problemas identificados de pessoas, de organizações e da sociedade. A investigação conduzida no ISTAR-IUL assenta na convergência entre a Ciência de Computadores, Tecnologias de Informação, Matemática Computacional e Arquitetura e Urbanismo (nas suas dimensões digitais). O ISTAR-IUL estimula na sua estrutura a flexibilidade, a diversidade e a colaboração entre áreas científicas e abordagens tecnológicas.

O ISTAR-IUL está organizado em quatro grupos de investigação: Digital Living Spaces (DLS), Information Systems (IS), Software System Engineering (SSE) e Complexity and Computational Modelling (CCM). Através de uma crescente inter dependência dos quatro grupos de investigação procuramos fortalecer a investigação multidisciplinar sem perder foco das áreas de investigação.

O perfil da equipa do ISCTE-IUL para o presente projeto de investigação vem principalmente dos grupos de Information Systems e Software Systems Engineering do ISTAR-IUL.

O grupo de Information Systems foca-se em sistemas de informação (SI) em contextos organizacionais, concentrando competências em desenho, implementação e avaliação de SI, tais como SI executivos, sistemas de apoio à decisão, relações entre os SI organizacionais e as redes de colaboração social, em áreas tão diversas como educação, marketing e turismo.

O grupo de Software Systems Engineering aborda o ciclo de vida completo do desenvolvimento de serviços intensivos de software de grande dimensão, distribuição e complexidade. O grupo tem como foco as suas especificações, arquitetura, desenho, implementação, garantia de qualidade, segurança, operação e evolução ao longo do tempo. O grupo dedica-se igualmente ao estudo dos processos, métodos e ferramentas utilizados económica e oportunamente nestas perspetivas.

Recursos humanos críticos a afetar ao projeto

1. João C. Ferreira (Doutorado)

Nasceu em 1967. É Professor auxiliar com agregação do ISCTE-IUL. Licenciou-se em Física pela Universidade Técnica de Lisboa (UTL / IST), Portugal, recebeu um Mestrado em Telecomunicações e um doutoramento em Engenharia Informática pela UTL / IST e um segundo doutoramento em Engenharia Industrial na Universidade do Minho. Agregação em Ciências Tecnologias e Informação pelo ISCTE em 2019. Seus interesses profissionais são: data mining, IoT, Inteligência Artificial,, Segurança de Redes, Sistemas transporte inteligente (ITS) e sistemas de mobilidade sustentável. Ele é autor de mais de 200 artigos científicos e editor de três livros. Executou mais de 30 projetos científicos, investigador principal em 3 FP7 e 3 PT2020. Elaborou mais de 100 revisões de artigos científicos e mais de 20 avaliações de projetos científicos. Presidente do CIS IEEE 2016-2018 e General chair das conferências: OAIR 2013 em Lisboa, INTSYS 2018 em Guimarães e INTSYS 2019 em Braga. IEEE senior member. Guest Editor MDPI energies e Sensores. Presidente do CIS em PT da IEEE (2017-2018). Pertence ao grupos de

investigação do ISTAR e ao Inov em Lisboa. Diretor do mestrado de sistemas de apoio à decisão no ISCTE.

Links: https://ciencia.iscte-iul.pt/authors/joao-carlos-amaro-ferreira/cv

https://scholar.google.pt/citations?user=K6cDsGQAAAAJ&hl=pt-PT

Orchid Id: orcid.org/0000-0002-6662-0806

ResearcherID B-5351-2009

Scopus Author ID 35481887000

2. Carlos Serrão (Doutoramento)

Nasceu em Lisboa em 1973. Licenciado em Informática e Gestão de Empresas, no ISCTE-IUL, em 1997. Mestre em Gestão de Sistemas de Informação, no ISCTE-IUL, especialização na área de Segurança de Informação, em 2004. Doutoramento em Arquitectura de Computadores e Sistemas Distribuídos, na Universitat Politécnica de Catalunya (Barcelona), em 2008. Desde 2008 que é Professor Auxiliar no ISCTE-IUL, Departamento de Ciências e Tecnologias de Informação, em que lecciona diversas unidades curriculares relacionadas com Segurança de Informação, e Gestão e Desenvolvimento de Sistemas de Informação Web e Mobile-based. Foi igualmente investigador na ADETTI-IUL, nas áreas de "Sistemas e Aplicações Distribuídas e Segurança de Informação", "Gestão e Proteção de Propriedade Intelectual Digital" e "Desenvolvimento de SI para a Web e Mobile", tendo estado integrado no grupo NUIGRAM (Natural User Interaction Graphics and Mobility). Desde Janeiro de 2015 que faz parte da ISTAR-IUL, estando integrado no grupo SSE (Software Systems Engineering), onde trabalha nas mesmas áreas de investigação. Desde 1996, participou em múltiplos projectos nacionais e internacionais financiados pela União Europeia, pela Agência Espacial Europeia assim como por entidades privadas. É o autor e co-autor de dezenas de artigos e comunicações em conferências internacionais, jornais e revistas assim como relatórios de projecto. É igualmente autor de diversos livros de desenvolvimento de aplicações com a linguagem de programação PHP. Membro fundador e líder do capítulo português do OWASP (Open Web Applications Security Project) até 2018, colaborando na divulgação, organização de eventos e em alguns projectos da organização. Membro fundador da Associação Portuguesa para a Promoção da Segurança de Informação (AP2SI). Empreendedor em startups na área de SI/TI.

Links: http://ciencia.iscte-iul.pt/cjcs; https://scholar.google.com/citations?user=t7RB_30AAAAJ; http://orcid.org/0000-0002-4847-2432; http://www.researcherid.com/rid/A-3115-2011

3. João Guerreiro (Doutoramento)

Nasceu em Lisboa em 1976. Mestre em Sistemas de Apoio à Decisão e Doutoramento em Marketing (ISCTE-IUL) é professor Auxiliar no ISCTE-IUL, onde leciona disciplinas de Marketing e Ciência de Dados Aplicadas ao Marketing. É Diretor do Mestrado em Marketing do ISCTE-IUL. É investigador do ISTAR-IUL e BRU-IUL, sendo os seus interesses de investigação na área do comportamento do consumidor, marketing digital, neuromarketing e as implicações da inteligência artificial para o Marketing. Publicou em *journals* científicos revistos por pares tais como Tourism Management, Journal of Business Research, Journal of Retailing and Consumer Services, Journal of Business Ethics, European Journal of Marketing tendo ganho recentemente o 2019 Best Paper Award na conferência GAMMA - Global Fashion Management Conference.

Links: https://ciencia.iscte-iul.pt/authors/joao-ricardo-paulo-marques-guerreiro/cv
https://scholar.google.pt/citations?user=eU1wqEgAAAAJ&hl=pt-PT
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4. Nuno Garrido (Doutoramento)

Nasceu em Lisboa em 1971. Licenciado em Engenharia Eletrotécnica, ramo de Sistemas e Computadores, pelo Instituto Superior Técnico (IST) em 1994. Doutoramento em Ciências e Tecnologias da Informação, no Instituto Superior de Ciências do Trabalho e da Empresa -Instituto Universitário de Lisboa (ISCTE-IUL) no Departamento de Ciências e Tecnologias de Informação. Desde 2015 é professor auxiliar no ISCTE-IUL onde lecciona unidades curriculares nas áreas disciplinares de programação e electrónica. É investigador do Instituto de Telecomunicações (IT) em Lisboa desde 1996, actualmente no grupo de sistema de rádio. Entre 2000 e 2001 trabalhou na Chipidea (Portugal) em projectos de circuito integrado na área de filtros e RF. Os seus tópicos de investigação incluem circuitos integrados, filtros analógicos, micro-electrónica, sistemas IOT e smart cities.

Links: https://ciencia.iscte-iul.pt/nmfg;
https://scholar.google.pt/citations?hl=pt-PT&user=0B3tQQcAAAAJ;
https://orcid.org/0000-0001-7404-6923; http://www.researcherid.com/rid/G-1124-2011

5. Luisa Domingues (Doutoramento)
Nasceu em 1974. Licenciado em Informática e Gestão de Empresas, pelo Instituto Superior de Ciências do trabalho e da Empresa (ISCTE) em 1997. Doutoramento em

Ciências e Tecnologias da Informação, no Instituto Superior de Ciências do Trabalho e da Empresa -Instituto Universitário de Lisboa (ISCTE-IUL) no Departamento de Ciências e Tecnologias de Informação. Desde 2013 é professora auxiliar no ISCTE-IUL onde lecciona unidades curriculares nas áreas disciplinares de gestão de projetos e de conceção de sistemas de informação. É investigadora do ISTAR-IUL no grupo de investigação de Information Systems (IS) com trabalhos realizados em cooperação com entidades externas (GeRAP, IGFEJ, entre outras). Os seus tópicos de interesse incidem sobre as áreas de modelos de negócio (IoT, Blockchain,..), gestão de projetos, conceção de sistemas de informação e e-government.
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6. Sílvia Luís (Doutoramento)

Sílvia Luís concluiu o doutoramento em Psicologia Social em 2011, pela Universidade de Lisboa, Faculdade de Psicologia. É professora auxiliar convidada no ISCTE-IUL e na Universidade do Algarve, e investigadora integrada no Centro de Investigação e de Intervenção Social (CIS), ISCTE-IUL. Os seus interesses de investigação centram-se na forma como variáveis psicossociais (por exemplo, percepção de risco, identidade) moldam a interacção pessoa-ambiente, e nas implicações desta interacção (por exemplo, aceitação de tecnologias). Sílvia Luís coordena linha temática transversal SCOPE CIS-IUL: comunidades, organizações e lugares sustentáveis, é Presidente do Capítulo Ibérico da Sociedade Europeia de Análise de Riscos (2018-2023) e membro suplente da Especialidade de Psicologia do Trabalho, Social e Organizacional da Ordem dos Psicólogos Portugueses (OPP; 2016-2020). Em 2016 Sílvia Luís foi reconhecida como especialista em Psicologia do Trabalho, Social e das Organizações e em Psicologia Comunitária (.

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https://orcid.org/0000-0002-2631-998X

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Annex E – Focus Group's PPT

LET'S START!

PAGE 03

MARIANTONIETTA RENDA — ISCTE BUSINESS SCHOOL

PLEASE, PRESENT YOURSELF.

PAGE 04

MARIANTONIETTA RENDA — ISCTE BUSINESS SCHOOL

8 MINS

QUESTION 1.

WHEN YOU READ ABOUT THIS PROJECT OF INTRODUCING DISTANCE PROXIMITY TECHNOLOGY IN THE HEALTHCARE BUILDINGS, DID YOU THINK THAT IT COULD WORK OR NOT? WHAT WAS YOUR **FIRST REACTION** AND WHY?

PAGE 05

ISCTE BUSINESS SCHOOL — MARIANTONIETTA RENDA

5 MINS

QUESTION 2.

WHAT **PROBLEMS** COULD THE START-UP'S DISTANCE TECHNOLOGY SERVICE/PRODUCT SOLVE IN THE HEALTHCARE SECTOR? WHAT **NEEDS** COULD FULFILL?

PAGE 06

ISCTE BUSINESS SCHOOL — MARIANTONIETTA RENDA

5 MINS

QUESTION 3.

WHAT SHOULD BE IN YOUR OPINION THE FIRST **AREA** TO FOCUS ON AND WHY? FOR EXAMPLE:

PAGE 07

MARIANTONIETTA RENDA — ISCTE BUSINESS SCHOOL

8 MINS

QUESTION 4.

in your experience/opinion, how COULD the start-up reach its customers? which **channel** is the most efficient in terms of introducing new ai technology in the healthcare sector? THROUGH WHICH **RELATIONSHIP**?

PAGE 08

MARIANTONIETTA RENDA — ISCTE BUSINESS SCHOOL

5 MINS

QUESTION 5.

IN YOUR EXPERIECE/OPINION, WHAT **PRICING MODEL** DO YOU THINK WILL WORK FOR THE START-UP?

Fixed Pricing
- Subscriptions fees
- Individual beacon purchase (asset sale)
- Pay-Per-View

Dynamic pricing
- Negotiated deals.

8 MINS

QUESTION 6.

Lots of ASSOCIATIONS AND COMPANIES are willing to help out start-ups. dO YOU HAVE IN MIND ANY **ASSOCIATION** THAT COULD BE INTERESTED IN THIS PROJECT? OR ANY **PARTNER** THAT COULD BE INTERESTED IN COLLABORATING?

Key Partners

Optimization and economy Reduction of risk and uncertainty Acquisition of particular resources and activities

- *Audax_ISCTE*
- *ISCTE*
- *Minew*
- *Key Account Managers*
- *Siemens*
- *Dynamo*

Annexes F – Focus Group's complete answers

Re: Link Focus Group | 12th of May @8PM (Italian Time)

GIAMPAOLO VIGLIA <g.viglia@univda.it>
mer 12/05/2021 19:45
A: Mariantonietta Renda <Mariantonietta_Renda@iscte-iul.pt>

Here you go Mariantonietta!

1. Did you think this project of integrating distance proximity technology in healthcare facilities for customer service will work or not when you first read about it?
   What was your first reaction and why?

My first reaction is positive. Integrating technology in presence and remotely is the future and there are companies like Teladoc that are trying to capitalize on the value of distance technology in Healthcare

1.
2. What problems do you think this Distance Technology service and product could solve in the healthcare industry, both from a patient and administrative standpoint?
   What needs could fulfill?

It can streamline processes, reducing waiting times. My only concern is a possible initial consumer skepticism that will be eventually overcome

3. Which area(s) do you think the start-up should prioritize first, given the challenges it might face? E.g. Data Storage and GDPR, Public Opinion, Healthcare network connections, Data Management Expertise.

They should start from the patient (customer) experience, making the consumer journey less stressful and less complicated as possible

4. In your experience/opinion, how could the start-up reach out its customers?
   In terms of incorporating new AI technology into the healthcare sector, which channel is the most effective?
   Through which relationship(s)?You may want to think about the suggestions in the Business Model Canvas (attachment) as well ("Focus Group").

Presented by physicians to reduce the initial skepticism

5. What pricing model do you think would fit for the startup, based on your experience/opinion? You might want to consider also the suggestions given in the Business Model Canvas in attachment ("Focus Group").

A dynamic pricing model to manage peak times

5.
6. Some associations and companies are willing to help out start-ups. Do you have in mind any association that could be interested in this project? Or any partner which could be interested in collaborating?

Unfortunately is not my area and I do not have specific connections here

6.
7. Do you have any suggestion or consideration about the project you would like to share?

Again, the need to start from the consumer. Sometimes processes become complicated (because of the need to respect data privacy with several layers of passwords etc.). It is important to keep it easy

Giuseppe Maria Gallo <pinuz95@hotmail.it>
dom 16/05/2021 16:45
A: Mariantonietta Renda <Mariantonietta_Renda@iscte-iul.pt>

1. Did you think this project of integrating distance proximity technology in healthcare facilities for customer service will work or not when you first read about it?
What was your first reaction and why?

I had mixed feelings. On the one hand, I think such a system would be beneficial for customers and would improve their experience. But, on the other hand, if I run a healthcare business, I wouldn't immediately see added value in using beacons, since cheaper and effective solutions already exist. The challenge is to find an application for this technology that can't be replaced by existing technologies. At a first sight, I find it more value-adding for retails, as beacons can be used to analyze customers behavior and optimize a store accordingly.

2. What problems do you think this Distance Technology service and product could solve in the healthcare industry, both from a patient and administrative standpoint?
What needs could fulfill?

The goal should be to solve problems that haven't more straightforward solutions.
For example, one of such problems could be the optimization of queues: existing systems allow you to book an appointment online and possibly let you know, through an app, how many people are in front of you and what is the estimated waiting time. But such systems aren't very flexible. A distance technology can be used to optimize the waiting time and adapt the scheduled appointments to the arrival time of customers, thanks to the automatic detection of an arrival. Moreover, it would allow a customer to have an appointment without booking, depending on the current status of the queue, the expected number of people that will arrive, and the expected duration of each appointment.

3. Which area(s) do you think the start-up should prioritize first, given the challenges it might face? E.g. Data Storage and GDPR, Public Opinion, Healthcare network connections, Data Management Expertise.

I'd probably prioritize healthcare network connections to fast prototype and test the first proof of concept in a small number of healthcare facilities.

4. In your experience/opinion, how could the start-up reach out its customers?
In terms of incorporating new AI technology into the healthcare sector, which channel is the most effective?
Through which relationship(s)?You may want to think about the suggestions in the Business Model Canvas (attachment) as well ("Focus Group").

I think that the best approach is to try to directly reach out to managers working in the healthcare business through any possible channel (email, social networks, physical meetings).

5. What pricing model do you think would fit for the startup, based on your experience/opinion? You might want to consider also the suggestions given in the

Business Model Canvas in attachment ("Focus Group").

I would adopt a subscription model with different tiers that adapt to the size of the business.

6. Some associations and companies are willing to help out start-ups. Do you have in mind any association that could be interested in this project? Or any partner which could be interested in collaborating?

Unfortunately, I don't know many associations or companies that invest in startups. The only company that I know that could be interested in the project is Centro Medico Santagostino, which was involved in the first stages of the creation of the Italian contact-tracing app, and seems to be innovative enough to support such a project.

7. Do you have any suggestion or consideration about the project you would like to share?

If I found such a startup, I'd start with local retails as it would be easier (but not trivial) to find customers and generate value for them. I would expand to the Healthcare sector only at a later stage, as an explorative project. This would reduce the risk of failure, and the acquired knowledge in the industry would improve the chances to succeed.

RE: Link Focus Group | 12th of May @7PM (Lisbon Time)

Costa, Rui (GE Healthcare) <Rui.Costa@ge.com>
mar 18/05/2021 11:34
A: Mariantonietta Renda <Mariantonietta_Renda@iscte-iul.pt>

Dear Mariantonietta,

Please find below my answers & comments on the questions asked (my apologies for not having it sent before). Feel free to call me in case you need to.

Once you have the project a bit more mature, me and two friends, all highly experienced in business, are looking for business ventures to support financially and help managing. If this makes sense to you, maybe you could make a project presentation to us. What do you think?

Best regards,

Rui Costa
General Manager Portugal
GE Healthcare

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General Electric Healthcare Portugal, Sociedade Unipessoal, Lda

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From: Mariantonietta Renda <Mariantonietta_Renda@iscte-iul.pt>
Sent: Wednesday, May 12, 2021 19:27
To: Costa, Rui (GE Healthcare) <Rui.Costa@ge.com>
Subject: EXT: R: Link Focus Group | 12th of May @7PM (Lisbon Time)

Dear Mr. Costa,

Thank you for your availability ☺.

This is a different approach to the research, but still it still worthwhile, and it would be great if you could answer to the following questions below by Sunday 16th,so that I can put the points of view and come back to you if necessary.

Here the questions:

1. Did you think this project of integrating distance proximity technology in healthcare facilities for customer service will work or not when you first read about it?
   What was your first reaction and why?

[RC]: My first reaction was trying to understand the concept and the value it brings for the healthcare facility and for the patient/user. This is a must to try to understand who would be willing to pay for it. When thinking of the patient finding it's way in a hospital or healthcare facility, it is a bit strange to think that people prefer looking to the phone instead of asking to the several personnel where to go. On the other hand, when thinking of understanding if there is a queue and whom much time the patient will have to wait before being receive by the health provider, it opens a whole lot of interesting opportunities. Also the planning for several tasks in the hospital can benefit (doing imaging diagnostics exams, lab exams, admin tasks, etc.). So, overall, my first reactions was curiosity and trying to understand the benefits it may bring to several stakeholders.

2. What problems do you think this Distance Technology service and product could solve in the healthcare industry, both from a patient and administrative standpoint?
   What needs could fulfill?

[RC]: In line with what was mentioned before, a "GPS-type" of orientation in a big hospital facility can help. Nevertheless, I do not believe it is the main benefit. Probably, the main benefit is time management, info on waiting times/queues, possibility to plan multiple tasks according with real time data, and also to help cross-selling in the hospital – for instance, if the waiting time is long, the patient can go to the bar and get promotions on menus from the bar; the patient can go to the hospital pharmacy because he/she gets info on the location + articles the pharmacy is offering that may be of interest. Other important info may be given, like the location of ATM machines, rescheduling of exams, etc.

3. Which area(s) do you think the start-up should prioritize first, given the challenges it might face? E.g. Data Storage and GDPR, Public Opinion, Healthcare network connections, Data Management Expertise.

[RC]: Clearly the business case: who should pay for this, how much, how the start-up plans to acquire customers, their cost of acquisition, amongst other. Data storage and GDPR are a must to address; Data Management expertise is a requirement for the

system to work, healthcare network connections may be a bottleneck if not addresses the right way (how will the system gather rea-time data, process data and make info available in the app) – I would also prioritize this.

4. In your experience/opinion, how could the start-up reach out its customers?
   In terms of incorporating new AI technology into the healthcare sector, which channel is the most effective? Through which relationship(s)?You may want to think about the suggestions in the Business Model Canvas (attachment) as well ("Focus Group").

[RC]: First of all, the start-up's customers need to be very well defined: who will pay for what, what are the target customers, the value offer needs a clear definition. I believe the hospitals/hospital groups may be primary customers, so the offer value for them has to be very clear. New AI technology may be incorporated via algorithms that bring benefits to users and either increase operational efficiency, reduce costs, add info that was unavailable or was available only at later stages, adds KPIs and changes behaviors in the right way. Devices, together with training on device users, is normally an effective channel. It may be beneficial to find a partner (potential customer/hospital group) that is willing to have a proof-of-concept implemented in small scale. This would allow the start-up to implement, learn, adjust and scale-up!

5. What pricing model do you think would fit for the startup, based on your experience/opinion? You might want to consider also the suggestions given in the Business Model Canvas in attachment ("Focus Group").

[RC]: Maybe a mixed model based on fixed cost (to cover assets and main implementation & development tasks) and variable cost based on usage. In the case of cross-selling activities (like the mentioned for the bar, canteen, pharmacy, etc), these services might pay a subscription fee based on the assets advertised or users that assessed their facilities (or views for their area of the app). Once again I highlight the need to have a clear value proposition for the payers.

6. Some associations and companies are willing to help out start-ups. Do you have in mind any association that could be interested in this project? Or any partner which could be interested in collaborating?

[RC]: There are several ways to get help, normally through business angels, venture capital firms, etc. Regarding associations and companies to collaborate, I'm not aware.

7. Do you have any suggestion or consideration about the project you would like to share?

[RC]: First of all, my congratulations on the project. The idea seems a very good one, I'm thinking on the possibility (and benefit) of having such system on touristic attractions, museums, etc. I wish you all the best and I'm available for going deeper in the product and business model.

Answers from the teleconference with Henrique Martins on 18/05/2021 20:00

1. Even though I believe it can work, I think there are limitations too in investing in an industry like a hospital and tracking people movements. There have been different similar technologies like RFID, Ecodes, tagging on doors to detect the movement of people around the building. Most of them has failed because the cost of maintaining is very high, so I think the set up costs might be very high and I don't think people perceive significant value, at least not enough to justify the that entrance costs. I think that's my first reaction and the second one is that not all patients have mobile phones - the question is whether the patient location, whether you can track the location phones, regarding the protection issues. Say I am going to a psychiatric appointment, and the system is recording that, the hospital already know I went to the psychiatric but this data cannot go outside the hospital data. So anonymization issues and data protection issues need to be carefully cracked, that you are sure you are not bringing any illegal issues. And I think people act very conscious to anything that has to do with recording movements, especially in Portugal after the Stayaway Covid App, which was a big failure and I don't think people would like the idea of someone recording their location from the phones, so it is a big spot and needs smartly communicated.

2. I think there is a need, definitely, especially in big hospitals people get lost or sometimes they don't know where to go and of course you can't use in GPS systems since it's not detailed enough so if the system is able to allow me to know where I need to go in the hospital, works like a guiding tool then I think it is how to find the need. Because if it is just gathering data from me but it's not giving anything back to the patients, I think it does solve some management issues regarding location and so on, hospitals don't traditionally care that much if a room is a little bit better or worse, maybe private hospitals would. You know, people hang around the hospital, they see if something needs repair or not, so I don't think that need might be significantly improved with this kind of technology. But location of patients and allowing patients to navigate, especially live facilities, I think it is a need that already exists.

3. I think they need to be very careful with the data stored and what data about the patient they actually store. This needs to be carefully meditated, even presenting the project to hospitals it must be carefully communicated.

4. They'd need to speak to the board because this type of technologies involves different hierarchy – patients' managers (who are responsible for organising, booking, scheduling), facility managers (as IT representatives).

5. Honestly, I don't know. I know that for Public Hospitals the contract has to be also a public one, I think, and you have to have a fixed price amount. They have to be able to establish a price and charging every year, for example. Because when I launch a tender I need to put a fixed price on it. I can't just put a price depending on how many patients go around for example. That type of billing them doesn't exist on Public Hospitals. Private Hospitals are different and financial arrangement can be drafted but in terms of payment it might be an issue for public hospitals. I would say that perhaps to go with areas – if you, for example, go with emergency room it would have a price. If you cover the patients' appointment area, then it would be a different price. So I would maybe isolate components of the hospital.

6. I think they really can approach the Portuguese hospitals administration association as they are interested in technology in general so they might be interested to know about it and maybe in one of their meetings. Before Covid they used to have meetings with hospital administrators where vendors could make their presentation in terms of product, as stands and finance the meeting (I don't believe they charged that much for start-up companies), so I believe this would be definitely one way to go.

7. I think they need to be very aware of what value is there for the patient and make sure that I can get value even without people knowing who I am. Sometimes this type of project goes into many details, like knowing this person, you can immediately check in, write on the record – but the problem is that all of those services require authentication and identification, and sometimes people don't like to be identified. But still they have a need for intra-building guidance. So if you accept that they might be "mystery client" so you may not know who they are but you can still deliver services to an unknown client, then I think it is more likely that this can be useful, otherwise I think people will be very afraid that the system could sort of control where they are going to.

Annex G – Project documentation for the Focus Group

Focus Group – 12th of May, 19:00 (Lisbon Time)

The discussion and questions will be based on the research having the objective of creating a Distance Proximity Technology Business Model to enter the B2B Healthcare Management market, first in Portugal and then in Europe.

In this regard, the project worked within the start-up Expand Reality resulted in a Beacons-based product and the associated **Data Management Platform** in support for Customer Service, Administrative and Building Healthcare Management.

Specifically:

- Customer Service Management

The support to the Healthcare industry' own patients entails a merge between the digital and physical worlds, where distance technology enables the final costumer to get informed about real-time location in the same building where they are, simply navigating through their phone through accessing to a QR code (e.g. where is exactly my appointment? How many people are in line before me? Where do I need to go to check-in? ...).

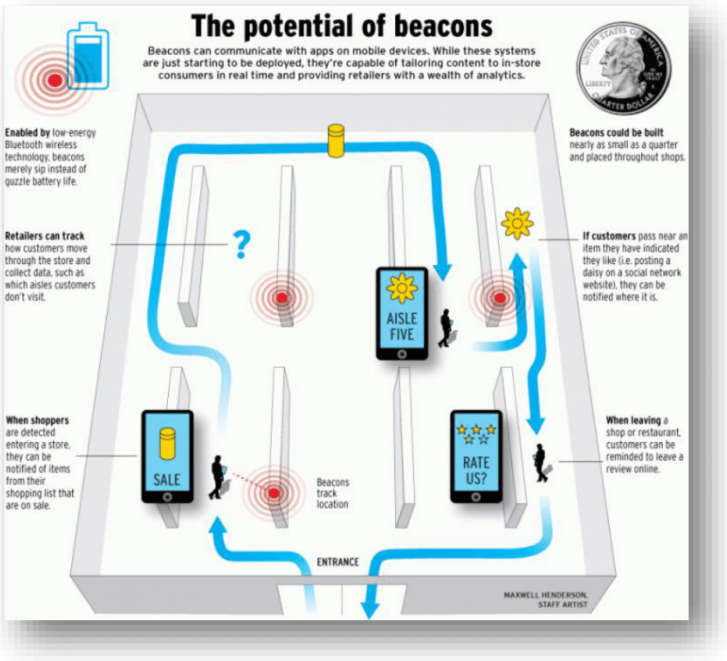

Figure 1 - https://neilpatel.com/blog/marketers-guide-beacon-technology-will-impact-business/

- Administrative Management

The start-up would help for different administrative purposes, specially through the platform:

1) Providing customers with an up-to-date support with AI solutions aimed at customer service. The advantage will be to provide skilled individuals with experience and know-how in AI strategy and control to lead such types of investments as technology evolve, patterns change, and final customers' needs change.
2) Competitiveness' network knowledge, as the start-up will operate in the sector rather than with a single partner, and centralizing data-based collection resources for management purposes and customers' orientation (e.g. through reports uploaded in the start-up platform).

- Building Management
  1) Supporting building and facilities changes' needs thanks to the track of the movements and study of space, real-time complains related to the building.

In this sense, with previously studying environment inputs, technology potential, start-up's will and the pandemic environment we are living in, the study and the consideration of all these factors helped me shaping the following first approach, that will be the centre of discussion during the Focus Group:

	Designed for:	*Designed by:*	*Date:*	*Version:*
Business Model Canvas	Expand Reality	Mariantonietta Renda	28/03/21	1

Key Partners

Optimization and economy Reduction of risk and uncertainty Acquisition of particular resources and activities

- *Audax_ISCTE*
- *ISCTE*
- *Minew*
- *Key Account Managers*
- *Siemens Dynamo*
- *Bending Spoons*

Key Activities

Problem - Solving and Platform/Network

- DPT Maintenance
- Platform Maintenance
- Data Maintenance
- R&D

Key Resources

Intellectual – Human Technology – Data

- Experts
- Network
- Know-how
- Partnerships

Value Propositions

Newness – Get the job done – Cost Reduction

B2B

- Help business keep up with the new customer habits' changes.
- Centralized Data Management
- DPT and AI Management

Customer Relationships

- Dedicated Personal Assistance.
- Co-creation
- Self-service

Channels

- PR (e-PR).
- Platform
- Website
- Media Placements (SEM)
- Key Account Managers

Customer Segments

Niche and Segmented markets

1st stage: Healthcare Sector

2nd stage: Local Retailers

Cost Structure Value-Driven

Fixed costs
- Salaries
- Software and Internet costs
- Encryption and decryption systems' costs
- DRM

Variable costs
- Content creation
- Adv fees (sponsorships...)
- Supplier Costs (Beacons)

Revenue Streams

Fixed Pricing
- Subscriptions fees
- Individual beacons purchase (asset sale)
- Pay-Per-View

Dynamic pricing
- Negotiated deals.

Designed by: The Business Model Foundry (www.businessmodelgeneration.com/canvas). Word implementation by: Neos Chronos Limited (https://neoschronos.com).

Period / Focus	2022	After ½ ROI	2025	2026 ...
Target Sector/s	Healthcare Sector	Healthcare Sector Local Retails	Healthcare Sector Local Retails	...
Internal Expertise	Marketing Software Anonymous Data Collection	Marketing Software Anonymous Data Collection	Marketing Software Master Data (Social Resp.)	...
Outsourced Expertise	Beacons Cloud Architecture App design	Beacons Cloud Architecture App design	Beacons Cloud Architecture App design	...
R&D	Data Protection research KPI over the Business Model	Data Protection research KPI over the Business Model	Business Model Revision	...
Service/Product	Centralized platform of digital proximity services	Centralized platform of digital proximity services	Centralized platform Data as source of management knowledge	...
Where	Online in Portugal	Online in Portugal	Online in EU : Portugal Germany, Italy, Finland, France, Spain, Poland, Ireland[12])	...

09/05/2021, Lisbon

Mariantonietta Ronda