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**EXPLORING SELF SOVEREIGN IDENTITY (SSI) SERVICES: A  
BUSINESS MODEL CANVAS ANALYSIS OF LEADING SSI  
COMPANIES**



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## ABSTRACT

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Exploring self-sovereign identity (SSI) services: a business model canvas analysis of leading SSI companies

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In recent years, the concept of self-sovereign identity (SSI) has drawn a lot of interest as a possible solution for the problems associated with managing digital identities. SSI aims to guarantee privacy and autonomy by giving people more decentralized control and security for their personal data. In this thesis the field of Self-Sovereign Identity (SSI) services is examined, along with its importance and applicability. The thesis analyzes the business models of well-known SSI businesses using Business Model Canvas (BMC) and highlights their major strengths and competitive strategies in the newly developing SSI industry. By providing insights into the foundations and driving forces underlying the SSI business models, and emphasizing the SSI's significance in the digital era, the thesis makes contributions to theory and practice. It gives a thorough grasp of the business models used by SSI organizations, empowering practitioners to use these insights while creating and implementing SSI services. SSI and its ramifications are better understood overall because of this study, which bridges the gap between theoretical ideas and real-world implementations in the field of identity management. This thesis not only provides a comprehensive analysis of leading SSI companies using the Business Model Canvas but also offers valuable insights for new entrants interested in the SSI market. By leveraging the knowledge gained from this research, entrepreneurs can navigate the evolving landscape of digital identity management and contribute to the advancement of SSI services.

Keywords: self-sovereign identity, business model canvas, SSI companies, digital identity.

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# 1 INTRODUCTION

In today's digital era, it is crucial to ensure that individuals have autonomy over their personal information, privacy, and security. The general population is constantly bombarded with news of data leaks of individuals, which is a cause of concern, and there has to be a solution that can safeguard individuals from such data leaks. This is where Self-Sovereign Identity or SSI comes into play. SSI refers to a digital identity system that allows individuals to exercise control and authority over their digital identities, including the sharing and using of personal data (Persona, 2023).

The SSI is an innovative technology and paradigm which has the potential to revolutionize how consumers and companies can have control over their data. Furthermore, with the increasing acceptance of SSI solutions, there is growing momentum towards this approach, and companies could profit from providing such services.

With digital identity becoming increasingly important in our everyday lives, it is critical to prioritize safeguarding data. According to authors Daniel Sutkowski and Paweł Czernicki (Sutkowski & Czernicki, 2022), who analyzed the Federal Trade Commission's Consumer Sentinel Network report, the number of identity theft instances recorded has increased over the last five years. The self-Sovereign Identity (SSI) method of identity management, which employs blockchain technology, is an emerging answer to this challenge. SSI is necessary to enable this control and protect against potential vulnerabilities.

In terms of individuals and businesses, SSI provides different advantages as individuals get control over their personal data, indirectly reducing the risk of identity theft and fraud which helps in the facilitation of easier access to digital services. Additionally, for businesses and organizations, SSI can streamline identity verification processes and facilitate secure and efficient credentials that can immediately help in verifying their legitimacy (Dock, 2023).

A business model is a structure that describes how a firm makes money. The target market must be identified, their requirements must be understood, and strategies must be developed to satisfy client requests. The business model also accounts for the expenses related to marketing and product development.

There are several sorts of business models, each created to meet the unique needs of various types of enterprises (Ames, 2022).

A firm's business model may be quickly and easily understood using a Business Model Canvas (BMC). The main success criteria of the firm and their interrelationships are described in the business model. In addition to serving as a manual for internal operations, it may be utilized to clarify to customers and other stakeholders how the firm should be run and what variables lead to success (Varma, 2021).

The Business Model Canvas fosters successful teamwork and communication by fostering shared knowledge of the business model and developing a shared vision (Sosna et al., 2010). Additionally, it serves as a valuable tool for strategic analysis and corporate planning, providing a systematic method to pinpoint opportunities for improvement and new directions for innovation (Casadesus-Masanell & Ricart, 2010).

The Business Model Canvas helps businesses see the connections, overlaps, and trade-offs between many aspects of their operations, which improves their ability to make decisions (Chesbrough & Rosenbloom, 2002). Additionally, by considering the generation of income, allocation of expenses, and value creation, the canvas makes it easier to assess the economic viability of business models over the long term (Gassmann et al., 2014). It provides business owners with a comprehensive overview of each component of their organization, including the value proposition, client segmentation, operations, and financial information.

The Business Model Canvas is a strategic tool for developing and analyzing business models. BMC analysis can help assist businesses in methodically understanding the interrelationships between these building blocks and developing strategies to produce value for their own organization (Osterwalder & Pigneur, 2010, pp. 22-30).

The research question of this study is "What are the key characteristics of SSI business models?". The thesis's main research objective is to identify the key components of sovereign identity (SSI) services by utilizing the business model canvas to analyze the top SSI providers. The primary objective is to identify the critical elements business model canvas study of organizations providing SSI – such as the technological infrastructure, legal and regulatory environment, partnerships, user experience, and revenue models – that are essential for creating a successful and long-lasting SSI business to enhance our understanding of the SSI business landscape which is a research gap the thesis will try to answer.

In the thesis, I will investigate what are the main components of a successful SSI business and seek to determine the fundamental aspects that comprise of profitable and successful SSI business using a business model canvas analysis. The results of this study will give SSI businesses and stakeholders useful information on how to create and maintain a flourishing SSI ecosystem. By providing an analysis of the SSI business landscape and the numerous business models utilized by SSI enterprises, the thesis may contribute to the scholarly



literature on SSI. The thesis might assist in guiding the formation of new SSI enterprises and influence the choices of current SSI organizations by studying the essential components of successful SSI business models.

The lack of awareness and study of the particular business models used by SSI firms contributes to the research gap in investigating self-sovereign identification through a business model canvas analysis of prominent SSI enterprises.

There is an absence of extensive research that is devoted to carefully analyzing SSI businesses models. By undertaking a thorough investigation of the business model canvas used by well-known SSI businesses, this research seeks to close this gap. It aims to pinpoint crucial elements, expose trends, fix problems, and identify possibilities in the SSI market aims to provide valuable insights into the key factors that contribute to the success or failure of SSI enterprises through a thorough analysis of their business models. Additionally, it will identify the challenges and opportunities within the SSI market and offer a framework for developing effective SSI business strategies.

The thesis contributes to the academic literature on SSI by providing a comprehensive overview of the SSI business landscape and the various business models used by SSI companies. It also provides practical insights for entrepreneurs and investors looking to enter the SSI market. By analyzing the key components of successful SSI business models, the thesis helps to guide the development of new SSI companies and inform the decisions of existing SSI businesses. As a result, this research adds to the body of literature by delivering insightful analysis of the business strategies and methods used by SSI organizations as well as useful advice for advancing and building business.

The thesis also assists SSI industry stakeholders, such as businesses and entrepreneurs, by offering insightful information and useful advice. The thesis identifies the crucial components and effective tactics used within the SSI industry by thoroughly analyzing the business model canvas implemented by well-known SSI organizations. SSI companies may use this information to better their own business models, spot potential improvement areas, and make wise operational choices. Additionally, it would be a helpful tool for those who are unfamiliar with the SSI sector, helping companies and entrepreneurs to create successful business plans and navigate the opportunities and obstacles of the sector.

## 2 THEORETICAL BACKGROUND

This master's thesis theoretical background section attempts to provide a thorough comprehension of the key concepts that serve as the study's foundation. Three essential concepts are first defined and explained in detail: self-sovereign identity (SSI), business model canvas and business models. It will lay the groundwork for understanding the examination of self-sovereign identification from the context of the business model canvas by examining and defining these fundamental terms.

### 2.1 Self-Sovereign Identity (SSI)

SSI is a digital identity management system that allows people or companies to have complete control over the administration of their account information as well as their personal data. It allows users to save data on their devices and exchange it for authentication and transactions without depending on a centralized data source. SSI gives users complete power over how their confidential information is accessed and used (Gillis, 2020).

The definition of Self-Sovereign Identity (SSI) may vary slightly among researchers and organizations since it is a new area of research and development. However, below are some examples of how SSI has been defined by different sources.

According to the Sovrin Foundation, a non-profit organization focused on promoting and developing SSI technology, "Self-Sovereign Identity is the idea that individuals and organizations can securely and privately own, control, and share their digital identity and reputation without the involvement of intermediaries." (Sovrin Foundation, 2016).

In their article "Self-sovereign identity: decentralized digital identity and verifiable claims," authors Drummond Reed, Christopher Allen, and Joe Andrieu define SSI as "a new identity model that allows individuals and organizations to create and manage their own digital identities, and selectively reveal

them to others as needed, without relying on a central authority to verify their authenticity." (Allen, 2016)

The Decentralized Identity Foundation (DIF), a community-driven organization focused on developing standards for decentralized identity systems, defines SSI as "an identity model that enables individuals and organizations to securely and privately own and control their digital identities, independent of any third-party authority." (DIF, 2022)

In their book "Blockchain Basics: A Non-Technical Introduction in 25 Steps," authors Daniel Drescher and David Metcalf define SSI as "a digital identity model that enables users to maintain ownership and control over their personal data and identity attributes, and to selectively disclose those attributes to others, without relying on a central authority." (Drescher, 2017).

Understanding the conceptual framework of digital identity is necessary for understanding Self-Sovereign identification. Any information that is associated with a person or group and is capable of being tracked online, which includes login information, passwords for bank accounts, and photos/videos uploaded on social networking, is referred to as digital identity. People can handle their digital IDs independently with SSI technology, removing the necessity for third-party providers to oversee their personal information. The term Decentralized identity is frequently used simultaneously with SSI (Dock, 2023).

There are three main roles in the Self-Sovereign Identity (SSI) ecosystem (Naik & Jenkins, 2021, 1):

- **Issuer:** An issuer is a reliable organization that distributes credentials to users.
- **Holders:** They are the customers who have an identity and obtain credentials from the provider that they keep in their digital wallet and show to verification agencies as required for verification.
- **Verifiers** are usually service providers who request credentials from users and verify them by means of a blockchain-enabled trust hip between the issuer and the verifier.

The issuer generates and distributes a digital credential containing information pertaining to the holder's name or characteristics. In contrast, the holder is the individual receiving it who safely keeps the credential in a digital wallet. The verifier is an independent third party who must validate the data provided by the user in the digital certificate.

A decentralised and extensible identity network connects the issuer, holder, and verifier, allowing for the safe and provable interchange of digital identities between different parties. Decentralized credentialing systems such as blockchain, decentralized identities (DIDs) and verifiable credentials (VCs) are used in this environment (W3C,2022).

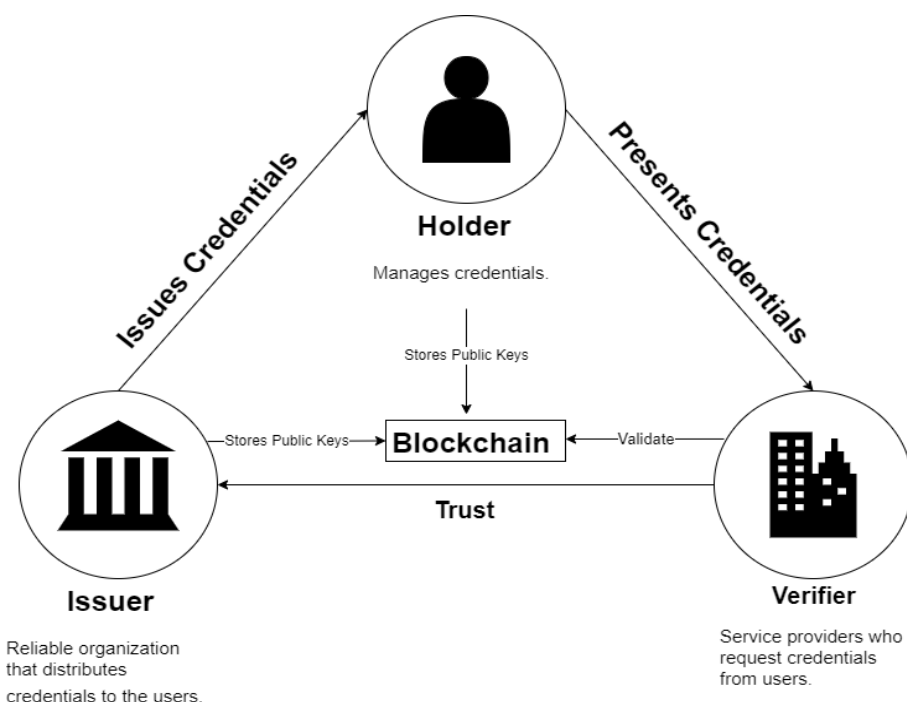


Figure 1: Verifiable Credentials Model (Affinidi, 2022)

There are three pillars of decentralized credentialing systems which are the basis of SSI, namely blockchain, decentralized identities (DIDs) and verifiable credentials (VCs). It is essential to understand what each of these systems does in regard to SSI.

1. **Distributed ledger technology (DLT):** The fundamental framework and protocols that enable concurrent access, validation, and updating of a networked database are referred to as distributed ledger technology, or DLT. It enables users to see changes and their origins and acts as the basis for building blockchains. DLT reduces the need for data audits, ensures the accuracy of the information, and restricts accessibility to those who are permitted (Frankenfield, 2023).

In contrast to blockchain, KERI (Key Event Receipt Infrastructure) offers a unique distributed ledger system. The human-centred internet project Matr Global created KERI, which differs from blockchain in that it does not rely on blockchains or consensus techniques like evidence of work or proof-of-stake. Key Event Receipts (KERs), essentially independent, encrypted records comprising all necessary information for certifying, are introduced by KERI as a replacement. These KERs could be distributed and kept by a community of users, enabling decentralised and reliable data administration (Keri, Home 2023).

**Blockchain:** The blockchain system is an interconnected collection of devices which utilize a private database or ledger. The data saved in blocks includes an encryption hash, a timestamp, and data from transactions, all of which are validated by processing prior to being transferred

to previously saved blocks. The blocks are subsequently linked together to create a safe and immutable data log (Hendrickson, 2023).

2. **Decentralised identity (DID):** DID is an identifier similar to a website URL that can be handled with a high degree of availability and securely validated. DIDs are linked to cryptography material, such as publicly accessible keys and service endpoints and are not created or maintained by centralized bodies. DIDs are private and resistant to manipulation, counterfeiting of identities, and other cyberattacks (Togggle, 2023).
3. **Verifiable credentials** serve as a digital wallet for essential identity papers such as passports, vaccination certificates, and various other identification documents. The digital verification procedure allows the holder to control their personal characteristics. This helps to conserve valuable time and establishes a straight channel of contact between the organization and the people it serves, which is an important first step in establishing trustworthiness (Schwartz, 2022).
4. The **SSI wallet** is a crucial tool that allows individuals to maintain and control their online identities, which gives it a vital role in self-sovereign identification (SSI) systems. Users may safely maintain and access their private data, login passwords, and cryptographic keys using it as an encrypted online repository which serves as a digital container. The wallet serves as a crucial instrument in the implementation of SSI since it makes the encrypted and private transfer of verified credentials possible while enhancing the security of users and protecting their personal information (W3C, 2019).

Blockchain technology is closely linked to verifiable credentials and decentralized identifiers, both critical components of self-sovereign identification (SSI). The aforementioned technology offers a personal identity management platform that is safe, discrete, and available worldwide. Because of its use of blockchain technology, SSI is the most efficient and dependable identity management solution (Hendrickson, 2023).

Decentralized identity management happens when people are granted credentials by legislative or bureaucratic entities, for instance, certificates of birth or social security identities, and maintain ownership of them during the course of their lives. This can be used to identify individuals or to build relationships for a variety of objectives. Law enforcement, property owners, or anybody else who needs evidence of identification rely on the data to confirm the legitimacy of the individual providing the credentials in accordance with the traits supplied. This procedure is entirely under the control of the person.

## 2.2 Business models

The business model is described by Gassmann, Frankenberger, and Csik (2014) as the strategy outlining the manner in which a company creates, transmits, and collects value. It includes the everyday processes and strategic choices that dictate how a business generates and generates value from its products while preserving a competitive advantage in the marketplace.

A company's business model is the strategy it employs to turn a profit. It includes a summary of any anticipated expenditures in addition to the products or services the business plans to offer, together with the market that it has selected. Strong business models are necessary for both new and existing businesses. They help new, rising firms attract funding, hire talent, and motivate management and staff (Kopp, 2023).

Chesbrough (Chesbrough, 2002) defines the Business Model as a description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams.

According to Teece (Teece, 2010), a business model refers to how a company arranges its operations, utilizes its resources, and interacts with stakeholders in order to generate and obtain value. This perspective underscores the comprehensive approach that companies take to create and capture value, incorporating aspects such as value proposition, revenue model, cost structure, and competitive positioning.

On the other hand, Amit and Zott (Amit & Zott, 2012) define a business model as the arrangement, framework, and management of transactions aimed at generating value by leveraging business opportunities. This definition emphasizes the significance of aligning essential elements of a business, such as value proposition, revenue generation, cost structure, and resources, to successfully exploit market opportunities and create value.

## 2.3 Business models of SSI companies

In self-sovereign identity (SSI) ecosystems, considerable consideration must be given to the business model's design and marketing. Although SSI solution adoption has many advantages, it also requires significant adjustments to legacy systems and corporate processes (Wang & De Filippi, 2020). In light of this, it may be necessary to completely restructure the existing business models, such as by implementing fees for transactions per credential usage. It is difficult to create an appealing value proposition at the ecosystem level because it must take into account the varied and sometimes at-odds goals of the numerous actors (De Filippi & Loveluck, 2016).

According to the findings of Laatikainen, Kolehmainen, and Abrahamsson (2021), their research indicates that self-sovereign identity (SSI) has the potential to bring about significant transformations in the digital landscape. Additionally, according to the experts SSI can support equity, individual freedom, and inclusion in the digital age, particularly in instances of use addressing groups without official identity credentials, such migrants or people from third-world countries. However, according to the individuals who the authors interviewed with, it is crucial for businesses to implement SSI and give digital trust priority. They stated that SSI implementation had strategic implications in addition to functional advantages. Adopting SSI can result in higher utilization of resources, new chances for inventiveness, increased profitability, cost reductions, the development of new income streams, and the investigation of new business models.

It frequently takes a lot of time to fully grasp the benefits of self-sovereign identification (SSI). However, adopting SSI requires making substantial upfront expenditures and accepting sizable risks. These risks are caused by issues like confusing regulatory and legal requirements, a lack of standards, a lack of expertise, and newer technology (Zwitter et al., 2020).

Self-sovereign identity (SSI) ecosystems are critically dependent on collaboration among numerous stakeholders. These ecosystems are made up of for-profit and philanthropic businesses, governmental and private institutions, service providers, and clients. However, the value of SSI is seen differently by various actors. Therefore, developing suitable incentives and arguing for the advantages of promoting cooperation and active involvement present considerable challenges. Establishing a workable business model and obtaining funding within collaborative ecosystems made up of both public and commercial entities is a significant challenge. It is crucial to create business models focused on ecosystems that benefit every member of the SSI ecosystem (Laatikainen et al., 2021).

The article "How blockchain technologies impact your business model" by Morkunas, Paschen, and Boon (Morkunas et al., 2019) which was published in *Business Horizons*, investigates the substantial effect of blockchain technology on business models. Although the article is not specifically addressing Self Sovereign Identity (SSI), it offers insightful information that may be used to analyze how blockchain technology will affect SSI business models. Given that blockchain technology is an essential part of SSI, the study is a useful resource that clarifies how blockchain could affect the functioning of business models related to SSI.

<b>Key Partnerships</b> <ul style="list-style-type: none"> <li>Strengthened company ties inside the supply chain</li> <li>Strengthened data integrity</li> <li>Facilitation of payments</li> <li>Shared networks</li> <li>Elimination of lengthy processes</li> </ul>	<b>Key Activities</b> <ul style="list-style-type: none"> <li>Transform business processes</li> <li>Peer-to-peer networks</li> </ul>	<b>Value Proposition</b> <ul style="list-style-type: none"> <li>Verifiability</li> <li>Access new products or services</li> <li>Faster transactions</li> <li>Less expensive transactions</li> <li>Smart contracts, fewer middle layers</li> </ul>	<b>Customer Relationships</b> <ul style="list-style-type: none"> <li>Greater transparency</li> <li>Self-service</li> <li>Automation</li> <li>No middlemen</li> </ul>	<b>Customer Segments</b> <ul style="list-style-type: none"> <li>Reach new customers</li> <li>Reach new customer segments</li> </ul>
<b>Key Resources</b> Access via peer-to-peer networks. Improvements in: <ul style="list-style-type: none"> <li>Verification</li> <li>Documentation</li> <li>Audits</li> </ul>		<b>Channels</b> <ul style="list-style-type: none"> <li>New channels</li> <li>New APIs, SDKs</li> </ul>		
<b>Cost Structure</b> <ul style="list-style-type: none"> <li>Reduced search costs</li> <li>Reduced negotiation costs</li> <li>Reduced IT costs</li> <li>Reduced transaction costs</li> <li>Increased costs of IT/software, development personnel</li> </ul>			<b>Revenue Streams</b> <ul style="list-style-type: none"> <li>Recurring revenues</li> <li>Transaction revenues</li> <li>Services revenues</li> <li>Crowdfunding</li> </ul>	

Figure 2: The blockchain and the business model canvas (Morkunas et al., 2019)

The study by Morkunas et al. (2019) talk about how blockchain technology, by bringing fresh features and possibilities, profoundly transforms conventional business paradigms. They emphasize the important areas wherein blockchain may have disruptive benefits, which include promoting safe and trust less transactions, increasing transparency, expanding effectiveness, lowering expenses, and allowing decentralized governance. Additionally, the report offers a methodology for examining how blockchain affects business models. Value network, value capture, value creation, and value proposition are the four main aspects that are described. As blockchain is a key component of self-sovereign identification systems, these elements are pertinent to the exploration of SSI business models.

## 2.4 Business Model Canvas

The Business Model Canvas is a tool that provides a comprehensive and thorough summary of the key elements required for effective product creation. While its main purpose is to outline the fundamental components of a company, it can additionally be successfully utilized to lay out the strategic aspects of particular products (ProductPlan, 2021).

The BMC is an effective tool for new ventures: Researchers have found that the BMC is particularly useful for new ventures, as it helps entrepreneurs to develop a clear understanding of their business model and identify potential risks and opportunities. According to a study by Blank and Dorf entrepreneurs who used the BMC were more likely to achieve product-market fit and secure funding for their ventures. (Blank & Dorf, 2019).

The BMC is not a one-size-fits-all solution: While the BMC is a useful tool for many businesses, it is not a one-size-fits-all solution. According to a study by Foss and Saebi, the effectiveness of the BMC depends on factors such as the



complexity of the business model, the industry context, and the firm's strategic goals (Foss & Saebi, 2016).

#### 2.4.1 Business Model Canvas Components

The business model canvas consists of 9 key building blocks (Osterwalder, 2010), which are:

1. *Customer segments*: Identifying the people and groups to which the company will add worth.
2. *Value propositions*: Discovering the clients' problems and describing what happens when the company's product or service is used to fix the problem.
3. *Channels*: Demonstrating the methods used to engage consumers to provide value while ensuring the feasibility of acquiring the goods and services provided by the consumers.
4. *Customer connections*: Describing the methods by which they plan to interact with and develop connections with their clientele in order to promote their business and its goods as a remedy to the consumer's issue.
5. *Revenue streams*: Specifying the manner in which the item will be purchased and the related expenses for the companies.
6. *Key resources*: Determining the resources required to develop, distribute, and advertise what the company is offering.
7. *Key activities*: Outlining the key actions required to develop, distribute, and publicize the product the company are selling.
8. *Key partnerships*: Determine the people, companies, or organizations on with whom you depend on sending your goods to consumers.
9. *Cost structure*: Calculating the costs of important tools, collaborators, and tasks needed.

Business Model Canvas Template				
<b>Key Partners</b>  Determine the people, companies, or organizations on with whom you depend on	<b>Key Activities</b>  Outlining the key actions required to develop, distribute, and publicize the product the company are selling.	<b>Value Proposition</b>  Discovering the clients' problems and describing what happens when the company's product or service is used to fix the problem.	<b>Customer Segments</b>  Identifying the people and groups to which the company will add worth.	<b>Customer Relationships</b>  Describing the methods by which they plan to interact with and develop connections with their clientele in order to promote their business and its goods as a remedy to the consumer's issue.
	<b>Key Resources</b>  Determining the resources required to develop, distribute, and advertise what the company is offering.		<b>Channels</b>  Demonstrating the methods used to engage consumers to provide value while ensuring the feasibility of acquiring the goods and services provided to the consumers.	
<b>Cost Structure</b>  Calculating the costs of important tools, collaborators, and tasks needed.		<b>Revenue Streams</b>  Specifying the manner in which the item will be purchased and the related expenses for the companies.		

Figure 3: Business Model Canvas Template (Osterwalder, A. (2004))

The Figure 3 above shows the business model canvas template and the description of what are the key factors that are looked at in each of the building blocks. Business model canvases have been used by a lot of companies and startups trying to map out the basics of running a business efficiently. This involves brainstorming with shareholders and those responsible for running the companies to enter a market effectively.

With the help of these building blocks investigating and evaluating the Business Model Canvas of firms that offer SSI solutions has the potential to make a substantial contribution to the field of digital identification and technological innovation. With the growing popularity of SSI, it is critical to understand the business models of the firms that provide these solutions to the market.

The Business Model Canvas has been found to enhance the understanding of business models according to the study made by Zott and Amit (2010) found that the Business Model Canvas helps managers and entrepreneurs understand the key elements of their business models and how they are interconnected. The study was based on interviews with 23 entrepreneurs and managers (Zott & Amit, 2010).

The article titled "The Business Model Canvas: A tool for entrepreneurship education and Incubation," published in the Journal of Research in Marketing and Entrepreneurship in 2017 aimed to investigate the usefulness of the Business Model Canvas (BMC) in entrepreneurship education and incubation.

The researchers found that the BMC was a valuable tool for entrepreneurship education and incubation because it enabled entrepreneurs to gain a better understanding of their business model and the factors that contribute to its success. Moreover, the use of BMC helped them to communicate their business ideas more effectively to potential investors, partners, and customers, as well as to identify potential challenges and opportunities in their business model and develop strategies to overcome them.

It helps to enable the visualization and study of a company's plan and provides an overall perspective of the business model. This involves updating the model as the business develops as a result of market shifts, new income streams, or growth. The canvas, by acting as a common source of information, allows all departments to add their particular expertise from their various fields. It serves as a framework for defining the processes of the business and how each part collaborates with one another (Hersztowski, 2020).

These sources, along with others, provide evidence of the broad acceptance and usage of the Business Model Canvas in both academic and practical settings. The tool's capacity to visually depict and evaluate the fundamental elements of a business model, its adaptability to diverse industries and circumstances, and its focus on creating customer value and driving innovation all contribute to its validation as the preferred tool for analyzing and developing business models.

#### **2.4.2 Business Model Canvas as a successful analysis technique**

By offering a formal framework for evaluating and optimizing business models, the Business Model Canvas (BMC) study has proven crucial in assisting firms in becoming successful. Companies, with the help of this analysis, have uncovered various new possibilities, address difficulties, and ultimately boost their chances of success through examining and continually revising their business models utilizing the BMC.

The success of Airbnb serves as a prominent example of how the utilization of BMC analysis has contributed significantly to the company's achievements. During its early stages, Airbnb faced the challenge of building trust and attracting customers to its platform. Through the implementation of the BMC, Airbnb effectively identified and refined their value proposition, focusing on providing a personalized and alternative lodging experience. By segmenting their customer base into hosts with spare rooms or homes and guests seeking accommodation, and generating revenue through booking commissions, Airbnb successfully aligned their operations, resources, and partnerships to establish a scalable and successful business model that disrupted the traditional hotel industry (Botsman & Rogers, 2010).

Netflix is another company that reaped the benefits of employing BMC analysis. When transitioning from a DVD rental business to a streaming service, Netflix utilized the BMC to assess their value proposition, re-segment their customer base, and prioritize critical operations such as streaming infrastructure

and the development of exclusive content. By continuously refining their business model through the BMC, Netflix successfully transformed into the leading global streaming platform (Johnson, Christensen, & Kagermann, 2008).

BMC analysis played a crucial role in the success and expansion of Spotify as a leading music streaming service. By enhancing their value proposition to provide unlimited music access, personalized playlists, and sharing features, Spotify gained a significant foothold in the streaming industry. Continuously refining their business model through BMC analysis and aligning their operations, resources, and partnerships contributed to Spotify's global success and growth (Küng, 2017).

The aforementioned examples provided illustrate how BMC analysis assists companies in assessing and improving their business models, making strategic decisions, and seizing emerging opportunities. By aligning their operations, resources, and value propositions, companies can effectively meet customer needs and establish sustainable competitive advantages. However, as the field of SSI continues to evolve, SSI providers must adapt and customize the lessons learned from other industries to address the unique characteristics and challenges of the SSI domain.

### **3 RESEARCH METHODOLOGY**

In this section, I will outline the process of the research methodology for the thesis. It will show the detailed way in which I conducted the literature review. And on also how the multicast study method would be employed for this thesis this will help me to provide a comprehensive understanding of the various components that influence SSI business models by doing a business model canvas analysis.

#### **3.1 Literature review**

In terms of the literature review it initially started with defining the research topic which was examining the BMC of SSI providers and specifying the focus areas, such as value propositions, revenue streams, customer segments, and partnerships specific to the SSI industry. In order to find more descriptions keywords and search terms related to BMC analysis and SSI services, such as "Business Model Canvas," "Self-Sovereign Identity," "SSI providers," "value proposition," "revenue streams," "customer segments," and "partnerships" were done to grasp an understanding of SSI and BMC.

For the literature review it was important to choose relevant academic sources, various reports as well as books that cover topics related to business models, SSI, and related fields. This was an important aspect of the literature review as conducting the initial search using the identified keywords helped to determine the direction of the thesis.

After choosing the relevant sources and keywords and having a blueprint it was time to expand the search by refining the search terms based on initial results and examine reference lists of relevant sources to find additional literature on BMC analysis and SSI services. This process helped in filtering out the relevant information that could then be thoroughly analyzed by extracting key concepts, methodologies, and case studies related to BMC analysis in the SSI industry.

Eventually it was time to organize and synthesize the findings: thematically or chronologically, identifying common themes and best practices in the BMC analysis of SSI providers which helped to form the basis of the literature review.

### **3.2 Multi-Case study**

The multi-case study approach for the thesis will focus on doing a business model canvas analysis of organizations that provide SSI. A case study technique would be very valuable in this scenario for various reasons.

The multiple case study is a research approach that uses numerous research positions to gain a comprehensive understanding of a certain topic. It comprises exploring correlations between variables and determining patterns by researching several examples. This research strategy is used in the field of management to gain a greater grasp of a certain problem or issue. It employs a systematic strategy to gather and analyze data from many sources, such as people, organizations, or communities. The multiple case study method allows researchers to acquire deeper insights into complex problems by evaluating many viewpoints, settings, as well as various data sources (CEOPedia, 2023).

The utilization of a multi-case study approach is highly beneficial in comprehensively understanding the unique business models of SSI organizations. By carefully selecting and analyzing a small number of organizations, this method allows for the identification of specific factors that contribute to their success or failure. It provides a detailed examination of the SSI business landscape, surpassing the broad scope of surveys or statistical studies.

Additionally, employing the multi-case study method enables the testing and refinement of the business model canvas framework, particularly within the context of SSI businesses. By applying the framework to specific SSI companies and analyzing the outcomes, it becomes possible to pinpoint areas that require modifications or enhancements to accurately capture the distinctive elements of the SSI business model.

This technique is particularly advantageous for analyzing the business model canvas of SSI providers, as it spans various industries and is continuously evolving. By using a cross-case study approach, it allows for the evaluation of multiple SSI service providers while comparing their business model canvases. This method uncovers recurring patterns, guidelines, and critical variables for successful SSI implementation. It offers insights into a firm's strategy, value propositions, revenue structures, and customer segments. Through the analysis of several examples, it reveals the strengths and weaknesses of companies in the SSI market, providing valuable strategies and recommendations for organizations to thrive.

Related to the sample selection, after conducting extensive research and careful evaluation, there were five SSI companies that stood out. These firms were chosen because they have demonstrated exceptional information, innova-

tive strategies, and an established record of success in the field of digital identification.

1. Evernym was picked because of its significant market share and standing as a major player within the SSI sector, recognized for contributing to decentralized identification solutions (Evernym, 2022).
2. SelfKey's selection was driven by its distinctive approach to SSI and its dedication to giving people control over their personal data, which made it an excellent fit for analysis (Selfkey, 2023).
3. Jolocom was chosen for the examination of SSI corporate business model canvas. Given its high standing in the industry, solid reputation, and excellent performance in providing cutting-edge SSI solutions (Jolocom, 2023).
4. Trinsic which provides infrastructure and developer resources for integrating SSI into platforms and applications, was selected to symbolize the technological foundation component of SSI business models (Trinsic, 2023).
5. IdRamp: By focusing primarily on businesses looking to use SSI the internet, IdRamp's presence offers perspectives on the real-world aspects of SSI deployment and administration for companies (IdRamp; 2023).

In order to assure a complete investigation, the initial sample size of the companies to be chosen was ten SSI organizations. However, it was found that several businesses were lacking the details that were necessary for a thorough examination of their business model canvas. As a result, these businesses had to be passed for the purpose of the research, and the attention was instead focused on a smaller group of companies that presented a broader understanding about the SSI environment and significant observations for the study's intended goals.

## 4 BUSINESS MODELS OF THE CASE SSI COMPANIES

In this chapter, I introduce the in-depth evaluation done through the business model canvas analysis that offers a thorough grasp of their value propositions, target client categories, revenue-generating methods, core activities, and strategic relationships. The analysis can help to find intriguing chances for partnership, investment, or eventual integration into my own company ventures by meticulously examining their business models. In what follows, I introduce the Business Model Canvas analysis of the following companies: Evernym, SelfKey, Jolocom, Trinsic, IdRamp.

### 4.1 Evernym

Evernym is a well-known corporation that provides SSI solutions. Their primary product, "Verity," is a cutting-edge platform that allows individuals and companies to securely create and manage digital identities. Evernym guarantees that personal data stays confidential, safe, and completely within the user's control by leveraging decentralized ledger technologies such as blockchain. Their SSI solutions provide people with entire ownership and responsibility over their digital identities, allowing them to choose to release information to trusted partners while maintaining confidentiality and data security (Evernym, 2022). In Table 1, Evernym business model canvas analysis is summarized that I will describe as follows.

Customer Segments	<ul style="list-style-type: none"> <li>• Companies and organizations.</li> <li>• Government agencies.</li> <li>• Developers and technological collaborators.</li> </ul>
Value Proposition	<ul style="list-style-type: none"> <li>• Self-Sovereign Identification (SSI): Evernym offers a decentralized and user-controlled digital identification system.</li> </ul>



	<ul style="list-style-type: none"> <li>• Privacy and Security: Emphasize confidentiality and safety.</li> <li>• Interoperability: Their platform facilitates seamless communication between different SSI systems.</li> </ul>
Channels	<ul style="list-style-type: none"> <li>• Direct Sales to the customer segment.</li> <li>• Partnerships with technology partners, programmers, and industry.</li> <li>• Online Presence by promoting services and engage with potential clients.</li> </ul>
Customer Relationships	<ul style="list-style-type: none"> <li>• Consultative Approach: Offering individual consultations.</li> <li>• Support and Training: Provide clients with continuous assistance, training, and resources.</li> <li>• Support a network of users, programmers, and collaborators to through collaboration.</li> </ul>
Revenue Streams	<ul style="list-style-type: none"> <li>• Licensing and Subscription.</li> <li>• Professional Service Fees.</li> </ul>
Key Activities	<ul style="list-style-type: none"> <li>• Investing in Technology Development research and Innovation.</li> <li>• Building partnerships and alliances.</li> </ul>
Key Resources	<ul style="list-style-type: none"> <li>• Evernymy unique SSI Platform.</li> <li>• Technology Expertise and 24/7 support.</li> <li>• Utilizing partnerships and networks.</li> </ul>
Key Partnerships	<ul style="list-style-type: none"> <li>• Founding Trustee of the Sovrin Network</li> </ul>
Cost Structure	<ul style="list-style-type: none"> <li>• Costs associated with continuous research and development.</li> <li>• Expenses related to operations and infrastructure.</li> <li>• Expenses for marketing, sales, and customer acquisition.</li> </ul>

Table 1: Evernym business model canvas analysis

#### 4.1.1 Customer Segments

Here are the potential customer segments (SourceForge, *Evernym* 2022):

- Companies and organizations looking for safe digital identity solutions.
- Government agencies are interested in SSI systems.
- Developers and technological collaborators that want to create on the Evernym platform.

### 4.1.2 Value Proposition

As mentioned in their website (Andrade-Walz, *About Evernym: The Self-Sovereign Identity Company* 2022):

- SSI(SSI): Evernym offers a decentralized and user-controlled digital identification system called Self-Sovereign identification (SSI), which empowers anyone to safeguard their own identity information.
- Privacy and Security: Put emphasis confidentiality and safety through using the use of blockchain and cryptographic protocols to safeguard user information and prevent fraud based on identity.
- Interoperability: Their platform is intended to facilitate seamless communication between different SSI systems, permitting users to keep track of their identities across multiple platforms and apps.

### 4.1.3 Channels

The approach of Evernym can be seen by the customers they work and provide their services to (Andrade-Walz, *Customers* 2022):

- Direct Sales: Supply their SSI solutions directly to businesses, organizations, and government agencies.
- Partnerships: Work with technology partners, programmers, and industry coalitions to broaden its reach and incorporate its goods and services into current platforms.
- Online Presence: Promotes its services and engages with potential clients through its website, social media platforms, and online marketing activities.

### 4.1.4 Customer Relationships

To establish customer relationships there are three approaches that Evernym takes SourceForge, *Evernym* 2022):

- Consultative Approach: Evernym offers individual consultations to help customers identify their particular identification issues and design appropriate solutions.
- Support and Training: Evernym provides clients with continuous assistance, training, and resources to help them deploy and manage their SSI systems.
- Community Engagement: To encourage collaboration and information sharing, Evernym supports a network of users, programmers, and collaborators. Evernym fosters a community of users, developers, and partners to encourage collaboration and knowledge sharing.

#### 4.1.5 Revenue Streams

Evernym diverse range of revenue streams, as outlined on their website, positions them for financial success which are as follows (Andrade-Walz, *Plans 2022*):

- **Licensing and Subscription:** Evernym earns income by licensing its SSI platform and charging a monthly fee for usage to its services. They have different plans which are bifurcated into developer (programmers and developers), standard (for regular customers) and enterprise (for business and organizations)
- **Professional Services:** To satisfy the specific needs of its clients, Evernym provides professional services such as consultation, installation, and customization.

#### 4.1.6 Key Activities

- **Technology Development:** Evernym invests in the constant development and upgrading of its SSI platform, assuring reliable reliability and ease of use.
- **Partnerships and Alliances:** Evernym continually looks to build partnerships and alliances in order to extend its ecosystem and boost SSI usage (Havas, *Joining forces with Avast 2022*).
- **Research and Innovation:** To stay at the leading edge of SSI technology and meet growing difficulties, Evernym makes investments in research and innovation.

#### 4.1.7 Key Resources

- **SSI Platform:** Evernym's unique SSI platform serves as the company's primary resource.
- **Technology Expertise:** Evernym has a team of blockchain, cryptography, and digital identity specialists that provide support 24/7 (SourceForge, *Evernym 2022*).
- **Partnerships and Networks:** Evernym uses partnerships and networks to gain access to a diverse set of resources and skills. (Andrade-Walz, *Customers 2022*)

#### 4.1.8 Key Partnerships

- Evernym is a founding trustee of the Sovrin Network, a worldwide public utility for SSI and in order to link its SSI platform with other solutions and increase its capabilities, Evernym collaborates with various technology suppliers (Evernym, *The self-sovereign identity company 2022*).

#### 4.1.9 Cost Structure

Based on the plans as well as the basic costs a company undertakes; they are as follows (Andrade-Walz, *Plans* 2022):

- Research and Development: Costs connected with the SSI platform's continual research, development, and innovations.
- Operations and Infrastructure: Expenses associated with the platform's backbone and support for operational activities.
- Marketing and Sales: Expenses for marketing, sales, and customer acquisition.

## 4.2 SelfKey

SelfKey (Selfkey, 2023) is a blockchain-powered digital identification platform. It allows individuals and businesses to securely maintain and govern their digital identities. SelfKey's major purpose is to assist users by granting them authority and ownership over their private data, while also allowing for safekeeping and exchange of identification information as necessary. SelfKey leverages blockchain to establish a decentralized and accessible system for identity verification, Know Your Customer (KYC) procedures, and digital asset management. In Table 2, SelfKey business model canvas analysis is summarized that I will describe as follows.

Customer Segments	<ul style="list-style-type: none"> <li>• People looking SSI management solutions.</li> <li>• Businesses and organizations.</li> <li>• Service providers in areas such as financing, housing, and cryptocurrencies.</li> </ul>
Value Proposition	<ul style="list-style-type: none"> <li>• SelfKey providing SSI Solutions.</li> <li>• SelfKey Identity Verification and its Compliance with regulations.</li> <li>• Marketplace for Services.</li> </ul>
Channels	<ul style="list-style-type: none"> <li>• Online Presence: SelfKey has a website.</li> <li>• Partnerships and Integration with technology partners, programmers, and industry.</li> <li>• App Stores and Marketplaces: SelfKey has an app.</li> </ul>
Customer Relationships	<ul style="list-style-type: none"> <li>• User Support: SelfKey offers user support help.</li> <li>• Community Engagement: SelfKey cultivates a community of users and contributors through arranging events.</li> </ul>

Revenue Streams	<ul style="list-style-type: none"> <li>• Token Sale: SelfKey held an initial token sale (ICO) in which the company sold their native utility token, KEY, to raise income.</li> <li>• Subscription Fees.</li> </ul>
Key Activities	<ul style="list-style-type: none"> <li>• Platform Development: SelfKey commits to the constant development and refinement of its brand managing platform.</li> </ul>
Key Resources	<ul style="list-style-type: none"> <li>• SelfKey's patented Identity Management Platform.</li> <li>• Technology Expertise: SelfKey has an assortment of experts as staff.</li> </ul>
Key Partnerships	<ul style="list-style-type: none"> <li>• Technology Partners. SelfKey teamed with Polymath, a security token platform.</li> </ul>
Cost Structure	<ul style="list-style-type: none"> <li>• Costs associated with continuous research and development.</li> <li>• Expenses related to operations and infrastructure.</li> <li>• Expenses for marketing, sales, and customer acquisition.</li> </ul>

Table 2: SelfKey business model canvas analysis

#### 4.2.1 Customer Segments

The customer segment of Self Key is as follows (SelfKey, 2022):

- People who are looking for safe and SSI management solutions.
- Businesses and organizations seeking simplified identity verification and compliance processes.
- Service providers in areas such as financing, housing, and cryptocurrencies who demand trustworthy identity verification and onboarding.

#### 4.2.2 Value Proposition

- SSI Solutions: SelfKey provides SSI solutions, allowing individuals to govern and regulate their digital identities while improving privacy and security (SelfKey, 2023).
- Identity Verification and Compliance: SelfKey offers an environment for streamlined authentication of identities and regulation compliance, decreasing onboarding time and enhancing adherence to regulations (SelfKey, *Relying parties* 2022).
- Marketplace for Services: Utilizing their validated digital identities, users may locate and utilize a range of goods and services (SelfKey, *Marketplace* 2022).

### 4.2.3 Channels

- Online Presence: To advertise its products and services, engage customers, and communicate with prospective customers, SelfKey runs a website, digital presence, and online platform (BitCourier, 2022).
- Partnerships and Integrations: For the integration of its distinctive technologies into diverse platforms and ecological systems, SelfKey works with technological associates, service providers, and various business alliances (SelfKey, *Partnership archives* 2022).
- App Stores and Marketplaces: Self Key distributes its identity management applications through app stores and marketplaces to reach a larger user base (SelfKey, *Download* 2022).

### 4.2.4 Customer Relationships

- User Support: SelfKey offers user help via a variety of channels, such as documentation online, FAQs, and customer support requests (SelfKey, 2022).
- Community Engagement: To promote collaboration, receive input, and promote creativity, SelfKey cultivates a community of users and contributors through arranging events, conferences, and forums (SelfKey, *Introduction* 2021).

### 4.2.5 Revenue Streams

SelfKey has two major ways of generating revenue (Walters, 2023):

- Token Sale: In 2018, SelfKey held an initial token sale (ICO) in which company sold their native utility token, KEY. This kind of financing enabled them to raise income for research and operating costs.
- Subscription Fees: SelfKey makes money for its identity management systems through fees for subscriptions, charging people and businesses depending on utilization or specified functionality.

### 4.2.6 Key Activities

- Platform Development: SelfKey commits to the constant development and refinement of its brand managing platform, with an emphasis on convenience, safety, and compliance with laws and regulations.

### 4.2.7 Key Resources

- Identity Management Platform: SelfKey's patented authentication platform functions as the foundational basis of its solutions, including au-

thentication of identities, regulation tools, and an online market for services (SelfKey, 2022).

- **Technology Expertise:** SelfKey has an assortment of identity management, blockchain, and cryptography professionals on its staff (SelfKey, Team 2022).

#### 4.2.8 Key Partnerships

- **Technology Partners:** SelfKey collaborates with technology providers to integrate its identity management platform with existing systems and infrastructure, ensuring seamless interoperability. SelfKey teamed with Polymath, a security token platform, to examine the possibility of combining digital identification with security token offers (STOs). The collaboration's purpose was to provide a streamlined and regulatory-compliant approach for issuers and investors involved in STOs. SelfKey and Polymath joined together to simplify the STO experience while combining powerful digital identification solutions (SelfKey, 2018).

#### 4.2.9 Cost Structure

- **Research and Development:** Costs related with continuous identity management platform research, development, and improvements.
- **Operations and Infrastructure:** Expenses associated with the upkeep of the required infrastructure, such as servers, security systems, and data storage.
- **Marketing and Sales:** Expenses for advertising, revenue generation, and acquiring new clients.

### 4.3 Jolocom

Jolocom is a privacy-oriented protocol and infrastructure for managing identities. Among its offerings is the Jolocom SmartWallet, which serves as a secure digital wallet for storing assets. In addition to asset management, the SmartWallet enables users to securely share their passports and driver's licenses online whenever necessary. With the Jolocom SDK, developers have the ability to integrate and create tailored decentralized applications that are sustainable and uphold the principles of self-sovereignty (Alchemy, *JOLOCOM - decentralized identity tools* 2022). In Table 3, Jolocom business model canvas analysis is summarized that I will describe as follows.

Customer Segments	<ul style="list-style-type: none"> <li>• Companies and organizations.</li> <li>• People who value privacy and security.</li> <li>• Developers and technological collaborators.</li> </ul>
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Value Proposition	<ul style="list-style-type: none"> <li>• Jolocom's Decentralized identity platform.</li> <li>• Seamless integration for developers.</li> <li>• Prioritizing privacy and data ownership.</li> </ul>
Channels	<ul style="list-style-type: none"> <li>• Developer Community: Jolocom actively connects with developers online.</li> <li>• Partnerships with technology partners, programmers, and industry.</li> <li>• Online Presence by promoting services and engage with potential clients.</li> </ul>
Customer Relationships	<ul style="list-style-type: none"> <li>• Community engagement by supporting and training clients with continuous assistance, training, and resources.</li> <li>• Support a network of users, programmers, and collaborators to through collaboration.</li> </ul>
Revenue Streams	<ul style="list-style-type: none"> <li>• Licensing and Subscription.</li> <li>• Professional Service Fees.</li> </ul>
Key Activities	<ul style="list-style-type: none"> <li>• Solution Development: Jolocom invests in ongoing development and enhancement of its decentralized identity platform.</li> <li>• Partnership and ecosystem building.</li> <li>• Creation of industry standards and compliance with relevant regulations.</li> </ul>
Key Resources	<ul style="list-style-type: none"> <li>• Jolocom's patented decentralized identity platform.</li> <li>• Technology Expertise in their team.</li> <li>• Utilizing strategic partnerships.</li> </ul>
Key Partnerships	<ul style="list-style-type: none"> <li>• Technology Partners: Jolocom works with tech companies.</li> <li>• Service Providers: Jolocom enters in partnerships with service providers across a range of industries.</li> </ul>
Cost Structure	<ul style="list-style-type: none"> <li>• Costs associated with continuous research and development.</li> <li>• Expenses related to operations and infrastructure.</li> <li>• Expenses for marketing, sales, and customer acquisition.</li> </ul>

Table 3: Jolocom business model canvas analysis

#### 4.3.1 Customer Segments

- Businesses and organizations looking for solutions for decentralized identity for their services and applications.



- People who value privacy and security and want control over their personal information and digital identities.
- Technical teams and developers looking for frameworks and tools to add decentralized identification functionality to their applications.

### 4.3.2 Value Proposition

According to the website these are the value that they provide (Jolocom, *Products* 2023):

- **Decentralized Identity Platform:** Jolocom is a decentralized identity platform that enables users to securely maintain and govern their digital identities.
- **Seamless Integration:** Developers may easily include decentralized identity capabilities into their applications and offerings via Jolocom's user-friendly tools, APIs, and SDKs.
- **Privacy and Data Ownership:** Jolocom places a high priority on privacy and data ownership, giving users control over their personal data and the ability to determine who has access to it. (Cliente, 2022).

### 4.3.3 Channels

- **Online Presence:** To exhibit its solutions, disseminate knowledge, and engage with potential clients, Jolocom keeps a website, blog, and other online platforms active.
- **Developer Community:** To assist the incorporation of decentralized identification capabilities, Jolocom actively connects with developers through online communities, forums, and developer resources. (ZoomInfo, 2021)
- **Partnerships and Integrations:** Jolocom works with service providers, industry alliances, and technology partners to integrate its identity solutions into a variety of platforms and ecosystems. (Jolocom, *Partners* 2022)

### 4.3.4 Customer Relationships

In order to garner a personal relationship Jolocom takes the approaches that are mentioned below (Jolocom, *About* 2022):

- **Technical Support:** To help customers install and make use of their decentralized identity solutions, Jolocom offers technical support and documentation.
- **Relationship Management:** Through account management, customization, and continuing support, Jolocom builds and maintains partnerships with enterprise clients.
- **Community Engagement:** To encourage cooperation, share best practices, and foster innovation in decentralized identity, Jolocom cultivates a community of developers, users, and contributors.

#### 4.3.5 Revenue Streams

Jolcom has two ways of revenue generation which involves (RocketReach, 2022):

- **Licensing Fees:** Jolocom makes money by charging businesses license fees for its decentralized identity platform, basing these payments on usage, the number of users, or particular features.
- **Professional Services:** For businesses and organizations looking for specialized decentralized identity solutions, Jolocom provides consulting, customisation, and implementation services.

#### 4.3.6 Key Activities

Jolocom's key activities include (Lohkamp, 2022):

- **Solution Development:** With an emphasis on security, usability, and interoperability, Jolocom invests in ongoing development and enhancement of its decentralized identity platform.
- **Partnership and Ecosystem Building:** To grow its ecosystem and encourage the adoption of decentralized identities, Jolocom actively pursues partnerships and collaborations with technology companies, trade associations, and service providers.
- **Standards and Compliance:** To promote trust and interoperability, Jolocom actively participates in the creation of industry standards and assures compliance with pertinent regulations.

#### 4.3.7 Key Resources

Here are the key resources of the Jolocom (Jolocom, *Resources* 2022):

- **Technology Expertise:** The Jolocom team includes professionals in the fields of decentralized identification, encryption, and safe systems.
- **Strategic Partnerships:** To gain access to more resources, knowledge, and market opportunities, Jolocom uses partnerships with technology providers, service providers, and industry consortia.
- **Decentralized Identity Platform:** As the main component of its services, Jolocom's patented decentralized identity platform offers identity management and verification capabilities. (Lohkamp, 2022)

#### 4.3.8 Key Partnerships

In order to establish partnerships Jolocom has (Jolocom, *Partners* 2022):

- **Technology Partners:** To ensure smooth interoperability, Jolocom works with technology partners to integrate its decentralized identification platform with current systems and infrastructure.

- **Service Providers:** To expand its decentralized identity capabilities and deliver integrated solutions to its clients, Jolocom engages into partnerships with service providers across a range of industries.

#### 4.3.9 Cost Structure

- **Research and Development:** Expenses related to on-going work on the decentralized identification platform's development and improvement.
- **Infrastructure and Operations:** Costs associated with upkeep of the required infrastructure, such as servers, security measures, and data storage.
- **Sales and marketing expenses:** Expenses related to sales, marketing, and customer acquisition activities.

## 4.4 Trinsic

Trinsic is an infrastructural supplier that accelerates the development of decentralized identification products. Trinsic promotes smooth interoperability by employing W3C verified credentials, stressing user-centric techniques and eventual decentralization. Trinsic streamlines the process of issuing, validating, and maintaining credentials through the use of their software development kits (SDKs) (Trinsic, 2023). In Table 4, Trinsic business model canvas analysis is summarized that I will describe as follows.

Customer Segments	<ul style="list-style-type: none"> <li>• Companies and developers.</li> <li>• Companies and groups in need of effective and secure identity management solutions.</li> <li>• Service providers in sectors requiring trustworthy identity verification and authentication, such as finance, healthcare, and e-commerce.</li> </ul>
Value Proposition	<ul style="list-style-type: none"> <li>• Trinsic provides SSI solutions.</li> <li>• Trinsic offers user-friendly development tools and APIs.</li> <li>• Trinsic focuses on establishing trust and fostering interoperability.</li> </ul>
Channels	<ul style="list-style-type: none"> <li>• <b>Developer Community:</b> Trinsic engages with developers through online communities, forums, and developer resources.</li> <li>• <b>Online Presence</b> by promoting services and engage with potential clients through the website.</li> </ul>
Customer Relationships	<ul style="list-style-type: none"> <li>• <b>Developer Support:</b> Trinsic provides forums,</li> </ul>

	<p>technical support, and developer.</p> <ul style="list-style-type: none"> <li>• Enterprise Relationship Management: Trinsic forges connections with businesses and organizations.</li> <li>• Community engagement by supporting and training clients with continuous assistance, training, and resources.</li> </ul>
Revenue Streams	<ul style="list-style-type: none"> <li>• SSI Platform Usage: Trinsic generates revenue by charging users fees based on their activities and transactions on the SSI platform.</li> <li>• Professional Service Fees.</li> </ul>
Key Activities	<ul style="list-style-type: none"> <li>• Trinsic's investment in platform development.</li> <li>• Trinsic collaborations and partnerships with IT companies.</li> <li>• Creation of industry standards and compliance with relevant regulations.</li> </ul>
Key Resources	<ul style="list-style-type: none"> <li>• Trinsic's unique SSI Platform.</li> <li>• Technology Expertise and having a team of specialists providing support.</li> </ul>
Key Partnerships	<ul style="list-style-type: none"> <li>• Trinsic collaborates with technology partners</li> <li>• Service Providers: Trinsic forms partnerships with service providers across various industries.</li> </ul>
Cost Structure	<ul style="list-style-type: none"> <li>• Costs associated with continuous research and development.</li> <li>• Expenses related to operations and infrastructure.</li> <li>• Expenses for marketing, sales, and customer acquisition.</li> </ul>

Table 4: Trinsic business model canvas analysis

#### 4.4.1 Customer Segments

- Companies and developers want to integrate self-sovereign identification (SSI) solutions into their programs and infrastructure.
- Companies and groups in need of effective and secure identity management solutions.
- Service providers in sectors requiring trustworthy identity verification and authentication, such as finance, healthcare, and e-commerce.

#### 4.4.2 Value Proposition

From the website of Trinsic the value that Trinsic provides are as follows (Trinsic, *Platform* 2023):

- **SSISolutions (SSI):** Trinsic provides SSI solutions that enable people to take charge of and govern their online personas, thereby improving privacy and security.
- **Developer-Friendly Tools:** Trinsic offers user-friendly development tools and APIs that make it easier to integrate SSI capabilities into systems and applications.
- **Trust and Interoperability:** Establishing reliance and fostering interoperability among diverse SSI systems and networks are two areas on which Trinsic concentrates.

#### 4.4.3 Channels

Trinsic has been very active online and they use their online presence in two different ways:

- **Developer Community:** To market its SSI solutions, Trinsic interacts with developers through online communities, forums, and developer resources (Slack, *Join Trinsic Community* 2020).
- **Online Presence:** Trinsic keeps up a website and social media accounts to share information, post updates, and engage with potential clients (Trinsic, *Home* 2023).

#### 4.4.4 Customer Relationships

Through the customer stories of Trinsic we can see how they help to garner customers and build relationships (Trinsic, *Customer stories* 2023):

- **Developer Support:** Trinsic provides forums, technical support, and developer documentation to help developers deploy SSI solutions.
- **Enterprise Relationship Management:** Through account management, training, and continuous support, Trinsic forges connections with businesses and organizations.
- **Community Engagement:** Trinsic promotes the development of a community of users, contributors, and developers by fostering cooperation, exchanging best practices, and co-creating SSI solutions.

#### 4.4.5 Revenue Streams

- **SSI Platform Usage:** Trinsic earns money by charging users fees based on the activities they carry out and the transactions they make on the SSI platform. They diversify this by having different plans namely explore

plan, which is free, build plan which is 99 dollars and launch plan which is customizable (Trinsic, *Pricing* 2023).

- Professional Services: For businesses and organizations looking for specialized SSI solutions, Trinsic offers consulting, customization, and implementation services.

#### 4.4.6 Key Activities

The key activities of Trinsic are (Trinsic, *Platform* 2023):

- Platform Development: Trinsic makes investments in the ongoing enhancement and development of its SSI platform with an emphasis on interoperability, security, and usability.
- Collaborations and Partnerships: Trinsic aggressively seeks collaborations and partnerships with IT companies and trade associations to broaden its network and ecosystem.
- Standards and Compliance: To build credibility and encourage the adoption of SSI, Trinsic takes part in the creation of industry standards and assures compliance with pertinent laws.

#### 4.4.7 Key Resources

- SSI Platform: Trinsic's unique SSI platform, which offers identity management and verification capabilities, serves as the foundation of its solutions. (Trinsic, *Platform* 2023).
- Technology Expertise: Trinsic has a team of specialists in decentralized, cryptographic, and SSI technologies. (Trinsic, *Contact* 2023).

#### 4.4.8 Key Partnerships

Trinsic approaches their partners in two segments which are technology and service partners (Trinsic, *Customer stories* 2023):

- Technology Partners: To seamlessly interoperate its SSI platform with current systems and infrastructure, Trinsic works with technology partners.
- Service Providers: To expand its SSI capabilities and provide integrated solutions to their clients, Trinsic enters into partnerships with service providers across a range of industries.

#### 4.4.9 Cost Structure

- Research and Development: Expenses related to continuous SSI platform development, research, and improvement.

- Infrastructure and Operations: Costs associated with upkeep of the required infrastructure, such as servers, security measures, and data storage.
- Sales and marketing expenses: Expenses related to sales, marketing, and customer acquisition activities.

## 4.5 IdRamp

IdRamp is a cloud-based identity and access management system that aims to help organizations handle identity verification and credential validation more effectively by leveraging decentralized information sharing. This platform protects user and administrator passwords while also assuring compliance with regulatory standards (GetApp, *IdRamp Overview* 2021). In Table 5, IdRamp business model canvas analysis is summarized that I will describe as follows.

Customer Segments	<ul style="list-style-type: none"> <li>• Companies and organizations.</li> <li>• Companies offering services and software developers.</li> <li>• Individuals wanting more control over their personal information and digital identities.</li> </ul>
Value Proposition	<ul style="list-style-type: none"> <li>• Decentralized Identity Solutions: IdRamp provides decentralized identity solutions.</li> <li>• Seamless Integration by providing user friendly tools for businesses and developers.</li> <li>• Trust and Interoperability amongst various management systems.</li> </ul>
Channels	<ul style="list-style-type: none"> <li>• Online Presence: IdRamp maintains a website.</li> <li>• Partner Networks: IdRamp works with technological partners, business alliances, and service providers.</li> <li>• Developer Community: IdRamp interacts with developers via online communities.</li> </ul>
Customer Relationships	<ul style="list-style-type: none"> <li>• Relationship Management: IdRamp forges partnerships with enterprise clients.</li> <li>• Community Engagement: IdRamp cultivates a community of developers, users, and contributors.</li> <li>• Technical Support: IdRamp provides technical support and documentation.</li> </ul>
Revenue Streams	<ul style="list-style-type: none"> <li>• Licensing and Subscription.</li> <li>• Professional Service Fees.</li> </ul>
Key Activities	<ul style="list-style-type: none"> <li>• Solution Development: IdRamp invests in the</li> </ul>

	<p>ongoing development and improvement of its decentralized identity platform,</p> <ul style="list-style-type: none"> <li>• Partnership and Ecosystem Building: IdRamp actively pursues partnerships and collaborations with technology companies, trade associations, and service providers.</li> </ul>
Key Resources	<ul style="list-style-type: none"> <li>• IdRamps Decentralized Identity Platform:</li> <li>• Technology Expertise: The IdRamp team.</li> <li>• Strategic Partnerships: IdRamp leverages partnerships with technology providers, service providers, and various industries.</li> </ul>
Key Partnerships	<ul style="list-style-type: none"> <li>• Technology Partners: IdRamp works with tech companies.</li> <li>• Service Providers: IdRamp enters partnerships with service providers across a range of industries.</li> </ul>
Cost Structure	<ul style="list-style-type: none"> <li>• Costs associated with continuous research and development.</li> <li>• Expenses related to operations and infrastructure.</li> <li>• Expenses for marketing, sales, and customer acquisition.</li> </ul>

Table 5: IdRamp business model canvas analysis

#### 4.5.1 Customer Segments

- Businesses and organizations looking for decentralized identity management solutions.
- Companies that offer services and software developers who want to give their systems the ability to authenticate and verify identities.
- Individuals who want more privacy and control over their personal information and digital identities.

#### 4.5.2 Value Proposition

IdRamp provides its value to the consumers in this way (IdRamp, 2023):

- Decentralized Identity Solutions: IdRamp provides decentralized identity solutions that give people authority over their digital identities, boosting privacy and security.
- Seamless Integration: For businesses and developers, IdRamp offers user-friendly tools and APIs that make it simple to incorporate decentralized identity capabilities into applications and services.



- **Trust and Interoperability:** Establishing trust and fostering interoperability among various identity management systems and platforms are the main goals of IdRamp.

### 4.5.3 Channels

IdRamp also has various channels through which they communicate their products and services to the potential consumers:

- **Online Presence:** To demonstrate its solutions, disseminate knowledge, and interact with prospective clients, IdRamp keeps a website and other online platforms active (IdRamp, 2023).
- **Partner Networks:** To broaden its influence and encourage the adoption of decentralized identity solutions, IdRamp works with technological partners, business alliances, and service providers (IdRamp, *Partners & collaborators* 2022).
- **Developer Community:** To assist the incorporation of decentralized identification capabilities, IdRamp interacts with developers via online communities, forums, and developer resources. (IdRamp, 2023).

### 4.5.4 Customer Relationships

IdRamp garners customer relationships in ways such as (IdRamp, *Unlock decentralized identity services for your customers* 2022):

- **Relationship Management:** Through account management, customization, and continuing support, IdRamp forges partnerships with enterprise clients.
- **Community Engagement:** To promote cooperation, exchange best practices, and foster innovation in decentralized identity, IdRamp cultivates a community of developers, users, and contributors.
- **Technical Support:** To help customers with the implementation and use of its decentralized identification solutions, IdRamp provides technical support and documentation. (IdRamp, *Contact* 2022).

### 4.5.5 Revenue Streams

- **Subscription or Licensing Fees:** IdRamp earns money from its decentralized identification solutions through subscription or licensing fees. As per the website the plan they provide is for free, but customers can schedule a demonstration and decide on a plan with the IdRamp where they decide on the revenue IdRamp can generate on the basis of using the product (GetApp, *IdRamp Pricing Plan & Cost Guide* 2022).
- **Professional Services:** For businesses and organizations looking for specialized decentralized identity solutions, IdRamp offers consulting, customization, and implementation services (IdRamp, *Contact* 2022).

#### 4.5.6 Key Activities

IdRamp's key activities include (IdRamp, *About idramp* 2022):

- **Solution Development:** With an emphasis on security, usability, and interoperability, IdRamp invests in the ongoing development and improvement of its decentralized identity platform. Their aim is to minimize the challenges, expenses, and intricacies associated with implementing a comprehensive password less zero trust approach for all types of organizations.
- **Partnership and Ecosystem Building:** To grow its ecosystem and encourage the adoption of decentralized identity, IdRamp actively pursues partnerships and collaborations with technology companies, trade associations, and service providers. IdRamp offers a cybersecurity mesh centered around an "identity-first" approach, enabling swift adaptation to novel features, and providing unparalleled customer experiences in alignment with the pace of business.

#### 4.5.7 Key Resources

- **Decentralized Identity Platform:** IdRamp's patented decentralized identity platform, which offers identity management and verification capabilities, serves as the foundation of its solutions (IdRamp, 2023).
- **Technology Expertise:** The IdRamp team includes professionals in the fields of decentralized identification, encryption, and safe systems. (IdRamp, *About idramp* 2022).
- **Strategic Partnerships:** IdRamp leverages partnerships with technology providers, service providers, and industry consortia to access additional resources, expertise, and market opportunities. As mentioned above they have partnered with many companies, hence establishing a strong partnership with major companies. (IdRamp, *Partners & collaborators* 2022).

#### 4.5.8 Key Partnerships

- **Technology Partners:** IdRamp works with tech companies to seamlessly interoperate its decentralized identification platform with current systems and infrastructure. The examples of partner companies are Google, Apple, Cisco, Amazon Web Services and many more (IdRamp, *Partners & collaborators* 2022).
- **Service Providers:** To expand its decentralized identification capabilities and provide integrated solutions to its clients, IdRamp enters partnerships with service providers across a range of industries.

#### 4.5.9 Cost Structure

- **Research and Development:** Expenses related to on-going work on the decentralized identification platform's development and improvement.
- **Infrastructure and Operations:** Costs associated with upkeep of the required infrastructure, such as servers, security measures, and data storage.
- **Sales and marketing expenses:** Expenses related to sales, marketing, and customer acquisition activities. Costs associated with ongoing research, development, and enhancement of the decentralized identity platform.

## **5 SIMILARITIES AND DIFFERENCES OF THE BUSINESS MODELS OF SSI COMPANIES: RESULTS OF THE CROSS-CASE ANALYSIS**

On the basis of the business model canvas analysis done in the previous section, the focus of the following section will be on comparing and contrasting the business model canvas analyses of Evernym, SelfKey, Bloom, Trinsic, and Id-Ramp. Key industry trends and best practices can possibly be discovered by pointing out parallels while taking note of contrasts will reveal the distinctive strategies and distinct advantages of each organization. This comparative research aims to provide a thorough grasp of how these companies function in the personal branding management sector while also highlighting possible areas for innovation and advancement.

### **5.1 Customer Segments**

#### **5.1.1 Similarities**

- **Individuals seeking identity management:** All of these businesses appeal to those who want to manage and control their own digital identities as they provide solutions for securely storing and managing personal information, identification papers, and credentials.
- **Companies and organizations:** These firms also cater to corporations and other businesses that want trustworthy and safe identity verification services.
- **Industries that rely on identity:** Financial organizations, hospitals, governmental organizations, and schools and colleges are among the businesses that rely largely on accurate and secure identification verification as they help to handle critical private data and assist those in need of strong identity solutions. offer tools and technology that enable busi-

nesses to independently verify the identification of consumers, partners, or workers, therefore improving security and minimizing fraud.

### 5.1.2 Differences

- Evernym targets anyone interested in decentralized and autonomous identity management, including people, companies, and organizations.
- SelfKey focuses on consumers who seek safe management of their digital identities as well as authority over their personal data.
- Bloom primarily targets people who want to use identity verification and credit assessment to improve their credit score and access to financial services.
- Trinsic focuses on companies and organizations from a range of sectors who need decentralized identification solutions that are scalable and interoperable.
- IdRamp concentrates on companies and organizations that require safe identity management, authentication, and authorization solutions for businesses, the government, and sectors like healthcare.

## 5.2 Value Proposition

### 5.2.1 Similarities

- **Privacy and Security:** All of these companies emphasize providing solutions that prioritize privacy and security for their customers' digital identities.
- **Decentralized identification:** Businesses like Evernym, Bloom, Trinsic, and IdRamp use blockchain-based technologies or decentralized identification systems. They provide solutions that make use of cryptographic protocols and distributed ledgers.
- **Identity Verification:** These firms offer identity verification tools and services to assist businesses and organizations in confirming the identities of their clients, associates, or staff members. The firms have a lot in common since they both use strong verification systems to lower fraud and increase trust.
- **Interoperability and Integration:** Trinsic and IdRamp concentrate particularly on providing instruments, APIs, and solutions that give interoperability and easy integration with current systems. They make it possible for companies and programmers to quickly adopt and incorporate decentralized identification solutions into their processes.

## 5.2.2 Differences

### Evernym

- **Unique Value Proposition:** Using decentralised authentication systems and encryption protocols for impermeable handling of identities using the technology of distributed ledgers, Evernym focuses on privacy and security.
- **Distinctive Features:** Using decentralised authentication systems and encryption protocols for impermeable handling of identities using the technology of distributed ledgers, Evernym focuses on privacy and security.

### SelfKey

- **Unique Value Proposition:** SelfKey's full self-sovereign identity management solutions enable people to control their online identities, which is a unique value proposition.
- **Distinctive Features:** SelfKey provides a comprehensive identity ecosystem with features including a digital wallet for managing documents, storing credentials, and conducting bitcoin transactions. User security and privacy are given top priority.

### Bloom

- **Unique Value Proposition:** Bloom specialized in verification of identity systems that confirm client identities, boosting trust and lowering fraud for organizations.
- **Distinctive Features:** Bloom distinguishes themselves by utilizing autonomous authentication systems and blockchain technology in order to provide a safe and open verification procedure. Within their network, they also provide evaluations of credit and financing options.

### Trinsic

- **Unique Value Proposition:** Trinsic specializes in decentralised management of identities and offers resources, APIs, and services that put a high priority on interoperability and easy integration.
- **Distinctive Features:** Trinsic sets itself apart from competitors with intuitive development tools and APIs that make it simple for companies and developers to implement and incorporate decentralized identity solutions into their current processes.

### IdRamp

- **Unique Value Proposition:** IdRamp also offers tools, APIs, and solutions that prioritize compatibility and integrating, specializing in decentralized identity management.
- **Distinctive Features:** IdRamp distinguishes itself by offering versatile and expandable identification solutions that smoothly interface with a

variety of current systems. Their top aim is facilitating interoperability, which enables organizations to link and exchange information across various decentralized identity frameworks.

## 5.3 Channels

### 5.3.1 Similarities

- Evernym and Self Key in order to contact its consumers, mostly uses direct sales and online channels. To market their SSI management systems, they engage in direct sales and forge alliances with companies and organizations across a range of industries.
- Bloom prioritizes using online distribution channels as their main strategy. Through their web page and online platform, they offer identity verification solutions, making it simple for businesses and associations to use and incorporate their products and services.
- Trinsic and IdRamp take a developer-centric approach and mostly employ channels that cater to developers. They provide decentralized authentication tools, APIs, and solutions, rendering them accessible through their official site, developer portals, and software development forums.

### 5.3.2 Differences

- Evernym is committed to forging strong alliances and working relationships with companies and organizations. The establishment of trust and ongoing assistance for their clients are their main priorities.
- SelfKey works diligently to build trusting connections with its clients by being open and taking a user-centric perspective. By offering thorough documentation, videos, and self-help tools, they place a priority on providing exceptional customer assistance and guaranteeing a flawless user experience.
- Bloom places a premium on building these through reputable and safe authentication services. To quickly respond to questions and rectify any problems, Bloom may provide particular assistance channels like email or chat.
- Trinsic is committed to developing strong bonds with its clients, especially with developers and companies looking for decentralized identification solutions. They offer an extensive selection of developer tools, such as documentation, code samples, and pathways for developer help through forums or community platforms.
- IdRamp prioritizes building individualized relationships with customers and configuring their decentralized identity solutions to satisfy particu-

lar consumer needs. They work closely with consumers by offering devoted client managers or project teams to guarantee smooth implementation and efficient communication.

SelfKey focuses user-centric assistance, Evernym and IdRamp place a strong emphasis on collaboration and customisation, Bloom places a high priority on trust and data safety, and Trinsic seeks to offer extensive developer tools. These variations represent the unique value propositions and customer engagement strategies of each organization inside their business model.

## 5.4 Customer Relationships

### 5.4.1 Similarities

- Evernym, Self Key and Bloom are devoted to creating dependable relationships with their clients. Their primary goal is to provide exceptional client service and ongoing support to guarantee that their SSI management systems are implemented and used in an efficient manner.
- Trinsic and IdRamp place a high value on developing and maintaining connections with developers, who make up the majority of their clientele. Their primary objective is to give developers the tools and information they require to effectively integrate into their decentralized identity management solutions.

### 5.4.2 Differences

- Evernym offers dedicated account managers or customer success teams to ensure effective communication, address customer needs, and provide technical assistance.
- In order maintain efficient interaction, attend to client demands, and offer technical assistance, Evernym deploys specialized account managers or customer success teams.
- By providing thorough documentation, tutorials, and self-help materials, SelfKey empowers its users. They continually incorporate consumer input in their plan for product development.
- Bloom places a high priority on stringent privacy and data protection laws, earning the trust of customers and companies. Customers can see how their data is being used and protected since they offer transparency in the verification procedures.
- Trinsic focuses on quick response times and fast help for clients that have technical questions or integration problems.
- IdRamp works closely with clients to comprehend their specific needs and provides specialized customized services. To assist clients in maxim-



izing the advantages of their decentralized identity systems, they offer continuing assistance, such as training courses or seminars.

## 5.5 Revenue Streams

### 5.5.1 Similarities

- To generate revenue, they may employ various models such as subscription fees, licensing fees, or transaction-based fees for the utilization of their software and services. Additionally, they might offer premium support or consulting services to generate additional income.

### 5.5.2 Differences

- Evernym makes money by providing SSI management solutions via a software-as-a-service (SaaS) model that is subscription-based and charges users according to utilization or the quantity of maintained identities.
- SelfKey makes money by providing associated services and SSI management systems. They potentially make money by selling licenses for their software to companies and other entities which require identity verification tools.
- Verification of identity services are the main source of income for Bloom. They generate income in a variety of ways, such as transaction-based fees for every single identity verification, verification costs, continued subscription fees for verification products..
- Trinsic makes money by selling licenses for its developer tools, APIs, and software development kits (SDKs) to companies and organizations. For customers deploying decentralized identification systems, they may also provide professional assistance like advice and customisation, opening up new business prospects.
- IdRamp has a subscription service business model, charging users on a monthly basis according to their consumption or the quantity of maintained identities. Additionally, they provide modification and integration services to customers, earning money from consultation and implementation costs.

## 5.6 Key Activities

### 5.6.1 Similarities

- The creation and maintenance of SSI management solutions and related products is handled by Evernym, SelfKey, and IdRamp.
- To provide user-friendly solutions, SelfKey and Bloom give user experience design top priority.
- Evernym and Trinsic concentrate on establishing alliances with businesses to increase their clientele and promote the use of their products.
- Trinsic focuses on tools and solutions for decentralized identity management, whereas Bloom concentrates in identity verification services.
- To raise awareness and encourage the acceptance of their goods and solutions, all five businesses participate in marketing and promotional initiatives. All the companies focus on partnerships for expanding data sources and reaching more businesses.

### 5.6.2 Differences

- Evernym emphasizes industry participation, cryptographic protocols, and decentralized identity systems more.
- SelfKey values software that is easy to use and safe identity verification procedures.
- Identity verification services and technology are a specialty of Bloom. They prioritize frameworks for analysing data, preventing fraud, and adherence.
- Trinsic focuses in creating applications and tools for decentralized identity management. They focus on building APIs, programmer resources, and library software for smooth integration.
- IdRamp is specialized in providing solutions and assistance for decentralized identity management. focuses on client service, integration of systems, and sustainability for their products.

## 5.7 Key Resources

### 5.7.1 Similarities

- All businesses rely on proprietary hardware or software to power their decentralized or self-governing identity management systems.
- All businesses require qualified technical personnel, engineers, and software developers.

- Their resources and capacities are significantly increased through partnerships and cooperation with corporations and organizations.
- Each business highlights the value of its infrastructure and technological platform.
- All businesses understand the importance of having user-friendly designs and interfaces in their products.

### 5.7.2 Differences

- Evernym proprietary technology is decentralized identity systems, cryptographic protocols, and distributed ledger technology.
- SelfKey's key resources are the SSI management software and related products as well as the proprietary technology, user interface design, and software development expertise.
- Bloom's key resource is the identity verification technology, data analysis algorithms, fraud prevention systems, and compliance to frameworks.
- Trinsic's key resource Decentralized identity management tools, APIs, and solutions along with the software development expertise, programming libraries, and documentation resources
- IdRamp's key resource includes decentralized identity management solutions and software along with technology stack, developer resources, and documentation.

## 5.8 Key Partnerships

### 5.8.1 Similarities

- All the case companies form strategic partnerships with organizations and businesses to integrate their identity management solutions into existing systems and workflows. These collaborations are focused on driving the adoption of self-sovereign or decentralized identity technologies, facilitating interoperability, and extending the usage of such solutions.

### 5.8.2 Differences

- Evernym forms a variety of collaborations with businesses involved in identity-related services, technology, and other sectors.
- In the areas of finance and digital services, SelfKey works with companies, financial institutions, and service providers.
- Bloom collaborates with businesses involved in credit, lending, and online markets.

- Trinsic focuses on forming alliances with software companies, developers, and tech-related businesses.
- IdRamp engages with organizations, institutions, and suppliers of technology in a variety of sectors.

## 5.9 Cost Structure

### 5.9.1 Similarities

- With the goal to enhance their SSI management systems, Evernym and SelfKey invest resources in research and development. They also spend money on technological infrastructure, security, and software development. Additionally, they incur costs for partnerships, sales, marketing, and customer service.
- Costs related to the creation and upkeep of Trinsic and IdRamp's decentralized identity management systems are incurred. They allocate funds for infrastructure, ongoing maintenance, and software development. They also incur costs for collaborations, sales, marketing, and customer service.
- The companies usually would pay for marketing, sales, customer service, and partnerships for identity verification.

### 5.9.2 Differences

- Evernym invests a lot of money in R&D, distributed identity systems, encryption protocols, and technological partnerships.
- SelfKey concentrates on the design of the user experience, data security, and technological infrastructure which could incur expenses based on how many resources are being used.
- Expenses for identity verification software, data analysis, fraud protection, compliance frameworks, and technological infrastructure are incurred by Bloom.
- Trinsic's and IdRamp's cost structure comprises software development and maintenance for decentralized identification solutions.

## 6 DISCUSSION

In this section I will analyze the research question comprehensively while providing guidelines for developing business models of SSI companies enterprises. By highlighting important factors to consider and practical methods for developing long-term business plans in the context of SSI, the analysis will try to attempt to bring clarity and a sense of direction to this quickly growing subject.

### 6.1 Answer to the research question

It is critical to consider both the findings from the literature especially the study by Morkunas et al., (2019) and the empirical research carried out in this study when assessing the major elements of Self-Sovereign Identity (SSI) business models which can help to fully comprehend the essential traits that characterize SSI business models. While the study offers a more comprehensive perspective on how blockchain technology is affecting company models, the analysis is mainly focused on SSI enterprises and their distinctive features. With this understanding, recommendations to help SSI businesses can help to create profitable business models that make use of self-sovereign identification concepts and modern technology.

Customer Segments	<ul style="list-style-type: none"> <li>• Individuals seeking identity management.</li> <li>• Companies and organizations.</li> <li>• Financial organizations, hospitals, governmental organizations, and schools/colleges rely on accurate and secure identification verification for handling critical private data and providing strong identity solutions.</li> </ul>
Value Proposition	<ul style="list-style-type: none"> <li>• Privacy and Security: These companies prioritize privacy and security in their solutions for customers' digital identities.</li> </ul>

	<ul style="list-style-type: none"> <li>• Decentralized identification: All the case companies utilize blockchain-based or decentralized identification systems. They leverage cryptographic protocols and distributed ledgers in their solutions.</li> <li>• Identity Verification: These firms offer identity verification tools and services to help businesses and organizations authenticate the identities of clients, associates, or staff members. Strong verification systems are employed to reduce fraud and build trust.</li> <li>• Interoperability and Integration: Few of the case companies focus on providing tools, APIs, and solutions that enable interoperability and seamless integration with existing systems. They facilitate the swift adoption and incorporation of decentralized identification solutions into various processes.</li> </ul>
Channels	<ul style="list-style-type: none"> <li>• Some case companies predominantly rely on direct sales and online channels to connect with their customers. They employ these channels to market their SSI management systems and establish partnerships with companies and organizations across various industries.</li> <li>• One of the case company prioritizes online distribution channels as their primary strategy. Through their website and online platform, they offer user-friendly identity verification solutions, simplifying the adoption and integration of their products and services by businesses and associations.</li> <li>• Other case companies adopt a developer-focused approach, mainly utilizing channels tailored to developers. They provide decentralized authentication tools, APIs, and solutions, making them easily accessible through their official website, developer portals, and software development forums.</li> </ul>
Customer Relationships	<ul style="list-style-type: none"> <li>• Few case companies prioritize building strong client relationships. They strive to deliver exceptional customer service and ongoing support to ensure efficient implementation and usage of their SSI management systems.</li> </ul>

	<ul style="list-style-type: none"> <li>• Whereas few case companies focus on cultivating relationships with developers, who form the majority of their clientele. Their main objective is to provide developers with the necessary tools and information for seamless integration into their decentralized identity management solutions.</li> </ul>
Revenue Streams	<ul style="list-style-type: none"> <li>• Revenue is generated through diverse models including subscription fees, licensing fees, and transaction-based fees for software and services usage. Premium support or consulting services may also be offered to generate additional income.</li> </ul>
Key Activities	<ul style="list-style-type: none"> <li>• Few case companies handle the creation and maintenance of SSI management solutions and related products.</li> <li>• On the other hand, some of the case companies prioritize user experience design to provide user-friendly solutions.</li> <li>• Whereas a few case companies focus on forming alliances with businesses to expand their customer base and promote product usage.</li> <li>• One of the case companies specializes in tools and solutions for decentralized identity management, while Bloom focuses on identity verification services.</li> <li>• All five businesses engage in marketing and promotional initiatives to raise awareness and drive acceptance of their products and solutions. Partnerships play a significant role in expanding data sources and reaching more businesses.</li> </ul>
Key Resources	<ul style="list-style-type: none"> <li>• Exclusive technology: These businesses depend on their unique hardware or software to drive their decentralized or self-governing identity management systems.</li> <li>• Competent workforce: Skilled technical personnel, engineers, and software developers play a vital role in these businesses.</li> <li>• Partnerships and collaboration: By partnering with corporations and organizations, these businesses expand their resources and capabilities.</li> <li>• Emphasis on infrastructure and technology:</li> </ul>

	<p>Each business highlights the significance of their infrastructure and technological platform.</p> <ul style="list-style-type: none"> <li>• User-centric designs: All businesses prioritize intuitive and user-friendly designs and interfaces in their products.</li> </ul>
Key Partnerships	<ul style="list-style-type: none"> <li>• All of the case companies establish partnerships with organizations and businesses to integrate their identity management solutions.</li> </ul>
Cost Structure	<ul style="list-style-type: none"> <li>• Few case companies invest in research and development, technological infrastructure, security, and software development to enhance their SSI management systems.</li> <li>• Other case companies incur costs for the creation and upkeep of their decentralized identity management systems, including infrastructure, maintenance, and software development.</li> <li>• All the case companies typically cover costs related to marketing, sales, customer service, and partnerships for identity verification.</li> </ul>

Table 6: Similarities of BMC elements of analyzed SSI business models.

Companies and organizations as well as people looking for identity management were identified as distinct customer categories in the examined SSI firms in the Table 6. However, by identifying other consumer sectors including financial companies, hospitals, governmental entities, and schools/colleges, the assessed SSI enterprises offer a more comprehensive perspective. To manage sensitive private data and provide reliable identity solutions, these industries rely on precise and secure identification verification.

The examined SSI companies emphasize the usage of decentralized identity systems that make use of blockchain technology even more. Few of the case companies use distributed ledgers and secure protocols to guarantee privacy and security in their solutions as shown in Table 6. In contrast, the study by Morkunas et al. (2019) does not expressly address blockchain technology and instead emphasizes value propositions such as authenticity, availability of new goods and services, rapid and inexpensive transactions, and smart contract functionality.

The examined SSI organizations offer a more thorough breakdown of the channel tactics used by various enterprises as can be seen in Table 6. For instance, one of the case company concentrates on online distribution methods through their website and online platform, whereas in the other case companies largely employ direct sales and online channels to engage with customers. The



remaining case companies take a developer-focused approach by making their tools, APIs, and solutions readily available through their official websites, developer portals, and software development forums. In contrast, the study by Morkunas et al. (2019) briefly covers new channels and APIs without mentioning any particular tactics used by specific businesses as can be seen in Figure 2.

The SSI firms under analysis and the paper both recognize the significance of developing solid client connections. The examined SSI businesses place a strong emphasis on providing great customer service and continuing support to guarantee effective SSI management system setup and operation. While few case companies concentrate on building ties with developers, who make up the vast majority of their customers, most of the other case companies place a higher priority on fostering relationships with their clients as mentioned in Table 6. Greater openness, self-service, and automation are highlighted in the study by Morkunas et al. (2019) as factors that support customer.

The paper and the examined SSI enterprises also note several sources of income, such as subscription fees, license fees, transaction-based fees, premium support, and consultancy services. Morkunas et al. (2019) mention crowdfunding as an additional source of income. These income sources give businesses using SSI business models a varied source of income.

More precise information about the firms' primary operations is provided by the SSI enterprises that have been analyzed in Table 6. For instance, SSI management systems and associated products are created and maintained by a few of the case companies. In order to deliver user-friendly solutions, two case companies put a priority on user experience design. Whereas in the other case companies concentrate on developing partnerships with companies to increase their clientele and encourage the use of their products. Partnerships, marketing and promotional efforts, and the expansion of data sources all significantly contribute to reaching new businesses. Peer-to-peer connections and transforming business procedures are mentioned in the paper as major efforts, although individual company-specific information is not given by Morkunas et al. (2019).

The paper and the examined SSI firms both emphasize the significance of essential resources in SSI business models. Morkunas et al. (2019) includes proprietary technology, expert staff (experienced engineers, technicians, and software developers), alliances, infrastructure, and user-centered designs as essential resources. Whereas the examined SSI enterprises place a strong emphasis on the value of specialized hardware or software as well as alliances with businesses and organizations to increase resources and capabilities. User-centric designs are stressed to provide intuitive and user-friendly interactions with the products and services as can be seen in Table 6.

Morkunas et al. (2019) in the paper acknowledges the significance of partnerships for integrating identity management solutions, as do the examined SSI firms. The study mentions enhanced firm relationships, data integration, payment assistance, shared networks, and the omission of time-consuming processes as potential results of partnerships, however the examined SSI businesses do not disclose precise information regarding the advantages of partnerships.

Morkunas et al. (2019) study and the examined SSI enterprises provided insight into the cost structure of SSI business models. Investments in R&D, technical infrastructure, security, software development, marketing, sales, customer service, and partnerships are mentioned particularly by the SSI companies under analysis as can be seen from Table 6. By citing decreased search costs, negotiation expenses, IT costs, and transaction costs, we can see that Figure 2 offers a more comprehensive picture. Additionally, it implies that there might be a rise in expenses for IT/software and development staff.

## **6.2 Guidelines for developing business models for SSI companies**

The development of a practical business model canvas solution for new entrants in the SSI sector will be the main topic of the next subsection. This study investigates crucial elements of the business model canvas analysis with reference to industry-leading businesses. Based on the result of this analysis, I developed guidelines to help new businesses to construct successful business models as well as take inspiration from parts of the elements for themselves by studying the techniques and tactics used by established firms. These guidelines are introduced next.

### **6.2.1 Customer Segments**

- Determine target client categories, such as people, businesses, developers, and governmental organizations, depending on their unique requirements and authentication problem concerns. For instance, SelfKey focuses on people who want more control over their digital identities, whereas Evernym targets businesses and governmental organizations and newer companies could take inspiration from this.

### **6.2.2 Value Proposition**

- Give priority to client security and confidentiality by concentrating on the companies that provide such solutions.
- Put an emphasis on providing those who have SSI management, like Evernym and SelfKey do.
- To improve the safety and reliability of identity management, use decentralized identity systems or blockchain technology, as demonstrated by Evernym, Bloom, Trinsic, and IdRamp.
- Identity Verification Services: As demonstrated by Bloom and Trinsic, offers verification of identity services and solutions to assist businesses in authenticating client identities and reducing fraud.

- Prioritize compatibility and effortless compatibility with current systems to make it easier for organizations to implement and utilize decentralized identification solutions like Trinsic and IdRamp.

### 6.2.3 Channels

- Use a variety of channels, including direct sales, collaborations, and digital channels, to connect with and engage your target audience. For instance, SelfKey focuses on digital platforms and alliances with key industry figures, whereas Evernym relies on direct sales and collaborative efforts.

### 6.2.4 Customer Relationships

- Develop lasting collaborations and cooperative ties with clients while offering continuing support and help, similar to Evernym. This can help to establish trust and support among the clients and the companies.
- Client-Centric Approach: As demonstrated by SelfKey, place emphasis on openness, user assistance, and a seamless user experience.
- Trust and Data Protection: To build credibility among users, emphasize stringent privacy protections and promote openness, as Bloom does.
- Providing extensive developer materials, support, and chances for cooperation, much as Trinsic.

### 6.2.5 Revenue Streams

- Subscription-based approaches or licensing charges are made available for utilization of self-sovereign identification systems, as shown by Evernym and SelfKey.
- Verification Services: Make money by offering companies authentication services, much as Bloom and Trinsic.
- Customisation and Integration: Charge firms using decentralized identity systems, such as IdRamp, for customisation options or integrating help.
- Investigate income sources such as license charges, subscription models, and identity verification services.
- While Bloom and Trinsic sell identity verification services, Evernym and SelfKey make money through subscription-based business models. So following such models newer companies can see that there is a financial incentive to be gained.

### 6.2.6 Key Activities

- The construction of the self-sovereign identification solutions should be centered on research and development, support for clients, and ongoing improvement. Trinsic, for instance, places a strong emphasis on developer engagement and assistance to promote adoption.
- Construct your own SSI solutions by making research and development investments.
- Establishing Partnerships: To increase market penetration and distribution options, establish strategic alliances with technology integrators, distributors, or industry thought leaders.
- Marketing and Education: Launch focused marketing efforts, create original content, and launch educational programs to spread the word about the advantages of SSI management.
- Customer assistance and Training: Offer helpful customer assistance, training courses, and resources to aid clients in putting identity solutions into practice and making good use of them.

### 6.2.7 Key Resources

- As seen in Evernym and SelfKey, technology infrastructure and intellectual property are given top priority. It is important to develop and maintain a secure infrastructure for self-sovereign identification solutions by investing in technological assets and intellectual property. For newer companies safeguarding and make use of the intellectual property rights connected to proprietary technology and self-sovereign identification solutions.
- Employing an experienced group with a background in blockchain technologies, cryptography, and decentralized identity systems. All businesses mentioned have a talented team and a wealth of industry knowledge, and it is clear that these factors have contributed to their success.
- Networks and relationships: To take use of the resources and experience of technology providers, trade associations, and communities, form strategic relationships with them. For resources and skills, Bloom and Id-Ramp make use of alliances and networks, which is proven to be successful.

### 6.2.8 Key Partnerships

- Working together with technology integrators or resellers for the distribution of self-sovereign identification solutions and broaden the market's reach. For instance, Evernym, Bloom, and Trinsic work with technology integrators and interact with developer communities in order to establish

extensive and compatible solutions, form strategic collaborations with other businesses.

- Collaboration with experts or influential individuals in the SSI field to raise your profile and establish credibility in the market. SelfKey collaborates with influential people in the business to raise its profile and legitimacy which is an essential step for establishing success.
- Getting involved in programmer groups, open-source initiatives, or organizations that promote standards in order to progress decentralized identity technology. An example of this is Bloom that participates in projects that are open-source and interacts with developer communities.

### 6.2.9 Cost Structure

- Allocate resources towards self-sovereign identification solutions continuing research and development, and operations expenses, regulation, and safety features. One such example is Evernym makes continuous R&D investments to improve self-sovereign identification systems.
- Operational Costs: Include expenses for employees, technical infrastructure, assistance for customers, and advertising initiatives. As seen SelfKey pays for costs associated with marketing, people, assistance, and infrastructures.
- Compliance and Security: To assure the safety of consumer data and comply with regulations and invest in strong security measures. Bloom adopts strict safety protocols and assures adherence to laws.

## 6.3 Contributions to theory and practice

This thesis contributes to the literature by being among the first studies identifying the components of SSI business models helping to expand the boundaries of knowledge and contributes to the ongoing discourse surrounding SSI business models. It complements current talks on SSI business models and helps to widen the knowledge boundaries. Additionally, it could serve as a starting point for forthcoming studies and give the following studies a strong basis. The thorough understandings gained from this thesis possess an opportunity to spur scholarly debate and motivate more investigations into the intricate workings of SSI business models, eventually spurring creativity and growth in the SSI industry.

This thesis explores the many influences that form SSI firms via in-depth study and detailed research. It meticulously finds and examines the essential factors that affect the success and persistence of these innovative SSI endeavours. It offers insights into the critical elements that significantly contribute to the effectiveness of SSI business models by meticulously breaking down the link between the Customer Segments, Value Proposition, Revenue

Streams, Channels, Customer Relationships, Key Activities, Key Resources, Key Partners, and Cost Structure of five successful SSI companies. By leading to the identification of crucial elements inside the SSI business models, the thesis might also greatly advance the body of literature already in existence about the topic.

By exploring previously unexplored areas, this thesis not only tries to close a significant gap in our knowledge but also reveals the complex internal mechanisms supporting SSI business models. The practical contributions of this research provide crucial suggestions for creating business models that are uniquely suited to the requirements of Self-Sovereign Identity (SSI) organizations. The aforementioned guidelines provide useful insights and advice about important elements of business model creation, acting as an operational basis for firms working in the SSI field.

To help SSI organizations build solid and effective business models, the aforementioned chapters detailed each guideline in detail and give relevant examples of companies to support such guidelines. These recommendations will assist SSI businesses in making better strategic decisions, streamline their daily operations, and improve their probability of success in the constantly changing SSI market.

## 6.4 Limitations and future research directions

The analysis of SSI business models has enormous potential for fostering innovation and tackling social challenges, but it remains a new topic with a number of fundamental constraints. In this part, I'll discuss the main obstacles that researchers and practitioners alike face while analysing SSI business models. Additionally, I will also highlight key avenues for further study that can assist to get around these obstacles and advance the profession. By tackling these issues and following these lines of inquiry, it can help to improve our understanding of SSI business models and speed up their acceptance and influence across a range of sectors.

### 6.4.1 Limited available scientific literature due to the novelty of the topic

Given the novelty of the subject and the absence of studies that have explicitly examined SSI (Self Sovereign Identity) business models, there might not have a large body of prior research from which to draw. The difficulty in acquiring thorough insights or a wide variety of viewpoints on SSI business models may result from this absence.

**Future research direction:** Additional inquiry and research are required to fill the gaps in the existing literature and broaden our understanding of SSI business models. To better comprehend SSI in the larger context of business models, researchers might investigate developing instances, engage in multidis-

ciplinary investigations, and work together with professionals from the industry.

#### **6.4.2 Lack of Established frameworks especially designed to study SSI business models**

There aren't any established frameworks or defined procedures to use when analysing SSI business models. The lack of data might make it challenging to evaluate and compare various SSI companies or get to useful conclusions.

**Future research direction:** Future research might concentrate on creating comprehensive frameworks or statistical instruments designed particularly for SSI business model analysis. These frameworks can aid both researchers and practitioners in assessing and contrasting various SSI methods, locating the most effective practises, and contributing towards the decision-making processes.

#### **6.4.3 SSI's Technical Complexity**

SSI incorporates sophisticated technical elements, such as decentralized identity systems and protocols for cryptography. To researchers lacking a solid foundation in technical concepts, comprehending, and evaluating these technical characteristics might be difficult.

**Future research direction:** Coordination between scholars from many fields, like business studies and computer science, can help to advance a thorough knowledge of the technological components of SSI business models. Interdisciplinary investigations can close the disconnect between the SSI's technological challenges and commercial ramifications, producing more comprehensive and perceptive research findings.

#### **6.4.4 Immaturity of the Ethical and Legal Considerations in the SSI context**

With regard to anonymity, ownership of data, and permission, SSI creates significant ethical and legal issues. It is crucial yet difficult to examine these features in the larger picture of SSI business models.

**Future research direction:** Future research should examine the moral and legal ramifications of SSI business models, looking at things like users permission, security of information, and regulations. The creation of moral standards and optimal procedures for SSI adoption in business models can be aided by this thesis's findings.

#### **6.4.5 Lack and need for long-term empirical studies**

An absence of long-term empirical research may exist since SSI is still a new concept. These studies would be able to monitor the effectiveness and effects of

SSI business models as time passes. Assessing SSI businesses ongoing performance can be difficult because of the scarcity of case studies and information on their future viability and adaptability.

**Future research direction:** Studies which monitor SSI enterprises over time can be conducted to examine the development trajectories, difficulties encountered, and successes attained. Such studies can offer insightful information regarding the SSI business models' longevity and adaptability.

#### **6.4.6 Understanding adoption and market dynamics claims future research**

The market's structure and SSI deployment are intricate processes driven by a number of variables, such as user acceptability, regulatory contexts, and technology preparedness. It is essential to comprehend all the variables that influence SSI business concepts, as well as the factors that encourage and hinder their acceptance.

**Future research direction:** Future directions for study could include examining the variables that affect the adoption of SSI across various sectors. This may entail researching market trends, corporate preparation, regulations, and feedback from customers. SSI business models and their interactions may be analyzed to assist in creating strategies that will encourage greater adoption of SSI.

#### **6.4.7 Interoperability and Standards open new research avenues**

Considering the smooth interchange of credentials and information throughout many systems, interoperability is a crucial component of SSI. The creation of guidelines and the building of compatible SSI business models are continuing issues that must be resolved.

**Future research direction:** Future directions for study might include investigating interoperability issues and creating frameworks or protocols that allow for smooth data sharing between various SSI systems. Additionally, research may be done to develop guidelines and norms that are applicable to the whole industry for SSI business models.



## 7 Conclusions

The main research question of this thesis was to identify the key components of sovereign identity (SSI) services by utilising the business model canvas to analyse the top SSI providers. The results indicate that SSI gives people more control, privacy, and autonomy over their personal data, and that user-centric strategies, strategic alliances, and privacy-focused design are major strategies utilised by top SSI firms.

The findings highlight the enormous potential of SSI as a remedy for the issues related to managing digital identities. By giving people more autonomy, privacy, and control over their personal data, SSI empowers people and revolutionises the way identities are maintained online.

The research process involved information from academic journals, business websites, and industry reports were collected during the research process. Leading SSI firms' business models were examined utilising the business model canvas, with an emphasis on their value proposition, client groups, critical activities, resources, partner relationships, and income streams. Through this approach, important understandings of the elements and tactics that lead to the success of SSI organisations were achieved.

The examination of well-known SSI businesses uncovers interesting patterns and similarities in their organisational structures. The necessity of building trust and providing a smooth user experience is highlighted by the emergence of privacy, data security, and user-centric design as significant focal areas. Additionally, collaborative agreements with businesses in industries like banking, healthcare, and administration serve a crucial role in establishing network effects and promoting adoption, underlining the need for cooperation among companies in the SSI ecosystem.

However, limitations must be addressed to encourage widespread SSI use. SSI firms, legislators, and industry stakeholders must work together to overcome the remaining considerable challenges of legislative complexity, interoperability concerns, and the requirement for education for users. Collaboration makes it possible to create norms and rules that find a balance between security, privacy, and creativity.

In the future, the SSI environment has the potential to change dramatically thanks to future technologies, particularly blockchain and decentralised identities. SSI businesses must constantly modify their business strategies to take full advantage of technology breakthroughs and stay at the forefront of the industry.

Future research on this thesis subject may take into account how SSI technologies are still evolving, such as improvements in blockchain and decentralised identity systems, and how it has affected the SSI ecosystem. Further investigation might focus on user education and awareness issues, as well as the regulatory opportunities and obstacles related to the implementation of SSI. Further research on the possible advantages and dangers of SSI in certain fields or sectors may yield insightful data for customised implementations.

Considering a variety of stakeholders, the conclusions drawn from this thesis have implications for practice. Entrepreneurs looking to break into the SSI industry may use the evaluation's best practices and winning methods to create strong and compelling propositions. Industry experts can improve current SSI solutions by taking into account the crucial elements and tactics used by top businesses. These insights may be used by policymakers to create regulations that encourage creativity, protect privacy, and advance interoperability within the SSI ecosystem.

This thesis investigated top SSI firms through an examination of self-sovereign identification services. It demonstrates the tactics used by these businesses, the difficulties and chances they encounter, and the possibilities of new technology in the SSI environment. The study's findings advance our understanding of SSI and offer insightful information to politicians, business professionals, and entrepreneurs. By making use of this information, stakeholders may help SSI services improve and become more widely used, thereby offering people more control over their digital identities.

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