

Business plan

SmartCollective UG

Big Data Processing



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Annex

1. Our company SmartCollective UG

1.1. Background

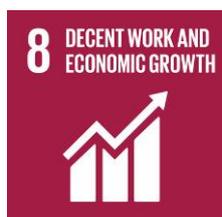
In our globalised and digitized world, the amount of data available is enormous and keeps increasing thanks to sensors and real-time analysis of activities in diverse areas of life. Data have become more and more valuable, yet big amounts of unstructured data do not have any use without specific selection, processing and structuring. Tackling these challenges is often referred to as “Big Data”, describing the analysis of large amounts of data from different sources at high speed by using innovative databases, language analyses or visualisation tools (IT Verlag für Informationstechnik GmbH, 2018).

At the same time, climate change has been increasing the pressure on global resources through more frequent and more extreme weather phenomena. Often, this leads to environmental hazards that threaten the livelihoods of people in densely populated areas. Even though the implications are more severe in the Global South, increasing temperatures and unusually strong floods and storms have posed challenges to society and environment in Europe: the German Meteorological Service (DWD) has recorded both a continuing trend of warming with an increase of the average temperature of 1.4 °C in the last 136 years and an increased intensity of heavy rain events on a national level (DWD, 2017).

Weather agencies like the DWD, other institutions that work in the field of climate research and prediction, but also actors that are involved in related fields of research within the national sustainability sector, require big amounts of data to be structured reliably and efficiently in order to attain superior governance and guarantee full data control.

1.2. Mission and Vision

We believe that a higher environmental consciousness can only be achieved through the provision of well-founded knowledge based on scientific research. Therefore, our goal as a company is to deliver professional Big Data processing to clients mentioned in the areas above. Through our work, we enhance the identification and mitigation of potential climate or land use risks and increase environmental consciousness while complying with the following UNDP’s Sustainable Development Goals:



Decent Work and Economic Growth

Our work will support the design of climate scenarios which are taken into account by many companies when it comes to their strategic decisions, influencing both the labour market and the development of the economy.



Industry, Innovation and Infrastructure

The analysis of land use patterns obtained through our data processing activities will provide a basis for innovative pathways in industry, infrastructure and other sectors.



Reduced Inequalities

Environmental predictions and scenarios are inevitably linked to the issues of climate justice and environmental justice. Precise and reliable results will support the development of new policies reducing inequalities.



Sustainable Cities and Communities

Cities being the most densely populated areas are most vulnerable to environmental risks. Therefore, models for risk mitigation obtained through thorough data analysis can foster resilience especially in urban settings.



Climate Action

To make an impact on both decision-makers but also society as a whole, the delivery environmental analyses and predictions depends on fast, reliable and precise selection and processing of the relevant data.



Partnership for the Goals

Since climate change is an issue that affects many areas of life, the results supported through our work will provoke vivid dialogue between the people, the public and institutions and encourage their cooperation.

Supporting those goals, we are convinced that our work will be a small but significant contribution to driving the process of change towards a more open-minded, collective and equitable society.

Based on our vision and the fact that we are well aware of the trust that our clients put into us by consigning their most critical data, we stick to our core values **integrity, honesty and care.**

Open communication and the full provision of data security, in our eyes, are the best policies to value both our clients and our own work. While we constantly try to improve, we take our responsibility seriously and do not exceed the capability of resources within our scope - both human and natural - to guarantee a sustainable working process.

1.3. Business fact sheet

The following fact sheet provides a short overview of the actors, workplace and routines in our business.

WHO?

→ One manager, three programmers and one administrative employee

WHERE?

→ In our Cologne office with an approximate size of 100m²

WHEN?

→ Depending on the order situation but usually from Mondays to Fridays between 09:00 and 18:00 hrs

HOW?

→ By processing Big Data at Jülich Supercomputing Centre for 0.5 hours per day and performing all other tasks at our Cologne office

1.4. Services and procedure

In the beginning of our journey, our services solely cover the areas of **Data Integration** and **Data Management**. The following definitions were retrieved from Techopedia Inc. (2019):

- **Data Integration** can be defined as the retrieval and combination of heterogeneous data as an incorporated form and structure. It allows the operators to merge different data, such as data sets, documents and tables.
- **Data Management** relates to the management of information and data for secure and structured access and storage.

Combining those two processes therefore includes the application of suitable types of data management to facilitate the best possible use of information and their maintenance throughout the data life cycle.

The need for modern Data Integration and Management is justified by the fact that older data management approaches replicate data inefficiently across redundant storage types and locations (cBEYONData, 2019). Those often lack visibility and cannot be classified as sustainable solutions to complex 21st century challenges.



Figure 1: Business workflow (own design).

In conformance with our core values, the company workflow is based on constant information exchange with our clients (see figure 1).

After the goals, requested work steps and methods have been defined by the client, a roadmap is created to confirm those and, at the same time, specify a clear idea about the components and duration of the collaboration.

Only then the data processing is started. Between the different steps, updates are continuously communicated with the client to improve working efficiency and guarantee an optimum outcome. Improvements will be made until the client's report that the results are as they wish them to be.

Finally, the results will be delivered. The clients will also receive a report about the work process, evaluating the steps and outcomes as well as further data processing potential.

1.5. Legal framework

Since SmartCollective UG is a start-up and can only provide a limited initial share, the *GmbH* (company with limited liability), by far the most common company form for corporations in Germany, is unsuitable. To

run a *GmbH*, the minimum initial share is EUR 25,000 - which can hardly be raised by a start-up.

The legal form *UG* (entrepreneurship company with limited liability) has existed since 2008 and can be described as an entry-level variant of the *GmbH* (Hartl, 2019). With a minimum share capital of EUR 1, it provides a realisable alternative for small-scale business ventures. Additionally, there are taxation benefits: As the *UG* is subject to corporate tax, it profits from comparatively cheaper tax rates. To secure the creditors, however, the law stipulates that at least 25% of the annual profit have to be saved as equity capital reserves. Considering the potential development and future perspectives of a company, the option to convert a *UG* to a *GmbH* at a later stage is given (Realis Verlags-GmbH, 2019).

Based on these findings, the most promising legal form to be used for our company is the *UG* as it has been added to our official name.

2. Market Analysis

2.1. Site

Just like real estate, location is an important factor for data centers that provide interactive services to people. For data centres that are successfully placed, the most efficient location is more about availability to high productivity connectivity than a nice view (Stanganelli, 2017). More considerations go into finding a good location for a business including, availability of market, accessibility to customers, workforce, transport costs among others. After a conduction of internet-based market analysis, Cologne in the Northern Rhine Westphalia has been chosen as the location for the data consultancy company. This is influenced by the following reasons which make the city attractive for this business idea.

- ***Cologne as a Metropolis***

Generally, proximity of data centres to a place of high population and well-educated workforce, and other companies accessing the company's services does not only boom market, reduce relocation costs or make staffing up the firm much easier- all other things being equal, it results in lower data latency (Stanganelli, 2017). Cologne as a Metropolis and the fourth largest city in Germany, has approximately 17 million people who live in a length of about 100 kilometres in and around the city more than any other European metropolis, thus, situated in the midst of a promising sales market (see figure 2). This informs a big market size for the data consultancy firm hence a good location.

- ***Business-friendliness and existence of big companies***

Cologne is one of the most business-friendly metropolises in Germany. The city is characterized by a modern dynamic industrial variety and well-balanced company structure which despite its economic development, ensures employment and development of people in the city (Stadt Köln, Status 2017). Cologne is known to be one of the most culture-rich and biggest industrial areas in Germany. This industrial and company structure coupled with a business-friendly environment pose a booming market for a company which seeks to ensure effective and efficient data management for other companies with maximum focus on sustainability.

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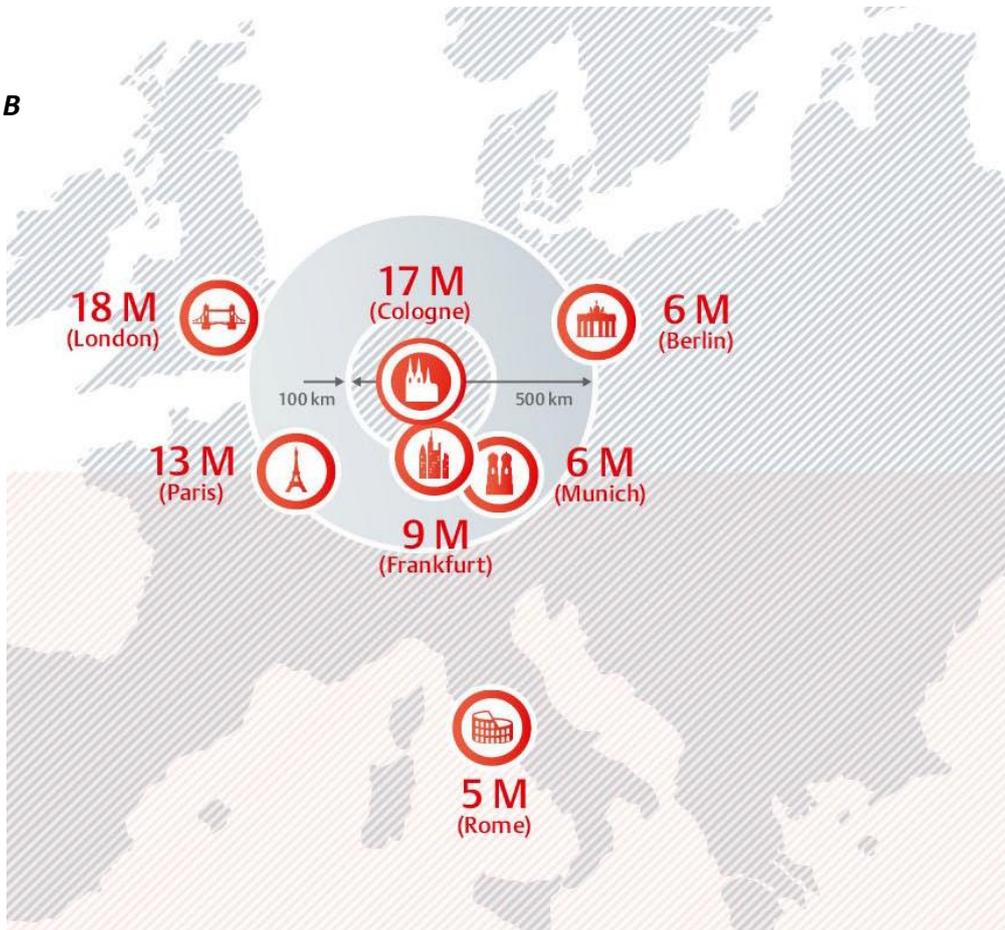


Figure 2: Cologne as a dynamic economic hub situated in a promising sales market (Stadt Köln, Status 2017).

- **Highly accessible city due to great logistics**

The economic dynamics of Cologne is not only due to its central location in Europe, but also due to its first-class accessibility (Stadt Köln, Status 2017). Cologne as a city is endowed with excellent network of railways, waterways, roads and airways with perfect logistics. From the city centre of Cologne, one can reach three international airports (the Cologne/Bonn Airport, the Dusseldorf Airport and the Frankfurt Airport) in less than an hour. The city is the most significant railway junction in Europe and the collation point for the Western European central highways (Stadt Köln, Status 2017). All these make the city highly accessible to people for business and service activities hence a good location for the business (see figure 3).

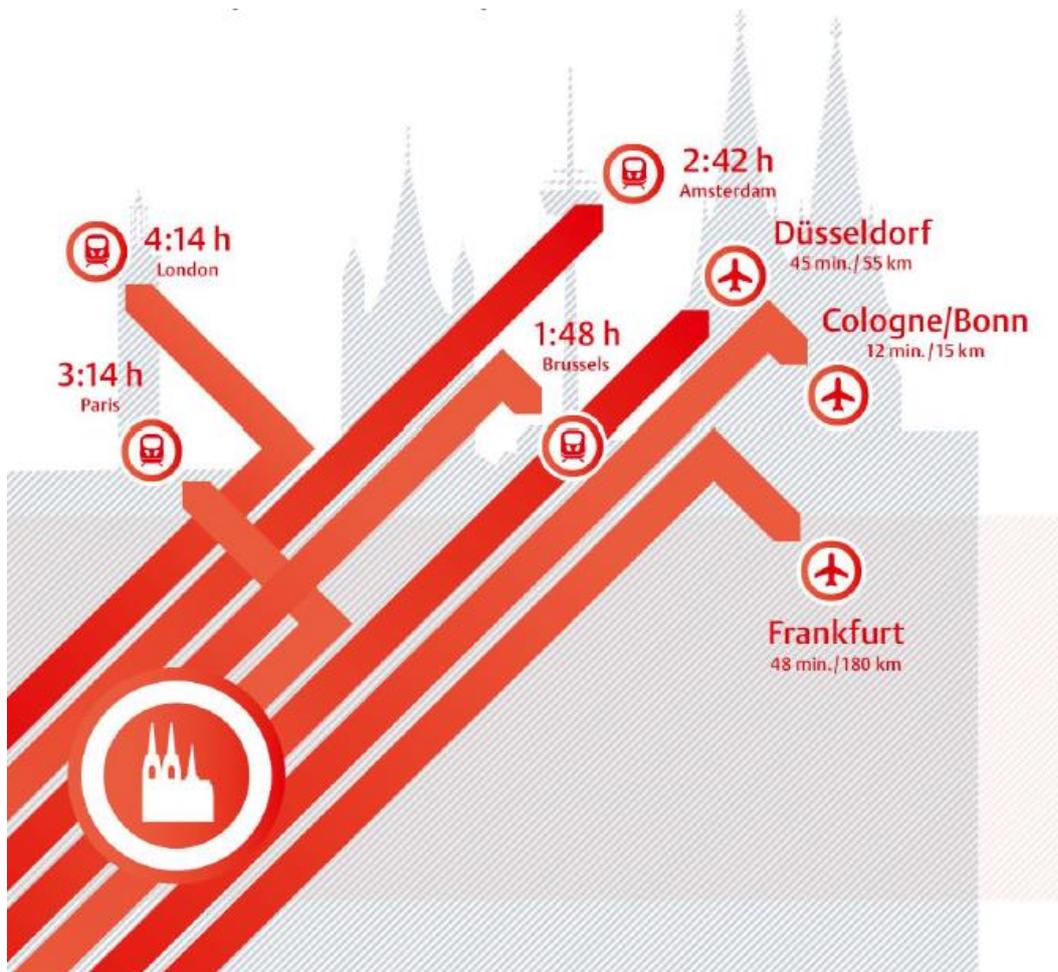


Figure 3: Cologne city accessible in less than an hour from the Dusseldorf, Cologne/Bonn and the Frankfurt Airports (Stadt Köln, Status 2017).

- **Proximity to Supercomputing Center**

The data consultancy company in order to find client data patterns, would hire a supercomputer in the Jülich Supercomputing Centre, one of the most powerful computer centres in Europe. This supercomputing centre is situated 50 km from Cologne and thus locating the data company in Cologne would keep cost down in terms of transport and sourcing.

- **Existence of Highly qualified workforce.**

Talking of well-educated workforce, the city is an outstanding higher education environment created by the “German Excellence University – the University of Cologne” which among other educational institutions in the city makes available highly qualified young human resources (Stadt Köln, 2017). According to Stadt Köln, 2017, there are about 100,000 students and paid vocational training courses in Cologne which ensures highly competent workforce capacity in the Metropolis. This attribute of Cologne makes it a good location for the company since acquiring skilled labour to staff the company would be much easier as compared to areas with few qualified personnels.

2.2. Size of the market

The German Big Data market has shown significant growth in the last years. In 2018, Big Data applications created a revenue of EUR 6.4 billion. This is a 10% increase compared to the year before, and market research predicts that this percentage increase will remain steady (IT Verlag für Informationstechnik GmbH, 2018). As depicted in figure 4, the revenue of Big Data services, which encompasses consultancy activities as SmartCollective UG will offer, has increased by EUR 500 million within two years.

In the German Big Data consultancy market, most players are small and medium-sized enterprises: a business type very typical for the German market, sharing values such as

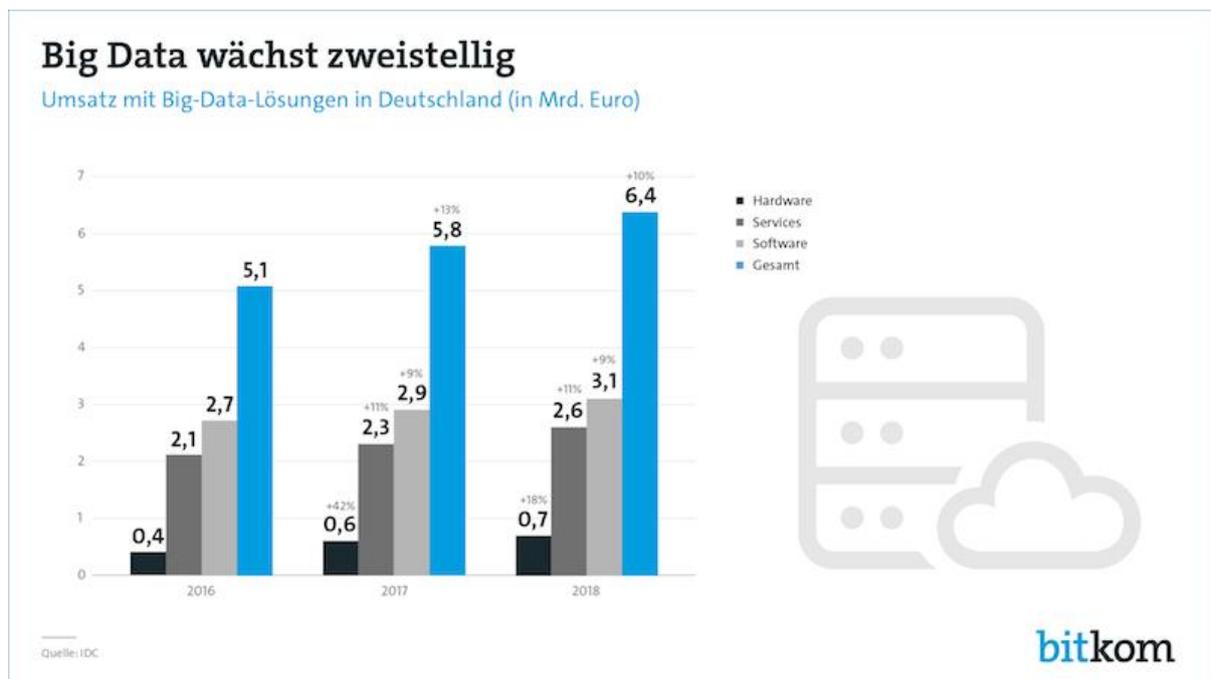


Figure 4: Growth of the German Big Data market (in billion EUR) between 2016 and 2018, showing in the areas of hardware, services, software and total (taken from IT Verlag für Informationstechnik GmbH, 2018).

longevity, thoroughness and precision. This enables the establishment of long-standing relationships with clients. At the same time, the high national privacy standards are upheld, protecting the client's critical data (Wisselink, 2016).

In 2018, a highly discussed data protection policy was introduced in the EU: The General Data Protection Regulation (GDPR) has had significant effects on Big Data analytics activities as the new legal framework restricts the processing of personal data (NetMediaEurope Deutschland GmbH, 2018). Since the regulation refers to personal data only, however, research dealing with climate and land use data is not affected by it. Therefore, SmartCollective UG's activities are no more restricted by the GDPR than other companies facing general administrative procedures connected to HR or other areas.

In addition to security and very good customer advisory qualities stated already, German big data consultancy companies are special also due to the solid scientific knowledge that back their consulting methodologies, for example in the area of Industry 4.0 which is one of the

main areas of focus for big data consultancy internationally. Germany made a thorough national collaboration with stakeholders, industries as well as research institutions in making sure that this key area of big data consultancy is strongly bound scientifically to also keep the country in its position as a leading industrialised country.

Location of German data market

As Germany’s major financial and telecommunication district, Frankfurt is the home to the largest number of data centres in Germany with more than 2,5 terabytes per every second at peak periods (Telehouse, 2019). This is because Frankfurt represents 70-80% of the current demand for data centres and is especially home to DE-CIX which is the country’s leading internet exchange with more than 500 customers internationally (Telehouse, 2019). Some other areas in Germany which are hotspots for data consultancy and have some number of data centres. Table 1 shows the various cities in Germany and the number of data centres available.

Table 1: German Data Centre Locations (“Data Centre Map”, [n.d.]) showing a list of various data centres locations in Germany and the number of centres in each location.

Area (Number of Centres)	Area(Number of Centres)	Area(Number of Centres)	Area(Number of Centres)
Aachen (1)	Dortmund (2)	Hannover (2)	Nettetal (1)
Bamberg (1)	Dresden (5)	Herford (1)	Nuremberg (15)
Berlin (14)	Düsseldorf (12)	Jena (1)	Oberhausen (1)
Bielefeld (1)	Erfurt (2)	Karlsruhe (2)	Rostock (1)
Bonn (2)	Essen (1)	Kiel (3)	Saarbrücken (1)
Bremen (3)	Falkenstein (1)	Leipzig (6)	Saarland (1)
Chemnitz (1)	Frankfurt (49)	Magdeburg (1)	Saarlouis (1)
Coburg (1)	Freiburg (2)	Mahlow (1)	Schwerin (1)
Cologne (4)	Halle Saale (1)	Mannheim (4)	Stuttgart (11)
Darmstadt (1)	Hamburg (14)	Munich (18)	Würzburg (2)

As seen in table 1, Frankfurt has the highest number (49) of data centres in Germany. Frankfurt is therefore the largest hotspot for data consultancy in Germany, followed by Munich, Nuremberg, Berlin (the capital city), and Hamburg. From the number of centres attached to Cologne from the table, comparably to the other nearby cities, it is wise to situate the company in this city since aside the market, there would be at least 4 centers to cooperate with when the need arises to make our work productive.

2.3. Customer client analysis

In order to set up and run a successful business, there is need to identify, assess and understand the intended customers (Growthink Inc., 2019). Customer-client analysis is an important part of a business plan that encompasses three important segments namely,

1. Customer Identification
2. Customer Needs Identification
3. How the company services and products satisfy customer needs.

1. Customer Identification

This segment of customer analysis allows companies to determine and define the customers that can be catered for by a company. Furthermore, having a specified customer base makes marketing of the company's product and services effective (Smith, 2016).

Our clients are companies, agencies or associations within the German sustainability sector that depend on big data for their operations. In this regard, companies such as the German Meteorological Services, Linde Gas AG, Akasol AG, Merck KGaA, Groninger & Co GmbH and Wacker Chemie AG are among our potential clients.

Linde Gas AG is a member of the Linde Group AG. It is a leading world gas company based in Munich that deals in chemicals and a variety of compressed and liquified gases and operates within the German sustainability sector. It employs nearly 64,500 employees in 100 countries and. In 2016, revenue generated was EUR 17,944 billion. Its operations promote climate protection as revealed by their "Clean Technology" model. Clean Technology allows for sustainable, ecological and feasible energy generation (The Linde Group, 2019).

Akasol AG is a leading company operating within the Energy industry sector based in Darmstadt. The company develops, tests, validates and manufacture a large variety of rechargeable Li-Ion battery systems with a wide range of applications. In 2017, the company's revenue was EUR 13.4 million. Its operations promote the efficient supply of environmentally friendly energy (AKASOL AG, 2019).

Merck KGaA company located in Darmstadt is a leading pharmaceutical, chemical, performance materials and life sciences manufacturer. It generated revenue of EUR 15.024 billion in 2016 and has close to 38, 000 employees in 66 countries. The company's values are integrated in promoting environmental integrity (Merck KGaA, 2018).

Groninger & Co. GmbH a company within the chemical and pharmaceutical industry, develops and manufactures specialized machines for accurate filling and closing of liquid pharmaceutical products. It has around 900 employees worldwide. Environmental protection and sustainable business practices are strongly embedded in their operations (Groninger & Co. GmbH, 2019).

Wacker Chemie AG is based in Munich and operates within the chemical and pharmaceutical industry. The company's core business involves the production and sale of chemicals. Their products aim to be environmentally safe and energy conserving (Wacker Chemie AG, 2019).

2. Customer Needs Identification

These companies within the sustainable sector make use of big data. There are five types of big data analytics namely prescriptive, diagnostic, descriptive, predictive and consumption analytics. A company's choice of analytical data type depends on the company's goal, business problem, stakeholders, the value of solving the problem and deliverables. Predictive analytics is the most commonly used type mainly because it is used to forecast the outcomes of specific scenarios (Anadiotis, 2017).

Prescriptive analytics is considered the most underused although it is the most valuable. It is used in determining the best solution among a variety of choices. Descriptive analytics is the least preferred because it is time consuming and produces valueless results. This is depicted in of relevance of different types of Big Data analytics (with regard to value and attainment).

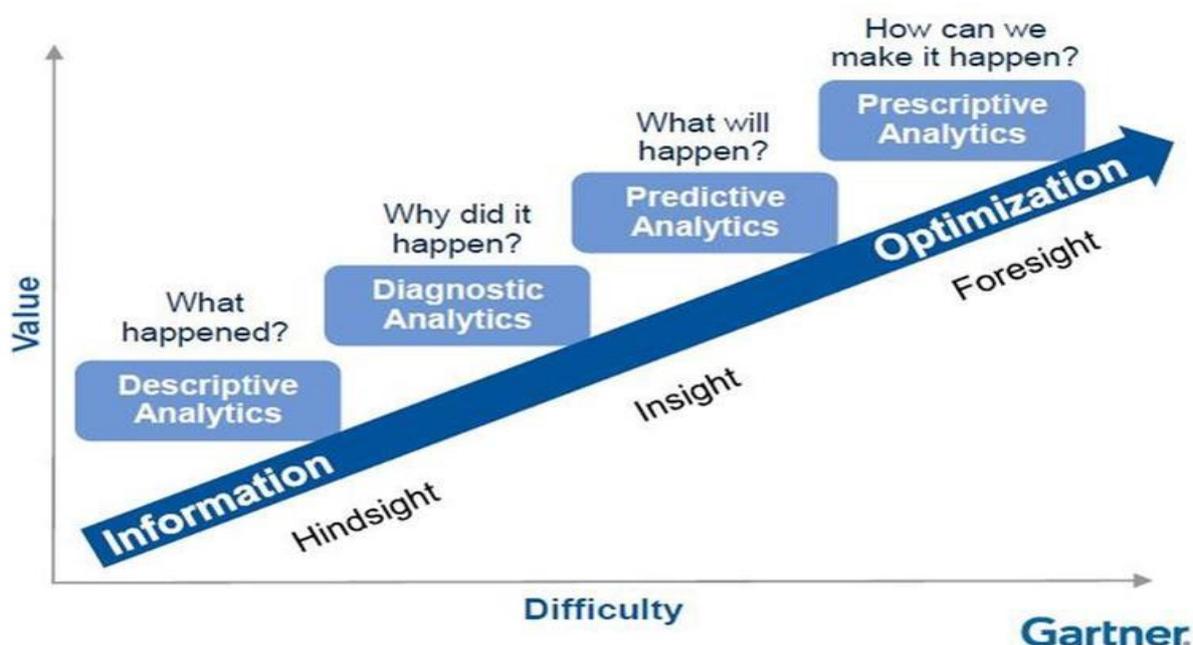


Figure 5: Overview of relevancy of different types of Big Data analytics (Anadiotis, 2017).

3. How the company services and products satisfy customer needs

A *customer need* is a reason that provokes a customer to buy a product or service. Eventually, this need leads to a customer's purchasing decision.

To purchase a product, customers instinctively check the product's functionality, price, performance, design, efficiency etc.; and to purchase a service, they look for empathy,

fairness, transparency, options and available information to help them make a decision (Breschi, 2019).

To satisfy the customers, the company needs to focus on specific expectations of the customers. By establishing a clear company vision, providing premier customer service to valuable customers and communicating with your ideal customers can help the company to find the customer's priority. To meet the expectations of the customers, the company has to think like the customers, know their customers, e.g. if I was the customer signing up for a service what would satisfy me? According to Breschi (2019), there are 5 common customer pain points and proactive steps to develop customer-first values. Those are:

- 1) Offer consistent company wide-messaging
- 2) Provide instructions for easy adoption
- 3) Ask customers for feedback
- 4) Nurture customer relationships
- 5) Solve for the right customer needs

Customer needs are the named and unnamed needs the customer has when they come in contact with our business, our competitors, or when they search for the solutions we provide. Therefore, our workflow scheme as described above has been adapted to enable a maximum of communication between the parties. It is definitely very challenging to satisfy the customers with our services because of the number of competitors in market. That is why, the next chapter focuses on competition analysis. We have to keep in mind, that only by satisfying customer needs, our company can easily increase profits and sell more services.

2.4. Competition analysis

Competitive analysis is a field of strategic research by collecting and reviewing information about the rival firms. It is completely legal. It is mainly researching and gathering the information already available in their websites, any news or articles published about that company or their yearly reports open for public. It's a smart way to find out what the competitors are doing and what kind of threat they present for the financial well-being. Now-a-days, with the innovation of new softwares and technologies everyday, the business owners get the chance to prepare them better than their competitors. With a regular and systematic competitive analysis the business owners can minimize the uncertainties. The last step after documenting all the information about each competitor would be identifying specific areas that need improvement (Tighe, 2017).

Moreover, competitor analysis is a learning opportunity for the start-ups, that gives an insight into own business, as well as for those who are already penetrated in the market. Through this analysis, one can find out why his competitor is successful or what made the competitor unsuccessful. (Buckley, 2017)

During competition analysis for our business, it is found that the increasing data variety is the great challenge for businesses working with big data. There are some companies who are competitors for us, i.e the companies working with meteorological and climate data, renewable energy data, or water management data to support their customers and have integrated their own data analytics department. The five most relevant players are presented below in both an overview table (see table 2) and more detailed company profiles.

Table 2: Overview of leading and successful competitors (own design, adapted from enercast GmbH 2018, MeteoGroup GmbH 2018, Kisters 2019, BV 2019, Reply 2019).

	Enercast	MeteoGroup	Kisters	Reply	Black and Veath
Location	Kassel	Berlin	Aachen, Duisburg, Dortmund, Kiel, Karlsruhe	Berlin, Bremen, Düsseldorf, Frankfurt, Hamburg, Munich	Wiesbaden
Activity	Power forecasts for renewable energy	Provide data for weather related decisions	Deliver software solutions for the sustainable management	Support Automotive, Energy and Utility Industries	Deliver solutions that preserve and protect water management system
No. of employees	30 employees (in Kassel)	400 employees (worldwide)	500 employees (worldwide)	5,500 employees (worldwide)	11,000 employees (worldwide)
Social media presence	Twitter, Facebook, LinkedIn, Xing	Twitter, Facebook, LinkedIn	-	Twitter, Facebook, LinkedIn, Xing	Twitter, Facebook, LinkedIn, Instagram, YouTube



- Enercast is a leading technology provider for applied artificial intelligence and the digital transformation of renewable energy, founded in 2011. Since 2011, they have been operating their forecast services via distributed and redundant data centers in Germany.
- Location: its headquarter is in Kassel, Germany (approximately 246 km distant from Köln)
- More than 14,000 sites worldwide are controlled with their wind and PV forecasts.
- The currently 600 TB of Managed Data are processed via a robust, industry-ready Big Data infrastructure – growth per day: 150 GB.
- They offer:
 1. Efficient asset management: Using their platform, forecasts can now be integrated quickly and interactively.
 2. Enabling energy trading: They help their clients (direct marketers and energy traders) to make better trading decisions. If historical weather data is combined with other qualitative information, artificial neural networks can find correlations and patterns that allow a stable price forecast.
 3. Powering the digitization of infrastructure: This enables their clients (energy and industrial companies) to increase productivity and reduce maintenance costs.
 4. Optimization of Smart Grids: Using their open forecasting platform, historical weather data and data of the current total energy consumption of a city or district as well as the local standardized and correlated.

(enercast GmbH, 2018)



- Their team of expert meteorologists is on hand 24/7/365 to deliver the highest-quality analysis and support. They have clients all over the world: with offices in 12 countries around the world, and 9 weather rooms in 8 of these countries.
- Location: Berlin, Germany (approximately 583 km distant from Köln)
- Mission: To help their customers make better weather-related decisions with state-of-the-art products and services.
- They offer: complete product suites for various industries, i.e. Shipping, Offshore, Energy, Road Management, Air Travel, Insurance, Water Management and Automotive.

- Their weather apps available on iPhone and Android: WeatherPro and MeteoEarth.
- Their State-of-the-art technology ensures businesses get accurate and up-to-date data

(MeteoGroup GmbH, 2018)

KISTERS

- Kisters is delivering software solutions for the sustainable management of energy, water and air resources, environmental protection and safety, and meteorology and climatology.
- They deliver the software solutions into various geographical markets in Europe, Asia, Australia and North America.
- Location: Headquarter in Aachen, Germany (approximately 75 km distant from Koeln) and has numerous offices in Germany (e.g. Duisburg, Dortmund, Kiel, Karlsruhe)
- Originally founded in 1963 as an engineering firm
- It is a medium-sized company with over 500 employees
- They support their customers achieving business goals with their effectively couples proven software solutions. They select the ready-made standard modules to build and configure the exact solution for their customers.
- Their visions:
 - 1) Direct dialog, fairness and a cooperative management style
 - 2) Not only providing traditional support directly to the customer, but also a wide range of “as a service” solutions through their certified IT infrastructure
 - 3) To help mitigate the impact of climate change, their software solutions are designed to analyze long-term trends, ensure supply security, warn urban environments and critical infrastructures of heavy rainfall and inform the public and private sector of extreme situations in time.
 - 4) They are looking to achieve ISO 27001 certification for their software development division.
- Their success factors: a strong customer base, solutions easily scalable, leading market position in Germany, Sustainability as a corporate purpose.

(Kisters, 2019)



They combine advanced software with expert consultation to identify, deliver and sustain high-value solutions for power, water, grid, renewables, oil & gas, and smart city applications.

- They deliver solutions that preserve and protect groundwater and watersheds, provide effective flood control, and manage storm drainage.
- With a *focus on data*, Black & Veatch helps to drive a coordinated effort in realizing value across their clients' organizations.
- Their vision: get recognition as a global leader in safety, innovative client solutions, career development and profitable growth.
- They build strong relationships with their clients and business partners based on seven fundamental values: integrity, common purpose, shared ownership, respect, accountability, stewardship, entrepreneurship.
- Founded in 1915; in these 100 years, Black & Veatch grew to become one of the world's most successful engineering, procurement, consulting and construction companies. For more than 35 years, Black & Veatch has been offering end-to-end data center and mission critical solutions.
- Ranked 14 in Top 200 environmental firms
- They have 11,000 professionals and 110 offices (covering six continents)
- Location: Wiesbaden, Germany (approximately 158 km distant from Köln), headquarter in USA

(BV, 2019)



- Reply is made up of a network of highly specialised companies, which support leading industrial groups (Automotive, Energy and utility) in defining and developing business models to optimise and integrate processes, applications and devices, using new technology and communication paradigms, such as Big Data; Cloud Computing; Digital Communication; Internet of Things; Mobile and Social Networking.
- Several office locations in Germany: in Berlin, Bremen, Düsseldorf, Frankfurt, Hamburg, Munich
- Reply assists companies operating in the *Utility* and *Oil & Gas* markets and defining new business models and innovative projects.
- They are supporting *Energy & Utility market* operators on issues related to Meter Data Management (MDM) and they define themselves as the ideal partner for defining Smart Metering solutions.

(Reply, 2019)

Through research about our competitors and analyzing the information, we can determine our visions and missions as a startup big data consultancy. We could analyze to determine

our service quality, market share, marketing strategies, and to identify our competition's strengths and weaknesses.

Although in comparison with our competitors, we are very small only starting with 5 employees. However, now we can encourage ourselves with some certain goals. We need to keep in mind that our competition can change quickly, and new players can emerge tomorrow, and the economy may upswing or downswing at any moment. We must clearly understand our competition so that we can evaluate our market position as a big data consultancy.

3. Financial planning

The purpose behind a financial planning in business is to predict future financial results and determine how best to use the company's financial resources to achieve organization's short- and long-term targets. Planning means looking well into the future, it is a highly creative and analytical thinking process (Hill, 2019).

3.1. Calculation of investments

For a business calculation, it is essential to focus on few different sections. Those are investments and depreciation costs, financing costs, consumption costs, labor costs, self costs, cash flow and return on investments. Those are discussed in the following sub-chapters to get an overview how it may work.

3.1.1. Investment and depreciation cost

Table 3: Overview of Investment and depreciation cost in EUR (own design).

Investment goods	Investment expenditures	Depreciation period (years)	Depreciation rate (%)	Depreciation costs p.a.
<i>Interior</i>				
Office renovation	16.000	n.a.	n.a.	n.a.
Office furniture	10.000	13	7,69	769,23
Ambience	400	n.a.	n.a.	n.a.
Other fitments	400	n.a.	n.a.	n.a.
<i>Work equipment</i>				
Computers incl. accessories	10.000	3	33,33	3.333,33
Printers	600	3	33,33	200
Copy machine	900	7	14,29	128,57
Telephones	650	5	20	130
Stationery	300	n.a.	n.a.	n.a.
<i>Vehicles</i>				
Company car	20.000	5	20	4.000
<i>Miscellaneous</i>				
Unexpected	5.750	n.a.	n.a.	n.a.
TOTAL	65.000			8561,14

For a startup office interior, it is estimated of an investment of EUR 26,800. There for office renovation includes floors, wallpapers, furnitures like tables, chairs; plants or other decorations for an good working ambience, and other fitments like kitchen accessories. Another investment should be on work equipments e.g. high-performance computers, printers, copy machine etc. of EUR 12,450. For the company car estimated investment of EUR 20,000. Finally, any unexpected cost may show up and therefore, allocated amount is EUR 5,750. So, it the initial investment is calculated of EUR 65,000.

According to Afa-Tabelle (2019), depreciation period of office furniture is 13 years which leads to a depreciation cost of EUR 769.23 per year for SmartCollective UG. Eventually for total investment of EUR 65,000, the depreciation cost is EUR 8561.14 (see table 3).

3.1.2. Financing cost

To cover the total investment expenditures of EUR 65,000, 30% are paid from savings and 70% are paid through a credit (see table 4).

Table 4: Overview of financing cost shares in EUR (own design).

Costs	EUR
Own capital (30%)	19.500
Financing through credit (70%)	45.500
Total	65.000

The financing through credit is based on a 10-year credit period with an interest rate of 2%. Every year, one tenth of the sum (EUR 4,550) are payed back plus the interest costs which are calculated individually for each year (as seen highlighted in table 5). The accumulated sum interest is EUR 5,005.

Table 5: Interest paid on debt in EUR based on a 10-year credit with an interest rate of 2% (own design).

Year	Balance of debt	Interest rate (%)	Interest costs p.a.	Refunding bank loan
1	45.500	2	910	4.550
2	40.950	2	819	4.550
3	36.400	2	728	4.550
4	31.850	2	637	4.550
5	27.300	2	546	4.550
6	22.750	2	455	4.550
7	18.200	2	364	4.550
8	13.650	2	273	4.550
9	9.100	2	182	4.550
10	4.550	2	91	4.550
Sum interest			5005	
Sum repayment				45.500

3.1.3. Calculation of labour costs

The company for starters would employ the services of five personnel including a manager, three IT-analysts and one administrative personnel. The size of labour force is kept at a qualified but lower level to save the company's operational costs especially in the early years of operation. There would be no extra cost to employ a driver who would access the service of the Jülich Supercomputing company with the company's vehicle, since that would be done by the IT-Analysts who before being employed must have acceptable driver's licenses. All salary rates of personnel were obtained through consultations and are based on employees' expertise as well as the required minimum wage in Germany per hour (EUR 8.84). Employees would work 8 hours per day with the exception of weekends, work leaves and public holidays. The company would bear direct labour costs of EUR 4,818,80.00 in a year (see table 6).

Table 6: Labour costs in EUR (own design).

Personal at cost centre	Salary per month	Number	Direct costs
Manager	7.916	1	95.000
IT-Analyst	10.000	3	360.000
Administrative employee	2.240	1	26.880
		TOTAL	481.880

3.3.4 Calculation of Consumption Costs

From table 7, the total of EUR 210,052.38 consumption cost represents all expenses in a year. The proposed office size for our data company is 100 m². According to Wohnungsboerse (2019), the average rent for Cologne is 12,56€/m². The rent cost was therefore calculated based on the office size and the average rent for Cologne. With a 500 tariff Netspeed, NetCologne charges EUR 69,95 per month (NetCologne, 2019). High-speed internet & telephone cost per year was calculated using the NetCologne's Netspeed tariff.

Table 7: Consumption costs in EUR (own design).

Expense	Fixed costs p.a.
Rent	15.072
High-speed internet & telephone	839,40
Data storage infrastructure subscription	64,71
Data integration software	257,07
Use of Supercomputing Centre in Jülich	175.219,20
Employee food and drinks	600
Marketing and PR	18.000
TOTAL	210.052,38

The costs of data storage subscription and integration software were based on the prices per year on various web advertisements for data backup services. The system usage of the supercomputer in Jülich which costs EUR 0,03 per core hour, will be used for

0,5 hours per day. With a total JURECA core number of 1872, each equipped with a minimum of 24 nodes per job, the supercomputer service costs EUR 673.92 for a day (i.e. 1872 nodes *

24 cores/node * 0.5h * 0.03€/h*cores). Employee food and drinks specifically coffee and tea, would be provided by the company with an average of EUR 50 per month.

3.2. Calculation of cost and price

For a clear overview, we did the calculation with revenue and costs for 10 years.

Table 8 shows the calculation of costs and revenue, and an estimated sales profit. An estimation of a positive annual result is projected to be achieved at the beginning of 2nd year since started. It is assumed to achieve a revenue of EUR 1.8 million from the 3rd year of our consultancy. This means target of SmartCollective UG is to reach 100% capacity from its 3rd year, after initially reduced capacities of 30% in the 1st and 60% in the 2nd year.

Table 8: Self cost calculation in EUR for 10 years (own design).

	Year 1	Year 2	Year 3	Year 4	Year 5
Capacity (%)	30	60	100	100	100
Revenue p.a.	540.000	1.080.000	1.800.000	1.800.000	1.800.000
Costs	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.
Depreciation costs	8.561,14	8.561,14	8.561,14	8.561,14	8.561,14
Financing costs	910	819	728	637	546
Labour costs	481.880	481.880	481.880	481.880	481.880
Consumption costs	210.052,38	210.052,38	210.052,38	210.052,38	210.052,38
Sum of costs	701.403,52	701.312,52	701.221,52	701.130,52	701.039,52
Sales profit	-161.403,52	378.687,48	1.098.778,48	1.098.869,48	1.098.960,48

	Year 6	Year 7	Year 8	Year 9	Year 10
Capacity (%)	100	100	100	100	100
Revenue p.a.	1.800.000	1.800.000	1.800.000	1.800.000	1.800.000
Costs	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.
Depreciation costs	8.561,14	8.561,14	8.561,14	8.561,14	8.561,14
Financing costs	455	364	273	182	91
Labour costs	481.880	481.880	481.880	481.880	481.880
Consumption costs	210.052,38	210.052,38	210.052,38	210.052,38	210.052,38
Sum of costs	700.948,52	700.857,52	700.766,52	700.675,52	700.584,52
Sales profit	1.099.051,48	1.099.142,48	1.099.233,48	1.099.324,48	1.099.415,48

3.3. Profitability and cash flow

Table 9: Cash flow calculation in EUR for 10 years (own design).

	Year 1	Year 2	Year 3	Year 4	Year 5
Sales profits	-161403,52	378687,48	1098778,48	1098869,48	1098960,48
Depreciation costs	8561,14	8561,14	8561,14	8561,14	8561,14
Financing costs	910	819	728	637	546
Labour costs	481880	481880	481880	481880	481880
Consumption costs	210052,38	210052,38	210052,38	210052,38	210052,38
Loss carried forward		-862807,03	-322625,03	397556,97	238643,38
Profit before tax	-862807,03	-322625,03	397556,97	397738,97	397920,97
Taxes (40%)	0	0	159022,7865	159095,5865	159168,3865
Profit after taxes	-862807,03	-322625,03	397556,97	238643,38	238752,58
Cash-flow (net prof.+depr.)	-854245,90	-314063,90	406118,10	247204,52	247313,72
Repayment credit	4550,00	4550,00	4550,00	4550,00	4550,00
Dividend	-858795,90	-318613,90	401568,10	242654,52	242763,72

	Year 6	Year 7	Year 8	Year 9	Year 10
Sales profits	1099051,48	1099142,48	1099233,48	1099324,48	1099415,48
Depreciation costs	8561,14	8561,14	8561,14	8561,14	8561,14
Financing costs	455	364	273	182	91
Labour costs	481880	481880	481880	481880	481880
Consumption costs	210052,38	210052,38	210052,38	210052,38	210052,38
Loss carried forward	238752,58	238861,78	238970,98	239080,18	239189,38
Profit before tax	398102,97	398284,97	398466,97	398648,97	398830,97
Taxes (40%)	159241,1865	159313,9865	159386,7865	159459,5865	159532,3865
Profit after taxes	238861,78	238970,98	239080,18	239189,38	239298,58
Cash-flow (net prof.+depr.)	247422,92	247532,12	247641,32	247750,52	247859,72
Repayment credit	4550,00	4550,00	4550,00	4550,00	4550,00
Dividend	242872,92	242982,12	243091,32	243200,52	243309,72

Combining all numbers, we calculated a cash flow for the coming ten years (as seen in table 9). It shows that our dividend will turn out positive in the third year and then stabilize around a value of EUR 243,091.32.

3.4. Return on Investments

Return on Investment (ROI) is a measurement of performance used to calculate the efficiency of an investment. ROI tries to directly measure the amount of return on a particular investment, relative to the investment's cost. To calculate ROI, the benefit (or

return) of an investment is divided by the cost of the investment. The result is expressed as a percentage or a ratio (Chen, 2018). The cumulated dividend is presented in figure 6 and exceeds the total costs from year 9 onwards.

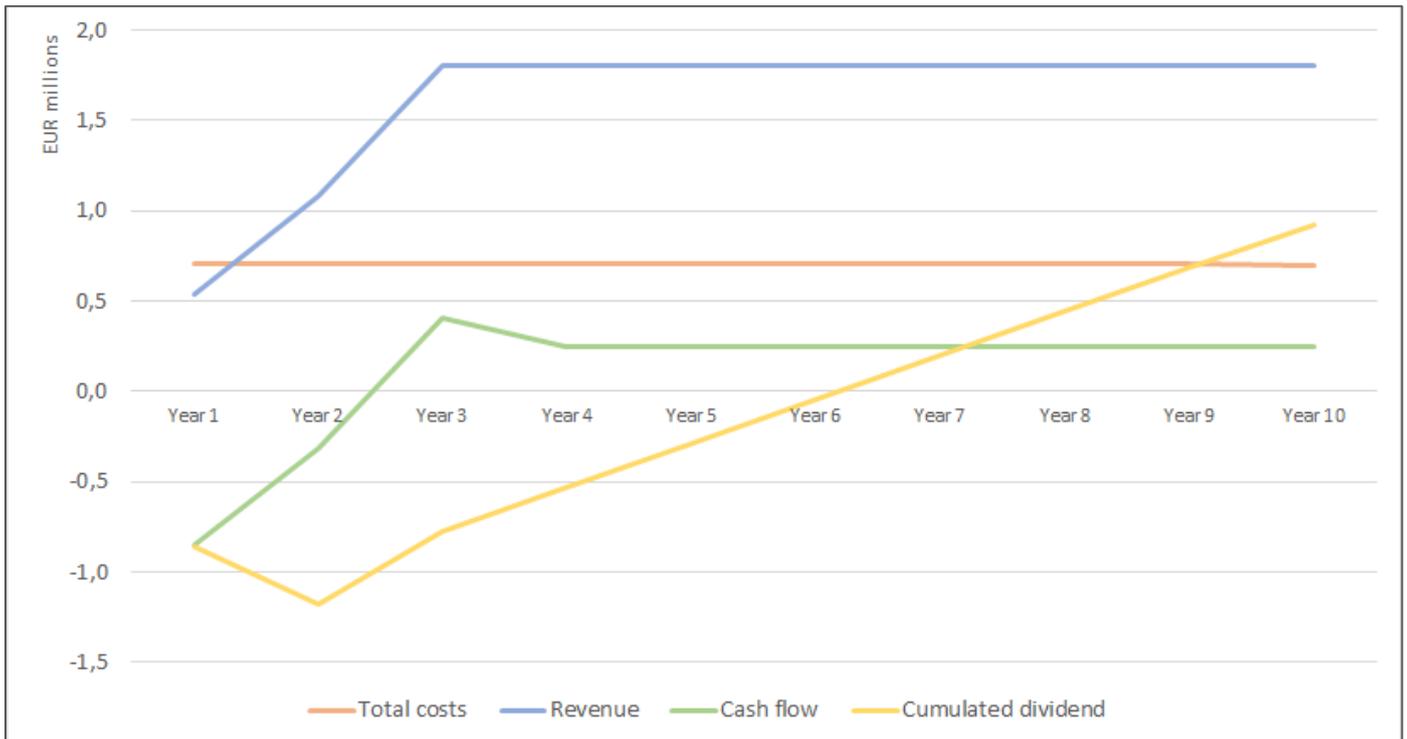


Figure 6: Development of key financial indicators over a 10-years period (own design).

4. Conclusion

With this business plan for big data consultancy we are providing a template as realistic as possible for successfully launching this business into the market. We are aware, that now-a-days new competitors are entering market everyday with innovative solutions. With a clever marketing strategy, we plan to increase our market capacity. Once the business is succeeding in Cologne, we are hoping so provide services and increase our business all over Germany.

5. References

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Annex

Article of association

(1)

Company name, Registered Offices and Financial Year

The name of the company is

SmartCollective UG

The registered office of the company is located at

Beispielsstr. 42, 50679 Cologne

The financial year of the company starts on/with

01/07/2019

(2)

Object of Business

The object of the company's business is providing consultancy services in the area of big data analytics which supports data processing of environmental companies in Germany. The company is entitled to pursue all business and carry out all measures which appear to serve its object. It may establish branches or subsidiaries abroad or participate in other utilities. The company is entitled to transfer or relinquish its business fully or partially to other companies, to conclude company agreements and enter into co-operations.

(3)

Share Capital

The total share capital of the company is EUR 19,500. This amount shall be paid immediately in full and in cash. As per the German Civil Code, 25% of the taxed annual turnover of the company shall be added to the capital until a total sum of EUR 25,000.00 is reached. The company will then be eligible to transform into a GmbH (Gesellschaft mit beschränkter Haftung).

(4)

Managing Directors and Representation

The company shall have one managing director.

If only one managing director is appointed, such managing director shall represent the company alone.

If more than one managing director is appointed, the company shall be represented jointly by two managing directors or by one managing director jointly with a holder of a special proxy.

(5)

Announcements

Announcements of the company shall be published exclusively in the Federal Gazette (Bundesanzeiger).

(6)

Formation costs

The SmartCollective UG shall bear the costs of incorporation.

(7)

Final provisions

-

Employment contract

Employee Agreement

THIS AGREEMENT made as of the _____ day of _____, 20__ , between the SmartCollective UG - Big Data Processing, a company incorporated under the laws of the Federal Republic of Germany, and having its principal place of business at _____ (the "Employer"); and [name of employee], of the Metropolis of Cologne, in the state of Northern- Rhine Westphalia (the "Employee").

WHEREAS the Employer desires to obtain the benefit of the services of the Employee, and the Employee desires to render such services on the terms and conditions set forth.

IN CONSIDERATION of the promises and other good and valuable consideration (the sufficiency and receipt of which are hereby acknowledged) the parties agree as follows:

(1)

Employment

The Employee agrees that he will at all times faithfully, industriously, and to the best of his skill, ability, experience and talents, perform all of the duties required of his position. In carrying out these duties and responsibilities, the Employee shall comply with all Employer policies, procedures, rules and regulations, both written and oral, as are announced by the Employer from time to time. It is also understood and agreed to by the Employee that his assignment, duties and responsibilities and reporting arrangements may be changed by the Employer in its sole discretion without causing termination of this agreement.

(a) The Employee is paid an amount of €_____ as salary and can be negotiated with employer before signing the agreement.

(b) The number of working hours per week are 40. The Managing Director might work in weekends and will not be paid any overtime pay as it is the sole duty of the Managing Director to manage the company as he is the 'trusted employee' and also is responsible for the activities of and taken by the company.

(2)

Position

For Manager

As a _____ Manager _____, the Employee is required to perform the following duties and undertake the following responsibilities in a professional manner:

(a) Represent the company before all manner of judicial, administrative or labor authorities with the powers mentioned in the article of Association of the company.

(b) Carry out all pertinent actions and operations to fulfill the corporate purpose.

(c) Decide on expenses that must be incurred with a charge to the Company's budget.

(d) Execute and sign all manner of public or private contracts, agreements or documents and issue credit instruments according to the terms of the German General Law of Credit Instruments and Operations, whether issuing, accepting, endorsing, or guaranteeing them or to collect their amount or assume obligations on behalf of the company, to take out loans and open bank accounts or accounts of another nature on behalf of or for the account of the company.

(e) Other duties as may arise from time to time and as may be assigned to the manager

For other employees

As a _____, the Employee is required to perform the following duties and undertake the following responsibilities in a professional manner.

(a) -.

- (b) -
- (c) -
- (d) -
- (e) Other duties as may arise from time to time and as may be assigned to the employee.

(3)
Compensation

- (a) As full compensation for all services provided the employee shall be paid at the rate of EUR 8.84 per labour hour. Such payments shall be subject to such normal statutory deductions by the Employer.
- (b) (may wish to include bonus calculations or omit in order to exercise discretion).
- (c) The salary mentioned in paragraph (1)(a) shall be reviewed on an annual basis.
- (d) All reasonable expenses arising out of employment shall be reimbursed assuming same have been authorized prior to being incurred and with the provision of appropriate receipts.

(4)
Vacation

- (a) The Employee shall be entitled to vacations in the amount of 20 days per annum.
- (b) In case of maternity leave by a working mother, the Employee is entitled to be paid during the leave for as much as six weeks prior to and eight weeks following birth.

(5)
Benefits

The Employer shall at its expense provide the Employee with the Health Plan that is currently in place or as may be in place from time to time.

(6)
Probation Period

It is understood and agreed that the first ninety days of employment shall constitute a probationary period during which period the Employer may, in its absolute discretion, terminate the Employee's employment, for any reason without notice or cause.

(7)
Performance Reviews

The Employee will be provided with a written performance appraisal at least once per year and said appraisal will be reviewed at which time all aspects of the assessment can be fully discussed.

(8)

Termination

- (a) The Employee may at any time terminate this agreement and his employment by giving not less than two weeks written notice to the Employer.
- (b) The Employer may terminate this Agreement and the Employee's employment at any time, without notice or payment in lieu of notice, for sufficient cause.
- (c) The Employer may terminate the employment of the Employee at any time without the requirement to show sufficient cause pursuant to (b) above, provided the Employer pays to the Employee an amount as required by the 2012 Labour Code or other such legislation as may be in effect at the time of termination. This payment shall constitute the employee's entire entitlement arising from said termination.
- (d) The Employee agrees to return any property of the SmartCollective UG at the time of termination.

(9)

Non-Competition

- (1) It is further acknowledged and agreed that following termination of the Employee's employment with the SmartCollective UG for any reason the Employee shall not hire or attempt to hire any current employees of _____.
- (2) It is further acknowledged and agreed that following termination of the Employee's employment with the SmartCollective UG for any reason the Employee shall not solicit business from current clients or clients who have retained _____ in the 6-month period immediately preceding the Employee's termination.

(10)

Laws

This agreement shall be governed by the laws of the Federal Republic of Germany.

(11)

Independent Legal Advice

The Employee acknowledges that the Employer has provided the Employee with a reasonable opportunity to obtain independent legal advice with respect to this agreement, and that either:

- (a) The Employee has had such independent legal advice prior to executing this agreement, or;
- (b) The Employee has willingly chosen not to obtain such advice and to execute this agreement without having obtained such advice.

(12)
Entire Agreement

This agreement contains the entire agreement between the parties, superseding in all respects any and all prior oral or written agreements or understandings pertaining to the employment of the Employee by the Employer and shall be amended or modified only by written instrument signed by both of the parties hereto.

(13)
Severability

The parties hereto agree that in the event any article or part thereof of this agreement is held to be unenforceable or invalid the said article or part shall be struck and all remaining provision shall remain in full force and effect.

IN WITNESS WHEREOF the Employer has caused this agreement to be executed by its duly authorized officers and the Employee has set his hand as of the _____, 20__ [the day first above written].

SIGNED, SEALED AND DELIVERED in the presence of:

[Name of Employee]

[Signature of Employee]

[Name of Employer Rep]

[Signature of Employer Rep]

[Title]

Opening balance

Assets		Liabilities+Equity	
Fixed assets (office supplies, electronics, company car)	€65,000.00	Long term liabilities: Bank loan	€45,500
		Partner's equity	€0.00
		Owner's fund	€19,500
Total Assets	€65,000.00	Total Liabilities+Equity	€65,000.00

List of figures

- Chapter 1.2. Mission & Vision: SDG logos taken from <https://sdgcompass.org>.
- Chapter 2.4. Competition analysis:
 - Logo for enercast taken from <https://www.enercast.de>.
 - Logo for MeteoGroup taken from <https://www.meteogroup.com>.
 - Logo for KISTERS taken from <https://www.kisters.de>.
 - Logo for BLACK & VEATCH taken from <https://www.bv.com>.
 - Logo for Reply taken from <https://www.reply.com/en>.