COMILLAS

UNIVERSIDAD PONTIFICIA

ICAI

Master in Industrial Engineering

Master's final project

DESIGN AND VALIDATION OF A BUSINESS MODEL BASED ON AN AUTOMATIZED SYSTEM OF CORPORATE VALUATION.

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Supervised by

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Madrid

May 2020

Declaro, bajo mi responsabilidad, que el Proyecto presentado con el título

DESIGN AND VALIDATION OF A BUSINESS MODEL BASED ON AN AUTOMATIZED SYSTEM OF CORPORATE VALUATION

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Abstract

This project builds the foundations of a startup that revolutionize how corporate valuations are made, from a manual way to an automatized process through machine learning. Through the Lean Startup methodology, to be closer to the final customer expectations and reduce the risk of failure, many experiences must be run and iterated with feedback from potential customers of both targeted segments– business owners and professional investors – to create a first operational business model canvas. The discovery of the industry through interviews as well as the analysis of the market and the macro-economic environment allow the elaboration of a Minimum Viable Product from which the startup could begin its operations. For now, until further research and development are made through funding, the service is a mechanical Turk which provides handmade valuations through discounted cash flows and multiples methods, but with time, the search for comparable companies and the financial forecasts will be the result of AI analyzing from private databases the behavior of a company. An example of the MVP is provided within the report, explaining step by step the content of the service provided by the startup.

Summary of the Project

Design and validation of a business model based on an automatized system of corporate valuation.

Introduction

Following the principles of the Lean Startup methodology, this projects aims to bring a new service in the sector of corporate valuation by creating a startup able to provide automatized valuations, without having any human participation in the report elaboration. In order to do so, some machine learning algorithms must be implemented, but this is not part of this project. This project is to determine a business model through many experiments, like creating a Business Model Canvas by making interviews with potential customers, analyzing the market and the economic environment and creating a minimum viable product that could allow to launch a business immediately, and upgrading it as time goes by.

The Business Model Canvas

Two potential customer segments were identified: business owners and professional investors. The idea is then to speak directly with some of the potential customers to have some feedback directly and be closer to the market from day one. Six interviews were made from accountants, Private Equities, CEOs... The expression of their needs and what they think could be changed or added to the existing services on the market can allow to precise what the new service could look like. Then, in a second time, another interview is made to confirm or modify the service from the startup. The process is iterative, as long as new modifications can be made easily to be presented to customers to have more feedback, the interviews go on. The Business Model Canvas built during this project is presented on Figure 3.

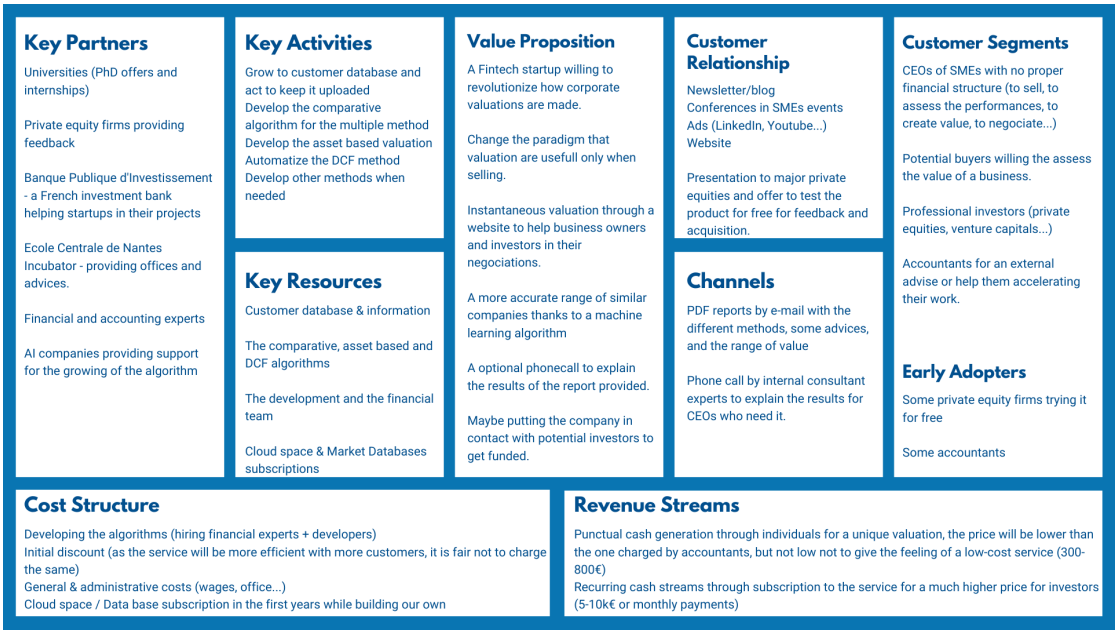

Figure 1: Business Model Canvas

Analysis of the industry

In order to create itself a place among this market of corporate valuation, an other experiment of the Lean Startup methodology consists in looking the environment in which it could evolve to be more adapted and to answer to a need at the right point in time. A Five Forces analysis by Porter allows to discover that the threat form competition, the barrier to new entrants and, to some extent, the bargaining power from customers is high. However, the service is a substitute to what's existing now, which confers to it a competitive advantage. One last point to notice is that, as they are no suppliers, they can exercise no bargaining power. The market analysis reveals that only a very few amount of business owners have an idea of how much there business is worth, while most of them acknowledge the value it can bring to their decision making. An quick market estimation proves the market can be viable, as there are more than four million companies just in France, and targeting only 0,1% with an average price of 500€ would make more than 2 million €in revenues. The service would create some switching costs that would bound the customers to the service, as they would want either to trust reliable data they've already used in the past, or they don't want to share some confidential data on every service available. Concerning trends, IA and machine learning are getting more and more attention, and more qualified workforce is then available to be hired and provide algorithms that would build a sustainable competitive advantage. Last point, the post-Covid-19 crisis has created a context

where professional investors has tremendous amounts of liquidities to invest, but may not be aware of which companies to invest on, and a service that could help having a quick overview of the value of a business could really create value. A summary of this is given on Figure 4.

Figure 2: SWOT analysis of the industry

Creation of a Minimum Viable Product

The creation of an Minimum Viable Product (MVP) helps launching a business at its earliest stages to discover as soon as possible the customer, while upgrading the existing service little by little. The MVP is here a sample report, which would give an estimation of the value of a given company - in this case, Suez - through two methods: the multiples and the Discounted Cash Flow, which are by far the two most used in the business. This MVP is a mechanical Turk, which means that it has been made manually, when in the long run, the algorithms will be able to produce it from an automatized way, with a better accuracy as it will benefit from many comparable situation to build its estimations.

Next steps and Conclusion

The service would now need to have the algorithms created, and for that to have a first round of funding to hire data analysts and programmers. New methods to extract the value of a business can be added, as well as a better comparison of a company with its industry. First drafts of the economic viability tends to indicate the startup could earn profits in a 5-year horizon.

Diseño y validación de un modelo de negocio basado en un sistema automatizado de valoración de empresas.

Introducción

Siguiendo los principios de la metodología Lean Startup, este proyecto pretende aportar un nuevo servicio en el sector de la valoración de empresas mediante la creación de una startup capaz de proporcionar valoraciones automatizadas, sin tener ninguna participación humana en la elaboración del informe. Para ello, es necesario implementar algunos algoritmos de machine learning, pero esto no forma parte de este proyecto. Este proyecto consiste en determinar un modelo de negocio a través de muchos experimentos, como la creación de un Business Model Canvas realizando entrevistas con clientes potenciales, analizando el mercado y el entorno económico y creando un producto mínimo viable que permita lanzar un negocio de forma inmediata, y actualizándolo con el paso del tiempo.

El Business Model Canvas

Se identificaron dos segmentos de clientes potenciales: propietarios de empresas e inversores profesionales. La idea es entonces hablar directamente con algunos de los clientes potenciales para tener un feedback directo y estar más cerca del mercado desde el primer día. Se realizaron seis entrevistas a contables, inversores privados, directores generales... La expresión de sus necesidades y de lo que creen que podría cambiarse o añadirse a los servicios existentes en el mercado puede permitir precisar cómo podría ser el nuevo servicio. Luego, en un segundo momento, se realiza otra entrevista para confirmar o modificar el servicio desde la startup. El proceso es iterativo, mientras se puedan hacer nuevas modificaciones fácilmente para presentarlas a los clientes y tener más feedback, las entrevistas continúan. El lienzo del modelo de negocio construido durante este proyecto se presenta en la Figura 3.

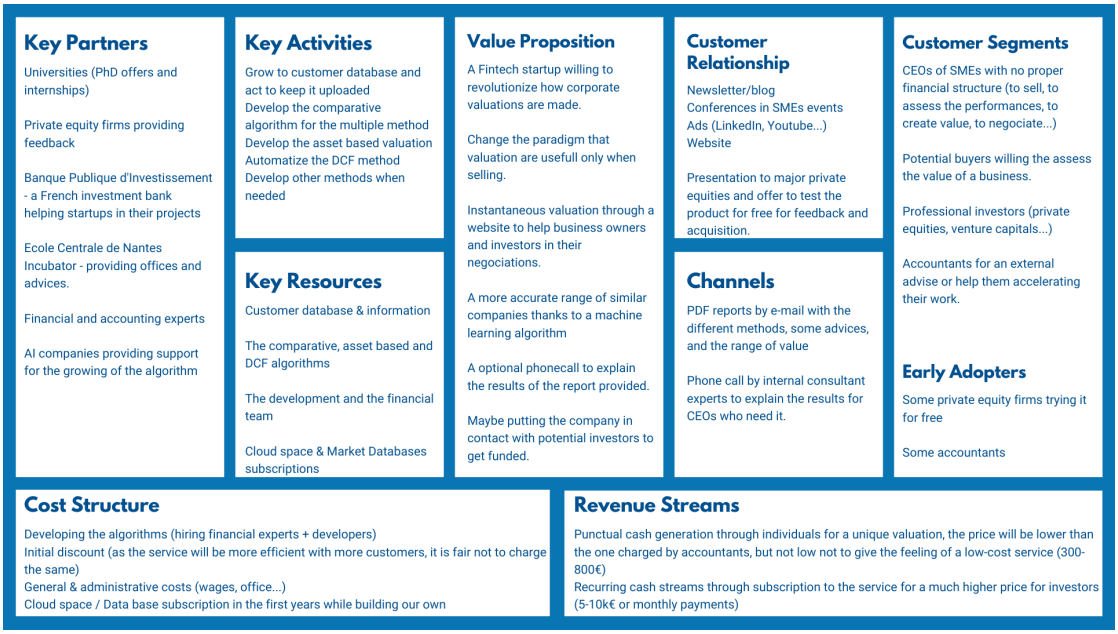

Figure 3: Business Model Canvas

Análisis de la industria

Para hacerse un hueco en este mercado de valoración empresarial, otro experimento de la metodología Lean Startup consiste en buscar el entorno en el que podría evolucionar para adaptarse mejor y responder a una necesidad en el momento oportuno. Un análisis de las Cinco Fuerzas de Porter permite descubrir que la amenaza de la competencia, la barrera a los nuevos entrantes y, en cierta medida, el poder de negociación de los clientes es elevado. Sin embargo, el servicio es un sustituto de lo que ya existe, lo que le confiere una ventaja competitiva. Un último punto a destacar es que, al no ser proveedores, no pueden ejercer ningún poder de negociación. El análisis del mercado revela que sólo un número muy reducido de empresarios tiene idea de cuánto vale su negocio, mientras que la mayoría reconoce el valor que puede aportar a su toma de decisiones. Una rápida estimación del mercado demuestra que éste puede ser viable, ya que sólo en Francia hay más de cuatro millones de empresas, y dirigiéndose sólo al 0,1% con un precio medio de 500€ se obtendrían más de 2 millones de en ingresos. El servicio crearía algunos costes de cambio que vincularían a los clientes al servicio, ya que querrían o bien confiar en datos fiables que ya han utilizado en el pasado, o bien no quieren compartir algunos datos confidenciales en cada servicio disponible. En lo que respecta a las tendencias, la IA y el aprendizaje automático están recibiendo cada vez más atención, por lo que hay más mano de obra cualificada disponible para ser contratada y proporcionar algoritmos que construyan una ventaja competitiva

sostenible. Por último, la crisis posterior a la crisis de 19 años ha creado un contexto en el que los inversores profesionales disponen de enormes cantidades de liquidez para invertir, pero pueden no ser conscientes de en qué empresas invertir, y un servicio que pudiera ayudar a tener una visión general rápida del valor de una empresa podría realmente crear valor. Un resumen de esto se da en la Figura 4.

Figure 4: Análisis SWOT de la industría

Creación de un producto mínimo viable

La creación de un Producto Mínimo Viable (PMV) ayuda a lanzar una empresa en sus primeras etapas para descubrir cuanto antes al cliente, al tiempo que se mejora el servicio existente poco a poco. El PMV es aquí un informe de muestra, que daría una estimación del valor de una empresa determinada -en este caso, Suez- a través de dos métodos: los múltiplos y el Flujo de Caja Descontado, que son con mucho los dos más utilizados en el negocio. Este PMV es un Turk mecánico, lo que significa que se ha realizado de forma manual, cuando a la larga, los algoritmos

podrán producirlo de forma automatizada, con una mayor precisión ya que se beneficiará de muchas situaciones comparables para construir sus estimaciones.

Próximos pasos y conclusión

El servicio necesitaría ahora tener los algoritmos creados, y para ello contar con una primera ronda de financiación para contratar analistas de datos y programadores. Se pueden añadir nuevos métodos para extraer el valor de un negocio, así como una mejor comparación de una empresa con su sector. Los primeros borradores de la viabilidad económica suelen indicar que la startup podría obtener beneficios en un horizonte de 5 años.

Acknowledgments

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Chapter 1

Introduction

1.1 Motivation

Knowing the value of your business is key to unveil its strengths and weaknesses. It is a necessary process for a negotiation when trying to sell the company or to buy another one, to raise capital, whether for an Initial Public Offering (IPO) or through professional investors such as Venture Capital (VC) or Private Equities (PE), or to contract debt, to deal with business partners or to cut costs... Nevertheless, very few business owners know the value of their own company. In the USA, a survey by IbisWorld from 2014 shown that 98% of them are in this case. The number in Europe is not known, but it is highly likely that the results are similar.

More than ever, while the world is facing one of its major recession due to the Covid-19 crisis - the global GDP per capita was expected to decrease by 4,2% in 2020 -, and hundreds of millions of jobs will be lost in the next few years, providing an accurate, cheap, simple to understand and instantaneous automatized valuation could be a decisive tool for business management of SMEs with no proper financial human structure to take the right decision that could spare them from bankruptcy, treasury issues and maybe even creating jobs at a longer term.

1.2 State of the Art

Business valuations can be made by various actors for different levels of precision and very different costs.

- **Accountants**, as close financial advisers of business owners, are often the ones to whom a CEO turns to in order to make this operation. They assess the value of the business at a given time by knowing the book value of the

company. Nonetheless, this book value is no more than a picture of the past of the company, what it managed to create, but under no circumstances it can predict the future behavior of the business nor its true value. Other methods must be applied to have this view of the value of the company.

- **Financial consultants**, either from specialized firms - as Duff&Phelps or Houlihan Lokey - or generalists ones like the Big Four - Deloitte, PwC, KPMG and EY -, they provide a solid analysis of the industry as well as a precise range of value of the business, but their work is often very expensive, from a few to several tens of thousand dollars, generally in proportion to the size of the business assessed, and can take up to several weeks.

- **Professional investors** of different types, private equities, venture capitals, investment banks. Their valuation service is often made for free as their interest is elsewhere in the process, whether on commissions on the transaction, on an access to the equity and the board of directors...

- **Online valuation services** of different business models, goals and fees. Some are free and charges the customer when putting him or her in contact with advisers or investors, some provide a service similar to a financial consulting firm, but with no direct contact with the client, and some are making automatized valuations with different level of analysis depth, like the American *BizEquity*, launched in the USA a decade ago and that entered the UK market in 2015 or the French *Avalor* for instance, recently created in 2019 and specialized in helping business owners for their jubilees plan.

The use of IA and machine learning algorithms to assess businesses is being studied recently and still has not provided solutions that make unnecessary the work of professional of valuations. For now, the models are an independent opinion but can be wrong or inadequate. One can reasonably think that the models will grow stronger in the decade to come to reach this trustfulness. But it is certain that already for now, they have a tremendous interest as they allow a deep analysis in terms of comparable companies and of the industry, and can already give a general overview of an industry, its trends and some meaningful insights.

Concerning business valuation methods, they are a huge number existing, but only a few are really used and useful. The most common methods are the following:

- **Forecasted performance based methods**: the future expected incomes are discounted to take into account the time value of money. The most common method using this concept is the Discounted Cash Flow (DCF), widely used and accurate way to obtain the value of an activity from what it should generate in the years to come.

- **Market & Transaction comparable methods**: analyzing the valuation & ratios of comparable companies allow to draw parallels to assess the value of an activity. Also known as Multiples method, simple to apply and to understand, this way is often used by CEOs that possesses a deep knowledge of the industry they operate on to successfully get the value of their company.

- **Asset based methods**: as explained before, this method gives the value of the company based on its assets, but do not give an estimation of the value of the company based on what its future activity. It can nonetheless give data on the company such as the inventory and the fixed asset status that can be used for decision making, for cost or revenue synergies for instance.

1.3 Ambition of the Project

1.3.1 Objectives of the project

The purpose of this project is to propose a solution for corporate valuation through a startup designed for business owners and investors, fully automatized and available online. In order to build this startup, the Lean Startup methodology will be followed for the objectives. In order to do so, the three following objectives will be fulfilled:

- **Building a Business Model validated by potential customers using the Business Model Canvas**: In order to improve a theoretical business model, different interviews with professional of valuation and business owners will be made to confront it to the different issues one may have concerning valuation, to propose them a solution and to validate the business model. These phases will be iterated to keep improving the canvas until a satisfying level is reach, otherwise some pivots will be made to ensure the service answers to the potential customers' needs.

- **Determining the Strategic fit to adopt**: Thanks to a deep analysis of the industry, the market, the trends and the macroeconomics environments, the positioning of the startup will be made to put it in advantageously on a competitive field. [STR21]

- **Creating a model sample manually of the service provided by the startup**: In this phase will be created the Minimum Viable Product (MVP) from the customers' feedback to run some experiments on it to continue improving and testing the idea. This will allow to decide which valuation methodologies will be used for the report and to build an example for an

existing company. Methods like multiples or Discounted Cash Flow (DCF) will be implemented. This phase could also be used to design the visual identity of the brand.

1.3.2 Personal Motivation

As shown previously, I strongly believe there is a market opportunity on corporate valuation when focused on customer experience and reliability as the competition level is quite low on online automatized valuation for now, and as many business owners still use the services of accountants and professional of corporate valuation. It seems that this service could also be highly valuable for investors like private equities or investments funds, for whom it could represent a cheap confirmation of their own valuation, an external advice and a meaningful gain of time, combined with a recurring source of income for the startup.

As a personal first step in entrepreneurship, this project is a personal way to complete an academic formation after diverse former experiences of project management in consulting or operations for instance. Involving a corporate finance topic in this project is also a way to develop or apply some concepts studied in the past two years that I find particularly interesting as they offer a different point of view from the engineer one, more technical, often put on the foreground. Learning the methodology for business creation is also a main driver of the selection of this project in case I choose in the future to build something on my own.

1.4 Methodology: Lean Startup

Lean Startup is a methodology based on the 'Agile' concept for launching new products, services o innovative businesses in the market based on validated knowledge, scientific experiments and iteration with the market. Lean Startups may exist in every kind of companies such as Telecommunications (Telefónica), Industry (GE), Energetics (Repsol), Banking (BBVA) or Retail (Mercadona). It is based in the three following pillars:

- Business Design: Every idea (product or service) should be built on a business model. It is the only way to be sure it brings value to the customer and to the company. Some tools like Business Model Canvas or Value Proposition Canvas will be used to do so.

- Customer Development: Steve Blank and Bob Dorf developed a 4 blocks validation process named Customer Development to help building the business model. The blocks are the following:

  - Problem/solution: Customer Discovery
  - Product/market: Customer Validation
  - Growth: Customer Creation
  - Business model: Company Building

- Product Development: using agile methods like Scrum or Kanban, I will define a set of hypotheses (Product Backlog) about the Business Model that I will test through iterative experiments in cycles (sprints) to validate the business model or to proceed to pivots depending on the obtained results. [MIG13] [PEN16] [HBR19]

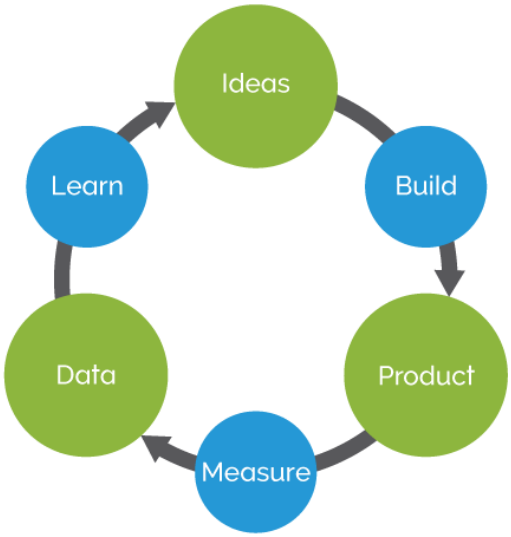


Figure 1.1: Illustration of the Lean Startup process

As shown on Figure 1.1, the process is iterative: from an idea, a simple product is created, and then thanks to data it is validated, improved or cast. The three steps to make between each step is to build, measure and learn, all the times close to potential customers not to waste time and benefit from immediate feedback.

1.5 Methodology: Corporate Valuation Methods

1.5.1 Multiples

The idea behind the valuation through multiples is to have a clear and immediate idea of how the market behaves to discover the value of a given company. But for this method to work, the list of companies that will serve as a reference should be chosen carefully. For the wholesale distribution, it would make no sense to compare Carrefour or Mercadona to Amazon Go for instance. But maybe Alcampo and Carrefour can be considered similar enough.

The challenge in this method is to be sure to compare what's comparable. For most companies, their are not that much companies similar. If an analyst manages to obtain ten of them that truly suits the targeted company's profile, then it is yet a satisfying result. Some databases offer data about a huge amount of companies and are used by professionals to quickly find the comparable companies with a key-word search on it. But the subscription to these bases is expensive, and most small structures can't afford them. And even then, a manual checking is required to determine the fit level.

Once the list of similar companies is obtained, by making the average of some of their financial ratios, one can obtain a good estimate of the value of a company of this sector. Most business owners uses this method, and even some professional investors tend to rely only on it in most cases. The financial ratios useful for a comparison are the following:

- EV/EBITDA or EBITDA multiple: The enterprise value (EV) of the firm is divided by its EBITDA, this way, with this ratio, by multiplying the EBITDA of the targeted company by the average ratio, one can obtain the EV of the company. By then subtracting the debt and adding the liquidities, that gives the equity value.

- PER or Price/Earning Ratio: for public companies, by dividing the price of a share by the earnings per share (EPS), then the theoretical value of the share is obtained and by multiplying by the total number of shares, that gives what should be the market cap and then the equity value.

Many other ratios can be quoted as the Dividend Yield, the PEG... but in reality, they are not used by no one, and even most of people use only the EBITDA multiple. [FER16]

1.5.2 Discounted Cash Flow

The purpose of the Discounted Cash Flow is to forecast the coming cash flows for the five next years, to discount them, and that give the value of the company for the given period. The discount rate is the Weighted Average Cost of Capital, that mean the weighted average of the required return ask by investors of both debt and equity.

$$WACC = k_e \frac{E}{E+D} + k_d(1-t)\frac{D}{E+D}$$

To have the value beyond this 5-year period, a terminal value should be estimated and then discounted. They are three ways to estimate this terminal value:

- The liquidation value: after the five years, considering that you end your activities, by selling every assets, you obtain a value of what you can get. This method should not be used in most cases as often, the company will continue its operations after the 5 years, and then it makes no sense to make this assumption.

- The multiple method: the use of this method in the DCF is paradoxical, because the purpose of the DCF is to get the intrinsic value of a company, when the multiples give the behavior of the market. But it can be used to have a quick idea of the terminal value of the firm.

- The constant growth model: this method is by far the most consistent and the most used, the value of the company after this 5-year horizon is given with the assumption that, as it is not possible to estimate the growth of the company for every year forever - even for the 4^{th} or the 5^{th} year it is yet a difficult exercise -, a constant growth g is chosen below the long-term growth rate of the economy to model the growth pattern of the company. The 5^{th} year free cash flow is then used according to the following formula to calculate the terminal value:

$$TerminalValue = \frac{FCF_5(1+r)}{r-g}$$

The enterprise value is then given by:

$$EnterpriseValue = \sum_{t=1}^{5} \frac{FCF_t}{(1+WACC)^t} + TerminalValue$$

From then, by subtracting the debt and adding the cash, you get the Equity Value. [FER08] [GAR20]

Chapter 2

The Idea Generation: from a brainstorming to a Business Model Canvas

2.1 A Fintech Project

For this project, the idea was to create an entrepreneurship project linked to corporate finance. In order to do so, the trends in Fintech – a portmanteau word for Finance and Technology – were analyzed to see in which sector the startup would fit. With a personal interest for corporate valuation and with the desire to learn more about it, it has been decided to link this to the following trends:

- Robo advising software
- RegTech App
- Investment and trading app

Indeed, the whole purpose of a valuation is to give to the person receiving it a clear and precise opinion about the intrinsic value of a company, in the case of a business owner, to sell, bargain or improve the performances, in the case of an investor, to assess the interest of making an offer and determining a price.

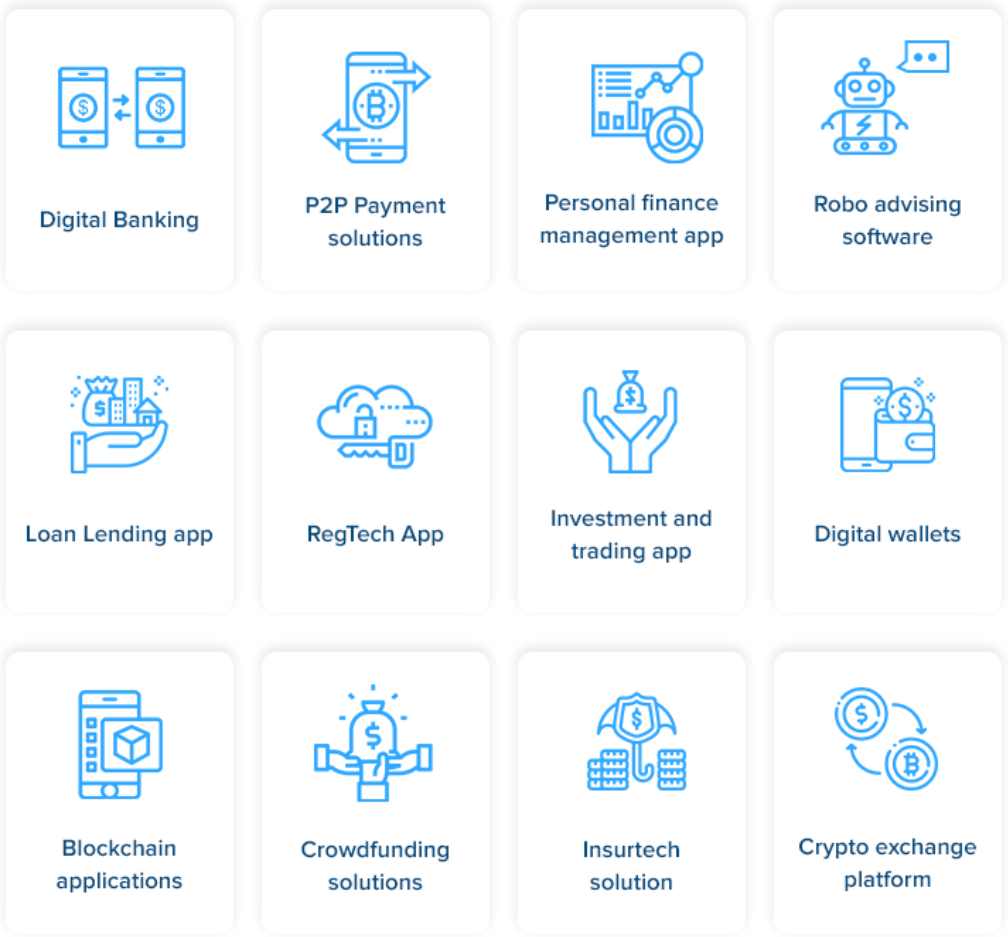


Figure 2.1: Trends in Fintech

A robo advisor seemed indicated, as it would recommend for investors the companies it estimated the most trustworthy, and the idea to build a business model around it appeared possible. It could analyze which company present an interest depending on who made the request by focusing on complementarities - geographical, know-hows, assets, products & services... - or on cost or revenue synergies for instance.

A kind of RegTech app – which consists in focusing on a very specific financial regulatory aspect that was formerly dealt by established professions as notaries or auditors for instance and replace it by technological solutions – was also considered, as the idea of providing a valuation used to be done only by some experts as the big four or accountants in the past, and as it appeared that this process could be automatized in most cases.

Finally, as a complement of the robo advisor, it has been thought that the startup could be about developing an investment and trading app, in order to recommend some investment first, but also to allow customers to buy stocks directly from the same app. That would imply that the companies present in the app would be publicly traded entities.

2.2 Finding the problem

In order to define which problem would be solved by the startup - that means, what are the under-served needs-, a different set of frameworks were used. A first one consisted of choosing different customers segment potentially targeted by the startup and to analyze which problems they could have. The three customer segments elected were the corporate finance team from a company, the company in itself and individual investors. The applied framework is given in Figure 2.2, and its purpose is to focus on one specific problem.

Figure 2.2: Problem Generation

To summarize, the corporate finance team of a company could benefit from a business valuation to assess the performance of the company and to run negotiations with investors, but it could happen that the ones in charge of the finance of a small structure lack of specific knowledge in this matter, as often it is the entrepreneur who is charge of it, helped by its accountant. Individual investors could be interested in an app that would provide corporate data with a visual and synthetic way in order to be able to take a decision quickly on whether or not investing.

2.2.1 Initial Business Model

From the previous problems identified, an initial business model has been created. The previous customer segments identified were kept, and it was decided to add professional investors, as they could also, as individual investors, be interested in the app. The app would then be focused for:

- CEOs of SMEs with no financial background to help them assess their business;
- Investors, professionals and individuals, looking for opportunities.

The Figure 2.3 shows the first draft of the Business Model Canvas. This business model canvas as well as the other tools used in this part are built to show the ideation process and the design thinking sessions that result in the initial business model to be tested with customers. The colors indicates the customer segment the post-it refers to: blue for the investors and yellow for the business owners. The other colors are more for general remarks or for elements common for btoth segments.

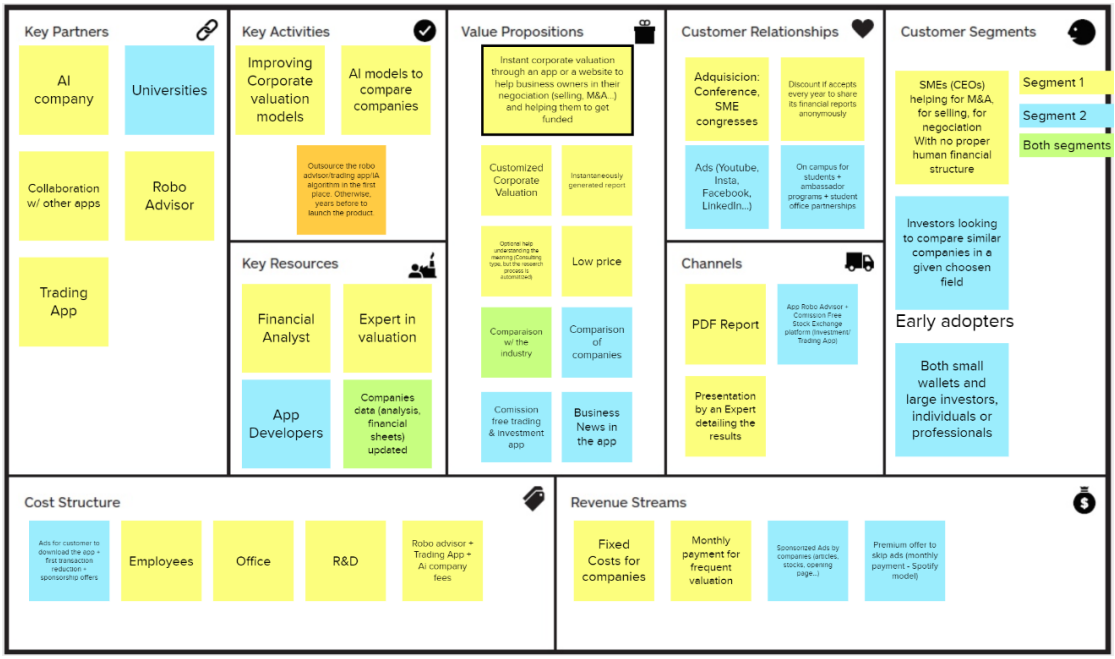


Figure 2.3: Initial Business Model Canvas

The main Value proposition is to provide, through a PDF report, a complete corporate valuation similar to one that would be provided by a financial analyst

team, but fully automatized through deep learning algorithms that would analyze the market and provide the best possible report by comparing to the most relevant companies the business it assesses. The report generation would be instantaneous with a minimal amount of data provided by the business owner in order to make the range of value the more accurate possible. In order to be competitive and to encourage customers to change their habits and make a valuation with the app, and not with their usual accountant, the price should be lower than one made manually by professionals. An optional phone call would be proposed to the customer to help him or her to understand it deeply and to make it their own. For the investors, the idea would be to class companies in different areas, as industries for instance. If you enter 'aeronautics' for instance, a range of different companies evolving in this sector would be proposed, in order to encourage the individual investor to invest, as choosing a hobby company could make the potential investor spending more as it is something he or she wants to believe in and would like to endorse. The list of companies would be provided with some KPIs to assess just in one look which ones are the most promising. The customer relationship would be built through advertising on social media, conferences, congresses, but also with student ambassadors who would present the company to their universities. The channels, as indicated before, would only be constituted by the report and the optional phone call to explain the results for the business owner. For the investors, they would interact with the robo advisor and the investment part of the app. The key resources would be the financial analyst team that would help the app and algorithm developers. As companies would enter data to make their valuations, the resulting database would represent a huge competitive advantage as well as a strong resource of the company. In this database, the following data could be stocked:

- Financial historics and forecasts
- Assets
- Betas of the company / industry
- Cost of Equity and Debt, WACC
- Competitive advantages
- ...

This database should absolutely remain anonymized, as business owners would never want to see their company associated with these data. This implies that the company should invest in cybersecurity, and that a dedicated team should work on it, or at least that it should be outsourced. The key activities of the business

would be to build and keep improving the algorithm of business valuation, as well as building strong AI algorithms to procure better and better comparison with the industry. The robo advisor and the investment part could be outsourced in a first place to focus on the core of the business. As a result, the startup should build strong partnerships with a robo advisor and a investment app. In order to build internal expertise in AI, a strategic rapprochement with an AI focus company would be very beneficial. Finally, being closed to universities allow to work with its laboratories, propose internships and PhDs and also getting closer to students that could be interested in investing in stocks. The cost structure would then be composed of R&D costs, advertising, General and Administrative costs, fees for the companies the startup would work with, as AI, robo advisor and investment app companies. The revenue stream firstly planned was the following: unique payments for one valuation, monthly payments for recurring investors and sponsored ads.

2.2.2 First iterations

After the first draft of the business model canvas, following the methodology of the lean startup, it was time to really focus on the customers. It was obvious that the main target of the company were business owners of small to medium size structure. This would be the first customer segment that would be tested during the different rounds of interviews. But this induces an incoherence in the first business model: if the companies the startup is going to assess are SMEs, they are not publicly traded, and then individual investors could not buy stock options from them. This is the first major shift operated in the business plan: individual investors – if business angels are kept apart – are not a customer segment. The idea remains to work on two fronts: with business owners, but also with investors, that would benefit from industry indicators provided by the companies themselves. So, the plan was to be able to work for professional investors, that could be interested in investing in non-listed companies. They could be business angels, private equities, venture capitals...

2.2.3 Early adopters and customer segments

Who would be the first adopters of the startup services? An early adopter is a person or entity willing to try the product or service at its inception, before it becomes a trend and while it is still unknown fr the majority. Generally speaking, they can be tech lovers, users of creative platforms like Kickstarters for instance... There are often called the 'lighthouse customers' because of the major role they play in the success of a product, because they can create a hype around a product

if they really enjoy it or think it is deeply useful. In order to analyze the demand, the different customer segments were put in a framework given in Figure 2.4.

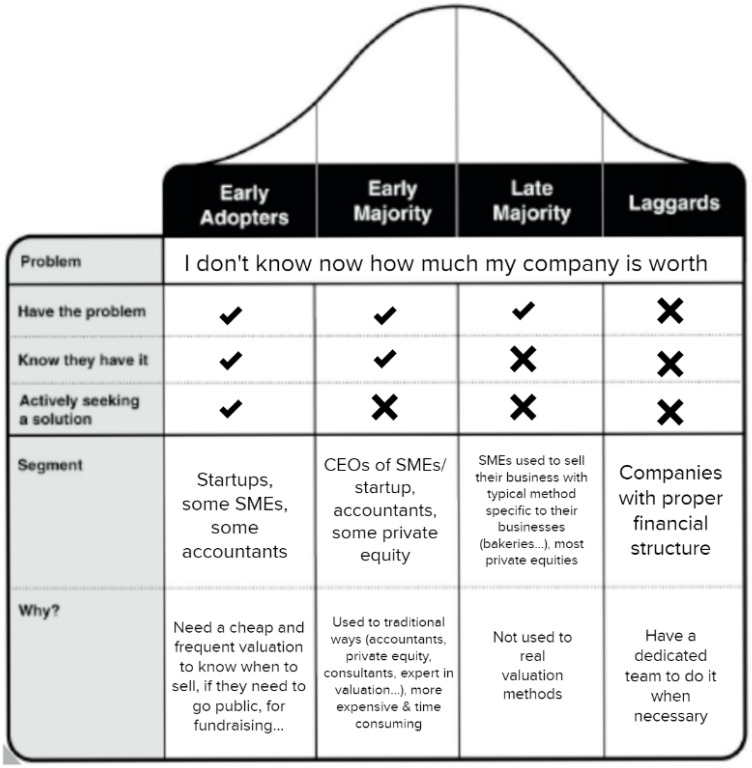


Figure 2.4: Early Adopters Framework

The problem the project aims to answer can be synthetized in the following problem: I don't know how much my company is worth. The framework differentiates the customers between early adopters, early majority, late majority and laggards according to four criteria:

- Does the customer have the problem?
- Does the customer know he or she have it?
- Is he or she actively looking for a solution?

The category of customers which respond 'yes' to every single question can be considered as the early adopters. The assumptions made – and that should be verified during interviews – is that startups, some SMEs and some accountants could be the firsts customers. Indeed, the purpose of a startup is to find a business model that will be sustainable, and to know constantly the value of it to raise funds

or sell at a given time. Nonetheless, the valuation of a startup seems to require a deep understanding of the value proposition, and appears to be hard to automatize in a first place. The valuation of this kind of businesses, with no former financial statement for instance, seems inappropriate in a first place. Some CEOs and some accountants may be interested in using the service initially. This could represent an external and independent opinion on how much a given business is worth, and if proposed at a cheap price, they should not be reluctant at using it. These early adopters, and especially among CEOs, would be the ones aware that knowing the value of their business is a sharp managing tool, not only needed for selling or in a negotiation phase, but also at every stage of the evolution of the company to truly discover the levers of actions to put the emphasis on revealing the true potential of a business.

The early majority is thought to be the majority of business owners and accountants, these times that uses valuation for selling only. These customers would be 'one-shot customers', that would not use the service on a regular basis. Maybe at this stage, it could be considered to work with some private equities willing to try the service, as the service would have proven its value for its first customers.

The late majority would be the rest of business owners, used and loyal to the 'old ways' of paying someone trustworthy to do it manually. The main issue here would be a trusting issue, whether on the protection of the sensitive data provided or just a reluctance on using on online service. The only reason that could make change their mind would be if the service is recognized as a reference, and that even their accountants recommend it. At this stage, the service could be evolved enough to propose valuation of business goodwill as well, which is not part of the MVP of the company, but which could bring a lot of new customers with business valuation methods proper at their business. The last customer segment in this late majority would be the rest of private equity, which received a positive feedback from their peers that uses it in the early majority. The addition of these customers can be the one that brings success to the company as they will proceed to recurrent and expensive payment to have access to the data, so the acquisition of this segment is vital for the company.

The laggards, the ones not using or almost never using the app, would most certainly be huge companies with a proper financial structure, as they would already have the analyst team working internally to assure this service. All the assumptions given before have of course to be confirmed through different rounds of interviews.

2.2.4 Value Proposition Canvas

Why would CEOs and their accountants an investors want to use the startup services? In order to answer this question, the Value proposition canvas can help formalizing the needs of the different customer segments and confronting it to what the service offers. The Figure 2.5 and the Figure 2.6 correspond to the application of the framework for the two segments. This framework is a way to formalize how the service of the company can be made to really suit with the expectations and the needs of the customers, by facing the point of view of the customer with the one of the startup.

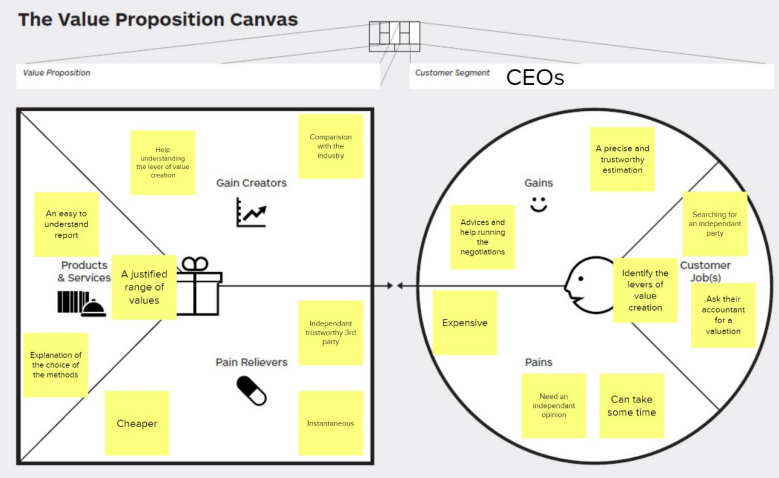


Figure 2.5: Value Proposition Canvas for CEOs

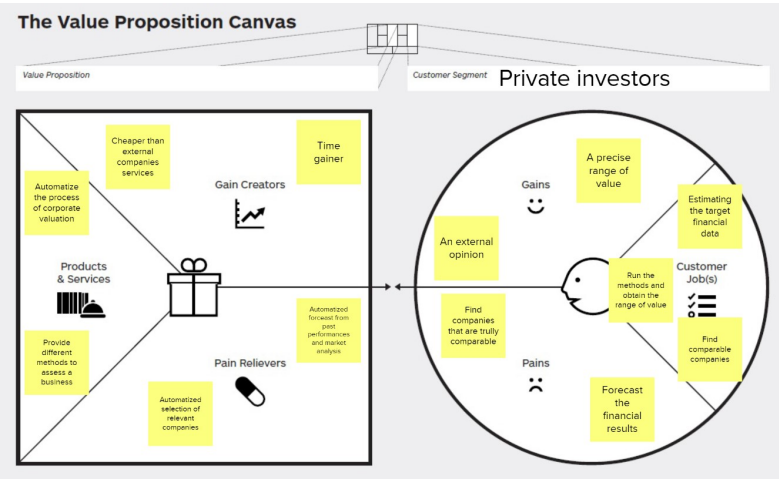


Figure 2.6: Value Proposition Canvas for Investors

2.2.5 Assessing the business model

By answering seven questions, a framework allows to have a first big picture of the design of the business model. For each customer segment, the idea is to assess on a scale from 0 - generally associated with a poor design - to 10 - something that is more attractive - the following questions:

1. Are there some switching costs? Is the customer bonded to the service or is he or she free to go away?
2. Are the revenues purely from unique transactions or are they automatically recurring?
3. Is the Cost of Goods Sold (COGS) occurring before or after receiving the revenues?
4. Is the cost structure cheaper or more expensive than the competition (from 30% lower to 30% higher)?
5. Is the added value created by the business model or by external parties?
6. How hard is it to expend the model and reach new customers? Are they limits to the expansion?
7. Are they significant competitive advantages that gives a protection from competition?

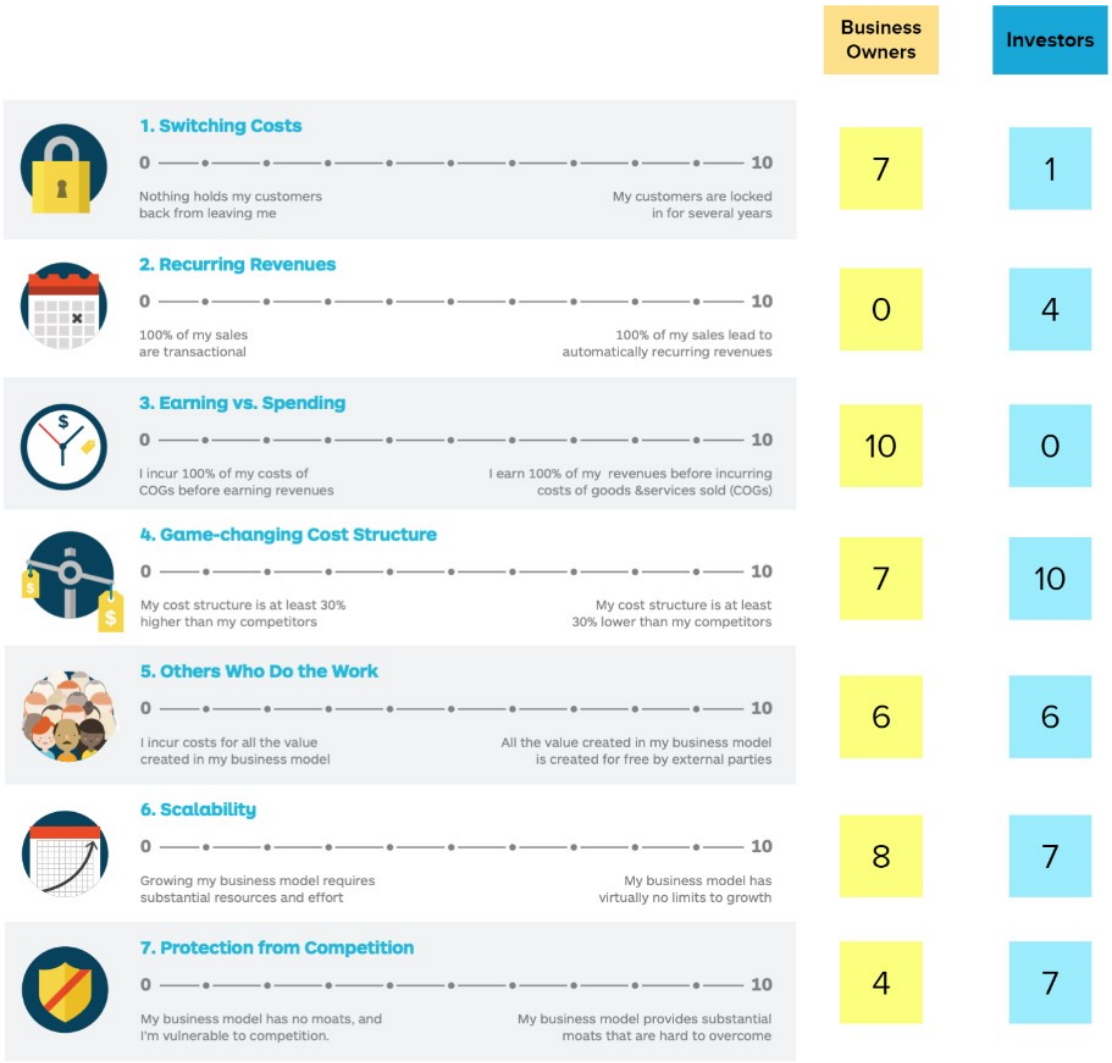


Figure 2.7: Seven questions to quickly assess the business model

One think to note is that all the following answers are purely speculative and will need to be tested in the future to improve the service and discover on which points the valuations can be upgraded. Let's answer these questions:

1. (a) For business owners, they don't need to have a valuation that often. Finding how to valuate their business is time consuming, and then induces a kind of cost, perhaps not directly financial, but indeed present. The fact that they have tried and valued the results of the service can for them be a good enough reason to continue using the service if they need to. An other thing to consider is that the referential will be the same and the results can thus be truly compared, which could not be

possible if changing of source of valuation every time. In addition, if they trust the service to put their company' sensitive data on it, they may not want to put them everywhere on the Internet and risking them to leak. However, if they are disappointed with the service, or if the word of mouth incite them to change, that is something possible. That's why the general grade given is a 7.

(b) For investors, the possibility to switch is greater and the associated costs lower as they do not need valuations made on the same foundations by the same algorithm for the same company. If a service is said to have similar or better results, they have every reason to change. Moreover, and particularly for professional investors more than for business owner trying to grow externally, this is part of their job to conduct this strategic watch, to know the state of the art in this area, what is done by whom. This gives a grade of 1.

2. (a) For business owners, the revenues are only transactional, a subscription cannot be contemplated for this customer segment as the need is one-shot. The given grade is a 0.

(b) For investors, both types of revenues can be envisaged. Indeed, for punctual buyers, the need is only transactional, and for professional investors, depending on them, they could choose to buy the service every time needed, or contract a subscription for an unlimited access at a lower price than if they bought the service each time and maybe and having premium advantages that should be defined. Final grade: 4.

3. (a) For business owners, the calculations are quite simple as most data are given by the business owner. The basic algorithm can be made with ease during the first months of the startup and then used without tremendous additions in the following years. Then, as the system would be automatized, the more customers, the better as no more additional costs would occur. That gives a 10.

(b) For investors, it is quite the opposite, the creation of the algorithm is the actual challenge and could take years to be implemented, and then would need constantly to be upgraded. No cost occurs after the customer's order, every cost is on R&D, which represents a 0.

4. (a) For business owners, the cost of providing a business valuation is a fixed cost and not a variable one, as opposed to consultants who have to allocate human resources to create it. This in the long run will allow to make a significant difference in the fees charged, as the cost structure is altered. Final grade: 7.

(b) For investors, as the system will be automatized, it will allow to offer the service at a significantly lower price to what's done currently by competitors. It is totally possible to propose a similar valuation with an analysis of the industry with a similar depth for 30% cheaper, so that gives a 10.

5. (a) For business owners, data will be provided by themselves, which reduces the data collection needed to only finding comparable companies and their financial information. Moreover, as more and more business owners will use the service, the internal data base will grow stronger and will be able to give a clearer picture of the state of a given industry, which will reinforce the added value of the service. Nonetheless, it is necessary to develop both the algorithm and the network effect to fully benefit from the advantages previously explained. That gives a 6.

   (b) For investors, the same things can be said, except that this time, the financial data of the assessed company won't be available and will need to be estimated, but the estimation will come easier and easier with a lot a customer, so it is still true that external parties are responsible for creating value to the startup. The grade is the same as for the other customer segment: 6.

6. (a) For business owners, once the algorithm is created, whether they are few or a tremendous amount of customer, nothing changes operationally. Customers may be from different countries, from different industries, the basic process remains the same. One thing that can be noticed is that for very specific companies, the valuation process results quite different, for instance for startups valuation of for stores where the business goodwill assessment can differ from other companies. For that reason, in order to be able to sell to these types of customers, a effort will be made in the future years to catch new clients and raise the scalability. That gives a solid 8.

   (b) For investors, as there are less actors susceptible to use the service, the grade is a bit lower, even if the market remains huge. That gives a 7.

7. (a) For business owners, the basic algorithm to develop is quite simple when the data are entered by the CEO. The only competitive advantage is the algorithm to find comparable companies, not that simple to obtain. Indeed, for the calculations, a simple Excel worksheet with some basic Visual Basic to run some macro would be more than enough, but to analyze what are the companies that are most relevant for a comparison needs lots of work. That gives a 4.

(b) For investors, a huge advantage of the service is that is can give a clear insight of the industry as well as providing the valuation in itself. It can look for many transactions and similar companies that a human being could not manually. This has the interest to help a generalist financial expert to gain some knowledge in an industry he or she may not know. The protection in itself is thus the ability to have developed the algorithm before other competitor, and to keep upgrading it the ensure it stays better. That gives a 7.

2.2.6 Business Model Canvas before interviews

With all these preliminary stages done, the first official business model canvas to be assessed during different rounds of interviews with potential customers. It will be tested through two interviews, the first one concerning the issue the customer is faced to and the second about the solution proposed in itself. As the interviewees are professionals, the two rounds had been realized during the same day, but the two parts were clearly separated in order to respect the spirit of the methodology.

Figure 2.8: Business Model Canvas to be assessed through interviews

Value Proposition

As shown in Figure 2.9 and explained before, the value proposition of this startup is to change how business valuations are made by switching from a manual esti-

mation to an automatized one. This presents many interests for the customer: it is cheaper, instantaneous and compare more companies when doing the multiple method, which may provide more accuracy. One main purpose of the startup is also to change the idea that a business valuation is useful only for selling, which is a generally accepted idea among business owners. By doing so, the startup can help identifying the strengths and weaknesses of the business analyzed and performing better from then.

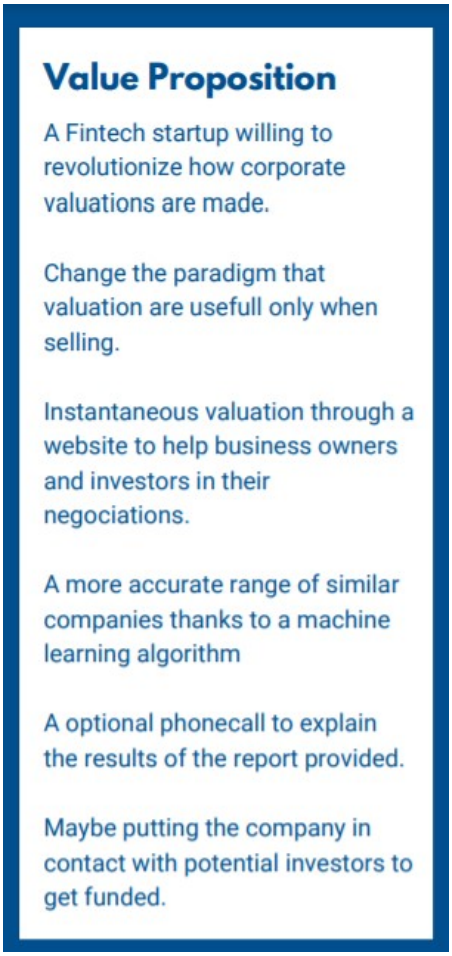


Figure 2.9: Value Proposition of the initial Business Model

Customer Segments

There are two main types of customer segments: people willing to assess the potential of a business they own or work for, like accountants. They provide the basic data about the company to realize this valuation. The second type of customers are people willing to assess another business, whether as business

owner to proceed to external growth or as professional investors to determine if the business is worth investing on or not. The early adopters would be more from the first segments with some CEOs already aware of the importance of knowing the value of their business , or some accountants that could use it as an external advisor to confirm their opinion from an objective way.

Figure 2.10: Customer Segments of the initial Business Model

Customer Relationship

How can the startup keep contact with its customers? How, after having dealing a first time with a customer, make sure he or she would think of using the same service several years later maybe when needed?

A first idea would be to create articles and provide some insights about financial matters that could be uploaded on the blog part of the website, or sent directly by

email through a newsletter. The issue with this process is that it can be considered as a spam for most users and would probably would never be read, so considering the ecological impact of stocking emails for nothing, this idea is debatable. These articles could provide some expertise in a given industry for instance, or just simply make a selection of interesting articles published recently.

A very interesting action would be to participate in some conferences or events, whether oriented to investors or for CEOs or SMEs. This would be a great way to build a network and let the word of mouth work. There are a lot of these events everywhere and at every time in the year. This could help not only for the acquisition of new customers, but also for the activation of new ones or the retention of others. As a matter of facts, concerning activation, if someone has already heard of you, has hesitated to buy but wasn't sure about that, the fact to create a direct and physical connection in such an event could break the last reticence barrier and help gaining his or her trust. About retention, if someone already used your service once, and discovers you on stage explaining in a convincing way the advantages of the service, you'd be more tempted to use it again in the future as during the presentation, you'd have felt more involved as it talks about something you personally experienced and you would have remembered it better.

Another way to reach new customers is through advertising, whether online, through YouTube, LinkedIn, Google, but also physical during the events presented just before for instance. An excellent SEO strategy should be implemented. For now, if you text 'Business' and 'Online Valuation', you are sent to articles that explains how to valuation online business, but it is hard to find a service that offers online valuation. By leading a successful SEO strategy, it could be possible to be at the top of the results of a Google search, that could bring many customers easily.

Finally, through the website, a 'Contact' from will be implemented to be sure that any request or question from any customer can be answered.The responsiveness should be great because, as an online business, if the customer do not have its answer in a very short term, he or she can just go and find for another provider of valuation. Maybe for that reason, a chatbot could really come in handy to deal with most matters, and when a human response is necessary, then only a person takes over.

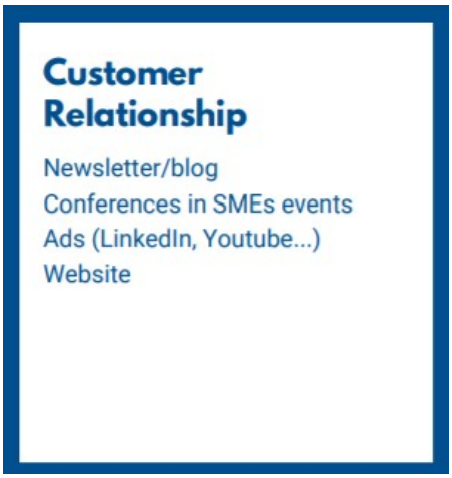


Figure 2.11: Customer Relationship of the initial Business Model

Channels

The channel is mostly unique and would consists of the sending of a medium size report through mail or downloaded directly from the website. There is no cost to supply the valuation to the customer, which represents a significant cost cut in comparison with competitors that often have to physically go presenting the result to the customers before to provide the report in itself. Another channel could be to explain the results with an optional short phone call to explain the results for those who elected this option.

Figure 2.12: Channels of the initial Business Model

Key Activities

Once the service is launched with an operational and efficient MVP, one activity of the startup would be to grow the customer database by attracting new customers and keep it updated. The associated marketing process is not very complex but necessary to keep growing, as explained in the Customer Relationship part.

To support the marketing effort to bring new customers, the service should gain in desirability by possessing cutting edge algorithms that help making more accurate assumptions and estimations, whether on the Discounted Cash Flow, in the Multiples methods or in new ones more relevant in some situations.

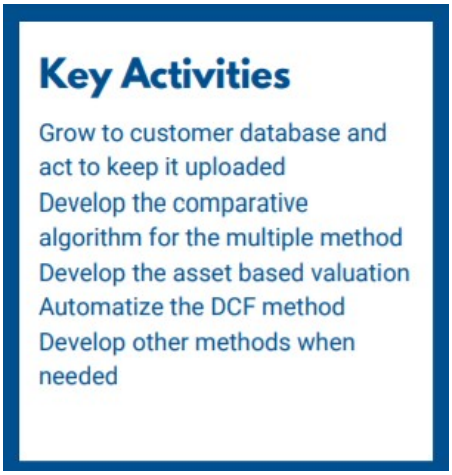


Figure 2.13: Key Activities in the initial Business Model

Key Resources

The key resources of the company are of course the database composed of the financial information of the assessed companies, the algorithm that allows to make these valuations, the team working on the development part as well as the financial part. This team need to be multidisciplinary with experts on machine learning and IA, on corporate finance and more specifically on valuations. This team will allow to evolve properly depending on the evolution of the customers needs.

The database is highly confidential as it will contain sensitive data that business owners would not want to see leaking, so it is essential to give a great importance to cyber security to avoid loosing the confidence of those who use the service before.

Figure 2.14: Key Resources of the initial Business Model

Key Partners

In order to be successful, as shown on Figure 2.15, the startup will need to build strong partnerships with many actors to benefit from advice, financial support and other things.

The first collaboration is with universities, to get closer to students to be able to offer PhD and internship for instance, or other academic projects or challenges. For students, it is very rewarding to know that for any piece of work realized while studying as an impact and is not only theoretical and that will never serve for nothing to no one. And at the occasion, it allows the company to grow and benefit from new ideas for a small price. Moreover, paying for PhD is a way to ensure that the developed solution stays best-in-class, and internships can provide good quality work for specific missions that are both interesting for the student and cheaper for the startup.

About the location of the startup, some incubators could accept to host the head quarters of the company. Centrale Nantes for instance possesses its own incubator and provide with the help of the alumni some advice and support. This would allow to reduce the fixed costs at the first stages of the company while having access to a good quality workspace.

The Banque Publique d'Investissement, a French investment bank for startups and small companies also provi

Figure 2.15: Key Partners of the initial Business Model

Cost Structure

For the Cost Structure, the main source of expenses would be the R&D part, as the service must provide cutting-edge algorithms. The two main types of employees needed for the deployment of the code would be developers and data scientists, supervised by financial experts like former financial accountants for instance. The Figure A.1 shows the average wages for three given countries as a reference for the three previously given positions. They are expensive wages for highly qualified employees, that are not that numerous in the market.

	France	Spain	Estonia
Data Scientist	44 752,00 €	35 704,00 €	33 971,00 €
Developer	37 682,00 €	27 313,00 €	28 007,00 €
Financial consulant	48 796,00 €	39 000,00 €	-

Figure 2.16: Average wages for the three needed positions in the startup for Spain, France and Estonia

The financial consultant can also be responsible for the marketing and selling part mainly, but as the team is quite small, it is probable that everyone can help with this part. But at the first stages, it seems not necessary to employ someone permanently to realize this market and customer relationship part.

The other costs are regular ones from a startup, with the general and administrative costs. Some subscriptions have to be made to various software, some hardware will have to be buy, the rent for the office paid and so on.

Figure 2.17: Cost Structure of the initial Business Model

Revenue Streams

For the revenue streams, the idea is initially to offer the service for a price way below the competition depending to the feasibility. The price is to be define jointly with the interviewees, but probably at a few hundreds euros per valuation. A subscription is to be proposed for professional investors that may need it frequently, this time for a much higher price of a few thousands euros probably. This two types of income brings more stability to the startup, similarly to the Spotify model, with recurring cash entering the bank accounts of the company and the associated customer retention.

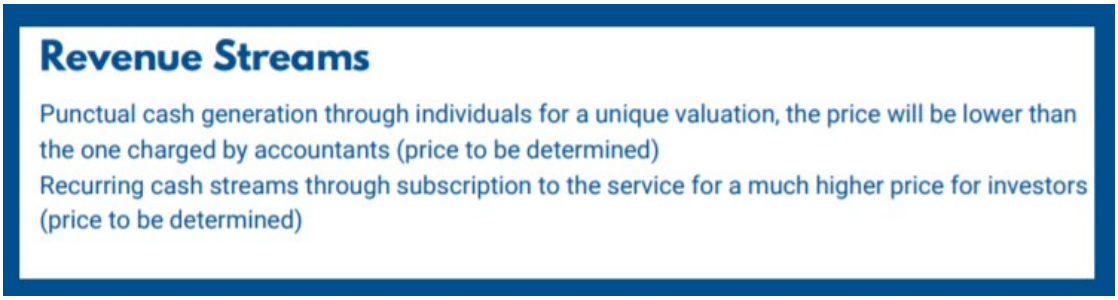


Figure 2.18: Revenue Streams of the initial Business Model

Chapter 3

Iterating the Business Model

The Lean Startup methodology allows to confront at the early stage of a project its relevance by interviewing directly potential customers to discover their problems and needs as well as to build with them what will become the product or service of the startup. The service is then iterated, and between every interview can be adapted to suit more to the feedback. The more the persons interviewed are from different backgrounds, the more the answers will differ and the process will be effective.

At least two interviews are needed to do so. The first one to discover the context of corporate valuation and what is lacking or could be improved in the existing ecosystem: it is the Problem Interview. The second is to present a first draft of the service, to ask for feedback and suggestion to improve: it is the Solution interview. A third one could be made to assess when the MVP is complete whether or not it can be launched in the market. This allows to reduce the risk of releasing a product that is not satisfying and could endanger the reputation of the company.

As it is a student project, I personally decided to make the two interviews during one session only. The reason is simple: as the interviewees are professionals, I do not want to waste their time twice and rather prefer to collect the data once and for all. This implies two things: the first one is that the project should be sufficiently advanced to both ask about the context, but more importantly, about a product that is serious enough to have interesting feedback on it. The second one is that, in order to respect the spirit of the methodology, the two parts of the interview should be clearly separated, and the interviewee should discover what the solution is in the second part of the meeting. Each interview lasted between forty and ninety minutes, depending on the interest of the interviewee and the time he or she had for doing it.

3.1 The Hypotheses to be tested

Following the Lean Startup methodology, in order to confront the project to the needs of the market, some hypotheses about the functioning of the startup must be assessed during interviews. To test them, the questions asked must be vague enough not to make them say what's expected. They must be simple to assess the core of the business, and even an apparently obvious question can lead to surprising answers that will help reinforcing the business model.

3.1.1 The hypotheses

The hypothesis must be given with an assumption to test and an associated percentage that should be respected to consider the hypothesis is true. With the few number of interviews done, the percentage may not have much sense here and could not be properly verified, nonetheless, it represent the estimations made initially. The hypotheses are the following:

- We think that potential investors could use the service to confirm their intention to buy;
- We think that business owners would see added value to valuation if it gives them a clear overview of the industry and the behavior of their competitors;
- We think that business owners could use the service to have an external and unbiased opinion of the value of their business to see if their accountants are not under or over estimating its value;
- We think that 60% of business owners could want to use the optional phone call to explain the results of the report.
- We think that 30% of the persons who formerly asked for a valuation had a negative experience (accuracy, price, delays...);
- We think that as an MVP, the DCF and the Multiples are more than enough;
- We think that 80 of the customers are business owners willing to assess their business, 10% are professional investors and the remaining 10% are decision-makers looking for external growth.
- We think that 60% of accountants could use the service either to gain time or to have a confirmation of their own opinion.
- We think that the collection of data due to past valuation constitute a solid competitive advantage that helps adding value to the report provided;

- We think that for 80% of business owners, the price paid should be lesser than the one they pay at their accountant;
- We think that 80% of business owners assess the value of their business only when selling;
- We think that 80% of professional investors do frequently ask for an external opinion when considering a transaction;
- We think that for 90% of the business owners, the report should be clear and concise, with only the assumptions needed for the methods and the results, as well as some levers of action to raise the value.

3.1.2 The questions

As explained before, the questions will be separated in two parts, one problem focus, and one solution oriented.

Part Problem

- Why would you ask for a business valuation of your company?
- Have you already made or asked for a business valuation in the past? Can you describe it?
- When it comes to make a business valuation, who would you contact to do it?
- Have you ever heard of someone refusing or not willing to valuate its business ? Why was that so?
- If you are a professional of business valuation, do you ever have used the services of a 3rd party to make it?
- How much would you pay to get a valuation of your business?
- How long is it acceptable for you to wait for a business valuation?
- What do you expect to find in a report of business valuation?
- Do you have access to a database with financial data (Betas, cost of Equity, cost of Debt, WACC...)? From 1 to 10, how much would you value the access to it?

Part Solution

- What is necessary for you to trust the service and that could make you buy a report?
- What functionnalities should be in it? And that you would like to see in it?
- How detailled do you want the report to be?
- What should be the tarification for this service?
- Would you need an additional service in addition of the report?
- Would you use or do you know someone that could be interested in using the service?
- What are the imputs of the company you want to know the value you would accept to enter?

One thing to keep in mind is that these questions represent more a guideline than the actual content of an interview. The purpose is to have a discussion about the matter, no to proceed to a questioning, and if this leads to other points, then the interview is also a success as it raises new questions to take into account.

3.2 Presentation of the interviewees

Six interviews have been made, with a particular attention to choose different profiles, professions and background for more diverse results. Some were chosen for their knowledge on business valuation, even if it appeared clearly that the service would not be very useful for them. Here follows the list of the interviewees:

- A financial advisor for SME with a background of certified-public accountant that also provides formations within big corporations and finance class for engineers and business students.
- A manager in a Private Equity firm with experience as CFO and in Banking, that also teaches corporate finance for engineering students.
- An infrastructure and Investment manager for a multinational, also teaching corporate finance.
- A CEO of a SME of around 30 employees near Nantes, France, in position for almost 20 years.

- A CEO of a SME of around 90 employees in Limoges, France, that often proceeded to external growth for his business bought to a bigger company ten years ago.
- An investment manager of a bank managing more than 3,5bn€ and 350 companies.

This panel allows to interviews different actors from both customer segments.

3.3 The Problem Interviews

As expected, for the business owners part, there is no feeling of need for a valuation except when it comes to selling the business. The method to sell is very well known and the interviewee did not estimated useful for him to change the status quo. It is with his accountant and helped by auditors that he intends to justify the selling price of his company.

A first surprise is that for all persons interviewed, none of them judged the business valuation process as expensive or long, which is however the result of the study from IbisWorld. Maybe the differences come from the fact that the interviewees were all Europeans, whether from Spain or France, and probably it works differently in the US. People are expecting a valuation to be made within two weeks more or less. Concerning the price, most of them did not question it and felt it was normal: for accountants, one of two day of work is reasonable, for the price the Big 4 charges, as huge amount are at stake for a transaction, a few thousands euros are no big deal. The most important thing that justifies the price paid is the reliability. If the numbers given are trustworthy, then a high price is well deserved. On the contrary, a low price, even for a perfectly functioning service, always gives the feeling to buy a low cost valuation and is not attractive.

A second surprise is about the perceived value of a valuation report. Almost unanimously, people answered it depends on the value of the business, which does not make much sense, as the process is the same, but they are used to pay or sell it to a different price depending on the size of the structure. The reason is only that as the company is bigger, the customer is able to get a lot of money out, and then it is logical to charge more, even if the workload, the methods and the research process is exactly the same. Personally, I even think it is becoming easier and easier as the structure grows big as the competitors as well known, the industry and the core of the activity is better understood... But what's probably true is that as the structure is weighting more, the persons for whom the reports is made are more demanding as there is more money at stakes. So this reasoning implies that a greater structure deserves a better treatment and more attention than a

smaller one to be more precise, and that justifies the differences in price. For the startup created, these considerations are not that important, as the reports would be made with the same requirements for any type of company.

Another lesson from the interviews is that Private Equities have a very different management approach between themselves. As I understood, they are minor differences between French and Spaniard PE and most importantly between private funds and funds from institutional entities as banks for instance. At least in France, there is a regulation that forces private investors to invest within a few months. This is in order to protect the people who entrusted them with their money to be sure it will be invested and not sleeping on a bank account or used for a less ethical reason. But this regulation therefore incites private equities to find what they can to invest on, even if this is not the best possible investment they could have made. Banks at the contrary have time to invest on a company, so they may ensure that the structure is worth their money, and then do not plan to stay for a fixed amount of time before to force the business owner to have their shares bought from a way or another. They would rather wait for the management team of the company they're on to trigger their departure. But the results of what's been said is that bank's capital investment divisions tend to rely only on themselves to assess the value of a business, and even this is just for starting the negotiations. The value is finally the price both party agree on and thus, no external opinion is a priori needed. For private funds, maybe a little bit more aggressive, an external advice is required as maybe a kind of argument of authority and as a way to reinforce their personal opinion on the value of the structure.

About the methods used or expected to be used, the opinions diverge. For accountants, giving a valuation report without an asset based method is non sense. For most other people, what's expected is the use of the multiples method and the discounted cash flow. Nonetheless, during an interview with a PE manager, it has been said that only the EBITDA multiple is used to have an idea of the value of the business. This EBITDA multiple results from a mix of the rule of thumbs as well as internal knowledge of the industry or from databases. But it was said that as the number of imputs and parameters to make the DCF are too many and a small change in one of them results in a major variation in the final result, it is not used 90% of the times.

3.4 The Solution Interviews

When presenting the results, the interviewees generally thought it was an interesting idea even if some of them had heard of similar project already implemented, that they could not name however.

A first advice to build a customer base is to function by profession types. Many interviewees explained that people trust their peers, and if the startup manages to convince just one of them, then the word of mouse would do the rest. The example given were for Privates Equities in Spain that are not that numerous and work together in the sense that they share some advice between themselves. Another example was that for instance for vet shops. The purpose would be to assist to events of this profession to convince them to use the service and with time to become the reference when it comes to sell it.

About the pricing strategy, it clearly appeared that, depending on the customer segment, whether they assess their own business or want to assess someone else', the price should not be the same. For a business in which either the owner or the accountant enters most of the important data by him or herself, the value is lesser as the sensitive data are known, as the value of the assets, the forecasts... It correspond to half a day to two days of work from an accountant, and it should be charged accordingly. As the service is automatized, that the fees are not going to the pockets of the accountant that can be a closed person to the business owner but to an opaque entity, it is normal to charge a lower fee. The retained idea would be to charge between 300€ and 800€, as with a upper price, people would go their accountant, and a lower price would give the impression the service is of poor quality. A price at around 500€ makes sense, with the possibility for 150/300€ more to have an explanatory phone call to detail the results if needed. For investors, the pricing is way different. It needs a lot more work to make the valuation as the challenge is to underline the added value of the business for the investor, whether in competitive advantage, in customer base, in cost and revenue synergies, in geographical or product complementarity... This needs a deeper analysis and people are willing to pay a lot more to have it done properly. This represents a difficulty as the startup would not be able to do it the first months of the startup. But if the service correctly manages to emphasize on the strengths of a business, then investors are willing to pay the same order of magnitude, which is at around 10.000€ per valuation. As the service should not require some manual interventions, it is natural to charge slightly less. Maybe something at 7.500€ could be tried, with the possibility to lower it if no one wants to buy it. But as said before, this needs a lot of work to be done to hope selling this service for investors. What could be done is to provide a minimalist estimation at the beginning with only the results of the valuation and no explanation for a very small price, but just as a temporary solution.

A private equity proposed to try the service for free for months, maybe a year in order to try it in real cases to provide feedback in one hand, and in the other hand to make a personal opinion on its reliability. This could be great as it could challenge the system as well as maybe creating loyalty to a valuable potential

customer is the experience is a success. This should be done once the service is trustworthy enough not to waste their time and possibly loose a customer.

A last point discussed during the interviews is the access to databases that aggregates all transactions and financial data about a tremendous number of company worldwide. These databases are updated monthly and give trends for the 10/15 years as well as provide multiples for industries and patches depending on the situation of the company to better understanding the situation of a company. These databases are expensive, that's why only a few players outside can have the luxury to afford them. For instance, probably few accountants could use them. The principal ones are the following:

- **IQCapital**: recognized as the reference, this database is also the most expensive in the market, with subscriptions at around 45.000€ per year apparently, the figures aren't available online. [IQC21]
- **MergerMarket**: also a great database used by many huge companies and investment funds, it seems that the subscription would be at around 25.000€ per year and would provide similar data than the ones from IQCapital. [MER21]
- **Bloomberg Terminal**: Even if this one is very famous, it could not fit the use the startup has, as it focus on data about the current state of the financial markets, and the access to historic data is not that easy according to some of its users. [BLO21]
- **PitchBook**: this one, less used among investors, seems to be truly attractive as it is way cheaper than its competitors above, and apparently is building a complete portfolio. For 16.000€ a year, this one could deserve to be watched closely. [PIT21]

These databases are absolutely necessary for the first years of the startup when it does not have access to any other source of information, and it could then be interesting to try to build our own, as it would allow to spare a significant amount of money each year.

3.5 Summary of the insights of the interviews

Here follows in the Figure 3.1 a visual summary of the most important learning from the two rounds of interviews. Of course, for additional information of the results of the interviews, a table will be added in an Annex with all notes from every interviews.

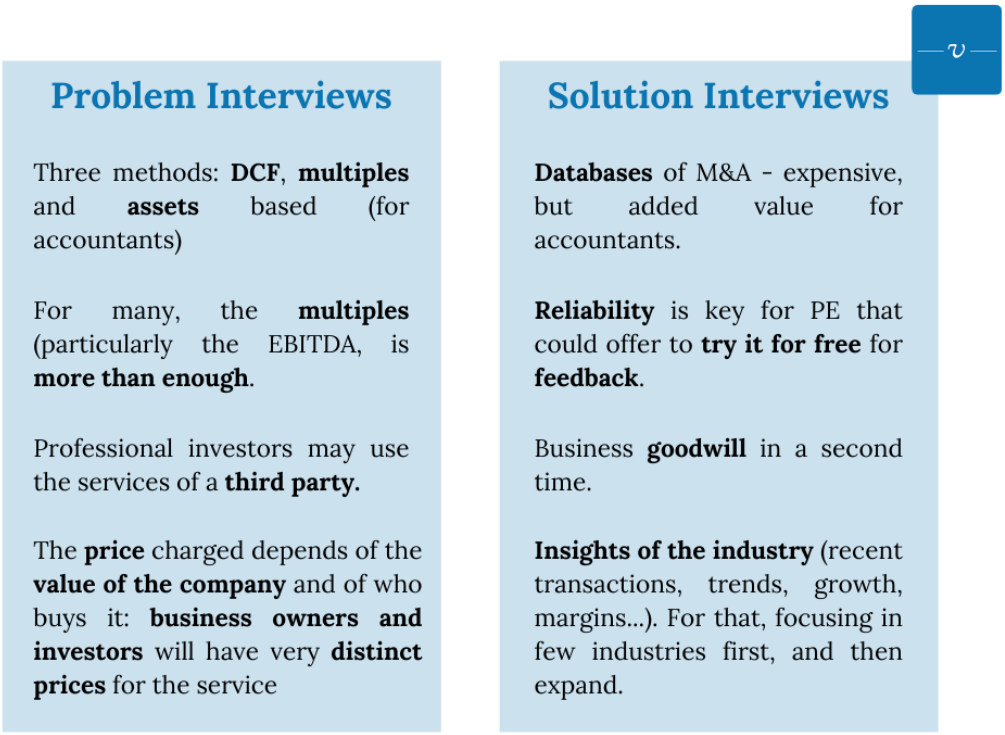


Figure 3.1: Summary of the insights from the interviews

3.6 The Actualized Business Model Canvas

From these feedback, it is now time to build the final Business Model Canvas for the startup. The core of the initial business model is still the same more or less, but some side aspects have known drastic changes to suit more to what's expected by the market. The final canvas is shown in the Figure 3.2, and represents the first version for which the business can now theoretically be launched. Of course, when the business will meet its first true clients, it will need to evolve from what it is, and then be in perpetual development to respond the best way possible to the changes of the market and the possibilities of the machine learning.

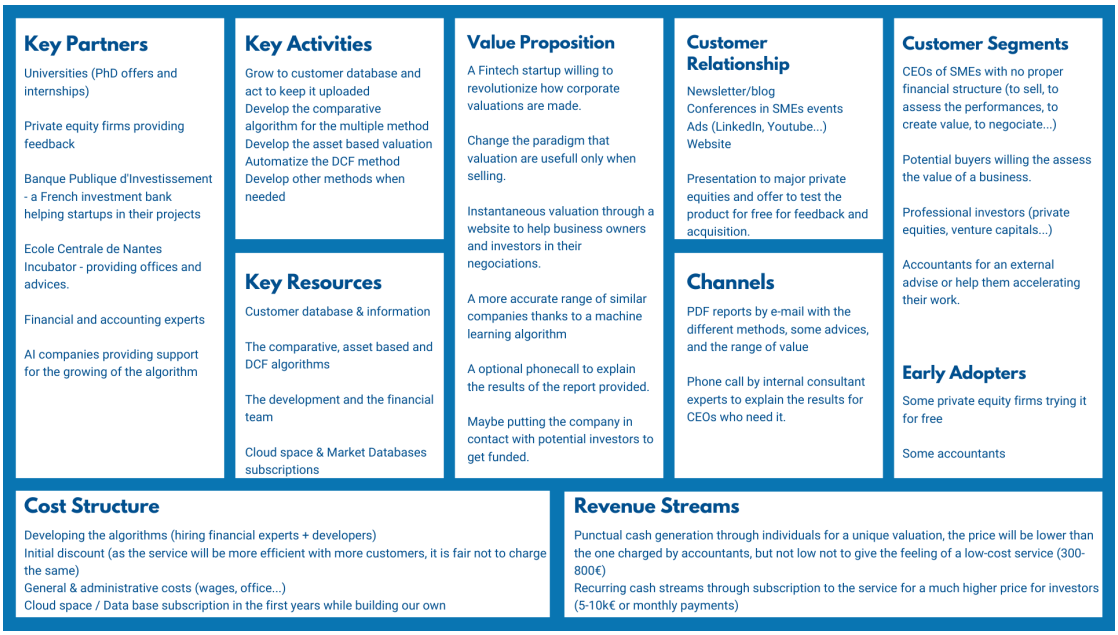


Figure 3.2: Latest version of the business model canvas after the interviews

In order to have an immediate view of the changes that have occurred since the beginning of the interviews, the Figure 3.3 presents in green what's been added and in red what's been removed. This shows that the interviews tend to confirm the initial analysis of the sector and that the initial business model was quite accurate. Of course, time will make it evolve, but this one can be used when launching the MVP and starting the business.

Figure 3.3: Changes since the beginning of the interviews

3.7 TAM, SAM and SOM

Now that the business model is established, in order to see if there is enough market to launch a startup to resolve these problems, a study of the market is recommended. The market size of the business valuation industry is not available online. So, in order to have a general idea of how much is the Total Addressable Market is worth, some assumptions were made and can be seen in Figure 3.4.

Market size business valuation USA	2,8	B$
GDP USA	21,43	T$
% of the USA GDP	0,013%	
World GDP	87,550%	T$
TAM	$ 11 439 104 059,73	1E+12
% addressable	20%	
SAM	$ 2 287 820 811,95	
% obtainable	5%	
SOM	$ 114 391 040,60	

Figure 3.4: Calculations for the TAM, SAM & SOM

The market size in the US is known, so with the rule of three between the US GDP and the world GDP and the percentage of the US GDP represented by business valuations, it is possible to estimate the TAM at around 11,4B$. As the

startup is not involved in IPOs, which is the most profitable service among the industry, let's consider than 20% of the TAM is part of the Serviceable Addressable Market, which makes the SAM reaching 2,3B$. If in the SAM, only 0,5% in 5 years from the beginning of the activities of the startup, that would represents up to 10M$ for the Serviceable Obtainable Market. The TAM, SAM and SOM can be seen in Figure 3.5.

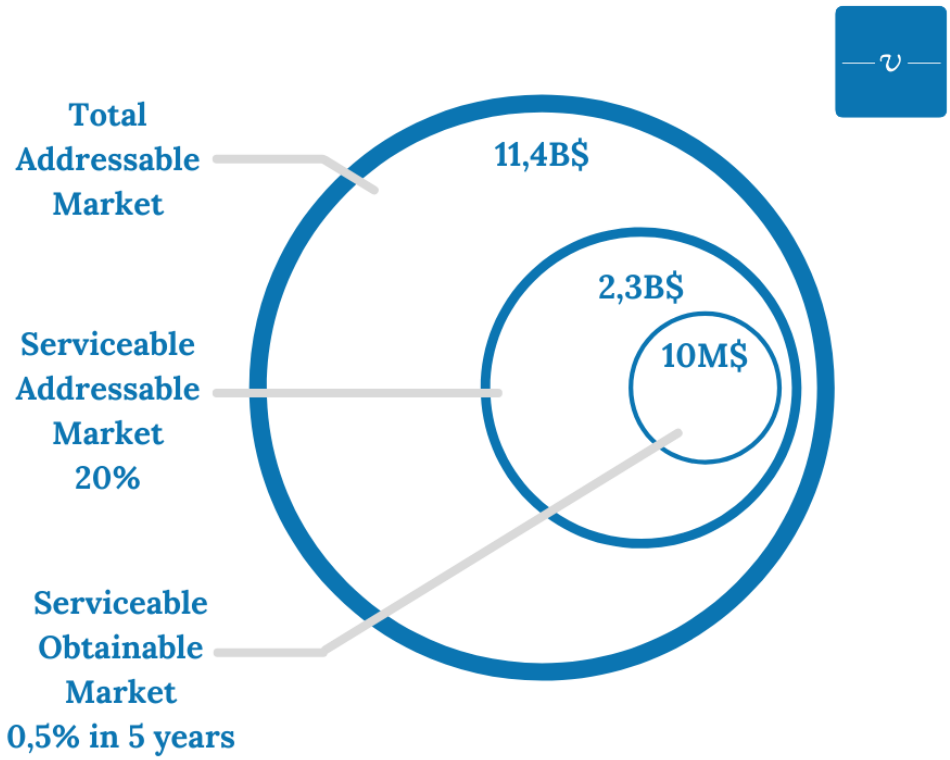


Figure 3.5: TAM, SAM & SOM

Once again, all these estimations are only assumptions at this stage and would deserve to be tested through additional experiments, that could mainly be realized through the website, but this will be developed later on in the MVP part in Chapter 5.

Chapter 4

Strategic Fit

The Lean Startup Methodology incites to discover as soon as possible the environment in which the startup would evolve on. In order to do that, the following framework can help identifying the principal matters that could have an impact on the success of the startup. This part directly relates to the creation of the Business Model Canvas as it complements it as illustrated on Figure 4.1. The trends directly impact the value proposition, the market forces plays on the customer part of the canvas, the industry forces can modify the infrastructure part and finally, the macro-economic part affects the finances of the company.

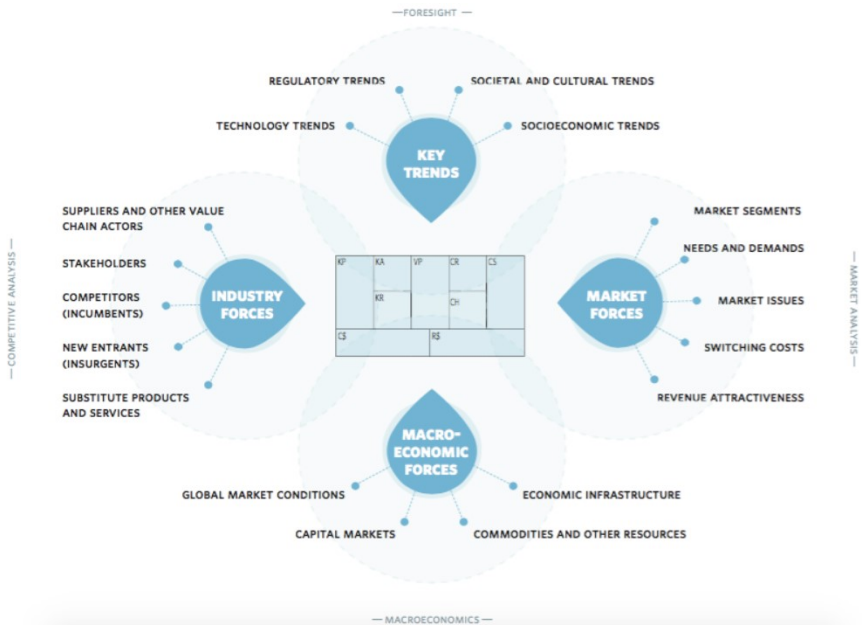


Figure 4.1: Impact of the environment on the Business Model Canvas

4.1 Industry Analysis

In order to have a clear view of the external environment and of the competitive environment of the industry, the application of the Porter's 5 forces will allow to review key points that will determine the threat from competitors, the barrier from new entrants, the bargaining power of customers, the threat of substitutes and the power of other stakeholders (in the traditional 5 forces, the last point is the bargaining power from suppliers, which makes no sense here, that's why it has been replaced with this new forces, more appropriate).

Threat from competitors

Who are the competitors the startup will be faced with? They can be of many types:

- Accountants
- Financial services from auditing firms or other specialized companies
- Online services similar to the one aimed to be created

Traditionally, business owners from small to medium size tend to ask their accountants for a valuation of their company, and when they need to sell or buy, they can ask a third party to have an unbiased opinion of the intrinsic value of the company. This third party can be external auditors, associations (like in France, the CRA, *Cédants-Repreneurs d'Affaires*, a National Association which helps business owners selling to find potential buyers).

The close relationship between a business owner and her or his accountant makes the choice of contracting the accountant for realizing the valuation very natural and spontaneous. They main offer is to provide a relatively quick and precise estimation as they know the business quite well and the relationship with the business owner allows them to ask for the details that will provide a greater accuracy. They can in a short time prepare and present their results directly to the owner and are payed with a single fee for their work that is usually said to be between 400€ to 1000€ more or less. If they excel at providing an accurate book value of the company, they may lack of references for a valuation by multiples in the election of comparable companies.

Professional buyers are often able to proceed themselves to a business valuation or to ask a dedicated internal team to do it, but may need to ask for a third party, also for an independent and more objective estimation. In the case

of private equities for instance, it seems that this independent actor is often a the corporate finance service of auditing firms like the Big 4 or other specialized in business valuation firms. They are established references in their work, and are the spontaneous name that comes to mind when thinking of estimating the value of a business. Their offer a deep analysis of the business as well as the industry, but charges a astronomical fee for their services. During the interviews, a range of 25.000€ to 40.000€ was given when talking about the price asked by companies of the Big 4. Some smaller actors can charge up to 10.000€ in average.

The last actor to have entered to industry are online business valuation services, that's say, direct competitors from the startup aim to build. They are from many types with different specializations and many business models, for instance Equidam which targets startups, Avalor for putting in contact sellers and buyers, Nimbo which provides valuations for free and gets paid when putting the customer in contact with an expert. Aswath Damodaran, the NYU teacher and international reference in corporate valuation, has developed a free app available only on the Apple AppStore to get the value of a business. It has no business model and has been developed for education purpose only. I tried to download it, but I couldn't find it anywhere, it is unsure its development has continued. What can be said is that these new entrants in the business are getting more numerous these recent years, but for most of them are still at their initial stages and trying to find a business model or building their customer base. Their branding is not really appealing at first sight and are quite hard to find in Google, maybe due to a poor SEO strategy. Very few are doing automatized valuations, many other are doing it manually and sending it online.

To conclude this part, the threat of competition is quite **high** and there is much to do to obtain a comfortable market share.

Barrier from new entrants

One thing is certain, if it is easy to be present in the industry, to build a loyal customer base and be profitable is not an simple task. The realization in itself of the automatized valuation report is a real challenge, but with a qualified team, this should be overcome with time.

Nevertheless, it can be complicated to hope for the business owner to think directly of asking for a valuation report on the startup website without further reputation or brand awareness. Moreover, business owners tends to think that business valuation is for selling and buying only, and if they are not recommended to proceed to one by they financial consultant - ie often the accountant -, they

would probably not use the online valuation service by themselves. It is mandatory to change this paradigm, and they are high chances to be able to do so according to the feedback of the interviews. If initially the business owner thought useless to get the value of his business with no selling intentions, when exposing the interests of it that the report could offer him, he changed his mind and finally affirmed that yes, it could be useful as a strategic tool and then, he could consider using it years before selling. There is a huge a communication to realize, but if the general idea is correctly conveyed, there are strong reasons to believe an online business could thrive with the business owner segment.

Concerning the professional investors segment, the barrier is also very high but for a whole different reason. Investors could be interested in using the service, but it has to prove its reliability. When talking with a someone working in private equity, it has been said that every private equity shares its tips to the others. It the startup manage to prove its value to one of them, it can be hoped that the others adopt it as well. However, if the service is not ready enough, it can has the exact opposite desired effect. What could be done to break this barrier would be, once the service is already launched and has several positive feedback form former customers, to propose for free the service for a few month to gather data on its efficiency. Maybe it will be powerful enough to convince the users, otherwise it should be reworked to be sure of corresponding to the expectations before to propose it again for trying. A long term trust should be built to manage to enter in the industry. But they are reasons to believe that these professional investors are not loyal to the third party they currently use and could accept the startup as a partner.

The barrier to new entrants are **medium to very high**, depending on the customer segment. This represents a threat as well as an opportunity. The market is still shattered, even if it is hard to make oneself a significant place in the industry, then, not so many new contestants could challenge it.

Threat of substitute

First of all, the service proposed by the startup represents in itself a substitute to what has been done for decades.

As a personal opinion, the industry should tend to use AI to determine the intrinsic value of a company instead of manual estimations. The number of data handled would be far greater, thus the precision, better. Then, a substitute can be understood as a company providing estimation through a better algorithm. As the research in this field keeps growing, it is highly possible that one day or an other, a sophisticated program arises and really proves it superiority and

reliability. Existing competitors could use their strong financial records to proceed to an acquisition, or at least try to retain their customer bases while developing their own solution. Concerning the cost structure, it seems difficult to think of a lower cost structure, as the process is to be automatized. Of course, the R&D costs will be huge, and the profitability will be proportional to the number of clients. One major drawback of the business model is that their are no tangible switching costs that would bound the customer to the startup. If a similar service appears, there is no reason to think that our private equity clients would be loyal to the startup, except for the reliability issue explained before. Maybe business owners would be more loyal as they may not be aware of new solutions, if they are satisfied with the provided service and as they would not require a valuation that often.

The threat seems **low to medium**, as the company aimed to be created will also be working on developing this solutions, and then the threat is more of a competitor type than a substitute one.

Bargaining power from customers

As the startup aims to work with venture capital, private equities and other professional investors, the transactions would normally be recurrent. As a result of this, the bargaining power from customers becomes really high and can seriously endanger the company and its business model. This issue was discussed during interviews and is top priority to tackle before to launch the service. Indeed, the risk is not only about a powerful customer with an important share of our revenues willing to pay less, but using this to force the startup to provide results that would be in their favor and biased to help them in their negotiations to buy companies cheaper. Even if it does not happens, the fact that other potential customers may think this may totally ruin the reliability needed for succeeding. Indeed, if the company is said to be bias in favor of some clients, not only the valuation made for these clients has no value, but also business owner who flee from the service as they would think that they would be undervalued. But also, as it has been said before, as they are plenty of choice available in the market, one may think that powerful potential customer would want to reduce the price. But they are huge reasons to think that it would not be accurate, and it was confirmed during interviews with managers from these structures. The total amount of money manages by these funds are huge, and the valuation cost is nothing compared to the price they could pay to acquire companies. Price is not a lever, trust is.

If business owners could want to try to bargain for every single non-usual fee, maybe that wouldn't happen for the startup as there are no physical contact that could allow that. The interviews run seemed to confirm this point too. Moreover, for 'one-shot' valuation needed for a specific consulting project or for a selling

negotiation, customers have no or very insignificant bargaining power [CRA10], which makes their bargaining power weak.

Tu sum up, the bargaining power from customers may not be that high, but it can be perceived this way as explained before, which could have tremendous effects on the company. Concerning this issue, the main task to realize is to find a way to ensure and to be able to prove that the service is and always will be unbiased. It may seems a difficult task, but for instance the Big 4 managed to do so, so little by little, there is a way to build this reliability. It should be acknowledged that the threat is **high**.

4.2 Market Analysis

What are the market forces the company will evolve onto? To have a clearer idea of the context, the five next points will be analyzed: what are the main issues of the market, who are the different segments, what are the needs and the demands, how big are the switching costs and finally, how attractive are the revenues.

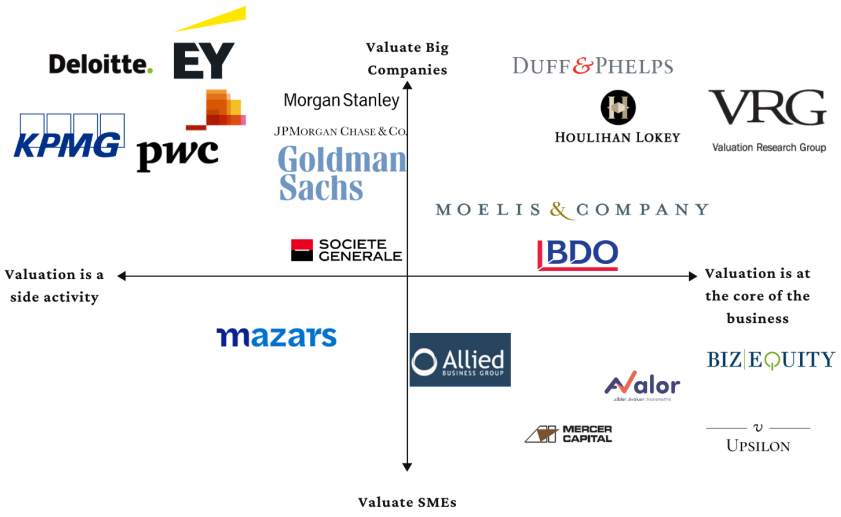


Figure 4.2: Positioning Map of the different corporate valuation firms

To have a clearer idea of who the competitors are, the Figure 4.2 shows the different actors evolving in the corporate valuation area, whether it is their core activity or a side service and whether they work with huge structures or smaller ones. In this positioning map will appear the Big 4, some of the major investment

banks, online services, specialized finance consulting firms... and also, of course, the startup willing to be created.

Market Issues

There is a need for business valuation, that is a certainty. During every interview made, this need was expressed. But too often, business owners tend to wait for the selling to assess the business instead of preparing it years before to act on the levers to add value. It seems absurd to discover the value of your house at the moment you want to sell it, there is no difference with a business. One major action that should be undertaken is a massive communication campaign during fairs, business owners events, congresses and so on to help them realize their is a way to simply create value by knowing your business.

Market Segments

As explained before, concerning business valuation, two main market segments are the most important ones - the business owners and their accountants willing to assess their company and professional investor for an independent opinion on the business they want to get the value of. As they are way more business owners and companies than professional investors, the biggest growth potential should come from CEOs, even if their transaction is punctual and often unique. If the company were to be implemented in Europe, which is the intention, just by considering France, they are more than 4.226.000 companies [INS19]. Even if the startup realizes a valuation report for only 0,1% of them every year, that would still represent 4.226 companies, and considering an average fee on 500€ per valuation, that makes a total revenues of 2.113.000€. One competitive advantage on the startup is that it is scalable easily and be expanded internationally. Nonetheless, the fact that professional investors represent a smaller growth potential doesn't mean they should not deserve attention. As the price they are willing to pay to access reliable information about the company they want to buy is bigger and the frequency of the transaction is way higher, their acquisition in the customer base would constitute a solid financial basis that could support the R&D and investments for instance.

Needs & Demands

According to an IbisWorld study from July 27th, 2020 [IBI20], the market size of corporate valuation firms in the US as decrease during the 5 previous years by 5,1%, but is expected to rise by 8% during 2021. The total market size in the US is 2,8bn$. The 5-past years figures are given in Figure 4.3. The data are unavailable for the market size and growth in Europe. It seems that concerning IPOs, the demand keeps increasing.

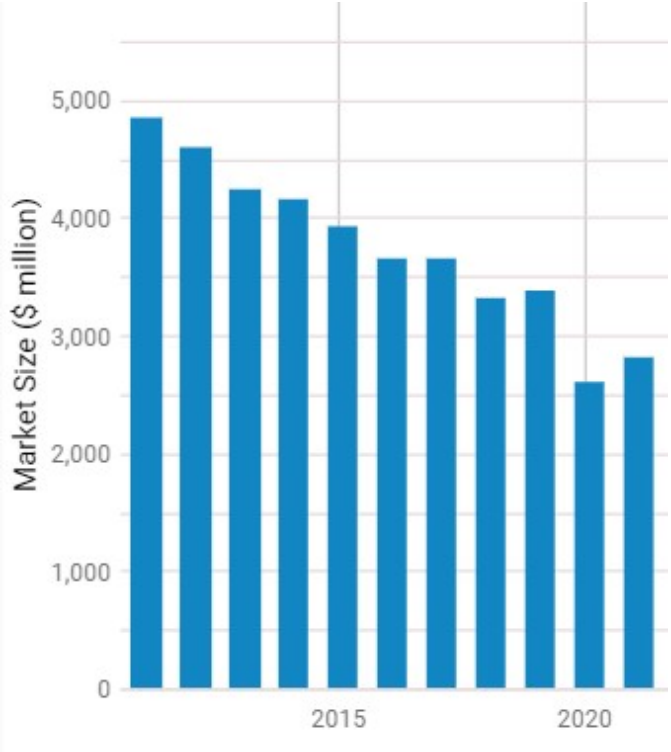


Figure 4.3: Market Size of Corporate Valuation in the US (IbisWorld)

Where the created company aims to operate, which is for SMEs valuations, the need for IPO will probably not be satisfied, at least at the beginning of the startup. Where there is a huge unsatisfied customer need is for selling or buying a business. Business owners want an independent opinion on the value of their company to start the negotiations on a solid basis. But this is not the only reason business owners could ask for a valuation, it can also be for preparing a jubilee planning, to facilitate the fundraising of the company, to help them for tax matters, for buying an other business or when negotiating with business partners.

As private equity funds and venture capitals are growing in Europe, they is high chances that their demand would also follow this trend.

Switching Costs

As the service created is not in competition with accountants, but as a complement - in which case, there would have been a switching cost as the accountant truly knows the core of the business - there are no real switching costs for business owners when they come to valuation. Nevertheless, four aspects must be kept in mind:

- as the startup aims to follow businesses to see their evolution to increase their value, if the business owner decides to change the valuation service, that doesn't make much sense as the referential would be changed too.
- a valuation is not a process that is needed every year for a company, but maybe a few times in a decade. A business owner who would have found a service trustworthy and that would have already tried it and is happy with the results would have no reason to loose time looking for another service.
- if the startup manages to make itself a name among the business owner community, they could recommend the service between themselves and the brand would be a symbol of reliability that CEOs would probably would not want to challenge.
- finally, as for now and as a personal opinion, it is not that easy to google online actors of valuation, and even when there is a website dedicated to that, it does not benefit from a design that could incite to buy.

A similar thing can be said for professional investors, in order to accept working with a valuation service, they need to have tried it for months to be sure to agree with its results. Changing often implies switching costs to try another one for this particular customer segment. It is easy to find services that would love working for them, but the selection process seems really demanding, and brand is everything. How the company is able to prove it is not biased, its results are accurate, the database its using is safe and protected...

Revenue Attractiveness

Business owners are willing to pay for a short, justified report that explains the elections of the methods and the hypotheses, a range of value as a result, and optimally, recommendation to improve the business. Professionals investors would pay for an accurate election of the similar companies and transactions for the multiple method. They would see in the report what are the strengths of the business if they were to buy it, what is the added value - by putting the emphasis on the management team ideally, even though this seems tough to automatize.

The largest margins can be achieved through business owners, as most of the data would be provided be the business owner him or herself. There is not a much of a variable cost for this digital service, once the service is working, there high interests to sell as much as possible. As for now, it seems hard to find cheaper services with a similar quality as the one aimed to be created. But price is not a lever in this industry, and to be cheaper is not a success factor as what's wanted is trustworthiness and accuracy above all. When comparing the price of the valuation

to the price of the transaction if it were to happen, it appears it is insignificant. However, one can imagine that in the hypothetical case in which the branding is well established and that there is no doubt about the quality of the service, the prices could be lowered a little to attract more customers and get rid of most of the competition.

4.3 Key Trends

Technology Trends

In order to improve the search for comparable companies and transactions, an algorithm based on **machine learning** seems indicated. As more and more students come graduated from degrees in this field, the startup could benefit from their innovation and ideas. As explained in the business model, it can be considered to propose PhD offer to continue growing and expanding the possibilities of the startup.

More generally, the rise of **AI** in the recent years represents an important opportunity as its use directly impact the success of the business model. Indeed, a predictive algorithm efficient to estimate factors of **growth**, **trends** and able to make accurate **forecasts** would be more than a competitive advantage, a true key to win. When we look at chess, the recent years have proved that now, algorithms can by far outperform the human mind and calculate very efficient outcomes than the human brain would not even consider worth analyzing. AlphaZero and Stockfish for instance are now able to make what we thought was impossible to do twenty years ago. If in this area it is possible, in what does it differ from the industry targeted in this project? With time and dedication, it is highly possible to produce estimations that totally makes the human ones obsolete.

On may also think to the development of efficient **chatbots**, as the ones present in robo advisers able to discover the needs of the customers. These chatbots could help the business owner when entering the data to assess the business to fully understand what's expected.

Regulatory Trends

Business owners could use the service to try optimizing the taxes paid. Even if this is not a motivation for the development of this service, many customers could want to use it in order to do so. The service created could then give recommendations about R&D investments or about management compensation for instance [BET21].

Societal & Cultural Trends

With the generalized concern about global warming, even if we tend to regulations about it, the actions undertaken results more of societal trends. For instance, people are talking more and more about green finance and how finance should encourage the funding of eco-responsive companies. Green bonds represents more than 2.4 trillion dollar nowadays, and this number should keep growing. Maybe, giving the information of whether or not the company valuated is taking actions to reduce its emissions to investors could add value to the service.

It is also aligned with the Sustainable Development Goals of the UN, as explained in Chapter 7, but to sum it up, the target 8.3 aims to:

'Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services'

The whole purpose of the startup is to help people to help people selling their business, in order to continue the employment of the company, or to help for negotiations when trying to raise capital, which with time, will certainly be responsible for job creation.

Socioeconomic Trends

With the backlash of the Covid-19, unemployment and all the other aftereffects, helping companies to keep their jobs and to be able to generate their revenues as they did in 2019 is top priority. As explained in the introduction part, the startup can be a way to access financing and then, a mean to have companies financed and able to continue their activities without firing.

4.4 Macro-Economic Forces

Global Market Conditions

The world of 2021 is still suffering from the consequences of the Covid-19. A financial crisis can be expected, and some experts talk about a recession coming, smaller than the one from 2008, but anyway having a deep impact on all societies, particularly since the western society did not totally recovered from the subprime crisis. A more important inflation than what's usual is expected in the years to come.

Capital Markets

Contrary to what can be thought in a first place, the access to capital is not harder because of the Covid-19 [DAI21]. Indeed, there is a lot a liquidity outside available from investors that are willing to spend it on innovative projects. Private Equities and Venture Capital are looking for opportunities to invest on more than ever before. Private Equity seem to have suffer a little from the crisis, but venture capitals are mostly untouched by it, and performed as well as the previous year [GOM20]. They are looking for new investing ideas. This is great for the startup for two reasons:

- when it comes to finance it, the access to investor would be eased, and the probability to have a VC or a PE in the capital of the company, to benefit from funding and mentoring raises.
- as they want to invest more, they will assess more companies, and their need for business valuations will rise too.

Contracting debt is not that expensive nowadays, the interests are said to be between 10% and 15%, so when the startup will have incomes that allow it to contract corporate debt, this could be an excellent opportunity to stop being financed by equity to obtain more liberty of action and having a cost of capital smaller.

Commodities and Other Resources

As a digital service, one of the few service required would be an access to a cloud service, maybe through a subscription to AWS for instance. A cloud is necessary to stock all the data from the companies that used the service as well as all other that are used to realize the comparison for the multiple methods.

Except that, the main cost factor would be due to the labor force. Indeed, as the employees needed are highly qualified and possess rare capabilities as machine learning, IA, finance and accounting, the resulting wages would be high. Some similar companies go to Estonia to lower this costs, as it allow to operate from the EU, with qualified labor force but significantly lower wages that the ones from Spain or France. Some other central or eastern Europe countries can be considered to lower costs.

Economic Infrastructure

Whether the startup is launched in Estonia, France or Spain, the economic infrastructure is excellent. The school quality is quite good, but it excels when

considering universities. The access to talent is then eased and will help building a high talent density within the company.

Corporate taxes are quite high but the trend is to decrease it. In France for instance, they decreased a lot in the past years, and in the years to come it is planned to go from 28% in 2020 to 26,5% this year and at 25% from 2022. This context is very in favor of the creation of this business, as not only the startup will have to pay less taxes, but more importantly it can be expected that the investments in France for instance would rise, and probably this could benefit the startup as more people could think of using it.

4.5 Summary

In order to summarize what's been explained before, a SWOT analysis given in Figure 4.4 recalls some bullets of the strengths, weaknesses, opportunities and threats inherent to the business.

Figure 4.4: SWOT analysis

Chapter 5

Creation of the Minimum Viable Product

The creation of the Minimum Viable Product is a key part of the Lean Startup process, because it is a moment when it is possible to directly test the product or service with the customer, to measure its potential success and attractivity as well as accumulating feedback from more persons. It is meant to evolve frequently but to be launch as soon as possible on the market. Here follows the different steps that led to its creation.

5.1 Branding

5.1.1 The name & the visual identity

The name of the company is Upsilon. It has been chosen for different reasons. The first one is that the Greek letter υ is the one that evolved to give the 'v' in the Latin alphabet and can then be related to 'value' and 'valuation'. The 'up' also gives a feeling of growth and is in adequacy with the purpose of the company. It is short enough to be remembered easily. I personally don't love it but could not think of a better idea.

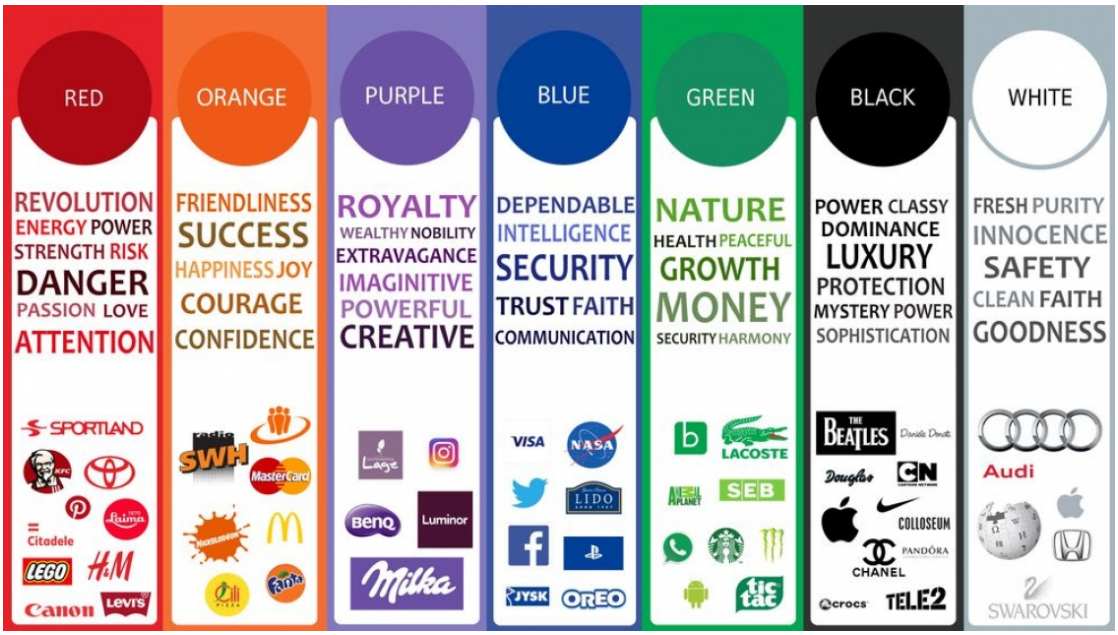
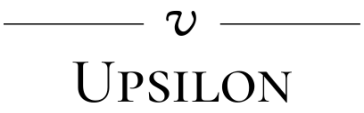


Figure 5.1: Color association for branding

About the logo, the typical color association for a company willing to be associated with the values of trustworthiness, security, responsibility, confidence, and even in a smaller measure success would be the blue. The black could also suit the company's ambitions as it is associated with sobriety and efficiency. All color association can be found in Figure 5.1. The idea would be to have a simple logo, that could possibly be declined in various colors, but would be mainly blue in its classic version, and black and white in its most simple version. Canva.com allows to design simple visuals and had been used for the creation of this. The final result is shown on Figures 5.2a and 5.2b. It is totally possible to imagine a logo with different color for special occasions of for given templates. For instance a black and gold logo is used for the simple version of the report in the MVP.

(a) Blue version, without the company name



(b) Simple version, with the company name

Figure 5.2: Examples of the possible declinations of the logo

An alternative version of the logo could be the one presented in Figure 5.3. I actually prefer this one, it is the first I made, but I did not remember its existence, and I found it again at the end of the redaction of this report, otherwise I would have gone for it, probably with different colors and more contrast however.

Figure 5.3: Alternative logo

5.1.2 Mission, Vision & Values

Even though I personally don't give importance to a company mission, vision and values statements - as a corporate culture can't be made just by writing a few words on a paper and then hoping that every employee would embrace it directly, but through a constant effort by the management to little by little spread it and

make it adopted - , this exercise has been made in order to give an idea of what would be the company's ideals on Figure 5.4. The mission is to for now to use financial data available online to help assessing the value of a company, but one can imagine to evolve from simply making valuations in a distant future to use data to give advice on many aspects of a business. The vision resulting from that would be to use data to help people when to overcome some struggles to just have them focus on their ideas and how to implement them, not on how to finance them for instance.

About the values, as some sensitive data are used in the business, integrity is key, as well as remembering than the company works ethically and without bias for all customers whatever their needs are. Of course, team work has an essential place within the organization to use at its maximum everyone's capabilities.

Figure 5.4: Mission, Vision and Value of Upsilon

5.1.3 4P

This framework used in marketing focuses on four points and can be used as a summary for how the service should be launched:

- **Product**: what is the product? what need does it fulfill? As explained before, the need for valuation is huge for various reasons, and an online actor with access to the M&A database obtained whether through a subscription or by building it itself through the years, with an accurate and instantaneous

report can substitute the manual valuations made nowadays. The product is the valuation report, and can be associated with a phone call to help business owners appropriate the ideas within.

- **Price**: the price will differ for the two customer segments. The quality and precision needed for investors is way bigger and should then be charged for a higher fee. In comparison with competitors, the service should be proposed for a lower price in either way.

- **Promotion**: this part focuses on the advertising, the public relationship and the promotion campains. The advertizing will be done through Google, LinkedIn, Youtube mainly, and also during congresses and conferences targeted for the different customer segments. The public relations would be managed only through the 'Contact us' part of the website at least in the beginning. Maybe a phone number will be provided for a more direct contact. About promotion campains, the first years, the product will be offered for a smaller price as its efficiency will not be optimal. For private equities willing to try the product, it can be offered for free for a fixed period of time in order to have feed back and make it grow on real cases.

- **Place**: where can the service be found? In the case of Upsilon, the only way to access it will be through the website. From then, everything continues to be managed online as the report is to be sent either by email or directly through the customer account in the website.

5.2 The Interaction with the Customer: the website

The purpose of the startup is to provide to the customer a report with the financial estimations of the business. It seems that the best way to do so is through a website, and not an app as initially thought, as the service may not be used that often by its customers, and an app is not a priority. Maybe in a longer term, it can be considered to develop one, but a mobile version of the website seems more than enough. In order to limit the costs but to have a real visualization of what it could look like, a first version was made using Wix.com, as the website offers a free hosting, the premium part is needed only to access the Google Analytics and to choose the domain, but in the context of this project, it is not necessary.

The main purpose of the website is to provide trust to the potential customer. It has to be simple and to provide every needed data in a sight. It has been created to have a Main Page with all relevant data, and then many other annex pages to

be sure to respond to every single question the customer would have. The Main Page is shown in Figure 5.5 and Figure 5.6.

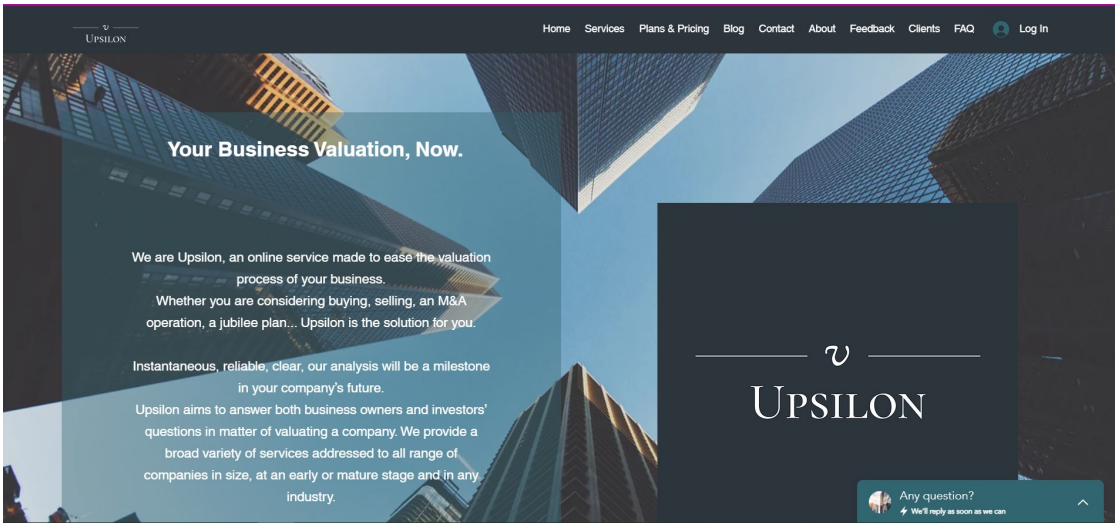


Figure 5.5: View of the Main Page of the website

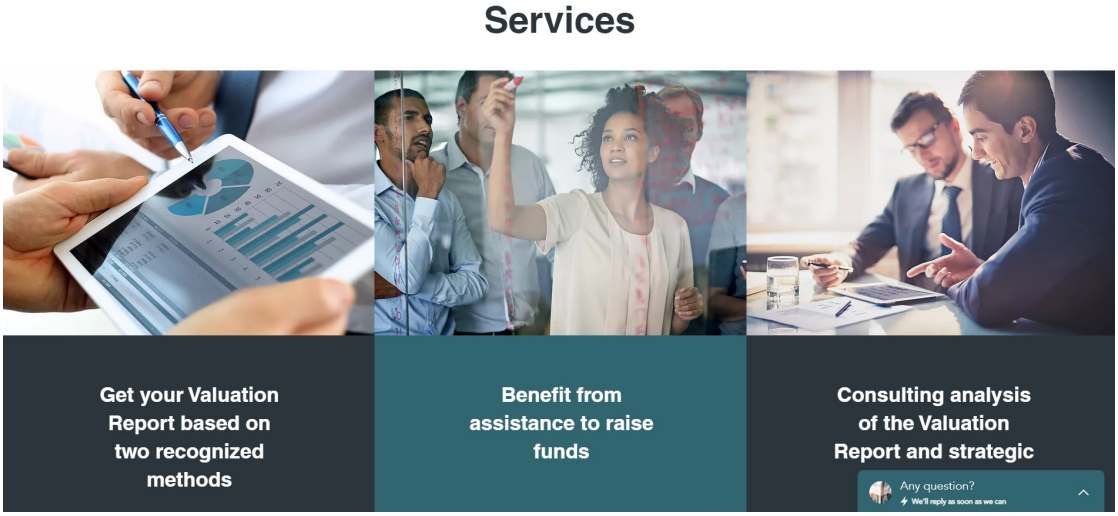


Figure 5.6: Presentation of the services of the startup

Customers will probably would like to know what they can expect from the service before to pay for it, that's why the creation of a sample report is part of the objectives of this project. It will be available in the Main page of the website as shown on Figure 5.7.

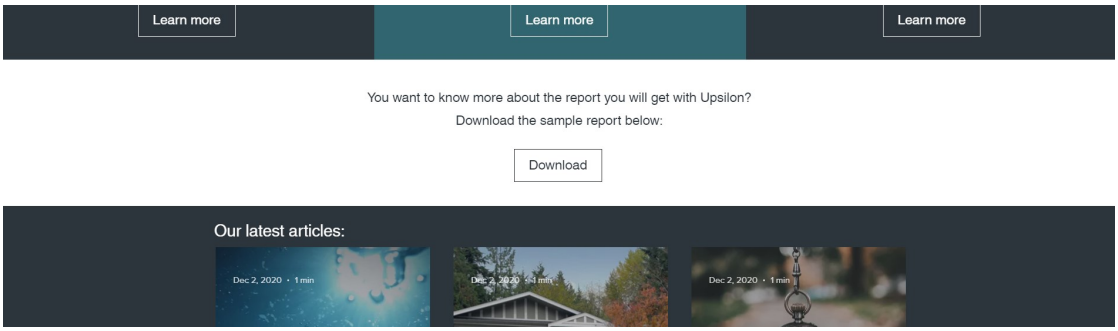


Figure 5.7: The sample report is easy to find on the main page

Here follows the list of the different tabs created:

- Home: this shows a general overview of the startup and what it offers;
- Services: it specifies more in detail what is offered depending on the different options the customer can select;
- Plan & Pricing: this tab indicates the pricing for the different formulas proposed and can be seen in Figure 5.8;

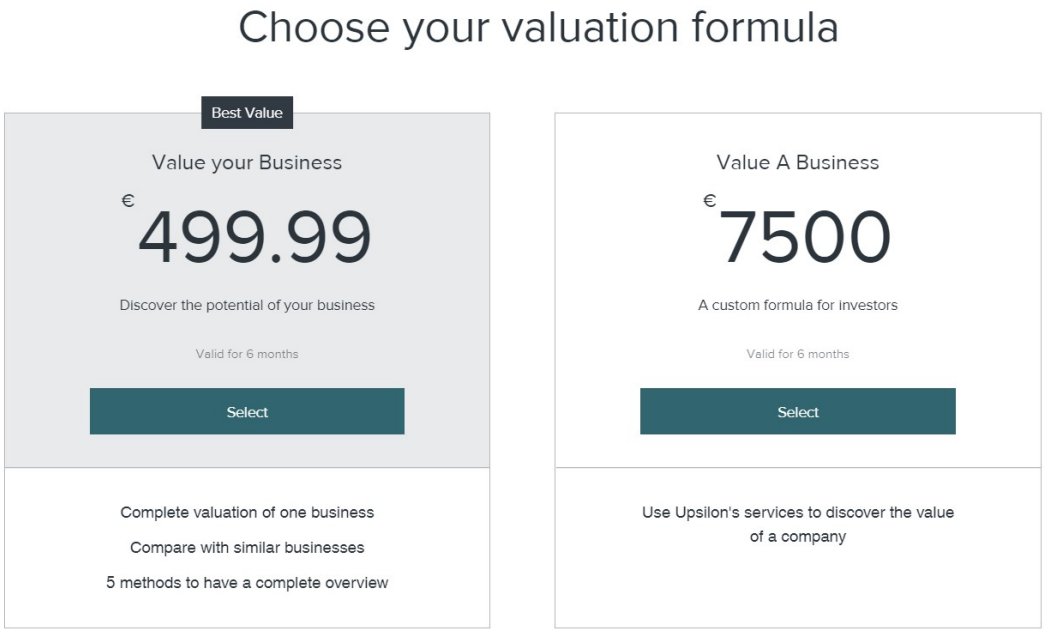


Figure 5.8: Pricing of the different formulas

- Blog: this part allows the company to build a community that could read articles written by employees in order to address news or opinions about corporate finance;
- Contact: as it is necessary for the customer to contact the startup for any advice or additional information, this tab allow in a simple way to tackle it;
- About: general information about the company to continue building this trust between the customer and the people behind the project;
- Feedback: in order to give credibility, former customers of the service would be asked to provide a short feedback.
- Client: by listing some well-known companies that trusted the service in the past, some reluctant potential customers could take the plunge and decide to order a report;
- FAQ: in case from the Contact tab the same questions often appears, they could be directly answered through this part.

The best way to visualize how the website looks like is to directly go and take a look at it following the link given here:

https://pacastellani1.wixsite.com/upsilonvaluation/

5.3 The Interest of the Website

The website does not only serves to showcast the services of the startup, but also to continue discovering our customers, their needs and desires. The use of Google Analytics and other similar tools can help defining KPIs to assess the attractivity of the service. Some example of KPIs that could be measured through the website would be given in the coming list:

- **Effectivity of the advertizing campain of social medias**: it is possible to fix a percentage of targeted customers that would click the link on the ad, and check frequently if the objectives are reached.
- **Number of people that ask for more informations**: for instance, by clicking on the Download button that gives access to the sample report, it is possible to check the number of visitors on the website that are interested enough to see a demonstration of the service. There are many buttons for asking more data that could provide essential information about what interests the customer.

- **Percentage of customers clicking on the Buying button**: an experiment could be to let available the buying part of the website, but which is linked to nothing and seems not to work for the customer, but which is in fact sending data to the webmaster. This could give very valuable data for the entrepreneur but can endanger the startup credibility because it can give the idea to the customer that the website is not working, and that even in the long run when the service will be available, the startup is not reliable.

5.4 The Sample Report

5.4.1 The methods for the MVP

For the MVP, the two methods that will be used are the multiples methods and the discounted cash flow. These methods have been explained in the Chapter 1, but to quickly remind the main elements, these methods are complementary and assess a value based on two different concept: the first one is that the company will evolve similarly to companies among the same industry with common characteristics, the second is to estimate the value by the future expected cash flows from the company.

For the multiples, the two utilized are the Price Earning ratio (PER) that divides the price of a share by the earnings it generates, and the EV/EBITDA or EBITDA multiple that divides the enterprise value by its EBITDA. Of course, the PER can be obtained only for public companies.

5.4.2 An example: the valuation of Suez

For my other Master Thesis of the MBA, I worked on the acquisition offer from Veolia to buy Suez. This gives me the opportunity to work on the corporate valuation methods to valuate the company, and now, these numbers can be used as an example to show how the service would work. But first of all, let's explain how the different value were obtained.

The multiples

To apply this method, the first thing to do is to find comparable companies. For Suez, the list of similar companies elected was the following:

- Waste Management Inc
- Republic Services Inc
- Veolia Environnement

- Acciona
- Clean Harbor Inc
- Kurita Water Industries Inc
- Beijing Enterprises Water Group
- Evoqua Water Technologies
- Chengdu Xingrong Environment
- Thermax
- US Ecology Inc
- Vaisala
- China Water Affairs Group
- China Everbright Environment Group

They should get their revenues from similar sources, in this case water and waste management, operate in similar areas if possible, propose the same types of contracts... Once this list is obtained, by finding online or calculating their PER and EBITDA multiples and making the average, the equity value can be obtained. For the PER, it is instantaneous: by multiplying the total number of shares by the ratio obtained before and the EPS of the company, that gives the theoretical market value of the company, and then the equity value. For the EV/EBITDA, by multiplying the EBITDA times the EBITDA multiple of the industry, that gives the enterprise value, and the equity value is obtained by subtracting the debt of the company and adding the cash. The results are given in Figure 5.9

Similar companies	Market Cap	Activities	Country	Presence	Morningstar P/E	Morningstar EV/EBITDA	Correlation Factor
Suez	**10 638 000 000 €**	Water, waste management. Ecological transition	FRA	Worldwide	21,84	9,73	
Waste Management Inc	$47 860 000 000	Waste disposal & recycling	USA	North America	31,81	14,53	
Republic Services Inc	$29 090 000 000	Non-hazardous sold waste collection, transfer, disposal, recycling and energy services	USA	USA	28,33	16,62	
Veolia Environnement	12 910 000 000 €	Water, waste, energy management. Ecological transition	FRA	Worldwide	52,67	7,48	
Acciona	6 790 000 000 €	Water treatment and management	ESP	Worldwide	32,30	11,39	
Clean Harbor Inc	$4 720 000 000	Environmental and Industrial Services	USA	North America	39,84	10,84	
Kurita Water Industries Inc	3 930 000 000 €	Manufacturer of treatment chemicals for water sanitation and facilities	JAP	Worldwide	29,84	10,14	
Beijing Enterprises Water Group	3 360 000 000 €	Water services & environmental protection	CHI	China, Germany	7,31	9,08	
Evoqua Water Technologies	$2 960 000 000	Water protection & management with municipalities	USA	Worldwide	45,02	16,51	
Chengdu Xingrong Environment	1 790 000 000 €	Water treatment and utilization, environment protection	CHI	East Asia, Germany, USA	11,75	10,28	
Thermax	1 470 000 000 €	Energy and environment solutions (heating, cooling, water & waste mgt)	IND	India, Nothern Europe	93,44	35,96	
US Ecology Inc	$1 180 000 000	Solid waste collection and mgt services	USA	North America	22,22	14,14	
Vaisala	$1 130 000 000	Environmental measures	FIN	Worldwide	37,84	28,20	
China Water Affairs Group	1 030 000 000 €	Water supplier	CHI	China	6,19	6,47	
China Everbright Environment Group	2 980 000 000 €	Environmental resource maanagement	CHI	China	5,00	6,85	
Average					**31,68**	**14,18**	
Value Suez					**15 432 321 302 €**	**14 287 265 760 €**	

Figure 5.9: Results of the multiples methods for the Suez example

The correlation factor is only for informative purpose, it corresponds to the degree of similarity between the company assessed and the one proposed. As it is rare to find two companies doing exactly the same activity, it is even harder to find plenty of them, but nonetheless even if the matching is partial, it should be better than with too few companies.

From these calculations, the two multiples give each one an estimated value of Suez according to the behavior of the competition. The company is estimated between 14,2bn$ and 26,4bn$.

The Discounted Cash Flow

For the DCF, there are many inputs for making the calculations. The first thing to make is to forecast the income statement for the next 5 years, for this, some hypotheses about the growth, the investments, the purchases, the fixed costs and the taxes must be made. Generally, most of them will remain at the same percentage they were the years before. The investments and the growth should nonetheless be estimated independently. For the growth, the assumptions were that the Covid-19 would have a huge impact in 2020, but at the end of 2021, the revenues would be the same as they were in 2019, and then the organic growth would continue after that with a 3% for 2022 and 2023 and 2% for 2024. The investments would more or less follow a similar rate.

Revenues	*17 556,30*	*18 252,00*	17 704,44	18 589,66	19 147,35	19 721,77	20 116,21
Other	*(60,10)*	*56,50*					
Purchases	*(3 648,60)*	*(3 720,70)*	(3 540,89)	(3 617,93)	(3 629,47)	(3 844,35)	(3 923,24)
Fixed costs & other expenses	*(6 999,20)*	*(7 089,80)*	(7 196,15)	(7 304,09)	(7 413,65)	(7 524,86)	(7 637,73)
G&A Costs (employees)	*(4 598,40)*	*(4 701,40)*	(4 806,71)	(4 914,37)	(5 024,45)	(5 136,99)	(5 252,06)
EBITDA	***2 250,00***	***2 796,60***	**2 160,70**	**2 753,27**	**3 079,78**	**3 215,57**	**3 303,18**
D&A	*(1 167,70)*	*(1 531,70)*	(1 439,80)	(1 511,79)	(1 587,38)	(1 682,62)	(1 800,40)
EBIT	***1 082,30***	***1 264,90***	**720,90**	**1 241,48**	**1 492,40**	**1 532,95**	**1 502,78**
Shares	*192,90*	*198,30*	203,85	209,56	215,42	221,45	227,65
Financial expenses	*(555,60)*	*(603,80)*	(656,18)	(688,99)	(716,55)	(745,21)	(767,57)
Financial income	*90,20*	*89,80*	89,80	89,80	89,80	89,80	89,80
Taxes	*(244,00)*	*(340,00)*	(100,34)	(225,74)	(270,27)	(274,75)	(263,17)
Earnings	***565,80***	***609,20***	**258,03**	**626,11**	**810,81**	**824,24**	**789,50**
D&A	*1 167,70*	*1 531,70*	1 439,80	1 511,79	1 587,38	1 682,62	1 800,40
Taxes cash flow adjustment	*250*	*340*					
CAPEX	*(1 230,30)*	*(1 454,60)*	(1 367,32)	(1 435,69)	(1 507,47)	(1 597,92)	(1 709,78)
CF from financing activities	*(593,00)*	*(860,70)*	(593,00)	(593,00)	(593,00)	(593,00)	(593,00)
Free Cash Flow	**160,20**	**165,60**	**-262,50**	**109,20**	**297,71**	**315,94**	**287,12**

Figure 5.10: Forecasts for the Discounted Cash Flow for the Suez example

The WACC is then to be calculated, as this rate will be the one to discount the different cash flows and that will serve as the discount rate for the constant growth

model for the Terminal Value of the company. All the needed data are available online with a bit of search on websites like Bloomberg or Morningstar. This way, the cost of debt and equity of the company is known, and with the balance sheet on the corporate website of Suez that gives the value of the debt and the equity, the WACC can be calculated.

The terminal value is estimated from the cash flow of year 5, the WACC which is the discount rate and an estimated value for the constant growth, chosen at 2%. By discounting all the cash flows with the NPV Excel function - for Net Present Value - and discounting five times the residual value, that gives the estimated value of the company based on its estimated future cash generation.

	2020	2021	2022	2023	2024
FCF	-262,50	109,20	297,71	315,94	287,12
WACC	3,58%				
NPV	631,44 €				
Terminal value	18 494,41 €				
Results	**16 140,56 €**				

Figure 5.11: Results of the Discounted Cash Flow for the Suez example

With this method, the value of the equity is estimated at around 16,1bn$. One thing that can be noticed is that this method, even if it appears more technical and rigorous than just studying the behavior of the market and saying that the company will behave similarly, considering the number of assumptions that are by definition wrong, gives results that are heavily biased by the choices of the person who made them. Maybe the algorithm aimed to be created would forecast results closer to what would happen, anyway, it is likely that it does it with a similar accuracy at least.

5.5 Explaining how the algorithm would work

This project is a typical machine learning example: how can we create a machine able to learn by itself to forecast the behavior of companies. If we consider the Discounted Cash Flow model for instance, the purpose would be to be able:

1. To forecast the financial results for the next five years
2. To give a terminal value to the company

Paradoxically, to assess the future demeanor of a company, the background of other firms would be needed to train the algorithm. By analyzing the financial statements of companies 5 or 10 years ago, and then looking what they managed to produce 5 years after, that constitutes a solid dataset for the test part of the algorithm.

For the multiples, it would be to find:

1. In which industry the company fits
2. What are the comparable companies among that industry

Let's assume the chosen model for the algorithm is a neural network, which at first sight seems indicated. The typical steps to create the dataset is as follow:

- **Collecting the data**: in this phase, the goal is to collect the raw data needed for the algorithm to develop itself. In Upsilon's case, this would be the financial statements - balanced sheets, income and cash flow statements mainly.
- **Cleaning the data**: not everything collected is necessary, in order to avoid time consuming and useless calculations, this step is necessary to have an efficient algorithm that will focus only on what deserves some attention.
- **Formatting the data**: every company will have its way to present its results, whether with additional lines, separations of elements that are considered the same in other companies - e.g. COGS that are separated between Purchase, Transports... -, lines that refers to the same aspect but with different names, whether due to differences of languages or not.
- **Choosing the right neural network**: according to the need, the neural network will not be the same. With no further research on it and with no particular background on machine learning, I can't say which one could be adapted here. But the election of one need to adapt the data to be at the same format at the expected inputs.
- **Indicating the parameters**: the configuration of the network allows to impose the rules to be respected when making the learning part.

How a machine learning algorithm works? From the dataset recently constituted, the idea would be to separate the dataset in two with a 70% - 30% up to a 80% - 20% proportion to use it in two parts:

1. **Training**: the major part of the dataset is used to learn by itself following the rules it has been given what it calculates should be the results

2. **Testing**: the second part of the dataset, for which the results are known, are directly computed onto the program to teach it if it had calculated for this inputs what the results should have been. From this part, it allows to 'correct' its behavior to make it stick more to reality.

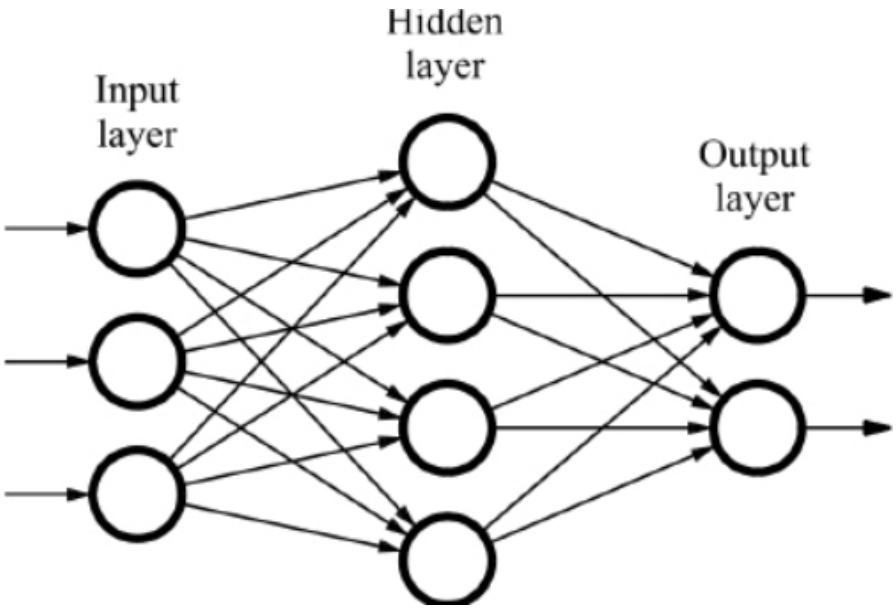


Figure 5.12: Definition of a neural network

What's important to mention is that the results won't be necessarily relevant in the first stages and that a huge amount of work is needed to make the returned results be coherent. [CHI19]

One difficult part to model is the impact of the macro-economic context on the valuation of a company. For instance, how is it possible to indicate the impact of the Covid-19 on the valuation of a firm. An basic idea would be to analyze how companies responded to crises in the past, like in the subprime crisis or the 1929 one. But even this cannot model correctly the trend companies will follow as the deep nature of these crises and their impact are different. If modeling a company in a 2% GDP growth seems achievable, when there is a disruptive element, then everything become more complex, and the assumptions should be really precise to be sure to respond to the environment.

A second and very easy part on Excel for instance is then needed to make the calculations and return the final values, just as it has been done in the sample example with Suez. The hardest part is of course to provide the preliminary data through the process explained just before.

5.6 From a MVP to a complete service: the road map to successfully enlarge the customer base

The MVP is a solid step to launch the business and try the product on customers while upgrading it. But it'd have deserve to be completed by major updates. The first aspect that would really add value to the service would be to provide a real expertise on the industry in which operates the company under a valuation process. An idea could be to bring the focus on one specific industry, to be able to provide a good level of detail about it by putting the emphasis on the main insights and once this is obtained, to expend to another industry. Maybe the best would be at first to have employees that become experts on one industry and provide manually the results, and as the research grows and the possibility expands, some algorithms would be able to pick from a database the relevant data for the given industry. This upgrade could be useful for investors that do not particularly know precisely the sector the want to invest on. This would probably be less useful for business owners who most certainly know the sector they evolve onto or want to expand.

A very important aspect that is not part of the MVP but should be one of the things implemented as soon as possible is the comparison of the ratios of the company with the competition. This has no direct impact on the results of the valuation, but that shows the strengths and weaknesses of a business at first sight, and also gives a quick view of the behavior of the competition. For an investor, that shows where the efforts should be made following the Pareto rule. If a company is shown to struggle selling its inventory when its competitors are able to do it more easily, then this becomes a path for reflection and proposals for managing the business more efficiently.

In parallel, new methods should be implemented. For instance, the current process can be done mainly for listed companies as the PER needs a share to be publicly traded to be applied. A special case is for instance when some companies are loosing money and are not at a given time profitable. The results of the valuation would not be what they should be. Even for a company close to bankruptcy, for a given investor, the cost and revenue synergies could substantially give value to an unattractive business. If it is one day possible to assess the synergies, then the service would become way more powerful as it would clearly give an justification of why is this business worth investing on, which is the one most important thing that all investors interviewed during this project have insisted on. Another thing that would be useful is the capacity to assess the goodwill of some businesses as bakeries or vet shops. This would bring a whole new customer base with similar needs but that cannot be resolved with the current system.

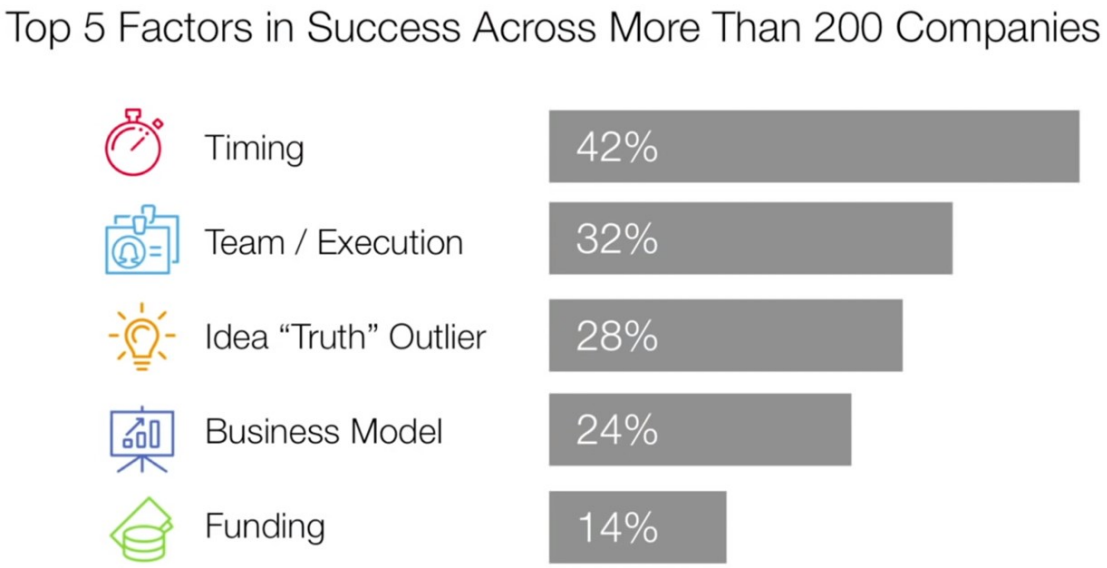


Figure 5.13: The success factors of a startup - Bill Gross, 2015

A last improvement would be to build or review the state of the art method for unveiling the value of startups. Many among the interviewee would argue that the team is the key factor of a startup and that the fact to build an idea about their capacity to successfully manage the startup to make it survive and, at last, thrive. It seems impossible not to give them reason about that, nonetheless Bill Gross, a successful entrepreneur, in a Ted event of 2015 explained that the management team and how they operated is only the second success factor [GRO15]. The first one is said to be the timing in which the startup is created and delivers its products or services. The Figure 5.13 shows the five main aspects for a startup to succeed. Maybe the team cannot be measured through KPIs, but the adequacy of a project with its resonance worldwide can. It may be possible to discover the customer needs for certain trends, the number of related projects created or the attraction of business angels or other investors for similar startups.

Conclusion

As a first step in entrepreneurship and corporate finance, this project was a mean to become more familiar with those concepts as well as applying some theoretical knowledge from the cursus MII + MBA from the Universidad Pontificia Comillas.

Concerning the project in itself, many experiments were run to discover if it could stand a chance in the aggressive market that is corporate valuation. The feedback from potential customers is globally positive, and some of them could be highly interested in becoming clients of the service. The economic context is quite adapted for the launch of the service in a few months from now. The creation of a MVP can give a clear idea of what can be expected from the startup, to start building a customer base for the day the algorithms would be perfectly functional.

About the economic viability of the company, as they are many uncertainties about the successful realization of the algorithms, it is hard to be certain of its success and its ability to generate profits, nonetheless, the first analysis of it tends to indicate a positive outcome if the startup manages to raise money from private investors at different stages of its developments.

Finally, this project is aligned with the Sustainable Development Goals from the United Nations as it strongly helps the economic part of it, without a direct negative impact on the social or the ecological balance.

Appendix A

Financial Forecasts: economic viability of the Startup

A.1 Cost structure

As explained in the business model canvas, the cost structure is essentially made of two main parts:

- The general & administrative costs: this part includes for instance the office rent, the insurance, the depreciation for office furniture, utilities and subscriptions to software needed for the operations. These software can be the ones needed for the developers and the data analysts. The database subscription with all the data about the market will also be a part of the G&A. Let's assume that for the beginning, the cheapest database presented before, PitchBook, will be the one used as it costs around 16.000$, ie. almost 13.350€.

- The wages: let's assume that the R&D part of the structure is handled only by the work of the employees, and thus the wages allow to estimate the cost associated.

Let's assume that the structure will be launched in France, with the associated wages, the Figure A.1 shows the average wages that the employee would receive, that allows to estimate the wages paid by the company with all the taxes, the social security, the occupational doctor and so on. A simulator has been used to estimate these numbers. From there, with the assumptions given in the table with the number of employees, that would give the cost structure for the company in terms of wages.

Job	Data Scientist	Developer	Financial consulant	Total
Average wages	44 752,00 €	37 682,00 €	48 796,00 €	
Wages paid by the company	63 540,00 €	53 508,00 €	69 288,00 €	
Year 1	5	5	1	654 528,00 €
Year 2	5	5	1	654 528,00 €
Year 3	10	10	2	1 309 056,00 €
Year 4	20	20	2	2 479 536,00 €
Year 5	25	25	2	3 064 776,00 €

Figure A.1: Average wages paid for the 5 first years

Nonetheless, there is something that can be tried for this startup. Reed Hastings in his book No Rules Rules explains the success of Netflix came from its high talent density. It consists mainly in paying talents at the top of what the industry can offer to attract the more efficient. There is good and bad in implementing such a policy, but in the case of an unknown startup, that could be interesting for many reasons:

- It can be hard to attract top talent if the structure is unknown and probably it would be hard to be difficult in the hiring policy.
- A huge salary can incite people to be invested in the company in the sense they would not try to find another job, better paid elsewhere if the content of the mission they work on is interesting in the startup.
- Hastings explains that an excellent talent, even if he or she is paid twice the average salary will bring way more than twice as much work. For creative position, he explains that a top talent will by far outperform two average employees as he or she is strength of proposal, have a different way to proceed and his or her motivation is often way above the average, and is not motivated to work for a bonus but to work for making progress.

With that being said, this startup is maybe an opportunity to try to build a structure with employees chosen carefully but generously paid. Let's assume that the wages will be 20% above the average to incite more people to join the company. This gives the corrected numbers in Figure A.2.

A.2 Revenue structure

For the revenue structure, during the first years, the company will probably not be able to deliver services to the customers. What can be considered is to have

	Wages
Year 1	785 433,60 €
Year 2	785 433,60 €
Year 3	1 570 867,20 €
Year 4	2 975 443,20 €
Year 5	3 677 731,20 €

Figure A.2: Top wages paid for the 5 first years

some people working on manual reports for business owners willing to value their company, as this do not require many hours of work, but it is unlikely that people come to Upsilon if there is no added value from the services of an accountant. That's why it seems more realistic to assume that for a given period, depending on the scenario (realistic, pessimistic, optimistic), no revenues will be earned. Then, probably only the service for business owners will be available as it needs less work to work fine, not in its best way, but with convincing results. Some months or years later, then the valuation for every kind of companies will be released and then the real growth will start.

A.3 Financing the startup

As explained, the startup will not produce revenues for years, so it seems unlikely that any bank would provide any kind of debt for the startup. The financing must come through equity. Then, everything must be tried, hoping that some investor will come interested with the project and will offer financing. As the project is directly linked with the investing sector, it is possible that this intrigue some of them as it will enable to ease the process of corporate valuation by offering an unbiased external opinion, and maybe at last become the new standard when it comes to business valuation.

From then, the project should be pitched to many business angels, private equities, venture capitals and all kind of structure that could be interested in obtaining part of the company in exchange for equity. The percentage of the company offered in exchanged for funding has not been estimated for now and would probably results of the discussions with the interested investors.

A.4 Financial forecasts

A.4.1 Realistic case

For a realistic forecast, the assumption were as follows, the initial hiring plan detailed in the Cost Structure part is respected, and the revenues given in Figure A.3 allow to be profitable from year 5.

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues		400 000,00	800 000,00	1 600 000,00	4 800 000,00
Wages	654 528,00	654 528,00	1 309 056,00	2 479 536,00	3 064 776,00
Marketing			60 000,00	160 000,00	480 000,00
Database, cloud & software	20 000,00	20 000,00	20 000,00	20 000,00	30 000,00
General & Admin	24 000,00	24 000,00	24 000,00	24 000,00	24 000,00
EBITDA	(698 528,00)	(298 528,00)	(613 056,00)	(1 083 536,00)	1 201 224,00

Figure A.3: Financial forecast for a realistic case

The projections are given in Figure A.4.

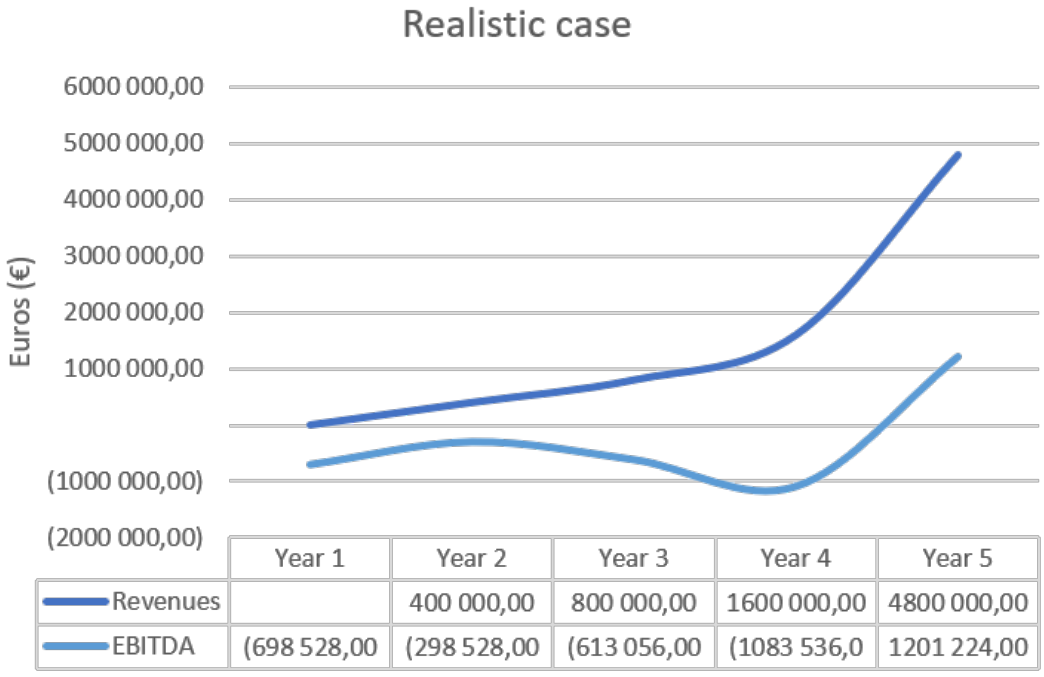


Figure A.4: Financial projections for a realistic case

A.4.2 Optimistic case

For the optimistic case, the revenues in year 5 are significantly more important due to the success of the service among professional investors. The hiring plan is the same, just the results are changed as shown on Figure A.5. The financial projections are given in Figure A.6.

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues		400 000,00	800 000,00	1 600 000,00	8 000 000,00
Wages	654 528,00	654 528,00	1 309 056,00	2 479 536,00	3 064 776,00
Marketing			60 000,00	160 000,00	480 000,00
Database, cloud & software	20 000,00	20 000,00	20 000,00	20 000,00	30 000,00
General & Admin	24 000,00	24 000,00	24 000,00	24 000,00	24 000,00
EBITDA	(698 528,00)	(298 528,00)	(613 056,00)	(1 083 536,00)	4 401 224,00

Figure A.5: Financial forecast for an optimistic case

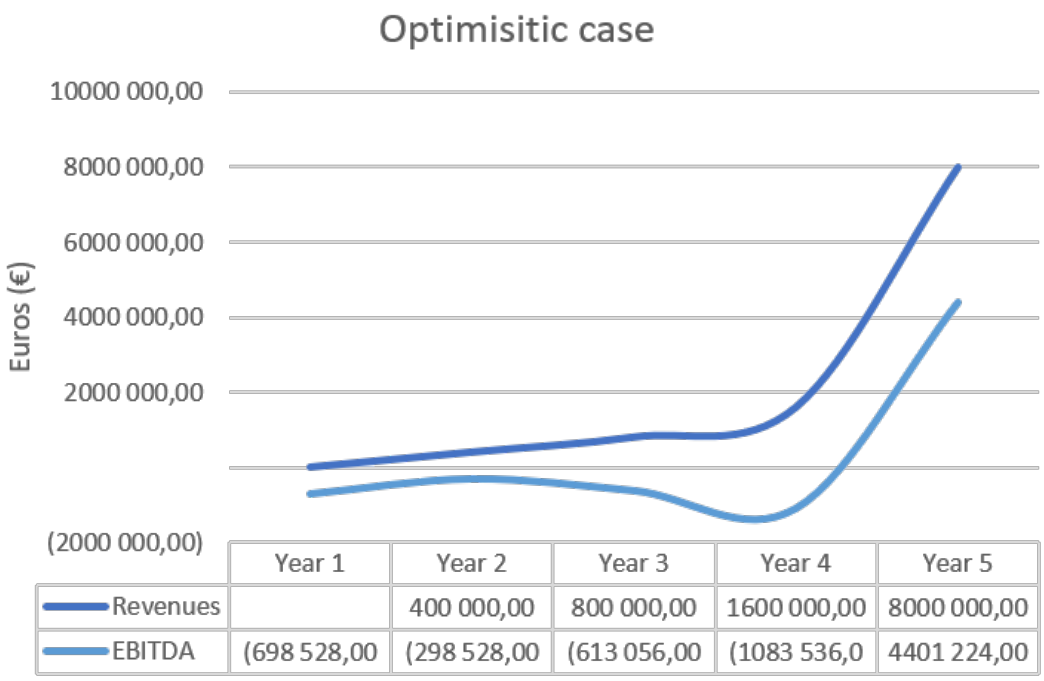


Figure A.6: Financial projections for an optimistic case

A.4.3 Pessimistic case

This part, maybe the most important to prove the resilience of the startup, respect the following assumptions:

- The revenues are reduced significantly every year, and particularly the fifth year that should correspond to the release of the valuation for investors. That could correspond to a lack of market awareness for the brand, or to a delay in the realization of the algorithm.
- The number of employees is then reduced compared to the initial plan, where the new number of employees is as shown on Figure A.7. Of course, with a reduced team, the expected results in term of development will also suffer from this undesirable situation.

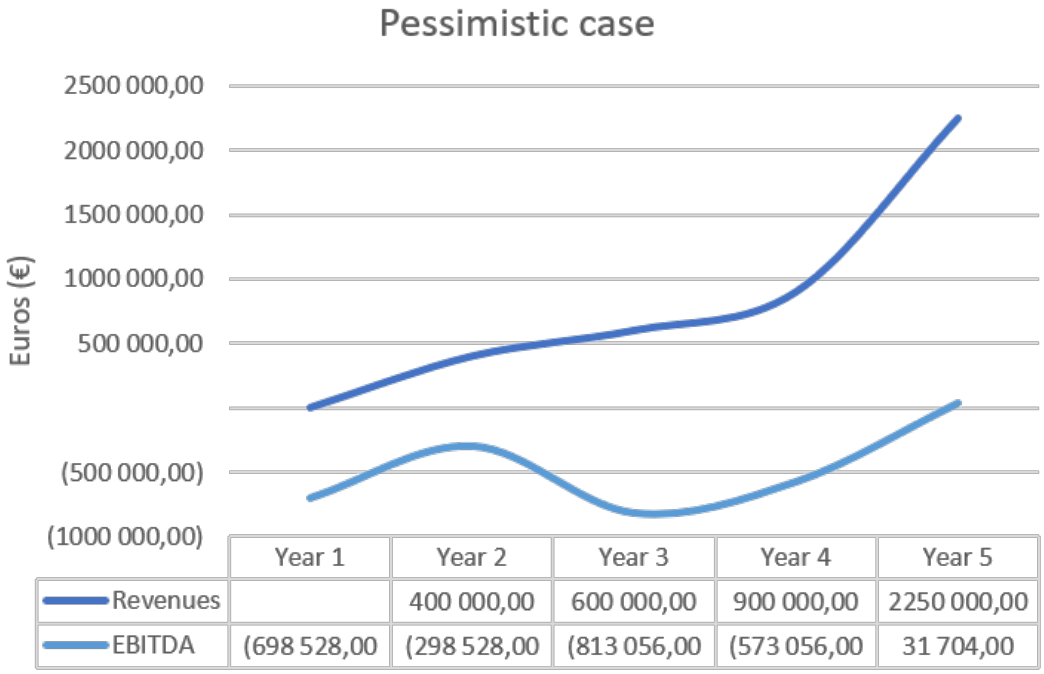
Job	Data Scientist	Developer	Financial consultant	Total
Average wages	44 752,00 €	37 682,00 €	48 796,00 €	
Wages paid by the company	63 540,00 €	53 508,00 €	69 288,00 €	
Year 1	5	5	1	654 528,00 €
Year 2	5	5	1	654 528,00 €
Year 3	10	10	2	1 309 056,00 €
Year 4	10	10	2	1 309 056,00 €
Year 5	15	15	2	1 894 296,00 €

Figure A.7: Constitution of the new team in case of few sales

The situation is very complicated, but at least the fifth year, the company is able to create a positive EBITDA for the first time as shown in Figures A.8 and A.9, which hopefully will be the case for the following years from then on.

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues		400 000,00	600 000,00	900 000,00	2 250 000,00
Wages	654 528,00	654 528,00	1 309 056,00	1 309 056,00	1 894 296,00
Marketing			60 000,00	120 000,00	270 000,00
Database, cloud & software	20 000,00	20 000,00	20 000,00	20 000,00	30 000,00
General & Admin	24 000,00	24 000,00	24 000,00	24 000,00	24 000,00
EBITDA	(698 528,00)	(298 528,00)	(813 056,00)	(573 056,00)	31 704,00

Figure A.8: Financial forecast for a pessimistic case



	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues		400 000,00	600 000,00	900 000,00	2250 000,00
EBITDA	(698 528,00	(298 528,00	(813 056,00	(573 056,00	31 704,00

Figure A.9: Financial projections for a pessimistic case

Appendix B

Alignment with the Sustainable Development Goals

This project is aligned with the objective 8 of the United Nations' Sustainable Development Goals shown on Figure B.1, which is Decent Work and Economic Growth. Indeed, this project is fully oriented onto the Economic part of the Sustainable Development, as it democratizes a particular aspect of corporate finance that is corporate valuation. The idea behind the startup project is to help two types of professionals to encounter their objectives:

- first, this startup idea is indeed focused on the desire to help innovators and companies (and mostly SMEs as bigger companies should dispose of a proper financial team) knowing how much there are worth to perform better or be prepared for funding application. A healthy company is a structure that will first of all keep employment but may also create new jobs, which is particularly essential in these days, as underlined by the United Nations in its frameworks to overcome the Covid-19 crisis, which is expected to imply a recession even worse than the one from 2009. This business intends to provide an (additional) expertise and an assistance in decision making at a cheaper cost and way more quickly than proposed traditionally. This reactivity could be a key factor for strategic governance.

- second, as the service will be proposed to external investors, whether they are professional investors looking for opportunities to invest on or business owners processing to external growth, it will help them achieving their objectives by potentially assessing more companies. By entering in the capital of the company, their will be able to provide resources, mentoring and advice to help the company grow, by acquiring a company, they will perpetuate their activities and maybe create jobs.

Figure B.1: The different goals, a call for action to promote prosperity while having a positive impact ecologically

Indeed, this project respond to the target 8.2:

'Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labor-intensive sectors'

as it allow decision makers to have an overview on the strengths and weaknesses of the business and may result in the desired diversification in case of the acquisition of a new business. The technological upgrading will come from a capital raising or a debt contraction that will certainly be eased during a negotiation thanks to a deep knowledge of the business that can be obtained partially through the service.

Nonetheless, the most significant target of the UN SDG for which the startup creation would answer is without a doubt the target 8.3:

'Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services'

that is totally the purpose of the service created. The objective is to be an external advisor, unbiased and precise, to compare the business with the industry, being obviously focused on SMEs and micro-sized business and maybe in the long run able to deal with startups too.

Appendix C

The interviews

Here follows the Excel sheet that collected all the data from the different interviews. In column are the interviewees and in the rows are the questions.

			18-févr	19-févr	22-févr
	Question	**Background**	Expert Comptable - Formation cadres de grands groupes - Contrôleur de gestion externe de PME - Enseignant Finance et Entrepreneuriat	Industrial Engineer and MBA in Finance San Francisco University - Banking - Private Equity - CFO - Teacher Finance	Engineer, Law degree, MBA Columbia Infrastracture Investor & Manager
	/02	*Why would you ask for a business valuation of your company?*	Many advantages, to buy to know your strengths and weaknesses, the same reasons you would want to know the value of your house.	In order to buy or to sell a company, the first step for nogociations. A subjective view.	Buying or selling an asset (or bidding for a contract, assess an investment opportunity) Value your own business, and find the levers to create value for the shareholders
	/03	*Have you already made or asked for a business valuation in the past? Can you describe it?*	Last week Usually once per trimester Helping a manager to buy a 3M€ revenues SME in St Nazaire (30% now, 51% in a 3-year horizon)	As a private equity, all the times.	Every month more or less, from both prespectives previously quoted, to buy or sell an asset, or to obtain the value of the business.
	/04	*When it comes to make a business valuation, who would you contact to do it?*	He can do it himself in a day (once he collected the datas) or contract a third party (other accountant)	He makes it himself, but also needs from an external and independant POV from a M&A shop, an investment banker, that he doesn't know personnal but have a total trust in him/her.	Own financial team (financial analyst, 5-10 years of experience) He makes himself his own back-of-the-envelop' estimation He uses the services of a 3rd party (either from the investment bank/corporate investor he contracted or if a more 'legal' approach is needed, he contracts one of the Big 4
	/05	*Have you ever heard of someone refusing or not willing to valuate its business ? Why was that so?*	No, never when it was before a transaction, but true that business owners or investors can be afraid of the price to pay. But trully believes that it is non-sense to refuse a valuation when needed and even without transaction.	No, that would be counterproductive in his business, very suspicious and sends the wrong message. The only persons reluctants may be some entrepreneurs with excellent entrepreneurship instincts but no superior education but that finally accept anyway.	In a specific moment, yes that definitly happens become business owners want a better situation for their company to valuate them Otherwise, some people with no financial education not willing to pay as they don't trust them more than their own personal estimates
	/06	*If you are a professional of business valuation, do you ever have used the services of a 3rd party to make it?*	Accountants	M&A shop, investment banker. Need to have full trust in him/her. Something very common, even necessary as there is a bias to avoid. The Big 4 is way too expensive as they charge up to 30-40k€.	-
	/07	*How much would you pay to get a valuation of your business?*	Usually proposed at 1500-2000€ per valuation for a 10M€ revenues SME, but depends on the revenues, which is quite of absurd, but as the company can pay more, it is charged more. But according to him, a valuation value is closer to 5000€ even if people don't charge that much.	No more than 10k€ for a valuation, the big 4 charges up to 30-40k€. Depends on the quality and the added value of the report	When its internal team makes the valuation, already paid Investment bank: included for free, they take a commission on the transaction Big 4: same price paid as for audit services (20-30k€ for the 2 last occurrences)
	/08	*How long is it acceptable for you to wait for a business valuation?*	A long waiting time is unacceptable, it should be done in less than a month/15 days. It takes him a day to do it properly once he collected the datas. In Extenso (Pornic) able to do it in a minute.	From 2 to 4 weeks maximum.	It depends on the business plan, 1 month on average, more for a more developed report
	/09	*What do you expect to find in a report of business valuation?*	1) Explain your choices: why those methods, why those ratios 2) Coherent methods & coherent prices: a precise range of values 3) Something that is not done at all currently: VULGARIZE the results, the purpose is for the client to appropriate these methods, not just to propose a pricing 4) Axis for change, improvement, on what acting to raise or to lower the value Ex: the accountant in front of him for the St Nazaire acquisition will provide 8 methods for 2019 numbers (too much and non-pertinent as 2020 came by) In the best case: different scenarios in different colors The 3 methods indispensable proposed spontaneoulsy: - Patrimonials - EBE / résultats (multiples) - Future profits (DCF) This is the minimum, but enough	What should appear is the added value: why does this company is the one I should buy? Why is it valuable, why is it different? Maybe put the emphasis on the management team	A clear explanation of the assumptions Financial forecasts Analysis of the ratios Range of value for the valuation (DCF + comparable trading companies + comparables transaction in the same industry) Alternative methods with additional results Sensitivity analysis
	/10	*Do you have access to a database with financial data (Betas, cost of Equity, cost of Debt, WACC...)? From 1 to 10, how much would you value the access to it?*	8-9 Very valuable	The most important thing is reliability. As long as it can't be proved that the source is trustworthy, no, it is not something usefull. 2-3	The most important thing is the quality of the information, often the valuable information is confidential and companies are not willing to share it. For listed companies, there is no problem to find the essential datas. For a simple valuation, the principle datas are easy to find
	/13	*What is necessary for you to trust the service and that could make you buy a report?*	Nothing necessary It would have been a totally different answer 10 years ago, but now people have no issues buying services online A lower price = less risk too	It exists a conflict of interest: who pays for the product? If this person is a frequent customer, the service could be tempted or forced to provide a advantageous buying price. If it was a one-shot service, it would be no issue. He compared it to the rating of agencies. If the customer is the governement, an NGO or an entity like that, no problem, but there would be lobbying from investment funds.	Concerning Vet clinics: they will trust their pears, suggest to go to the 'Vet representative comitee'/'Vet convention' or something like that
	/14	*What functionnalities should be in it? And that you would like to see in it?*	The patrimonial methods should be in it, otherwise it's incomplete To implement it: the owner enters the added value or the capital loss for some strategic assets (real estate, business goodwill...) and for the rest, we consider that the net value is the selling value. The question could be: For how much would you sell your fixed assets? The purpose is to know the difference between the Price bought and the amortization (ie the residual value) If it is not clear enough, possibility to have a 5-minutes calling to be explained ad be sure of what entering.	If its free: just the valuation and nothing more (50€) If he pays for that: very detailled, the added value should be shown, and he has no problem to pay the same price for services that can be done manually nowadays (10k€) DCF, multiples + another one maybe	A step by step tarif, something cheap just for the valuation A premium function: more detailled functions, help to build the business plan These companies have no issue paying lawyers, accountants, auditors, tax advisors: charge the same (10-15k/year is possible) When transactional, usually 1/2% taken by commission by investment banks, with the whole package (due diligence, legal stuff...), so consider taking a maximum of 2% is transactional Help to build the Business Plan Tax advisor Access to funding Access to Working Capital
	/15	*How detailled do you want the report to be?*	Vulgarized, clear, synthetic, the keys to understand, relevance Introduction: why those criterias & methods? 3 methods vulgarized Conclusion: the price is between x & y.	Free: not detailled, just the price Paying: detailled and for 10k€, very well detailled	For Vet clinics: something very simple, there is a need, but no financial formation, and no need to make it complex. More than a page, they won't read it
	/16	*What should be the tarification for this service?*	Charging 1500€ would be too much as people would go to traditional ways Less than 1000€, but not too cheap, to remain credible (avoid 150€) Range: 500-900€	Just the valuation: 50€ If trustworthy and very complete, it is even better than having to look for an independant 3rd party: 10k€ without a problem	A step by step tarif, something cheap just for the valuation A premium function: more detailled functions, help to build the business plan These companies have no issue paying lawyers, accountants, auditors, tax advisors: charge the same (10-15k/year is possible) When transactional, usually 1/2% taken by commission by investment banks, with the whole package (due diligence, legal stuff...), so consider taking a maximum of 2% is transactional
	/17	*Would you need an additional service in addition of the report?*	Telephonic assistance: would be perfect Charging initially from 500-600€, with 2 phone calls -> 800-900€	Estimates of the assets Due diligence (labor, legal...) but it could be another 3rd party that does it, not necessarily the service itself	Business Plan Tax advisors Access to funding Access to working capital
	/18	*Would you use or do you know someone that could be interested in using the service?*	Sure that yes, huge market, many people interested	It has to become a prestigious service to be used by PE. But if one uses it frequently and is certain of its trustworthiness, all PE from Spain (200-300) would use it as the word of mouth is really strong between PE. The hardest part is to build that trust relation. One idea would be the propose the service for free to the biggest PE first (if they don't accept, to the smaller ones), they try it for some transactions, and I try to convince them of the utility of the service. Then, I can charge them.	People with no financial education
	/19	*What are the imputs of the company you want to know the value you would accept to enter?*	As it would allow people to have a more precise estimation, it is not a problem, so the imputs for the patrimonial method	This is the most difficult thing to get, because companies would not want to have their datas used to compare their business to other. But if they willingfully do so, then the service become way more valuable, the database from question 9 too, and PE would want to access the service.	Simple valuations don't need complex data (only revenues, operating margins, investments, expected growth rate Premium: more detailled Go step by step
		General opinion	Top, very interesting idea, believes it can work	Need to build the prestige of the service to work	Very good idea, important to target SMEs. Lot of value, he talked a lot about vet clinics or pharmacies ('fonds de commerce')
		Other suggestions	Employees to be sure of the solidity of the company Students looking for a job, future potential CEO for job application...		Go take a look to the Damodaran Uvalue App, a free service proposed to valuate, but no business model around it.
		Total score	10+5/10+8+8+8+1 =34/39	10+10+8+4+2+0 =34	10+5+4/8(condiciendo7)+4+2+0 =25/29 le interesa, pero no lo necesita como tiene su propia team

08-mars	25-mars	01-avr
Engineer CEO SME Nantes	CEO SME	Capital Investment Crédit Mutuel Equity (3,5bn€), the investment part of the bank.
Only in order to sell its company	External growth, eliminate competition, increase market share, results of inaction -> reinforced competitors	Transmission, M&A Change in the equity structure, change of shareholders, minority shareholders willing to sell, IPO Regulatory fiscal valuation Before selling to have an idea of the price Every semester in PE to see the evolution of the portfolio
No, he will do that only for cession or transmission	5/6 times in the past, deep knowledge of the industry that allowed him knowing which company to target	Only Multiples DCF is often biased and you can make the numbers say whatever you want 80/90% only multiples But this is just a base for the negociation, sometimes, the seller propose an order of magnitude, and they don't even need a valuation. Most private equities with private funds by regulation are forced to invest their money under a few months, they have to find companies, so in a way, the price they pay for entering the capital is not that important. The multiples are decotated if the deal is for buying a small percentage of the company (as they have no control over it), depending on the liquidities, if it is public (more expensive) or not, because if it is public, it will be easier to find buyers, depending on the size of the structure...
His own expert accountant and probably an external advisory in order to be objective	Does it himself through EBITDA multiples Helped with auditors (KPMG), lawyers, venture capitals for LBO	Do it with her team only No need for an external advisors as it is just a negociation, the value is the price the seller and the buyer agree on. The offer lust always meet the demand
No, something that people don't often tell	-	-
-	-	No
Hesitation Half a day of work 350 - 400€	Proportional to the amount of the total transaction, as the risk goes higher with it	Maybe as business owners pay their accountant to do so, the order of magnitude should be at around 1000€ Depends on the company Hard to say
A week Half a day of work more extra information collected with the business owner	-	Instant for her, as only using the multiples
The different technics of valuations explain and their results (if differents results: why) A range of price	Detail of the assets, solidity of the revenue stream, historic analysis of the company, growth/decline situation, market studies, relative growth compared to the industry, management teams, corpses in the closets, analysis of the supply chain, issues with customers/suppliers, due diligence, fixed costs and margin analysis, ratio comparisons, state of the stocks How to finance the project, study of the possible synergies	The added value, some insights on the management team, how are the internal processes, why should she invest in the company. Hard to automatize.
Not asked because values the confidentiality of his data above everything else	-	Yes, Capital IQ, MergerMarket for database on transactions, financial data on companies ArgosWityu Index for multiples Monthly updated & with trends for 10/15 years
The client should never be identified. The classification of the company for comparisons should be blur enough to enable the company to stay anonymous. As the service grows more and more powerful, the initial valuations that collects data from the first customers should not be charged at the same price as the ones that will come after.	Need to prove its mastery of the industry. Advice: start with few industries very well known. Build the reputation to know what you talk about, then expend.	The best way to know if your valuation is good is to wait and see the selling price. If the results are similar, it is trustworthy. For instance, what's acceptable would be to have a valuation under by a 10/15% the first semester or a 15/20% a year after, but if you have overvalued the company, you have a problem. *This part i did not understand, is it better to always undervalue???*
Just to know, but no added value, how does same size companies work in different industries Different levers can be interesting 2/3 years before to sell in order to work for rising the selling price And in this case, it makes sense to use several times the service	Insights of the industry, comparisions, ratios comparisons	
A little cheaper (half, a quarter?) Never at 100€, it gives the impression the service is of poor quality. What is the reliability of such a low cost service? When the reputation of the service is built, we can consider charging the same amount as for accountants	Depends on the transaction, but more or less the equivalent of the work of 3/4 days of work from a specialized professional payed 2000€/day 6000/8000€	Same as before
No need for a generalist expert advises. Might need a specialized consultant for a phone call is the report indicate a very specific point of improvement		
Not often, for cession, transmission, external growth Maybe 2/3 years before to sell to assess the business	Investors, auditors	
Yes, willing to enter everything for the report to be as precise and reliable as possible, but we must ensure the datas will be confidential.	Everything needed if confidentiality is respected	
Interesting idea, even if he doesn't think he would use it often	Good idea, even if already exists Good idea to position as a 3rd party, as an external agent	Will have no use of the service, not convinced The valuation is not the most interesting, maybe the comparables?
To build the company to be a reference, to change the paradigm (valuation is not essential). The service must build such a reputation it changes the way things are done now.	Contact Fanny Hibon CIC Capital Investment (Nantes) Lots of liquidities available, might be very useful for investors to have a clear insight of the industry Use the comparision tool to give a clear overview of the industry (recent transaction, growth, margins...)	Some wealth managers may lack of tools to be super efficient The data base are super expensive, so accountant could not have access to them, the service could bring added value through that
5/10+0(maybe a little bit hard on this one)+8+4+2+1 =20/25 (even if its closer to 25/30, the current situation is not a pb for him, but a cheaper solution would be better for him, and he will use it)	10+10+8+4+4+1 =37	5+0+8+0+2+0 =15 Don't have the use for it

Appendix D

The Sample Reports

Here follows two examples of the reports that a customer could receive. A first version is the complete one with the assumptions, the results and so on, and a second is a summary infographics to have in one sight all relevant data to take a decision. The first one will be more developed with time, this is just to give an idea of the structure. It is made manually for now, but with the possibilities of the automation, its structure may have to evolve.

UPSILON

VALUATION REPORT

SUEZ SA

31/08/2020

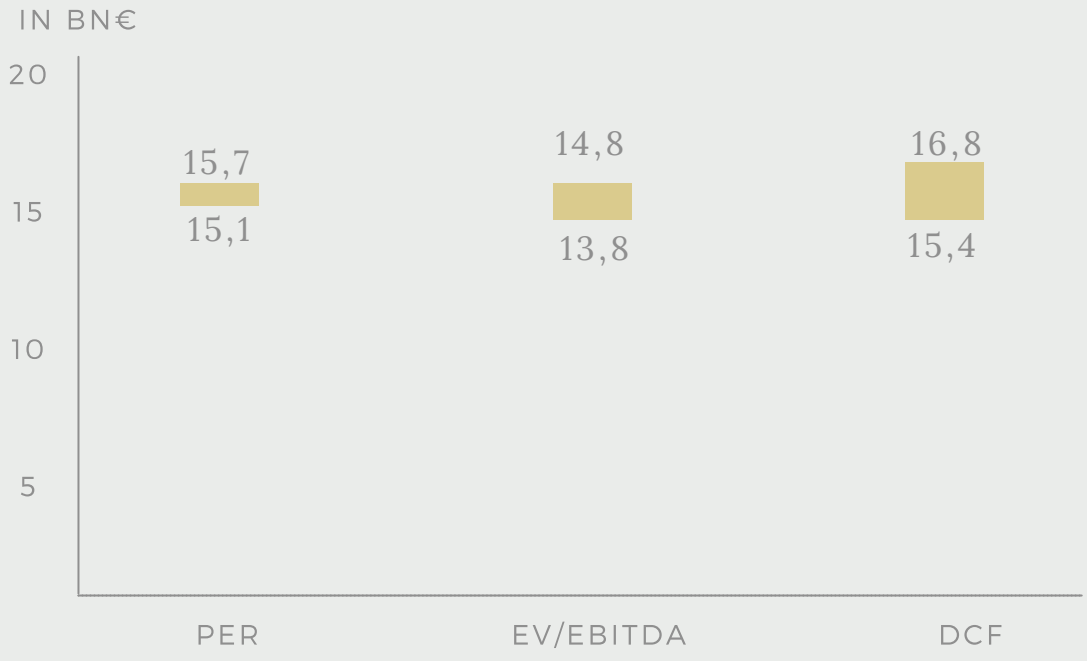
DISCLAIMER

UPSILON CAN NOT BE HELD RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PRESENT IN THIS SAMPLE REPORT. THE DATA USED FOR THE CALCULATIONS ARE EITHER PROVIDED BY THE CUSTOMER, PUBLICLY AVAILABLE OR ESTIMATED DATA. UPSILON HAS NOT AUDITED THE COMPANY TO ENSURE THE RELIABILITY OF THE PROVIDED INFORMATION

SUMMARY

YOUR VALUATION

Here follow the results of your valuation according to the three methods used: The price/earning ratio, the enterprise value/EBITDAratio and the discounted cash flow. The results are given as a range to better indicate the uncertainty of the assumptions.



WHY THOSE MULTIPLES

EV/EBITDA or EBITDA multiple: The enterprise value (EV) of the firm is divided by its EBITDA, this way, with this ratio, by multiplying the EBITDA of the targeted company by the average ratio, one can obtain the EV of the company. By then subtracting the debt and adding the liquidities, that gives the equity value. It is one of the ratios that allows to the quickest idea of the value of a business. For an industry, it is expected for a company to value a certain amount of times the value of its EBITDA.

PER or Price/Earning Ratio: for public companies, by dividing the price of a share by the earnings per share (EPS), then the theoretical value of the share is obtained and by multiplying by the total number of shares, that gives what should be the market cap and then the equity value. This ratio indicates how much should someone pay for the share accordingly to its earnings.

THE ASSUMPTIONS

SIMILAR COMPANIES

Waste Management Inc
Republic Services Inc
Veolia Environnement
Acciona
Clean Harbor Inc
Kurita Water Industries Inc
Beijing Enterprises Water Group
Evoqua Water Technologies
Chengdu Xingrong Environment
Thermax
US Ecology Inc
Vaisala
China Water Affairs Group
China Everbright Environment Group

	SUEZ	INDUSTRY
PER	31.68	21.84
EV/EBITDA	14.18	9.73

ABOUT THE DCF

The estimation of the cash flow of the company for the 5 next years as well as a modelization of the performances of the company after this period through a terminal value, once discounted gives a solid estimation of the enterprise value. Once the long term debt is subtracted and the cash is added, that gives the equity value. The terminal value is obtained through the contant growth model, the company is expected to grow at a constant rate forever.

The DCF allows to have a proper financial model of the expected behavior of the firm to know what cash flows it will generate. It focuses on the internal performances of the company, and not on the market trends to assess the value of a business.

THE ASSUMPTIONS

	2020	2021	2022	2023	2024
GROWTH	-3%	5%	3%	3%	2%
COST OF EQUITY		6,18%			
COST OF DEBT		3,95%			
WACC		3,58%			
BETA		0,83%			
CONSTANT GROWTH		2,00%			

FORECAST FOR THE DCF

Revenues	*17 556,30*	*18 252,00*	17 704,44	18 589,66	19 147,35	19 721,77	20 116,21
Other	*(60,10)*	*56,50*					
Purchases	*(3 648,60)*	*(3 720,70)*	(3 540,89)	(3 617,93)	(3 629,47)	(3 844,35)	(3 923,24)
Fixed costs & other expenses	*(6 999,20)*	*(7 089,80)*	(7 196,15)	(7 304,09)	(7 413,65)	(7 524,86)	(7 637,73)
G&A Costs (employees)	*(4 598,40)*	*(4 701,40)*	(4 806,71)	(4 914,37)	(5 024,45)	(5 136,99)	(5 252,06)
EBITDA	***2 250,00***	***2 796,60***	**2 160,70**	**2 753,27**	**3 079,78**	**3 215,57**	**3 303,18**
D&A	*(1 167,70)*	*(1 531,70)*	(1 439,80)	(1 511,79)	(1 587,38)	(1 682,62)	(1 800,40)
EBIT	***1 082,30***	***1 264,90***	**720,90**	**1 241,48**	**1 492,40**	**1 532,95**	**1 502,78**
Shares	*192,90*	*198,30*	203,85	209,56	215,42	221,45	227,65
Financial expenses	*(555,60)*	*(603,80)*	(656,18)	(688,99)	(716,55)	(745,21)	(767,57)
Financial income	*90,20*	*89,80*	89,80	89,80	89,80	89,80	89,80
Taxes	*(244,00)*	*(340,00)*	(100,34)	(225,74)	(270,27)	(274,75)	(263,17)
Earnings	***565,80***	***609,20***	**258,03**	**626,11**	**810,81**	**824,24**	**789,50**
D&A	*1 167,70*	*1 531,70*	1 439,80	1 511,79	1 587,38	1 682,62	1 800,40
Taxes cash flow adjustment	*250*	*340*					
CAPEX	*(1 230,30)*	*(1 454,60)*	(1 367,32)	(1 435,69)	(1 507,47)	(1 597,92)	(1 709,78)
CF from financing activities	*(593,00)*	*(860,70)*	(593,00)	(593,00)	(593,00)	(593,00)	(593,00)
Free Cash Flow	**160,20**	**165,60**	**-262,50**	**109,20**	**297,71**	**315,94**	**287,12**

UPSILON

VALUATION REPORT

SUEZ SA

HYPOTHESES

FOR THE METHODS

ESTIMATED GROWTH OF **-3%** FOR 2020, **5%** FOR 2021 AND **3%** FROM 2022 TO 2024

BETA	**0,83**
COST OF EQUITY	**6,18%**
COST OF DEBT	**3,95%**
WACC	**3,58**
CONSTANT GROWTH	**2%**

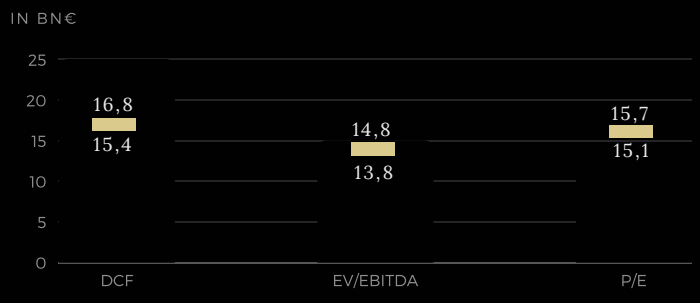
RECENT TRANSATIONS

COMPANY	BOUGHT BY	AMOUNT
WATER INC	AQUACORP	4,3BN$
AGUA LTD	ABC INC	8,1BN€
EAU SA	EGOUTS&CO	0,9BN€

RATIOS	SUEZ	INDUSTRY
RETURN ON EQUITY	**14%**	**12,3%**
GROWTH MARGIN	**5%**	**3,8%**
INVENTORY TURNOVER	**28%**	**26,4%**
RECEIVABLE TURNOVER	**19%**	**13,6%**
CASH	**6%**	**7,5%**
DEBT	**71%**	**67,1%**

RESULTS

OF THE DIFFERENT METHODS



TRENDS IN

THE WASTE AND WATER MANAGEMENT INDUSTRY

A 2,7% AVERAGE GROWTH THIS YEAR

A 9,4% RAISE IN M&A OPERATIONS SINCE 2015

CHINA'S MARKET SHARE: 24% (+4,1%)

INTERNATIONALIZATION OF THE REVENUES: +4,3%

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