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DDMS: 數位化製造解決方案

Dreger Digital Manufacturing Solutions (DDMS)

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Executive Summary



Dreger Digital Manufacturing Solutions (DDMS) is an IT consulting firm that provides various services for manufacturing companies. Its core business are projects related to process optimization, digital transformation in the shopfloor, or IT strategy, but it also offers services that complement these, namely software development/ integration, as well as workshops and PoCs. DDMS aims to bridge the gap between traditional manufacturing/ operational technology on one side and digital technologies on the other side, enabling its clients to fully leverage the advantages that modern digital technologies can provide.

Its headquarters will be located in Germany, and it will focus on micro, small, and medium enterprises (SMEs) as its core customer group. This group is currently lagging in terms of digitalization, but there is a constant and increasing demand for this, which will ensure that DDMS can acquire enough clients, even though there are already numerous players in the market.

The organization structure is based on Germany's freelance model, which allows for various tax and regulatory advantages for self-employed professionals. Necessary expertise and work capacity can be supplemented by using subcontractors if necessary. This model is ideal because it allows the author to gradually transition from traditional employment, without needing either a large upfront investment or having high fixed costs. DDMS will be entirely self-funded and does not need any borrowed capital at this stage.

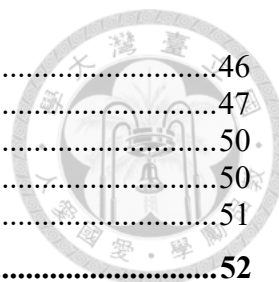
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List of Abbreviations



AUMA	Association of the German Trade Fair Industry (German: Verband der deutschen Messewirtschaft)
AI	Artificial Intelligence
BDI	The Voice of German Industry (German: Bundesverband der deutschen Industrie)
B2B	Business to Business
B2C	Business to Customer
CAGR	Compounded Annual Growth Rate
COGS	Cost of Goods Sold
COVID-19	Coronavirus Disease of 2019
DDMS	Dreger Digital Manufacturing Solutions
DVD	Digital Versatile Disc
ERP	Enterprise Resource Planning
EU	European Union
EUR	Euro
e.g.	for example (Latin: <i>exempli gratia</i>)
G20	Group of Twenty
G8	Group of Eight
GDP	Gross Domestic Product
GmbH	Limited Liability Company (German: Gesellschaft mit beschränkter Haftung)
IIoT	Industrial Internet of Things

IMF	International Monetary Fund
IT	Information Technology
KG	Limited Partnership (German: Kommanditgesellschaft)
LLC	Limited Liability Company
MBA	Master of Business Administration
MES	Manufacturing Execution System
NATO	North Atlantic Treaty Organization
NTU	National Taiwan University
OECD	Organization for Economic Cooperation and Development
OT	Operation Technology
PESTLE	Political, Economical, Social, Technological, Legal, Environmental
PAC	Programmable Automation Controller
PLC	Programmable Logic Controller
PoC	Proof of Concept
RWTH	Rheinish-Westphalian Technical University (German: Rheinisch-Westphälische Technische Hochschule)
R&D	Research & Development
SAP	Systems Applications and Products in Data Processing
SCADA	Supervisory Control and Data Acquisition
SEO	Search Engine Optimization



SME	Small and Medium Enterprises
SWOT	Strengths, Weaknesses, Opportunities, Threats
USA	United States of America
USD	United States Dollar
VAT	Value Added Tax
VDMA	Mechanical and Plant Engineering Association (German: Verband Deutscher Maschinen- und Anlagenbau)
VUCA	Volatility, Uncertainty, Complexity, Ambiguity



Chapter 1: Introduction & Company Overview



1.1 Company Overview

Dreger Digital Manufacturing Solutions (DDMS) is a company that provides IT services & consulting as well as project planning & execution for manufacturing companies that are on the verge of digital transformation. It is initially focused on the German market but has expansion potential to provide services to any German and/ or English-speaking company at a later stage.

DDMS addresses three major concepts of today's time: First, the adoption of digital technologies rapidly becomes a must for all kinds of businesses (Bullock, 2018), not only for increasing their market share and/ or profits but also simply to just survive in the VUCA world (Norinder, 2020). Second, this transformation happens at the intersection between classical manufacturing technologies that have been analog for decades and are now becoming more and more digital on the one hand, and classical IT that has been around and thriving since the 1970s ("The History", 2018), but only now begins to have more and more contact points with manufacturing technologies on the other hand ("Digital Skills", 2021). This becomes especially relevant in the shop floor, where the physical value creation is happening (Marchant, 2022). Third, many SMEs often do not have the resources to hire specialists for non-core business topics, or they shy away from it, because of fluctuating business conjuncture. To achieve digital transformation nonetheless, using contractors or outsourcing these tasks becomes a more attractive option (Ismail, 2023).



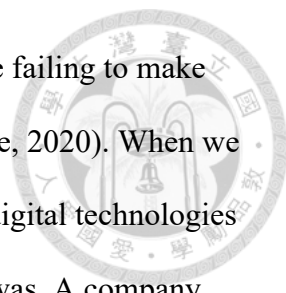
1.2 Motivation

1.2.1 *Background of the Founder*

The founder, Marten Dreger, started his career in what can be considered classical manufacturing. He studied Mechanical Engineering at RWTH University in Aachen, Germany, and moved on to work for Miele & Cie. KG, a prestigious German luxury home appliance manufacturer, considered to be among the top brands in the world for white goods. During seven years working at Miele, he noticed that the company adapted more and more digital technologies and that innovation and business benefits often required a successful integration of IT and manufacturing. This integration, however, was not always easy to achieve, since experts in the fields of IT and manufacturing (or shopfloor) often have vastly different mind- and skillsets, the former being very focused on theoretical/ digital, and the latter more prone to practical/ physical. Eventually, the author decided to leave Germany and move to Taipei, Taiwan to study in the Global MBA program at NTU. Although his final goals were not yet fully fleshed out at that time, he hoped to one day be self-employed. During his study at NTU, apart from attaining the business knowledge that would be necessary to do this, he also delved into the field of programming, learning as much as he could about IT skills and working on some projects in his spare time. Finally, he decided that this combination of his previous background and work experience, combined with his newly attained IT knowledge and business understanding, would allow him to realize the idea of running his own business.

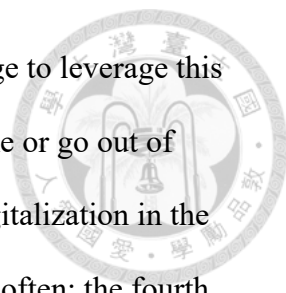
1.2.2 *Digital Transformation becomes a Must in Manufacturing*

With the rise of digital technologies, many companies found their business model disrupted as new competitors appeared and customer preferences changed. This



led to a transformation throughout the business landscape, with some failing to make the transition (Ross, 2021), and others succeeding in doing so (Moore, 2020). When we consider different industries, it makes sense that some would adopt digital technologies faster than others, depending on what their initial value proposition was. A company such as Netflix, which was renting out DVDs to provide customers with the opportunity to watch their favorite movies, would naturally consider moving from this physical medium (DVD) to a digital medium (in this case: on-demand-streaming) to fulfill the same value proposition ("Netflix", n.d.). On the other hand, businesses that create physical products as their value proposition (manufacturing industry) could not make the transition in such a way, because they could not simply replace the physical component of their value-creation process. This meant manufacturing industries were lagging behind other industries when it came to digitalization (Low, 2020).

However, digital technologies still hold a lot of potential to enhance, improve, or even revolutionize manufacturing and or its associated processes, which could save their respective companies a lot of money. These cost savings could materialize through better quality control using continuous process supervision paired with machine learning, automation and thus reducing human error when feasible, reducing raw material consumption through intelligent machine control and more efficiency, and reducing unplanned downtime of production equipment through increased connectivity (Greenwood, 2023). Further benefits might be that a higher customer focus could be achieved, if made-to-order concepts are applied to single products, by setting relevant parameters according to customer's requirements directly during the manufacturing; also increased resiliency/ adaptability and decreased reaction time to changes in the market and/ or competition ("Why Digital", n.d.).

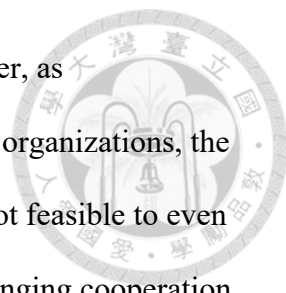


As is often the case, once a few players in the industry manage to leverage this newly available advantage, it would pressure all others to do the same or go out of business eventually. This is what has happened in the past years. Digitalization in the manufacturing industry (also known as the term Industry 4.0, or less often: the fourth industrial revolution (Raveling, 2020)) is on the rise, and there is no way around it for any company in this field in the long term (Greenwood, 2023).

1.2.3 *Communication Gap between IT and Manufacturing*

Oftentimes in real-world business scenarios, communication gaps between different functions or departments of a company can occur. These might be due to personal reasons, which will not be covered here, or due to a different background/education of the related parties. As a somewhat stereotypical example, mechanical engineers tend to have great knowledge of technical details but care little about the actual business applicability of what they are working on. On the other hand, graduates of business administration focus very much on the monetary aspects of business, without necessarily understanding any underlying technical problems or opportunities (in the case of a manufacturing company). This causes numerous inefficiencies in practice and has led to the creation of various courses of study that teach a mix of these two disciplines, intending to train persons who can understand both sides and act as effective intermediaries (Dennon, 2023).

However, a similar gap now has become apparent between the field of manufacturing and IT/ digital technologies. For these two fields, interdisciplinary study courses are not yet available or at least not common ("How To", 2021). This means that the challenges that the manufacturing industry is currently facing with the increasing necessity of digitalization, are amplified by a gap in supply of potential employees who



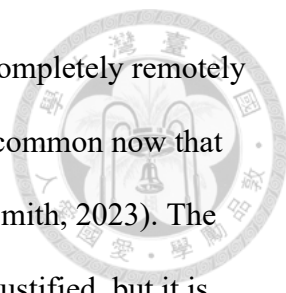
can effectively bring these two sides together. This poses some danger, as transformation/ change is already usually a very difficult process for organizations, the challenges of which have been covered by extensive research. It is not feasible to even further this difficulty, by allowing inefficiencies or potentially challenging cooperation between the main two actors, which is why companies must and will actively look for people and/ or service providers who can fill this role (Harmon & Bilow, 2019).

1.2.4 *Rise of Outsourcing for Non-Core Competencies*

Once a company realizes they have a skill gap as described in the previous chapter, there are multiple possible ways of dealing with this. For instance, it would be possible to build up this competency internally, by putting employees through cross-training in the different related departments/ functions (Perry, 2021).

However, this takes time and might not be quick enough. Also, there might be no current capacity for the employees to handle this workload on top of their existing tasks. Hiring a new employee for this role might also be possible, but this brings different challenges: As established, people with this skillset are not that numerous yet, and even if it is possible to find a suitable candidate, it needs to be considered if a permanent job opening is justified in the current economic situation of the company (Lew, 2019).

Using a contractor on a project basis can be a solution here. By letting own employees focus on their core tasks and outsourcing the temporarily needed work, companies can take advantage of the specialized skillset that the contractor offers, but stay flexible at the same time, without needing to go through extensive planning that the filling of a permanent position might require (Post, 2023). A second, closely related point is that the required skillset might not be available in the direct vicinity of a



company. Hiring someone in a permanent position who is working completely remotely has been possible during and after COVID-19, but is becoming less common now that many big players are enticing their employees back into the office (Smith, 2023). The concern the companies have for remote work might or might not be justified, but it is less of a problem for contractors who only have a relationship with the company for a limited time. Finally, the use of a contractor can lead to some financial advantages, as numerous additional wage costs do not need to be covered by the employer. Also, contractors are paid by the hour or lump sum per project, so the spending becomes easier plannable, and focused as in the case of permanent jobs, that get paid a monthly wage (Ismail, 2023).

1.3 Mission & Vision

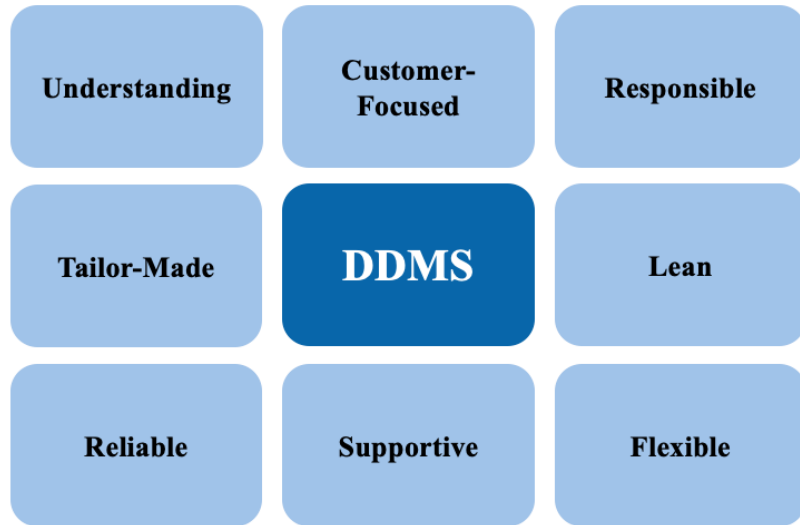
DDMS aims to bridge the gap between manufacturing and digital technologies for business customers who are part of the producing industry (secondary industries). By providing consulting paired with individual project support and services, DDMS helps its customers make the transition from conventional to digital and enables them to further grow and achieve their business objectives. DDMS does this by fully understanding the core business of their customers and then finding and implementing a suitable solution in the IT landscape, instead of the other way around. DDMS wants every manufacturing company to profit from the opportunities that digital technologies hold and will accompany each customer as a trusted partner until this goal is reached.

1.4 Business Objectives

To achieve its mission and vision, DDMS will rely on eight guiding principles. They are visualized in **Figure 1** and form the base of any action that DDMS conducts.

Figure 1:

DDMS' Guiding Principles



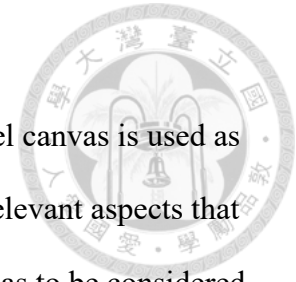
These guiding principles translate into the following business objectives:

- **Understanding:** deep comprehension of the customer's core business as a base, instead of a "one-fits-all" approach
- **Customer-focused:** all work done exactly according to the customer's requirement
- **Responsible:** full support through all project phases, from concept to go-live
- **Tailor-made:** fully individualized projects and services, no mass products
- **Lean:** no unnecessary components or functions that the customer does not need
- **Reliable:** solutions designed in the most robust way possible
- **Supportive:** full guidance to new digital potential, independent of the customer's current IT involvement

- Flexible: small to medium projects with varying degrees of involvement, from simple advisor to partial project lead



Chapter 2: Framework & Data Collection

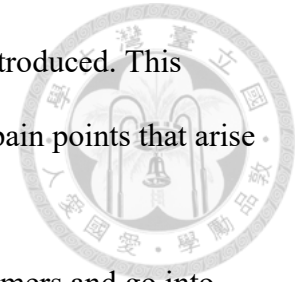


To present details of the business concept, the business model canvas is used as the main framework. It contains nine sub-structures and covers all relevant aspects that need to be understood in order for DDMS to become successful. It has to be considered that the business model canvas is a generalized model that applies to all kinds of businesses, not specifically to the founder's business idea. The model fits most naturally to B2C businesses that are likely to have multiple employees and offer distinct products or services in high quantities, but this business plan is about B2B individually designed services provided by a freelance entrepreneur, so some components of the canvas are shortened and/ or adjusted to fit this case. Each component is presented in detail in the following chapters, with some of them being merged into a single chapter.

Considerations of how to collect relevant data to support the business decisions of DDMS are explained in the following as well, if applicable to the chapter.

First, an initial market & industry analysis is conducted in Chapter 3. It is mainly based on third-party aggregated studies, focuses on the concepts mentioned in the introduction, and contains frameworks such as PESTLE and Porter's Five Forces. Consequently, it also covers DDMS' location choice and addresses quantitative data about the industry in question as well as customer pain points. Supporting evidence is given by individual industry experiences collected from e.g. articles. This chapter is the main data analysis part of the thesis and thus forms the base for the company's strategic decisions that are consolidated in the structure of the business model canvas in the following chapters.

In Chapter 4 the potential customer segment for DDMS is introduced. This covers e.g. their size, products, market reach, and specific needs or pain points that arise from the previous chapter and ends with a positioning statement.



Chapter 5 will then explain how DDMS can help those customers and go into detail on its value proposition. It talks about the available product portfolio, including core business such as IT consulting, digital transformation, and IT strategy; but also about auxiliary services like software solutions, managed services, training & workshops, and proof of concepts (PoCs). Finally, it contains two example scenarios to facilitate a better understanding of DDMS' key products.

Chapter 6 deals with customer channels and relations respectively. It distinguishes between digital and analog channels and goes into detail about DDMS' customer landscape, mainly the difference between first-time and regular customers. Last, it contains the marketing & sales strategy.

Next, chapter 7 is about the key activities that DDMS needs to conduct to successfully support the previously explained aspects of its business. It focuses on the most critical internal actions ranging from e.g. constant industry monitoring to all project-related steps such as quotation, planning, execution, and follow-up.

Chapter 8 then complements this by introducing key resources and partners that DDMS aims to attain. It starts by outlining the choice of company structure and uses this as a baseline to conclude how resources must be managed and how partners can play a role in complementing DDMS' business profile.

Ultimately, chapter 9 will deal with the financial aspects of this business plan, by first covering cost structure and revenue streams, then lastly laying out a five-year financial plan including a growth perspective.

In Chapter 10, a risk assessment is done, factoring in the previous market & industry findings of Chapter 3 and the chosen company structure and traits described by the business model canvas in chapters 4 to 9. It contains a SWOT analysis as well as an estimation of possible financial losses through various risk scenarios.

Chapter 11 consists of potential plans for DDMS as well as a conclusion of all previous content and thus wraps up this business plan.

Chapter 3: Market & Industry Analysis



3.1 Choice of Location

DDMS will be based in Germany. This decision is straightforward, as Germany is the founder's home country and he got most of his job experience there. This preemptively eliminates both language and culture problems that could be a concern in non-western countries with languages other than German or English. Germany has lots of players in the manufacturing industry, many of which are technology leaders (Rüßmann et. al., 2015). Its high wages contribute to a rising demand to either reduce manpower or utilize existing personnel more efficiently, which is what digital technologies can help with. The following chapter will go into more detail on various characteristics of Germany as a location and also shortly elaborate on what this means concerning DDMS.

As opposed to businesses that rely on brick-and-mortar presence, DDMS can be more flexible when choosing its exact location. In Germany, there are economic hubs in the following regions ("Industry", 2023):

- Munich & Stuttgart metropolitan areas (high tech, automotive manufacturing)
- Rhine-Neckar region (chemicals, IT industry)
- Frankfurt (finance)
- Nuremberg (service industries)
- Cologne & Hamburg (ports, aviation, media)
- Dresden, Jena, Leipzig, Berlin (high tech)

As will be explained later, DDMS will focus on SMEs as its primary customer group (refer to Chapter 4.1.2). The density of these SMEs mostly coincides with the

given hubs and is laid out in more detail below in **Table 1** for the top 5 non-city states ("Mittelstand", n.d.). Notably, the lowest density of all states, in Saxony-Anhalt, is 3,160 SMEs per 100,000 inhabitants, which is still a lot.

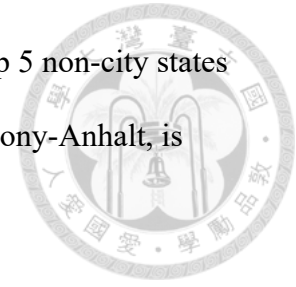


Table 1:

SME Density 2021 in Germany, Top 5 Non-City States

States	SME per 100,000 inhabitants
Bavaria	4,603
Hesse	4,213
Schleswig-Holstein	4,110
Baden-Wurttemberg	4,088
North Rhine-Westphalia	3,911

Adapted from: Mittelstand im Einzelnen. (n.d.). *Institut für Mittelstandsforschung Bonn*. Retrieved March 29, 2024, from <https://www.ifm-bonn.org/statistiken/mittelstand-im-einzelnen/unternehmensbestand>

As becomes obvious from the given data, there is potential business for DDMS in all of Germany. Thus, choosing a relatively central (or slightly southern) location seems reasonable, as long as no major customers are known in advance. If, however, DDMS already has one or more customer leads in a certain location, then setting up its headquarters there would make sense regardless of further business opportunities in different regions, as Germany is not that large and even remote locations can be reached within a day trip if necessary.



3.2 Location Analysis (PESTLE)

Figure 2 shows the PESTLE Analysis of Germany. It can be argued that Germany is an attractive location for DDMS. Details about each of the categories and why their characteristics could be beneficial to DDMS will be elaborated in the following subchapters.

Figure 2:

PESTLE Analysis Of Germany

P	E	S	T	L	E
Political	Economical	Social	Technological	Legal	Environmental
<ul style="list-style-type: none"> ▪ Democratic Republic ▪ Most influential country in EU ▪ Politically stable ▪ Member of NATO, OECD, G8, G20, World Bank, IMF ▪ Strong allies with France 	<ul style="list-style-type: none"> ▪ GDP 4.5 Trillion USD in 2022 ▪ 3rd largest economy in the world ▪ Very good job conditions ▪ High income and corporate tax ▪ 69.3% tertiary sector ▪ 23.5% secondary sector 	<ul style="list-style-type: none"> ▪ Very high living standard ▪ Social security ▪ Good healthcare ▪ Government-funded higher education ▪ About 23% of population has migratory background ▪ Low birthrate of 1.6 	<ul style="list-style-type: none"> ▪ Technological leader in: engineering, automobiles, metal, machinery, chemicals, medicine, aerospace, renewable energy tech ▪ Lacks behind in terms of software-led innovation 	<ul style="list-style-type: none"> ▪ Prohibits discrimination ▪ Strict privacy & data protection laws ▪ Consumer protection ▪ Welcomes foreign investors 	<ul style="list-style-type: none"> ▪ Clean & attractive environment ▪ Famous for tourism ▪ Concious about environment ▪ Aims to increase renewable energy use ▪ Low environmental hazard

3.2.1 Political Factors

Germany is a democratic republic, one of the most influential countries in the European Union (EU), and also its largest contributor (McEvoy, 2024). It is a member of numerous other multi-national unions, such as NATO, OECD, G8, G20, World Bank and the IMF. It traditionally has strong diplomatic relations with France. Its relations with the USA used to be good as well, even though recently this is not as clear anymore (Rahman, 2023).

In conclusion, Germany can be considered one of the political pillars of the whole European area. Its position as one of the politically most stable countries both in Europe and worldwide does not indicate any risk for an upcoming business from this side.



3.2.2 Economic Factors

Germany's GDP is 4.5 trillion USD, which makes it the 3rd largest economy in the world today (Starcevic, 2024). It has a low unemployment rate and very good job conditions, such as a high salary, a high number of vacation days, and attractive working hours (Rahman, 2023). Income tax is comparably high, ranging from 14-42% for individuals.

Compared to other countries, Germany has a low amount of raw materials, leading to most of its economy being either in the tertiary (service) or secondary (industry) sector with 69.3% and 23.5% contribution to the GDP in 2022 respectively (O'Neill, 2023). The corporate tax is about 30-33%.

Although most of Germany's economy is in the service sector, industry makes up almost a quarter of it. Not all of those will be relevant industries, however it still translates into a lot of potential clients for DDMS.

3.2.3 Social Factors

Germany has one of the world's highest living standards, providing among others robust social security, healthcare with mandatory health insurance, and government-funded higher education that is accessible to anyone (Rahman, 2023).

It has a pluralistic society, with 19 out of 83 million inhabitants having a migratory background, accounting for 23% of the total population in 2022 ("Press

Release", 2023). The birth rate in Germany was 1.6 in 2021 ("Fertility Rate", 2022), which is very low, and this leads to increasing aging of the population.

Germany's social factors encourage the founding of a service-based company. Especially the fact that higher education is readily available in Germany pairs well with the aim of supporting digital transformation and the need for skilled personnel that DDMS has.

3.2.4 Technological Factors

Germany is a technological leader in many fields, among others: engineering, automobiles, metals, machinery, chemicals, medicine products & pharmaceuticals, aerospace, and renewable energy technologies such as solar & wind power. It is home to some of the most recognized and advanced companies in these areas. However, when it comes to software-led innovations, Germany lags behind other regions like North America or Asia and is trying to close the gap (Rahman, 2023).

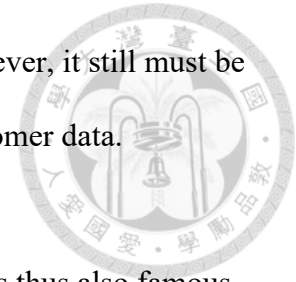
Having lots of companies that are keen to keep their technological advantage is ideal for DDMS, as this is exactly what the firm is providing as a service for its customers. The fact that Germany recognizes there is still a gap in terms of software technologies & companies, indicates that a firm in this field can enter the market.

3.2.5 Legal Factors

Germany's legal landscape aims to prohibit discrimination of any kind, be it for gender, age, religion, ethnicity, or others. It has strict privacy and data protection laws and strong end-customer protection. The founding of a new company is not obstructed, and foreign investors and companies are welcomed just as local ones (Rahman, 2023).

The focus on privacy and data protection is a peculiarity of the German, respectively European markets, that is quite different from other markets in that regard.

For DDMS with a B2C business model, it is of less relevance. However, it still must be considered if DDMS is involved in projects which involve end customer data.



3.2.6 Environmental Factors

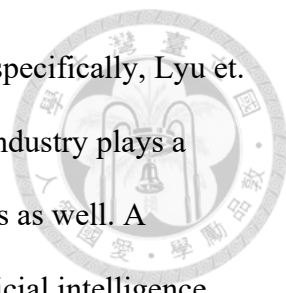
Germany has clean and attractive landscapes and cities and is thus also famous for tourism. Many people are conscious of the environment and green alternatives for consumer goods. There are also efforts to transform the energy landscape towards renewable energy sources (Rahman, 2023).

Generally, there are few environmental hazards in Germany. In a few areas close to big rivers there have been devastating floodings in the past, but these events are rare. Storms are a bit more frequent, but their danger level is low compared to other countries (Münch, n.d.).

For DDMS, the emphasis on environmental-friendly technology and sustainability can be an advantage, if the company manages to successfully integrate relevant know-how into its portfolio. Several initiatives related to this field are ongoing, but the correct course of action for companies is not always clear, so this can be an opportunity for DDMS to acquire customers.

3.3 IT Consulting in Manufacturing

Industry 4.0 is an ever-present term for manufacturing companies. The reasons why these companies want to adopt it, are numerous and some of them have already been outlined in chapter 1.2.2; more are explained here to ultimately assess the market demand for related IT consulting: Maware & Parsley (2023) found that Industry 4.0 can support companies that already employ lean manufacturing principles in attaining better sustainability. Although the study was conducted on US companies, this can be extrapolated to the German market and tied closely to the German people's high

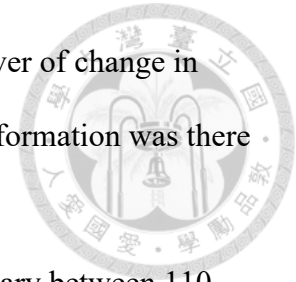


awareness of this topic, as mentioned in the previous chapter. More specifically, Lyu et. al. (2023) state that the digital transformation of the manufacturing industry plays a significant role in the low-carbon development of Chinese companies as well. A discussion paper by McKinsey (Bughin et. al., 2017) found that artificial intelligence (AI), as a sub-field of Industry 4.0, already led to manufacturing being on the verge of a revolution that could change almost all we currently know, from plant designs to supply chain models. It also raises concerns that many companies are currently unprepared to face this future. One reason for this is the difficulty of integrating existing production equipment, also referred to as operation technology (OT), with the IT components of Industry 4.0 (Berardi et. al., 2023). Interestingly this also resulted in some efforts to establish a hybrid approach called Industry 3.5 that combines several components of Industry 4.0 with the already existing manufacturing systems and was described by Chien et. al (2017) for the semiconductor industry.

Most notably, Buer et. al. (2020) found that a company's size is a good predictor of its digitalization progress, putting SMEs at a disadvantage when it comes to implementing digitalization. Complimentary to that, Ghobakhloo & Iranmanesh (2021) determined success factors for SMEs Industry 4.0 transition and, among others, found that the first and also most important step for these types of companies is to get external support. This pairs well with the findings of Freimark (2023), who stated that 72% of German companies expect external IT support to play an important or even very important role in their future.

When evaluating IT in more general terms, there are sometimes concerns that the whole field was overhyped due to the recent COVID-19 pandemic, and that soon after its end, it would recede to its former state. However, Ben-Zvi & Luftman (2022)

found this to be unjustified and stated that "IT is the enabler and driver of change in every aspect of every business in every sector" and that digital transformation was there before COVID-19 and will continue to endure after.

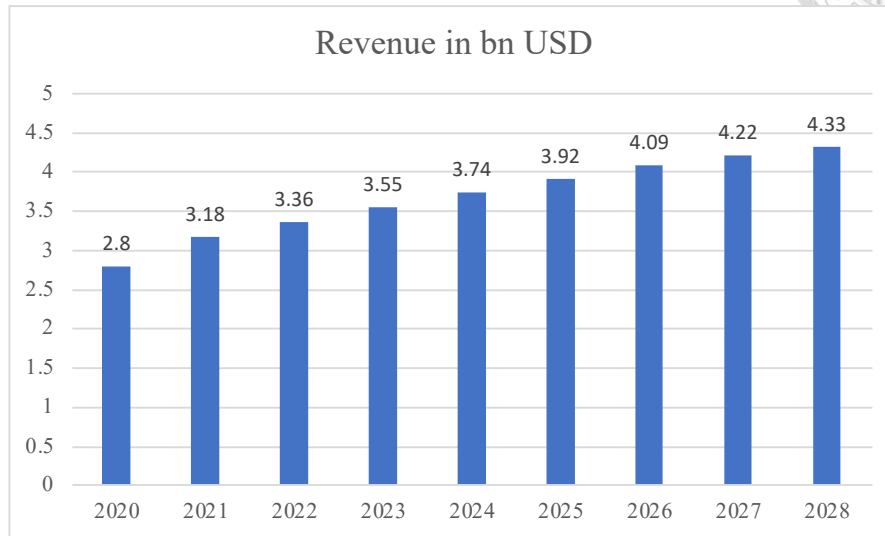


Hourly rates for freelancers who work in IT consulting can vary between 110 and 160 EUR, with too many factors (e.g. age, location, expertise, specific task) to give a general formula (Ilg, 2022). Considering that DDMS will not be able to show vast expertise in the beginning, then the hourly rate will likely need to be oriented toward the lower end of this spectrum.

Overall, the total market volume of IT consulting & implementation is projected to be around 3.74 billion USD in 2024, with a CAGR of 3.37% until 2028 (for details refer to **Figure 3** below). That makes Germany the 5th largest market for this kind of business. The underlying reason is indeed the desire of companies to adapt to digital transformation/ Industry 4.0, and is further enabled by a robust IT infrastructure and high worker education with COVID-19 acting as a short-term catalyst that leads to a more widespread acceptance of many digital technologies. ("IT Consulting", 2023)

Figure 3:

Total Market Volume for IT Consulting & Implementation in Germany



Adapted from: IT Consulting & Implementation - Germany. (2023). Statista Market Insights. Retrieved March 29, 2024, from <https://www.statista.com/outlook/tmo/it-services/it-consulting-implementation/germany>

There are close to 150,000 manufacturing companies in Germany ("Industry Breakdown", 2023), 98.9% of which are categorized as SMEs ("Mittelstand", n.d.). These companies are distributed all over Germany, with some higher density in south and west Germany as already introduced previously in Chapter 3.1. Considering that DDMS does not need a large number of customers to be financially viable (refer to Chapter 9.2 for more details), this amount of potential customers is easily sufficient.

In summary, the research given in this chapter clearly shows the market's need for IT consulting on one hand and, on the other hand, strongly implies that DDMS will have a large number of potential customers available if it decides to focus on SMEs as core customer group (also refer to chapter 4.1.2).



3.4 Industry Analysis (Porter's Five Forces)

Figure 4 shows Porter's Five Forces analysis for IT consulting in the manufacturing industry. Each of the five forces will be elaborated on in the following subchapters. Based on the result of this analysis it becomes clear that DDMS will not have an easy time entering the market. Some ideas on how to cope with its difficulties will be mentioned as well.

Figure 4:

Porter's Five Forces for IT Consulting in Manufacturing



3.4.1 Competitive Rivalry

Generally, the IT consulting industry is highly competitive. There are many existing players on the market, ranging from small to large, competing for projects, with large companies dominating the market (Lindner, 2023). Distinguishment is a key factor to being successful, and it can come in the form of e.g. specialization towards a certain kind of customer. This is what DDMS will do, by carefully focusing on a certain

company profile, details of this choice will be explained in Chapter 4.1. However, other factors such as experience from past projects and client relationships or professional networks are most likely even more important. This can pose a problem, especially in the starting phase of DDMS, as both of these factors might not be properly met yet.

Many competitors are large general consulting companies that have a branch specializing in IT consulting in manufacturing (Loos, 2023). Even though they are not all based in Germany, this competition still needs to be taken seriously, because their brand image is recognizable to customers and they have a lot of references. However, their larger number of served customers might lead them to adopt a one-fits-all approach. DDMS might hope for distinguishment through the fact that it serves a smaller number of customers and can thus focus on their wishes more thoroughly. This can only work if DDMS manages to reach customers and position itself correctly.

Lastly, not all companies follow through with projects in the same way. Some might only consult, while the customer does the execution, while others, same as DDMS, aim to develop and provide a complete solution.

3.4.2 Threat of New Entrants

The threat of new entrants in this industry can be considered moderate. On the one hand, the IT consulting industry is attractive due to the high demand for its services ("IT Consulting", 2023); it furthermore does not require as extensive up-front capital as other industries, such as manufacturing itself. On the other hand, there are entry barriers: This field requires expertise and preferably existing client relations paired with a good reputation, which are not easy to come by. As elaborated in chapter 3.4.1, it will be a key consideration for DDMS how to overcome these barriers.



3.4.3 *Bargaining Power of Buyers*

Buyer's bargaining power must be considered high, due to the amount of IT consulting companies available in the market (Davies, 2022). Buyers can negotiate contracts and potentially choose different consultants for different projects, pitching them into a quotation battle to lower prices. Some IT services, e.g. cloud storage space, have also gone through a commoditization (Deakin, 2021), giving further power to buyers, but in the case of specialized IT consulting & projects, this influence can be neglected. For DDMS it means that its cost structure must account for potentially smaller revenues. Ideally, the customer retention would be high enough to allow for good compensation in exchange for a smoother project execution.

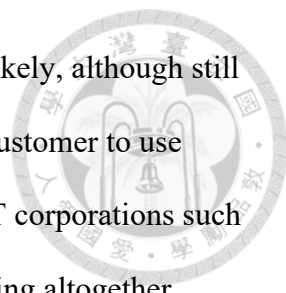
3.4.4 *Bargaining Power of Suppliers*

Suppliers for IT consulting firms would mostly be major IT companies (for hardware, software, and possibly cloud infrastructure), which can have significant bargaining power. Fortunately, these companies are also in competition with each other, meaning that there is usually at least a choice between multiple suppliers. Other suppliers might provide services e.g. for programming & development, but these could even be a commodity, depending on the language and/ or type of service required. As a result, supplier bargaining power can on average be classified as moderate.

For DDMS, the expected expenses for supplier materials and services will be noticeable, but less than other expenses such as salaries. The moderate supplier bargaining power does not pose any significant challenge to its business model.

3.4.5 *Threat of Substitutes*

Any IT consulting firm could face indirect competition through the customer company's in-house IT departments, depending on the size and structure of the company



in question. This is far more likely for larger corporations, and less likely, although still possible, for SMEs. Another possible substitution would be for the customer to use either self-service platforms or automation tools provided by large IT corporations such as AWS, which could eliminate these customers' need for IT consulting altogether. These scenarios are less realistic for complicated or business-critical projects. Again, the rating of the overall threat of substitutes should be moderate.

Naturally, this is an issue that DDMS must address convincingly. Most of the key points from chapter 3.4.1 apply for possible substitutes just as well as for direct competition.

Chapter 4: Customer Segment



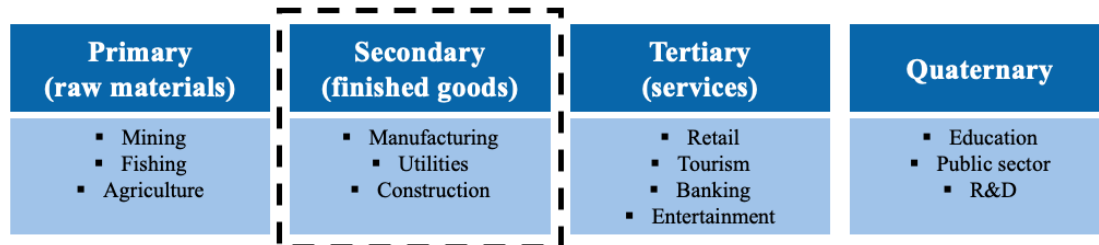
4.1 Customer Company Profile

4.1.1 Products

DDMS customers are in the secondary sector, particularly the manufacturing industry, with a physical product as the main component of their value creation. It does not matter whether they sell directly to end consumers (B2C) or are a supplier for another company (B2B), as long as they produce physical parts. An overview of the industrial sectors (Pettinger, 2021) with DDMS's choice is given in **Figure 5** below.

Figure 5:

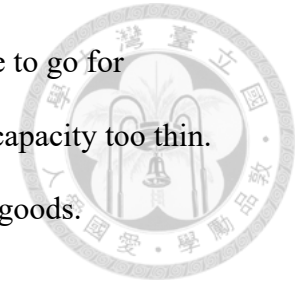
DDMS' Customers Industry Sector



Adapted from: Pettinger, T. (2021, December 19). Sectors of the economy. *Economics Help*. Retrieved March 30, 2024, from <https://www.economicshelp.org/blog/12436/concepts/sectors-economy/>

It has to be noted that there are some specific sub-industries with an individual set of laws, rules & guidelines, e.g. medical products, aerospace, or automotive (Anjoran, 2022). In any project the requirements must be defined by the customer anyway, so it would seem that this is not an issue; but if one of DDMS's strengths is to clearly understand customer requirements and reduce costs caused by misunderstandings and rework, then it means DDMS must have at least basic

experience for these sub-sets of rules. Starting, it would be advisable to go for companies in neither of these specialized fields, to avoid spreading capacity too thin. This could e.g. mean manufacturers who produce regular consumer goods.



4.1.2 Size

DDMS aims for micro, small & medium enterprises (SMEs) as its main customer. There are two key reasons for this: First, larger corporations usually have complicated and extensive processes and hurdles that need to be dealt with, which will take time on one hand and can potentially pose roadblocks for any project. These are factors that DDMS as a small and just upcoming company wants to avoid. While having a large corporation as a customer could potentially mean a great reference, it is risky to spend a big amount of time on a project that might not be completed to the customer's satisfaction, hindering DDMS's growth potential when it is crucial to grow fast. Second, it has already been explored that in-house IT departments are a substitution threat to DDMS services. By going for smaller customer companies, this threat can be avoided to some extent.

Table 2 shows the definition of SMEs according to a commission recommendation of the European Union (EU Recommendation, 2003). For DDMS both private and public companies are desirable as potential customers.



Table 2:

Definition of SMEs According to the EU

Company Size	Employee Count	Turnover in EUR p.a.	Balance Sheet Total in EUR
Micro	<10	<2,000,000	<2,000,000
Small	<50	<10,000,000	<10,000,000
Medium	<250	<50,000,000	<43,000,000
SME (overall)	<250	<50,000,000	<43,000,000

Adapted from: EU Recommendation 2003/361. (2003, May 6). Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises. *The Commission of the European Communities*. Retrieved March 12, 2024, from <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003H0361>

4.1.3 Location & Market Reach

Since DDMS' location is Germany, it aims for German-based companies as primary customers. However, other German-speaking companies, e.g. from Austria or Switzerland can also be considered as secondary customers. It would potentially mean more traveling efforts but is still viable depending on the type of project or service that should be performed.

Lastly, even English-speaking companies from other countries worldwide could be an option for the future. Because this would mean even more difficult alignment and high travel expenses, it is likely not an option for DDMS in the first years unless the project does not require physical presence at some point. It is still important to not rule

out these customers, as there might even be the possibility that a recurring customer wants DDMS to do a project in one of their foreign subsidiaries.

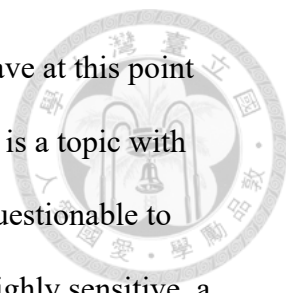
Concerning market reach, the whole spectrum from local to worldwide is acceptable to DDMS and should not make a difference at all. Germany is known for having many hidden champions, small or lesser-known companies that have the technology lead and customers worldwide in their respective field; in 2020 there were 1600 companies like that operating in Germany, a quarter of which were SMEs, out of 3400 hidden champions worldwide ("Hidden Champions", 2022) For DDMS it would be ideal to acquire one or multiple of these as recurring customers.

4.1.4 Pain Points

The overarching challenges that companies face in terms of Industry 4.0 can be described as follows (Raveling, 2020):

- Standardization of interfaces
- Cybersecurity
- Human-robot-interaction
- Customized production & batch size 1
- Self-controlling processes
- Big Data & AI
- Work & training
- Customer-centric thinking

Out of these, DDMS will mainly deal with the standardization of interfaces, customized production & batch size 1, and big data & AI. Projects in the field of self-controlling processes are thinkable as well, although less likely. The remaining categories are either less tangible (work & training, customer-centric thinking) or



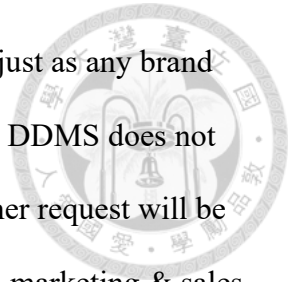
require very specific niche expertise that DDMS does not claim to have at this point (cybersecurity, human-robot interaction). Cybersecurity in particular is a topic with more and more demand ("IT Consulting", 2023) and it could seem questionable to exclude it from DDMS's services. However, given that this field is highly sensitive, a failed project would be disastrous for DDMS's long-term prospects and that is why it will not be pursued at this point.

It also has to be noted that the standardization of interfaces is a challenge that arises from digital technology in the first place, so it will only come up in the context of companies that have already dabbled in digitalization. Providing solutions for this specific task might require more IT knowledge and less actual understanding of the client's industry or product. Customized production & batch size 1, as well as self-controlling processes on the other hand, are challenges that have existed before the rise of digital technologies; only with the use of these technologies they are somewhat easier to solve. For these challenges, a deep understanding of the underlying industry and manufacturing landscape is necessary and can be precisely the reason why DDMS is chosen instead of a more IT-focused service provider. Finally, big data & AI can not be considered a challenge per se, but can instead be applied to solve several different problems; it likely requires both deep IT expertise and knowledge about the underlying problem field.

4.2 Positioning Statement

Trying to appeal to all kinds of customers and not choosing a specific market segment can be dangerous (Hawkins, 2017); in this case, it could mean that projects may not be finished to the customer's satisfaction if DDMS spreads its resources too thin. To avoid such cases, the previous sub-chapters lay out its core customer profile.

This profile serves as a guideline for managing decisions. However, just as any brand that targets people over 50 also sells its products to people below 50, DDMS does not categorically decline customers outside this core profile. Any customer request will be considered individually, especially in the beginning phase. However, marketing & sales efforts, but also e.g. internal training or development will be done with the core customer in mind, mostly disregarding effects on anything outside this profile.



Chapter 5: Value Proposition



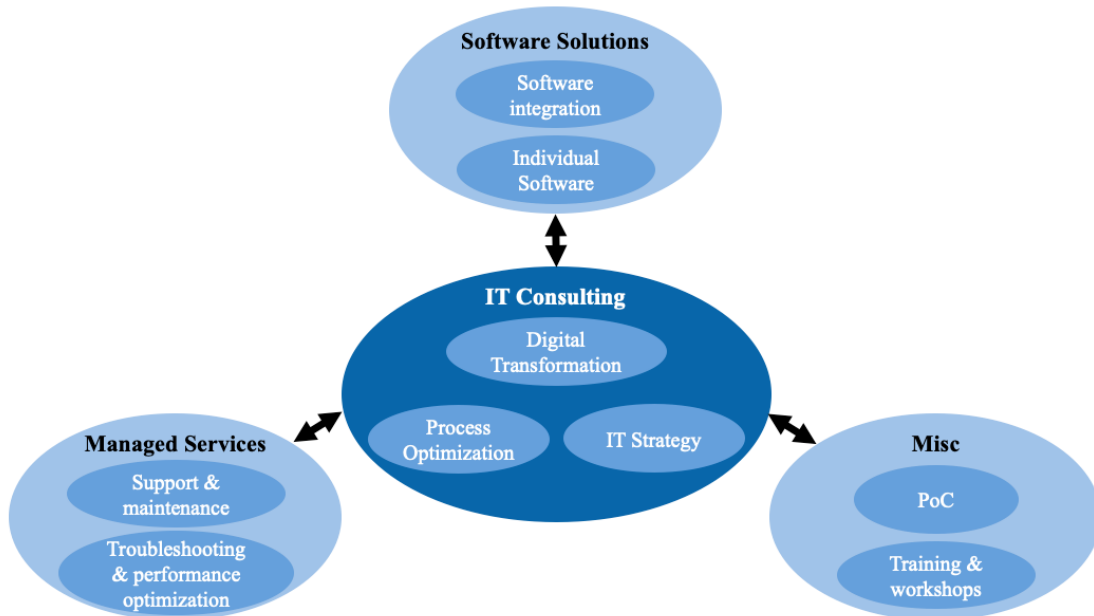
5.1 Product Overview

DDMS' product portfolio consists of five components, each of which will be explained in more detail in the following sub-chapters. Of those components, IT consulting is the core business, that will account for the main part of both DDMS' activities and revenue. The others serve a complimentary purpose, with some of them potentially being part of a larger project if the customer desires long-term support (managed services) and others being a way of getting exposure and potential projects (training & workshops, proof of concepts). Their revenue potential is lower than for IT consulting but better plannable, and it is a reasonable way to diversify DDMS' product portfolio and also even out manpower demand. Finally, software solutions are a niche case for customers who have their whole plan already set and just want the execution, in this case development/ sourcing of appropriate software to fit their landscape. **Figure 6** below shows an overview of these services; each of which will be explained in more detail in the following sub-chapters.



Figure 6:

DDMS Products Landscape



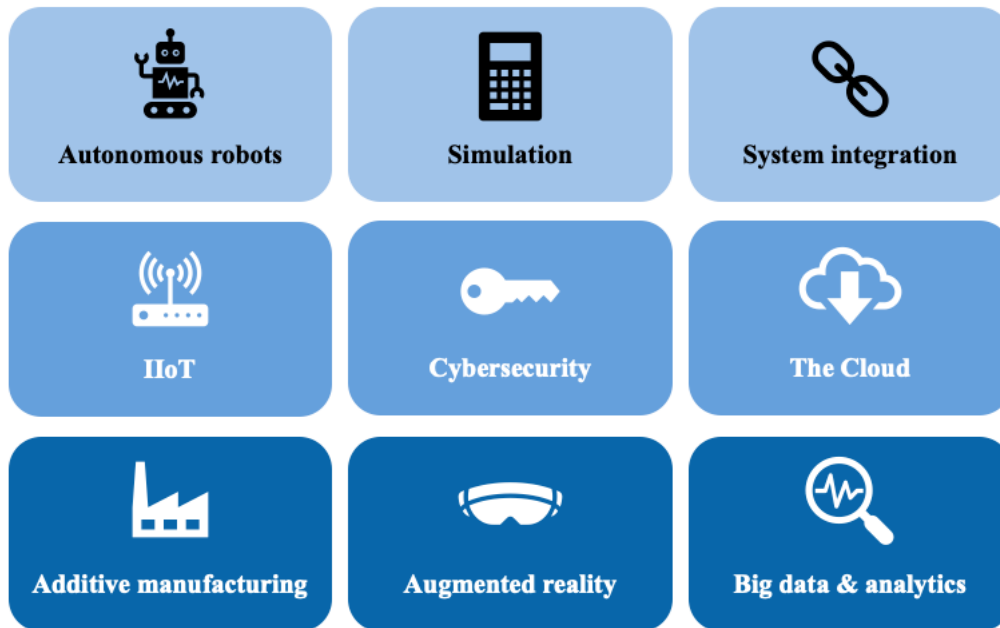
5.2 IT Consulting

5.2.1 Process Optimization

For any manufacturing company, constant process optimization is an all-present topic. There are usually a number of traditional ways to achieve this optimization, be it e.g. through different machinery, streamlined work organization, or adjustment of other parameters (Immerman, 2021). With the rise of digital technology, and the incorporation of such technology in a lot of modern manufacturing equipment, another way of process optimization is through the leverage of these digital capabilities. Possible technology fields are given below in **Figure 7** (Rüßmann et. al., 2015):

Figure 7:

Technology Fields in Manufacturing Process Optimization



Adapted from: Rübmann, M., Lorenz, M., Gerbert, P., Waldner, M., Engel, P., Harnisch, M., Justus, J. (2015, April 9). Industry 4.0: The Future of Productivity and Growth in Manufacturing Industries. *Boston Consulting Group*. Retrieved March 17, 2024, from https://www.bcg.com/publications/2015/engineered_products_project_business_industry_4_future_productivity_growth_manufacturing_industries

These can be very potent forms of optimization, simply because experienced manufacturing companies already realize most of the potential that traditional optimization methods offer; this is because they have been implementing these kinds of optimizations for decades. In the case of digital technology, as laid out in Chapter 1.2.2, there has been a delay in adaption for manufacturing companies. This now leads to a situation, where potent process optimization potential could theoretically be realized, but possibly there is no in-house expertise available to do so. If it is attempted anyway,

future problems regarding e.g. compatibility, scalability, or efficiency could arise and diminish or offset the optimization potential, even if it seems successful at first.

DDMS can step in and support customers with these issues, by bringing expertise from both IT and manufacturing and working together with its customer's shopfloor as well as their in-house IT to find the ideal solution. The degree of work that DDMS covers in these projects is variable: If its customers want to do the execution part by themselves, DDMS will only step in as project advisor or partial project lead. If the customer wants DDMS to develop the whole solution, then DDMS will do the project planning together with the customer and execute it. This could mean that an appropriate IT solution is sourced from a third party, or developed/ sourced by DDMS, if that is the better option. Process optimization is the most tangible of DDMS' IT consulting portfolio, because of how potential optimizations can be quantified in terms of money.

5.2.2 Digital Transformation

In difference to the previous chapter, digital transformation does not simply aim to improve the efficiency of an already existing process. Instead, it often aims to create new business ideas altogether; ideas that would not be possible to implement without the use of digital technology. A formal definition has been given by Vial (2019), stating that digital transformation is "a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies". The main areas that digital transformation can be applied to are given below in **Figure 8** ("Digital Transformation", 2022):

Figure 8:

Digital Transformation Fields



Core operations	Experience	IT infrastructure	Information management
Transforming them from physical to digital by either reshaping how the value is delivered or what is delivered	Reconsidering the customer/ partner and employee experience as a solid experience-feedback mechanism	Adoption of available cloud-based tools to operate software, build and seamlessly integrate new applications, store/retrieve data, and compute	Building a data-driven organization where decision-making relies heavily on insights obtained from gathered data

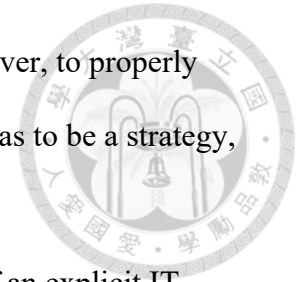
Adapted from: Digital Transformation Guide: Reshaping Your Business to Meet the Digital Age. (2022, April 27). *altexsoft*. Retrieved March 17, 2024, from <https://www.altexsoft.com/whitepapers/digital-transformation-reshaping-business-to-meet-digital-age/>

Naturally, the concept of an IT strategy has a higher level of abstraction involved and is best discussed with experts who have helped with some projects in this field already and who are not biased by too much routine in a specific industry. DDMS can fill this role, by leveraging its independent viewpoint and past projects. Project success evaluation for digital transformation will be less straightforward than for process optimization. Apart from that, DDMS' project contribution is according to customer requirements, ranging from consultation only to full execution, and thus this product resembles process optimization in that regard.

5.2.3 IT Strategy

Today, almost any company that does not have an explicit IT strategy is leaving potential revenue on the table and could be in danger of being taken out by the competition (Hertvik, 2022). The reason for this is already partly explained in Chapter 1.2.2: Since more and more competitors leverage the potential of digital technologies, it

becomes increasingly risky for companies not to do the same. However, to properly benefit from oftentimes costly investments in IT technology, there has to be a strategy, which many companies do not bother with.



Since DDMS' customer profile focuses on SMEs, the lack of an explicit IT strategy is even more likely, since SMEs oftentimes lack general strategic planning capabilities (Wang et. al., 2011). This means consulting in this area is a must-have for DDMS' product portfolio, even if the course of the project will differ significantly from both process optimization and digital transformation projects: The main difference is that projects will be less tangible; they won't be linked to a specific customer product or business area, and it will be difficult to evaluate their success in terms of money, due to their long-term abstract nature.

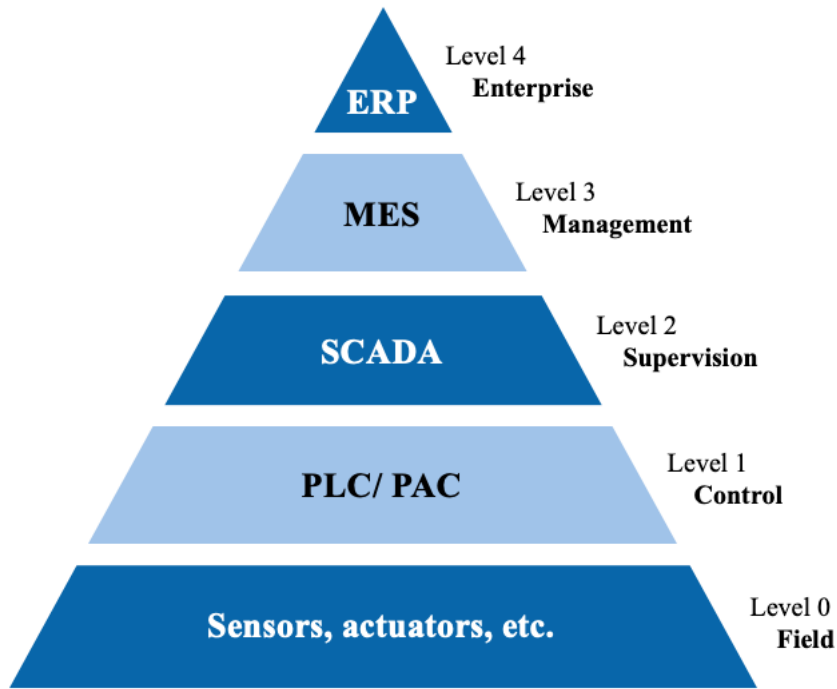
5.3 Software Solutions

5.3.1 Software Integration into Existing Eco-Systems

For any project, DDMS must consider that its customers already have IT systems in place that they want to keep using. For manufacturing companies, these are usually enterprise resource planning (ERP) and manufacturing execution system (MES), as well as supervisory control and data acquisition (SCADA), programmable logic/automation controller (PLC/ PAC) and finally sensors, actuators, etc. on the lower levels. A schematic landscape of these systems is given in **Figure 9** below (Lukić, 2021).

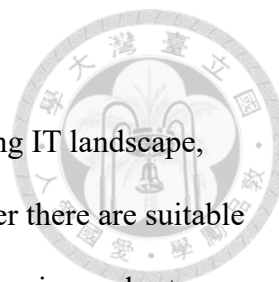
Figure 9:

Exemplary Systems Landscape



Adapted from: Lukić, V. (2021, April 20). ERP-MES-SCADA we are offering an all-in-one solution. Not! *8Sigma*. Retrieved March 30, 2024, from <https://8sigma.eu/erp-mes-scada-we-are-offering-an-all-in-one-solution-not/>

In a successful Industry 4.0 scenario, the systems on these levels must be able to communicate with one another flawlessly. Therefore, DDMS must be ready to integrate a potential project solution into these systems e.g. via interfaces. In order to do this, DDMS must keep in touch with the developers of these systems, e.g. SAP or Oracle, to know about the available possibilities. Of course it is also possible that customers use smaller systems or processes that they don't want to change, so for these cases DDMS would need to find a reasonable integration as well.



5.3.2 *Development of Individual Software*

If a project does not require integration into an already existing IT landscape, then a stand-alone solution becomes an option. Depending on whether there are suitable softwares available in the market, DDMS can help with selection, sourcing and setup, or develop new software according to its customer's requirements. Usually, this type of service is part of a larger IT consultation project.

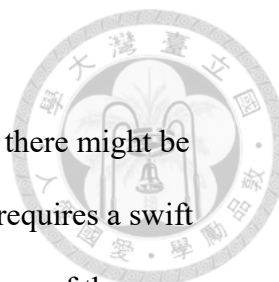
5.4 *Managed Services*

5.4.1 *Support & Maintenance*

For any project, customers often not only want a successful completion but also a guarantee that the newly implemented solution will keep running smoothly in the future. Support & maintenance contracts are common both in the manufacturing industry and IT; DDMS therefore also offers this kind of service to put customer's minds at ease and continue supporting them.

Since DDMS is responsible for the IT side of a project, this means mostly applying patches and bug fixes, if needed. If IT systems change, DDMS would also adapt its solutions to continue working, if a support & maintenance contract has been entered. Physical maintenance would need to be conducted by the customer themselves, or a third-party manufacturer of involved hardware, e.g. sensors, but DDMS can advise how extensive this maintenance needs to be.

While support & maintenance are a necessary part of DDMS' product portfolio, it is still beneficial in two ways: First, it is an unforced way to keep in touch with relevant people at a former customer and may lead to further projects in the future. Second, it provides small, but constant and plannable revenue to smooth out periods with less project work.



5.4.2 *Troubleshooting & Performance Optimization*

Especially during the phase directly after project completion, there might be unexpected situations that had not been considered in advance. This requires a swift follow-up to keep the occurring problems at the customer minimal. Any of these services, if initially part of the project description, would not be charged to the customer and be categorized as troubleshooting. For the situation that an existing running solution should be optimized in some way after the fact (e.g. implementing new functionalities), DDMS would charge the customer and treat it as a performance optimization project. It is expected that troubleshooting would occur mostly soon after project completion, while performance optimization might be requested some longer time after, possibly when the customer changes something else in their production landscape that has some relation to the previous project.

5.5 *Training & Workshops*

For many projects, new software might be introduced. This requires training for anyone who is involved with that part of the customer company's structure. Since DDMS is usually involved in the whole project, it is natural to also do this training and potentially even use this opportunity to spot overlooked weaknesses in the developed solution. Initially, this would be part of the project package, but it could potentially come into play at a later time when the customer decides to train further staff, at which point it could be charged extra.

Also, for some projects, the customer might not yet know their exact requirements. For these cases, DDMS offers to conduct one or multiple workshops with relevant customer company personnel and develop the project requirements with them. This could be part of the defined project package as well.

5.6 Proof of Concept (PoC)

In many cases, a customer will not commit to a full project order, unless they know that the intended solution can potentially work in practice. This is called a proof of concept (PoC) and usually involves a small-scale implementation of the solution (Gillis & Pratt, 2023). If it can be shown that the solution works in a controlled and restricted environment (test environment), then it can be assumed that it can work on a larger scale. Doing a PoC for any potential customer can work in DDMS' favor, as it is a tailor-made advertisement that aims directly at a pain point this customer has. For this reason, it would make sense to offer PoCs for free, if it is followed up by a project order. PoCs will also provide some network effect, the more customers DDMS already has: Even if no project order can be generated, the gained knowledge will be useful to further understand and potentially solve other customers' pain points.

Chapter 6: Customer Channels & Relations



6.1 Customer Channels

6.1.1 Digital Channels

DDMS maintains a website with all related contact information and is reachable by phone and email as the standard means of communication. There is no need to extend these two channels by more niche channels because DDMS deals with business customers only.

However, for existing customers, there is also the possibility of using Microsoft Teams chat or similar software, e.g. for support issues. This is reasonable if this tool had already been used during the project implementation with the customer as well; it can therefore continue to serve as a communication means; with relevant data and/ or chat history already in place.

Furthermore, DDMS has a social media presence, but only on the professional networks LinkedIn and Xing. Since German-speaking companies like to use Xing, it is a must, but LinkedIn is also gaining popularity in Germany, with 14 million members compared to Xing's 17 million ("Online-Marketing", 2021). On a side note, LinkedIn might give DDMS a head start in case of a planned expansion to English-speaking countries.

6.1.2 Analog Channels

DDMS will have an office that allows for small-scale meetings and remote conferences. For any larger event, such as workshops or training, another location will be rented to save fixed costs. Word-of-mouth recommendations are one major aspect of gaining orders and new customers, but especially in the beginning phase, DDMS must be present at relevant industry exhibitions and build up a network and customer

pipeline. Once some projects have been conducted successfully, it would be reasonable to feature articles in industry journals.



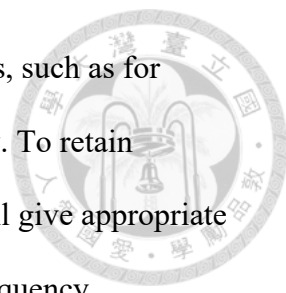
6.2 Customer Relations

6.2.1 Customer Landscape Overview

Ultimately, DDMS aims for a low amount of high-revenue projects. This fits best to its small size, individualistic approach, and the fact that it is not yet widely known. Aiming for two to five big projects per year (with some smaller projects as complements) would be ideal, even though this might not always be achievable. To work towards this goal, DDMS tries to enter into a long-term relationship with its customers, in other words: Most customers in its landscape should be regulars. If a regular customer has smaller projects that would not ideally fit the above description, they can still be accepted, because the relationship is already established, customer requirements are understood and this means less need for manpower for the project preparation phase.

6.2.2 Regular Customers

Regular customers should make up the main part of total customers and therefore revenue. This has several notable advantages: First, the overall customer company structure and industry are already known, leading to less time and manpower being used to understand their requirements and decision processes. Second, a trustworthy relationship is already established, further facilitating smooth project progress and less effort for requirement definitions, quotations, and contract negotiation. Overall, this means that projects are more likely to succeed and at the same incur less cost from DDMS' side, meaning more net gain.



Even fixed costs that are not directly related to single projects, such as for marketing or customer acquisition, will be lowered with this strategy. To retain customers and enter this mutually beneficial relationship, DDMS will give appropriate discounts to regular customers, depending on project volume and frequency.

6.2.3 *First-Time Customers*

First-time customers are a chance for DDMS to extend its reach through potential word of mouth, a professional network, and positive references. In that regard, they are more useful than regular customers, but this comes at a price: The previously mentioned benefits of regular customers do not apply to first-time customers, meaning that projects will generally incur more costs and have a higher chance of failing, e.g. if requirements are not properly understood or possibilities are not judged correctly.

The appropriate strategy must be as follows: Since each first-time customer is a chance to gain yet another regular customer, DDMS must carefully consider the above risks and pay special attention to customer satisfaction. Ideally, any of these customers should consider DDMS again first for any similar upcoming projects. It might even be acceptable to use additional efforts and operate at a loss if it means more orders from this customer in the future; project net gain should not be the primary concern. Of course, DDMS can choose not to pursue this, if a customer turns out to be not fitting to its landscape. Potential reasons for this could range from intransparent decision processes, infeasible project requirements, or payment-related issues. Those customers will still be served to the best of DDMS' ability, but no further efforts will be made to turn them into regulars.

6.2.4 *Marketing & Sales Strategy*

Summing up DDMS's strategy when it comes to marketing and sales, there is a clear focus on its core customer group and recurring customers. Related efforts, such as presence and engagement on professional social media are also geared towards these groups, even though publications of e.g. PoCs on these platforms can increase DDMS's exposure overall.

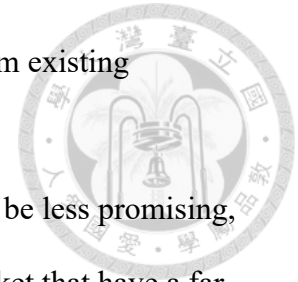
If at any point in the starting phase, DDMS encounters serious trouble acquiring clients, a referral program will be put in place, giving bonuses to any client that successfully refers DDMS to another potential client; only if an order is placed. This might be less interesting for big corporations, but can certainly be an attractive option for SMEs.

Finally, there is the option of providing services free of charge and taking a percentage of resulting profits or savings that the client company benefits from. This approach can be considered the equivalent of a free trial and is powerful in regard to scoring sales, but it also carries some risk. It might therefore only be applied if two conditions are met: DDMS must be extremely confident that the service leads to a tangible (that is to say quantifiable) profit or cost saving, and the resources needed to provide this service do not exceed a threshold that would put DDMS in financial trouble in case of a project failure.

Considering how critical and most likely difficult customer acquisition will be in the starting phase, any approach can be considered acceptable, with company resources shifting towards this goal if they are not needed for current projects. Acquisition through networking is the most promising, but to also attract customers outside of this

network, DDMS will pay attention to getting positive references from existing customers to showcase its online presence.

Last, topics such as search engine optimization (SEO) might be less promising, because as laid out in Chapter 3.4.1, there are big players in the market that have a far bigger presence online. Trying to compete with this would likely be a waste of resources; instead, DDMS goes for a more niche market anyway and relies on personal interaction.



Chapter 7: Key Activities



7.1 Business & Industry Monitoring

DDMS needs to constantly stay on top of the newest available technologies and opportunities for IT in manufacturing, as well as understand potential customer pain points. Since customer companies are often caught up in their daily business (Raveling, 2020), they expect DDMS to suggest solutions, even if in some cases the way of solving a problem might be already laid out by the customers themselves.

Business & industry analysis is a soft factor activity that is nevertheless critical for success. To get the most out of it, DDMS will conduct the following sub-activities:

- Subscribe to relevant industry journals & publications
- Join professional associations & forums
- Attend conferences & trade fairs
- Study market research reports
- Keep in touch with experts on professional networks
- Partner with universities for exchanges

The amount of work to be put into these tasks needs to be considered carefully, as it will denote a fixed cost and it is difficult to link to any future revenue. Also note that some activities can be reduced once DDMS has reached a certain customer base, at which point the first-hand experiences and direct network will be a more relevant source of information than the previously mentioned ways.

7.2 Source/ Develop Software

Depending on the project requirements and availability of software solutions in the market, DDMS might be able to develop relevant software for the customer

company by itself, source it from a third party, or a combination of both. Each case requires different activities to follow through:

The first case is straightforward if DDMS has the necessary skills; if not, then a subcontractor needs to be used, which can pose challenges, depending on its work quality, cost, and availability but has advantages in terms of flexibility. Especially in the beginning, DDMS needs to be comfortable with integrating contractor work packages, as it is unlikely to have all skills in-house. The second case will be rare, as an already existing software solution to a problem would most likely mean that DDMS' consulting services are not needed. If it comes to this situation nonetheless, then DDMS can help with the sourcing or establish contact with the software developer.

Last, a combination of existing software with a customization made by DDMS is possible. This brings the challenge of having to adapt to a set architecture, but also the advantage of not needing to develop a whole solution. In some cases, it can also mean that customers are already familiar with the use of software (e.g. Microsoft Excel combined with plugins, or SAP with custom transactions), which improves project acceptance and success chances.

7.3 Projects

7.3.1 Project Process Overview

Projects are the core business of DDMS and consist of four key phases which will be described in more detail in the following sub-chapters. **Figure 10** below shows a visualization of these phases.

Figure 10:

Project Phases at DDMS



7.3.2 Quotation

Each potential project starts with DDMS creating an appropriate quotation. This step, while necessary, is also of great importance, because it will determine if DDMS gets the order or not. A good quotation must have a competitive price and logical structure for the customer to understand it. Ultimately, a quotation set too high can mean that DDMS does not get any orders, while a too low quotation would implicate that DDMS operates at a loss for the affected project.

This means that DDMS must have a good intuition beforehand, which steps will need to be conducted for the project, how much cost they will incur, and how many manhours they involve. Experience with the customer's industry as well as their decision processes and company structure, as well as a complete understanding of DDMS' capabilities, is critical here. Creating quotations will get easier both with more experience that DDMS gets and if it is dealing with the same customer multiple times.

7.3.3 Planning

The planning stage has a great influence on a project's success chances and is therefore a critical step. Similar to creating the quotation, it involves knowing what type of work packages will be needed, and at what point in time. As a difference, it is not necessary to estimate costs in detail here, but the emphasis lies more on a reasonable

and achievable timeline. Customer companies might want to employ their project management methods, so DDMS needs to be familiar with different ways of running projects, such as Agile, Scrum, Critical Path method, etc.



7.3.4 Execution

Project execution is among the most critical of DDMS' activities. It involves the actual doing and processing of work packages in projects and can be as individually different as DDMS' approach: Research of a potential solution, recommendation to the customer, and implementation on the shopfloor are all part of project execution and require different success factors.

Research of a potential solution presumes knowledge of the IT landscape outside of the customer company, while a recommendation to the customer will be most successful if DDMS has a deep understanding of both the customer's industry and their pain points. Implementation on the shopfloor finally requires DDMS to first complete its part of the work package (e.g. development/ sourcing of a fitting software), then synchronize it with the customer company's structure and processes for seamless integration.

7.3.5 Follow-Up

DDMS knows that even after a project is completed, there will be unforeseen events that may require an adaption of some sort. For these situations, it will naturally support its customers free of charge, if the requirements of the project are still the same. If the requirements change, there may have to be a renegotiation or a follow-up contract. The execution of this is often straightforward, as the solution already exists and working relationships with the customer company are already established. In any

case, for DDMS' overall capacity planning it is important to consider that many projects will include this phase.



7.4 Data Management

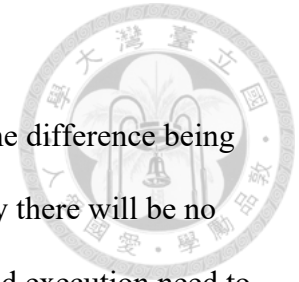
In some cases, a customer might want DDMS to do some sort of data management for them, e.g. if the customer does not have any IT infrastructure themselves. Since DDMS does need to have this kind of infrastructure and is already involved with the development of a solution, this request comes naturally. It has both advantages and disadvantages: On the one hand, offering this service might encourage the customer to follow through with a project that they would otherwise discard because of potential infeasibility. Also, DDMS can change over time, resulting in constant revenue. On the other hand, DDMS enters into a long-term contract and can not just cancel this service. This means it must consider its resources and also e.g. the influence of the evolving IT landscape to keep this service running at all times.

7.5 Workshop Preparation & Moderation

To run a successful project preparation workshop, some activities must be considered, e.g.: Finding a suitable venue; ideally this would be at the customer's premises to save costs and also use the familiar environment to put involved personnel at ease. Alternatively, a third-party location could be rented as a venue. It would then need to be prepared with catering, visualization equipment, etc. and there would need to be an agenda with clearly stated goals. Other preparations in the background for DDMS would include some initial interviews about the situation and/ or pain point to have some general understanding and to be ready to provide inspiration or guidance, leading up to a potential solution. Also, the DDMS employee needs to have workshop moderation experience and capabilities as a prerequisite.

7.6 PoC Execution

Conducting a PoC is very similar to a regular project, with the difference being its much smaller scale and less focus on financial feasibility. Usually there will be no follow-up phase, but all other phases, such as quotation, planning and execution need to be gone through. Some projects that DDMS does will likely be PoCs, particularly if the technology in question is not yet in use for a lot of industry applications. As established in Chapter 5.6, this can be an opportunity for DDMS to get one or multiple project orders and should be treated accordingly.



Chapter 8: Key Resources & Partners



8.1 Company Structure

DDMS will start with just one person, the founder himself. There are numerous reasons for this. First, it is possible to run DDMS parallel to a regular job, which greatly reduces financial pressure on the company because it does not need to pay a salary and therefore has very low fixed costs. This allows DDMS to gain relevant experience on smaller projects without having to focus on generating high revenue. Second, it avoids all difficulties related to permanent employees, such as hiring the correct people, less flexibility in case of low-order situations, etc. It would be possible to turn DDMS into a multi-employee company (e.g. the German GmbH, similar to a limited liability company LLC) once the revenue is high enough to support that, but there are no concrete reasons to do that apart from limiting the company liability. Instead, the combination of freelance labor conditions and occupation allows DDMS to serve its customers and also entails some further advantages described in the following, which is the third reason for selecting this organization form.

In Germany, a freelance occupation (as opposed to a craft) is not subject to trade tax. The amount of this tax depends on the responsible municipality and can range between 7 and 17 percent on the revenue, but can be even higher in individual cases, so its avoidal is a great benefit to DDMS. Note that any multi-employee company in Germany is always subject to this tax. Furthermore, freelancers are not required to do formal accounting. (Klein, 2024)

In practice, it would still be advisable for DDMS to do this, but not having it as a government-imposed requirement helps in the starting phase. Finally, a freelancer can hire subcontractors if he/ she can not do all the required work by themselves (Peetz,

2018). DDMS wants to rely on multiple partners for different tasks anyway (refer also to chapter 8.3), and the freelance model supports this option without any disadvantages. A schematic overview of how work is organized at DDMS is given in **Figure 11** below.

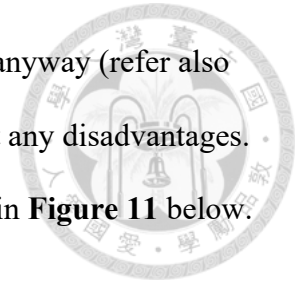
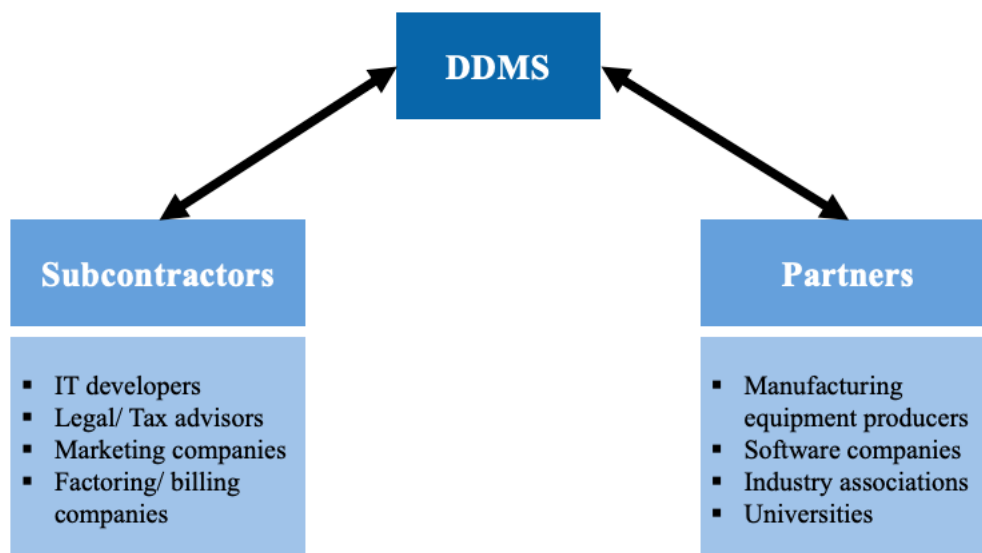


Figure 11:

DDMS Organization Layout

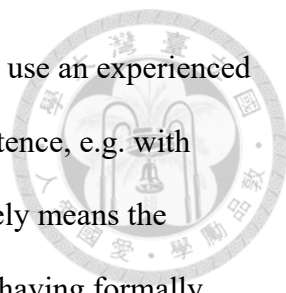


Note that while all entities shown are considered partners, those on the left side are in a much more closed relationship with DDMS and are thus considered subcontractors. A more detailed explanation of each partner is given in Chapter 8.3.

8.2 Key Resources

8.2.1 Experience in IT

DDMS needs to be able to find potential solutions to a customer's problems and also evaluate those solutions in terms of their feasibility. This means it must have both knowledge about the advantages and disadvantages of certain software, infrastructure, etc., and also experience in integrating these into an existing customer company



landscape. The most straightforward way to achieve this would be to use an experienced software developer as a subcontractor. Relying on superficial competence, e.g. with self-taught programming skills could lead to problems because it likely means the integration into existing systems is not adequately considered. Also, having formally verified IT expertise (e.g. through a university degree combined with relevant practical experience) involved in a project is likely to positively influence the customer's decision to order.

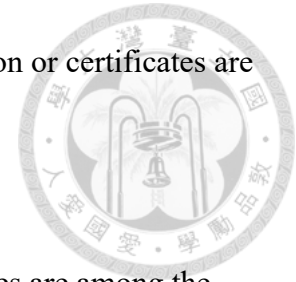
8.2.2 *Experience in Manufacturing*

Even if the product provided by DDMS is from the IT field, one of the main success factors is its clear understanding of any customer's pain points. Since customers are from the manufacturing industry, this requires experience in this field, ideally in multiple subfields. As laid out in Chapter 1.2.3, the communication gap between experts in IT and manufacturing can pose challenges and cause projects to fail, which is why DDMS must have manufacturing experience on board. As opposed to the previous paragraph, this expertise must not necessarily be formally verified, although it certainly also helps to convince customers of DDMS' ability to complete any project.

8.2.3 *Project Management Basics*

Depending on customer preference, DDMS can be a project team member or take partial project leader responsibility. For the second case, knowledge about project management basics is a necessity, and for the first case, it at least somewhat helps to smoothen the project's course. Although the work packages in DDMS' projects can be complicated and require lots of manpower, the surrounding project management is straightforward and not comparable to e.g. big R&D projects done at large corporations.

This means that basic experience is enough and no formal verification or certificates are needed.



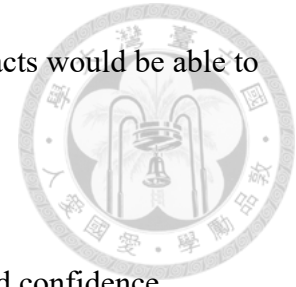
8.2.4 Professional Team & Network

Both in-house expertise as well as available external resources are among the most critical success factors for DDMS. Since it will start with the founder as the only permanent employee to reduce costs (see also chapter 8.1), it means that a big portion of the needed expertise needs to be made up by contracted work. This furthermore means that relevant professionals must be reachable through an extensive and trusted professional network.

The situation poses a challenge for DDMS: On the one hand, the more contracted work is used, the less predictable the results become; there might also be planning issues if a contractor does have the relevant skills, but no capacity. With in-house experience, this would never be a problem, as both planning and work quality are in direct control of DDMS. On the other hand, combining all needed expertise in just one person is difficult; and hiring more employees is too cost-intensive and risky for a company that is just starting out and does not yet have their order books filled. This might change after a few years, and only when DDMS can secure a constant stream of revenue, the advantages of permanent employees can be leveraged fully. Ultimately, a professional network in terms of execution skills (not for customer acquisition) can be seen as a means to balance the lack of capabilities at DDMS at certain points in time and must be worked on accordingly.

For customer acquisition purposes, a professional network is equally important (Rae, 2023), especially so in the beginning years of DDMS. If hiring of additional permanent employees were to be considered at some point in time, this would play a

key role; meaning that candidates with more previous industry contacts would be able to contribute the most in terms of order generation.



8.2.5 *Attractive Company Appearance*

At any point in time, DDMS must convey professionalism and confidence, because apart from the price, reliability and capability are likely key factors for customers when they decide who should get an order. One of the most convincing ways of showcasing this capability is to use references from previous successful projects. This shows once again that the beginning phase of DDMS will be the most critical; if no references exist yet, how can it convince customers to place an order? Moving up from less known and smaller customers is a likely path, but at the same time, DDMS' company appearance needs to be as impressive as possible, while at the same time showcasing integrity and honesty.

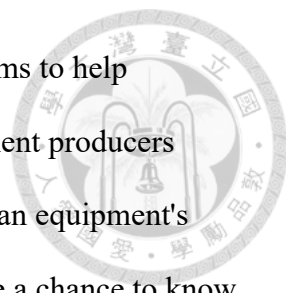
8.3 Partners

8.3.1 *IT Developers*

IT is a major part of DDMS' product, so for any task that can not be done in-house, be it for lack of skill or capacity, a third party needs to step in. This means that DDMS must have relevant IT developers as business partners and ideally be in a relationship with them that entails capacity contingents, knowledge exchange, and reasonable fees for their services, e.g. with bulk pricing or other means. This relationship should be mutually beneficial, as e.g. advice on the feasibility of a potential solution could lead to more business both for DDMS and their partners.

8.3.2 *Manufacturing Equipment Producers*

Modern manufacturing equipment usually has digital capability, but the challenge of how to integrate it into an existing system in a meaningful way remains if



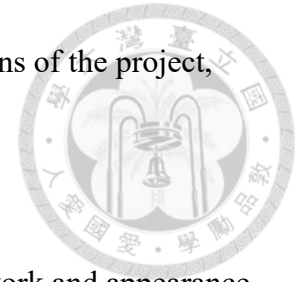
interfaces are not natively compatible (Raveling, 2020). If DDMS aims to help customers do that, then partnering with major manufacturing equipment producers makes sense. Not only will DDMS be able to gain insights into how an equipment's digital interface can be accessed and integrated, but also there will be a chance to know more about demands that customers have towards their manufacturing machines and the problems they run into. Lastly, it might be feasible to have a referral system where DDMS can recommend manufacturing equipment of a producer that it partners with, and where this partner could recommend DDMS for implementation follow-up at the customer if necessary. This would increase customer acquisition on both sides.

However, many of the renowned manufacturing equipment producers are large companies, so partnering up with them might not be an easy task. It might be more promising to gain access to the mentioned benefits through these companies' suppliers of digital hardware and software.

8.3.3 *Software Companies*

Every digital solution needs software to run. In some cases, it might be as simple as a web-based tool that can run on any browser, but often there would be much more sophisticated software required. Since the demand for digital solutions has only been increasing, there is a large number of software on the market. Much is provided by big companies, but some small players provide individualized or niche software solutions. It is not likely that DDMS can or should develop all of its required software by itself, so partnering with one or multiple software companies would be essential. The idea is, of course, to provide the customer with the best solution for a good price, not to choose the solution that results in the most revenue for DDMS. If that means relying on third-party software, then this will indeed be DDMS' recommendation. However, this can only

work if the software integrates flawlessly with all other considerations of the project, hence the need for a partnership with the software company.



8.3.4 Industry Associations

As established before e.g. in chapter 8.2.4, professional network and appearance are critical success factors, especially in early phases. Joining relevant industry associations, e.g. VDMA, BDI, or AUMA, can help create network opportunities and facilitate knowledge exchanges. Going to fairs and exhibitions and advertising for DDMS on these occasions is also part of this.

8.3.5 Universities

When it comes to developing completely new and innovative solutions, universities are often on the front line. Since DDMS also has PoCs as part of its product portfolio, it makes sense to consider universities as partners. These are not as critical as the previously covered partners, mainly for the reason that DDMS is almost purely practically oriented, while universities have an approach more geared towards research. For this reason, it is feasible to either aim for a very loose and noncommittal partnership with a preferred university or to aim for project-based short-term cooperation.

8.3.6 Legal/ Tax Advisors

DDMS will not hire any permanent legal advisor, as this would be unreasonable for such a small organization. Still, it might be necessary to rely on a legal expert in case of problems or for contract-related questions. The same applies to everything related to tax; it might be less relevant in the beginning, but with the growth of DDMS it would become a necessity to adjust tax and growth strategy.

Using a contractor for this kind of work is sensible, but because of the confidential nature of the topics, DDMS prefers to use the same person and/ or

organization to do this instead of switching between multiple service providers. This means a fixed partnership is intended.



8.3.7 *Marketing Companies*

DDMS does not have in-house expertise in marketing and, same with legal counsel, does not intend to hire someone purely for this, as it would not be feasible as long as the company is small. However, visibility plays such an important role that it is not advisable to do marketing without expert consultation. There are many service providers available that can fill this role, and it would even be possible to switch or use multiple marketing partners at the same time.

8.3.8 *Factoring/ Billing Companies*

To avoid liquidity concerns caused by late paying customers, DDMS will partner with companies that buy accounts receivables and handle all payment-related issues. This incurs some additional costs, but considering that DDMS is running a few projects with potentially substantial volume at some point, the delay or default of even one project can cause problems that are not worth dealing with. Also, without relying on a factoring company, DDMS would need to handle the additional workload for the billing, etc. by itself, which is not one of its core competencies and therefore to be avoided.

Chapter 9: Cost Structure & Revenue Streams



9.1 Cost Structure

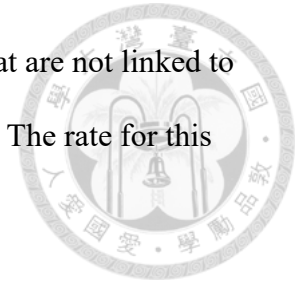
9.1.1 Direct Costs

Direct costs occur directly linked to the generation of revenue and are summed up under costs of goods sold (COGS) in this financial consideration. For DDMS, the main part of these costs is subcontractor fees, as DDMS does not sell physical goods and thus does not need to purchase raw parts or materials. As explained earlier, subcontractors are used if the author does either not have the skill to perform the task by himself, or if he lacks capacity. A suitable way of estimating these costs without knowing details about the project is to set a percentage of the project revenue. This can also be useful to set a reasonable project price if the needed amount of subcontractor work is known.

For smaller projects, the author can do many tasks by himself, so the COGS rate is set to 40%. Over time, DDMS will be able to work on larger projects, which are more complicated and also require more manhours in total; this brings the COGS rate up to 55%. The resulting absolute numbers for these estimations can be found in **Table 3** in Chapter 9.2.

For service & maintenance contracts, a rate of 25% is assumed. It is lower for two reasons. First, the contracts are designed in a way that should limit the amount of additional work that DDMS needs to do; if a lot of maintenance work is required, the contract amount will be proportionally higher. Also, after having completed the project related to this contract, more in-house expertise will be available at DDMS, limiting the amount of outsourced work.

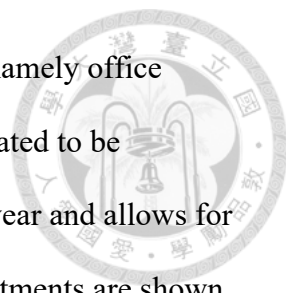
Finally, for miscellaneous work such as e.g. consultations that are not linked to any project, the author will do it himself and only incur minor costs. The rate for this type of work is set to 15%.



9.1.2 Indirect Costs

Indirect costs can not be linked directly to DDMS's revenue and are instead considered per year. They reappear in **Table 4** in Chapter 9.3.2. In this paragraph, the calculation/ assumption of each of the positions will be briefly explained. To get started acquiring customers, DDMS will use external services to launch a small marketing campaign for 5,000 EUR each in the first two years, then reduce this amount to 2,500 EUR per year when some customers have been acquired and DDMS's professional network has grown. The travel budget will start at 3,000 EUR in the first year, and then continually increase by 1,000 EUR each year as more and more projects get taken on. For software licenses 500 EUR in the first two years are assumed, then increasing to 1,000 EUR after that; it needs to be noted that this expense is difficult to calculate in advance, as some clients might require specific software that DDMS would not get before agreeing on a contract with this client. Accounting and tax advice are estimated at 1,000 EUR, 1,500 EUR, and 2,000 EUR in the first three years.

For the office space, it is assumed that DDMS wants to use 60m²; the average office rent in Germany is 230EUR per m² per year, resulting in a rent of 13,800 EUR per year. This is the largest expense of all, which is why DDMS will start out using no designated office. This is common in the freelance model and there is no reason to unnecessarily spend money on this, as long as DDMS does not yet have the customer base to warrant it. Moving to a designated office is planned in the third year.



Furthermore, there are some initial investments to be made, namely office furniture and IT equipment. For office furniture, 1,000 EUR is estimated to be sufficient. For IT equipment, DDMS invests 2,500 EUR in the first year and allows for an additional investment of 1,000 EUR in the third year. These investments are shown in table **Table 6** in Chapter 9.3.4. Given these company assets, depreciation is calculated with straight-line depreciation and no residual value for both, but with 10 years lifetime for the office furniture and only 5 years lifetime for the IT equipment.

As mentioned before, the author wants to gradually transition to running DDMS, which is why the costs are kept to a minimum. Once profitability is established, it is reasonable to reinvest profits to further grow the company. The author's initial equity in the company is 25,000 EUR which will be used to pay for the initial investments, with the surplus being converted to DDMS's cash reserves (also refer to table **Table 5** in Chapter 9.3.3).

9.2 Revenue Streams

Table 3 below shows the projected revenue streams for DDMS, together with COGS as explained previously in Chapter 9.1.1. The main part of the revenue is generated by project work. Both the amount and the volume of the projects increase over time, as DDMS will be able to acquire more customers and gain more experience in handling more complex projects. Service aspects such as workshops, PoCs, software development, or integration are already included under projects, as they are usually linked in some way and a separate calculation would not be meaningful at this point. Service contracts and miscellaneous services are listed separately because they have different COGS rates. German VAT, which is at 19% for these kinds of services does apply, but is ignored in the calculation. DDMS's customers need to pay this tax and

DDMS needs to directly transfer it to the German tax authority, which is why it makes no difference in the calculation whatsoever.



Table 3:

DDMS Sales Forecast

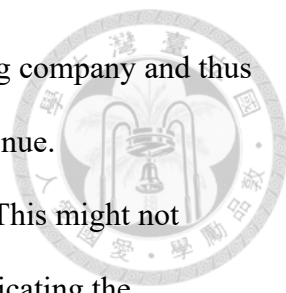
	2025	2026	2027	2028	2029
Projects					
Count	2	5	8	9	11
Avg. Revenue	5,000	8,000	12,000	15,000	17,500
Avg. COGS	2,000	3,600	6,000	7,950	9,625
Revenue	10,000	40,000	96,000	135,000	192,500
COGS	4,000	18,000	48,000	71,550	105,875
Service Contracts					
Count	0	1	2	4	6
Avg. Revenue	0	800	1,200	1,500	1,900
Avg. COGS	0	200	300	375	475
Revenue	0	800	2,400	6,000	11,400
COGS	0	200	600	1,500	2,850
Misc					
Revenue	1,500	2,500	3,500	4,000	4,000
COGS	225	375	525	600	600
Total Revenue	11,500	43,300	101,900	145,000	207,900
Total COGS	4,225	18,575	49,125	73,650	109,325

9.3 5-Year Financial Plan

9.3.1 Assumptions

In the following chapters, DDMS's financial statement forecasts are given. They are based on the following assumptions:

- DDMS is entirely self-financed and does not have liabilities in the form of loans, etc.

- 
- All accounts receivables are sold to a factoring/ billing company and thus received immediately. Also, there is no unearned revenue.
 - Accounts payable are treated as if paid immediately. This might not apply in practice, but there is no benefit in overcomplicating the statements in this early stage.
 - DDMS does not have gains apart from its core business.
 - Freelancers in Germany are subject to income tax, which is variable and goes up to 45%. It is calculated accordingly in the statements.
 - DDMS does not have any inventory, as no physical goods are sold.
 - All generated profit will be retained

9.3.2 *Income Statement Forecast*

The income statement forecast shown in **Table 4** is based on the sales forecast and the assumed expenses described in Chapter 9.1.2. It becomes apparent that DDMS can make a profit from the start, which is common for the freelance model.



Table 4:

DDMS Income Statement Forecast

	2025	2026	2027	2028	2029
Revenue					
Sales	21,000	61,200	134,700	206,500	280,000
COGS	8,025	26,550	65,325	105,305	146,900
Gross Profit	12,975	34,650	69,375	101,195	133,100
Expenses					
Marketing	5,000	5,000	2,500	2,500	2,500
Office Rent	0	0	13,800	13,800	13,800
Travel	3,000	4,000	5,000	6,000	7,000
Software Licenses	500	500	1,000	1,000	1,000
Accounting	1,000	1,500	2,000	2,000	2,000
Misc	500	1,000	1,500	1,500	1,500
Depreciation	600	600	800	800	800
Total Expenses	10,600	12,600	26,600	27,600	28,600
Earnings before Tax	2,375	22,050	42,775	73,595	104,500
Income Tax	0	2,280	8,405	20,307	33,287
Net Earnings	2,375	19,770	34,370	53,288	71,213

9.3.3 Balance Sheet Forecast

The balance sheet forecast shows a minor investment in the third year, but apart from that, all profit is retained as cash. This is done to simplify the view, even though in practice the author would need money for his livelihood, and take out the needed amount. This would reduce DDMS's cash and retained earnings. Subtracting this money in the form of a dividend would also have been possible, but to judge DDMS's potential as a business, it makes more sense to keep it simple.



Table 5:

DDMS Balance Sheet Forecast

	2025	2026	2027	2028	2029
ASSETS					
Current Assets					
Cash	24,475	44,845	79,015	133,103	205,116
Total Current Assets	24,475	44,845	79,015	133,103	205,116
Fixed Assets					
Office Furniture	1,000	1,000	1,000	1,000	1,000
IT Equipment	2,500	2,500	3,500	3,500	3,500
Less: Accumulated Depreciation	600	1,200	2,000	2,800	3,600
Total Assets	27,375	47,145	81,515	134,803	206,016
LIABILITIES & EQUITY					
Total Liabilities	-	-	-	-	-
Equity					
Capital	25,000	25,000	25,000	25,000	25,000
Retained Earnings	2,375	22,145	56,515	109,803	181,016
Total Equity	27,375	47,145	81,515	134,803	206,016
Total Liabilities & Equity	27,375	47,145	81,515	134,803	206,016

9.3.4 Cash Flow Statement Forecast

Equivalent to the balance sheet forecast, the cash flow statement forecast shows an accumulation of DDMS's cash reserves through all the retained earnings. Initial and follow-up investments in the first and third year respectively are also displayed.

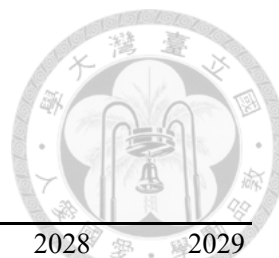


Table 6:

DDMS Cash Flow Statement Forecast

	2025	2026	2027	2028	2029
Starting Cash Balance	25,000	24,475	44,845	79,015	133,103
Cash Flow from Operations					
Net Earnings	2,375	19,770	34,370	53,288	71,213
Add Depreciation	600	600	800	800	800
Net Cash from Operations	2,975	20,370	35,170	54,088	72,013
Cash Flow from Investing					
Office Furniture	-1,000	0	0	0	0
IT Equipment	-2,500	0	-1,000	0	0
Net Cash from Investing	-3,500	0	-1,000	0	0
Cash Flow from Financing					
	-	-	-	-	-
Ending Cash Balance	24,475	44,845	79,015	133,103	205,116

9.3.5 Break-Even Analysis

As becomes apparent from the financial statements forecast, DDMS makes a nominal profit in the first year. However, for DDMS to be a reasonable venture for its founder, the profit must be higher than the salary that the author could earn in a comparable employment position. This would mean the earnings before taxes must surpass an amount of at least 65,000 EUR, which is achieved by the fourth year. This somewhat slow amortization can be attributed to the fact that both client number and project volume are likely low in the beginning, but can quickly rise to much higher numbers, which leads to a very comfortable profit by the fifth year, with the potential to still increase in the future.

Chapter 10: Risk Assessment



10.1 SWOT Analysis

10.1.1 Internal & External Analysis

The initial research, as well as statements and assumptions about DDMS given up to this point are taken as the base for the internal & external analysis, which is the first step in conducting a SWOT analysis. The findings are given in **Figure 12** below.

Figure 12:

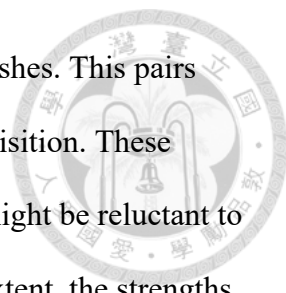
Internal & External Analysis (SWOT)

Strengths	Weaknesses
<ul style="list-style-type: none">▪ Combined manufacturing & IT expertise▪ High general flexibility▪ Quick decision-making▪ Tailor-made approach	<ul style="list-style-type: none">▪ Limited resources▪ Difficult workload planning▪ Lack of specialized niche knowledge▪ Challenging customer acquisition
Opportunities	Threats
<ul style="list-style-type: none">▪ Better networking opportunities with SMEs▪ Stick to niche market▪ Natural growth and upskilling potential	<ul style="list-style-type: none">▪ Better market presence of larger firms▪ Dependent on overall economic situation▪ Relying on few clients and projects

In the following chapter, the most critical combinations of this analysis will be referred to in more detail; to find strategies that either parry potentially dangerous situations or benefit from promising ones. This constitutes the second step of the SWOT analysis.

10.1.2 Derived Strategies

Strength-opportunity-combinations: Given that DDMS consists only of its founder, this results in strengths of high flexibility, the ability to make quick decisions,

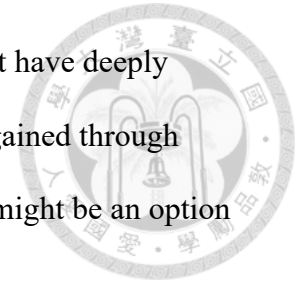


and also to customize every project according to the client's exact wishes. This pairs well with the opportunities to network with SMEs for customer acquisition. These companies are used to lean and "hands-on" decision processes and might be reluctant to hire a large consulting firm, DDMS's main competitor. To a lesser extent, the strengths also pair with the fact that precisely the low employee count means very high upskilling and growth potential, e.g. through the selection of adequate subcontractors.

Strength-threat-combinations: As for the threat of losing business to large consulting firms, this is equally addressed by DDMS's flexibility and customer-centric approach. While the competitors also promise this, many potential clients will feel that a smaller firm with only a few clients will be able to understand the needs of each client more clearly and deliver more value. The dependence on the overall economic situation is a problem for many companies; if there is a recession, few want to invest and as a result, there are fewer business opportunities. DDMS's advantage here is that it consists only of its founder and subcontractors, meaning that if no orders are generated, at least DDMS does not have the high permanent cost of employees that could put the company under pressure. It would still be advisable to create financial reserves in a way that allows for periods in which no revenue is generated at all.

Weakness-opportunity-combinations: The use of subcontractors, while convenient for e.g. the reasons given in the above paragraph, has the potential to be a weakness because of the difficulty of distributing work packages and planning projects without relying on permanent employees. On the other hand, if DDMS manages to run a few projects like this, this liability can turn into a situation where almost unlimited upscaling is possible. It might not be desirable in all cases, but with enough experience and the right set of subcontractors, it would be possible to take on more and more

projects and increase revenue. Also, while DDMS currently does not have deeply specialized expertise for niche industries, this knowledge might be gained through practical exposure to a project and, if this niche looks promising, it might be an option for DDMS to pursue further projects in it.



Weakness-threat-combinations: Last, the fact that DDMS relies on few customers and at the same time cannot easily acquire new ones, means that DDMS must be very vigilant not to lose customers through careless or incompetent behavior. This, however, is well in line with its mission and should be prioritized anyway.

10.2 Risk Scenarios & Mitigation

Table 7 shows selected risks according to estimated impact and an assumed probability. Only risk scenarios with either a high impact or a high probability (or a combination of both medium) are considered relevant. Each risk is given an associated measure that ideally prevents the scenario from happening, or, if that is not possible, limits the damage to DDMS.

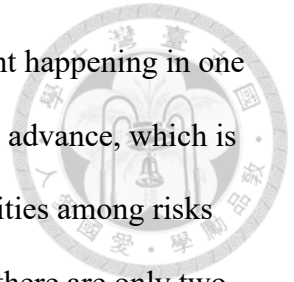


Table 7:

DDMS Risk Scenarios & Mitigation

Risk	Impact	Probability	Measures
Cybersecurity: e.g. data breach, ransomware attack	high	med	Pay close attention to cybersecurity best practices. Use professional help
Legal: e.g. contract disputes	high	low	Use legal advisor. Consider using standard contracts.
Financial: project miscalculation	med	med	Estimate to be on the safe side. Learn from past miscalculations.
Operational: resource shortage	high	med	Have alternative subcontractors available. Consider quotas for busy subcontractors.
Reputation: dissatisfied clients	high	low	Always focus on customer satisfaction. Consider discounts or free rework.
Project: e.g. scope changes, delays	low	high	Pay special attention to planning phase. Use fixed project description.
Health: e.g. burnout, isolation	high	low	Maintain strict schedule for leisure next to work. Seek personal contact with clients and subcontractors.

Both the estimated impact and the probability of such an event happening in one year are assumptions. It seems infeasible to exactly quantify a risk in advance, which is why the estimations are qualitative. This is enough to compare severities among risks and draw attention to the most critical ones. In this case, fortunately there are only two risks that combine a high impact with an at least medium probability; these need to be considered especially carefully. As for those risks with a combination of high and low, it makes most sense to focus on reducing the dimension that is high, as this should be easier to achieve. The measures in the table are designed accordingly.




Chapter 11: Future Plans & Conclusion



11.1 Future Plans

While expansion is not strictly necessary for DDMS, it remains a possibility, mainly in two dimensions: First, increasing the number of projects and growing DDMS from a freelance model to an LLC with 5-10 employees is an option. This would require significant transitions in many areas laid out in the previous chapters and carry some risk; at the same time, it would increase potential profits. At this point, DDMS does not aim for this kind of expansion, as the described business model promises good profitability and also caters to the founder's interests, while the transformation to an LLC would likely mean that he would be in a management role only. The second option would be to expand to non-German countries and/ or clients. This could be done without transforming the company structure and is still reasonable from a capacity standpoint if DDMS takes on a lesser amount of other work at the same time. There would be numerous challenges, particularly in the field of regulations and taxes, but ultimately it could prove worthwhile to explore this path. As briefly mentioned in Chapter 1.1, the client's language would need to be English, meaning an expansion to either the USA or Great Britain appears the most natural, with Great Britain being the more likely target because of the closer proximity. It also opens up the possibility of acquiring international clients from these origins that use English as a company language but have factories in Europe. Given the international background of the founder, this second option is the preferred one; it can be considered as soon as DDMS establishes itself in the market.

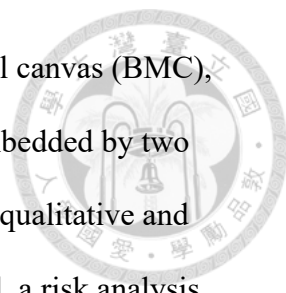
11.2 Conclusion



This business plan lays out the strategy for the author to become self-employed and work in the field of IT consulting as a freelancer, under the company name Dreger Digital Manufacturing Solutions (DDMS). The targeted customers are manufacturing companies, creating a link to the author's past education in mechanical engineering and job experience in a consumer goods manufacturing company. In particular, SMEs are targeted as the core customer group, as this plays to the strength of a small business just starting and avoids confrontation with larger competitors. DDMS will be located in Germany and offer project services such as process optimization, digital transformation, and IT strategy development, as well as several complementing services, such as software development, PoCs, and workshops/ training.

Given that digitalization gets more and more important in the context of manufacturing, and knowing that a communication gap between pure IT experts on one side and manufacturing experts on the other side makes implementation tricky, the founding of DDMS is reasonable. The demand for such services has been steadily increasing, and as an additional factor, companies increasingly considering outsourcing them e.g. to freelancers. This makes it very likely that DDMS will find clients, even though there are many other players in the market already.

DDMS does not have a classic organizational structure with permanent employees but instead takes advantage of the German freelance model, which allows the use of subcontractors. This choice is ideal for the author to transition into this new business with the least risk possible, while at the same time retaining the option to scale up quickly if need be.



The structure of this business plan follows the business model canvas (BMC), which contains all relevant topics that need to be considered. It is embedded by two additional chapters: First, a market & industry analysis that contains qualitative and quantitative information about DDMS's market potential, and second, a risk analysis that takes into account all established assumptions and decisions about DDMS and derives related risks as well as an estimated impact and countermeasures.

DDMS aims to bridge that gap between manufacturing and IT and helps its customers achieve a smooth transition to a factory that uses digital technology to its fullest advantage. It focuses on understanding its client's core business and serving as a reliable and trusted partner, with confidence that each customer may eventually turn into a recurring client.

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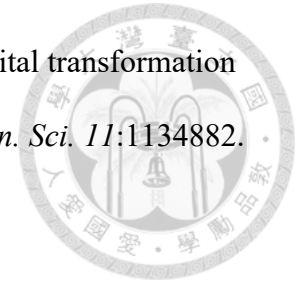
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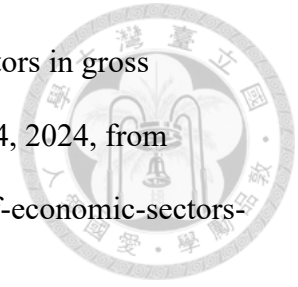
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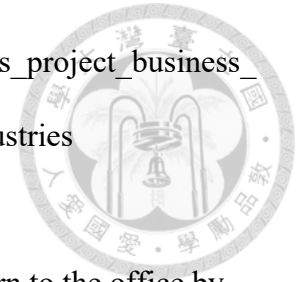
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Appendix A: Business Model Canvas Overview



Key partners	Key activities	Value proposition	Customer relationships	Customer segments
<ul style="list-style-type: none"> IT developers Manufacturing equipment producers Software companies Industry associations Universities Legal/ tax advisors Marketing companies Factoring/ billing companies 	<ul style="list-style-type: none"> Industry monitoring Develop software Projects Data management Workshops/ PoC 	<p>Products</p> <ul style="list-style-type: none"> IT consulting Software solutions Managed services Misc. supporting services <p>Traits</p> <ul style="list-style-type: none"> Fully individualized Understanding client's business Lean & reliable 	<ul style="list-style-type: none"> Focus on recurring clients Discounts for recurring clients Referral program for new clients in the beginning 	<ul style="list-style-type: none"> Secondary sector (manufacturing) companies Client can be B2C & B2B Micro, small & medium enterprise (SME) Location in Germany Aiming to push digitalization No in-house expertise
<p>Key resources</p> <ul style="list-style-type: none"> Manufacturing & IT expertise Project management Professional team & network 			<p>Channels</p> <ul style="list-style-type: none"> DDMS website MS Teams Linkedin/ Xing DDMS Office Phone/ email 	
<p>Cost structure</p> <ul style="list-style-type: none"> Subcontractor fee, marketing, office rent, travel costs, software licenses, accounting, miscellaneous expenses 			<p>Revenue streams</p> <ul style="list-style-type: none"> Consulting fee, projects, maintenance & service contracts, workshops, PoCs 	

Appendix B: DDMS Projects Example Scenarios



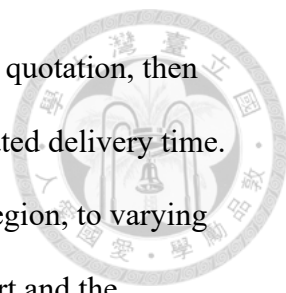
Scenario A: Process Optimization

Company A manufactures plastic parts, but uses mainly older production equipment without a lot of digital capabilities to do so. As a consequence, there is no real-time data collection about the produced parts. Since no machine can reasonably be supervised by an employee all the time, this sometimes leads to faulty products, that are only discovered once a certain amount has already been produced. This results in financial losses due to lost production time and scrapped material/ wasted energy. In order to improve this process, DDMS recommends to equip the machines with a thermal image camera that are a low-cost option to collect relevant data about each produced part. The taken image features temperature data which can be compared to the temperature profile of a good part, to instantly detect problems in the production process. To take advantage of this data, it must be integrated into the MES of company A, which is used and constantly monitored by the shopfloor employees. That way, the responsible person, e.g. the shift leader can quickly know about which machine has a problem and assign personnel to fix it, before more bad parts are produced.

This scenario is a typical process optimization, as it only improves an already existing process with the help of newly available digital technologies. The main challenge is to find a reasonable integration of these digital components with the already existing old production environment.

Scenario B: Digital Transformation

Company B produces wooden pallets for industrial use that are mainly sold in the vicinity of its production site in Germany. Most customers are recurring, and the



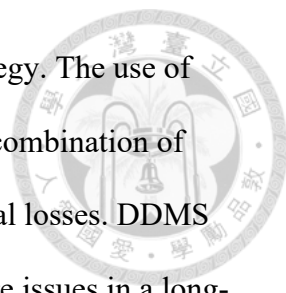
ordering process is done in manual fashion, with customers getting a quotation, then placing orders for each type of pallet and getting feedback for estimated delivery time. Although there would be potential to sell these products in a wider region, to varying customers, management fears both the additional administrative effort and the unpredictability of the incoming orders.

DDMS recommends the switch to a digital platform for selling the pallets, similar to an online shop. After successful implementation, customers can directly see available products, with prices and delivery time. The delivery time is calculated according to company B's production capacity and shipping distance. That way, manual back-and-forth communication can be avoided and company B does not run into trouble juggling manual orders from too many customers.

In contrast to scenario A, this switch can be considered a digital transformation, as it changes the way value is delivered to company B's customers, and at the same time very likely leads to it acquiring new customers. It is more challenging to implement, because the use of digital technology is not isolated to a single process, but instead needs to be seamlessly connected between different processes.

Scenario C: IT Strategy

Company C manufactures high quality valves for industrial applications and has already been implementing digital technologies in the past, e.g. for the production process, inventory management and parts of customer service. Recently it encounters more and more trouble with the compatibility of some of its used solutions. Management also suspects that some digital technologies cost more money than they ultimately bring in.



It turns out that company C does not have an explicit IT strategy. The use of different IT solutions in isolated cases may serve a purpose, but the combination of incompatible ideas leads to more administrative work causes financial losses. DDMS can help with mapping out a strategy that addresses company C's core issues in a long-term sustainable way, and helps making the most of available digital technologies, with emphasis is on scalability and profitability.

The difference to scenarios A and B is that DDMS does not need to do any implementation; the service is purely to consult. In that regard, the task is less practical, but requires more strategic finesse.