



Designing a Digital Business Model for Internal Audit Functions: A Framework and Case Study from the Financial Sector

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Abstract

Background: The internal audit function is a strategic infrastructural function of a company, organisation, or institution. Its digital transformation process must align with the organisation-wide digital business transformation process. The main determinants distinguishing successful from unsuccessful companies and internal audit functions are their overall business models. **Objectives:** The main aim of this paper is to propose and design a unique digital business model canvas for the internal audit function and test its usefulness in practice. It also aims to investigate the current state and characteristics of internal audit functions' business models and their innovations in the financial sector. **Methods/Approach:** A combination of a comprehensive literature review and qualitative empirical research is applied to achieve the defined objectives. **Results:** A unique canvas for designing the internal audit function's business model is proposed. It summarises, on one page, how the function creates, delivers, and captures value for its stakeholders. This theoretically developed and empirically validated model is suitable for developing, describing, analysing, and synthesising customer segments, value propositions, channels, customer relationships, strategic direction, key resources, key activities, key partnerships, and operational direction. **Conclusions:** Empirical investigation of the current state and characteristics of internal audit functions' business model innovations and their compliance with global digital transformation trends shows that, in the Croatian financial sector, internal audit functions digitally innovate some elements but do not yet holistically transform all aspects. Thus, their digital business models differ in digital maturity, though digital transformation processes within the internal audit function align with those at the institutional level.

Keywords: internal audit function; business model canvas; digital transformation; business model innovation; financial sector

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Introduction

The contemporary era is characterised by the proliferation of disruptive digital technologies (e.g., additive manufacturing, artificial intelligence, augmented and virtual reality, big data analytics, blockchain technology, cloud computing, drones, internet of things, internet of services, mobile technologies, robotics, social networks, wearable technologies, etc.) in everyday private and business life. The adoption of these technologies in companies' business has become a necessity for their survival in a global market that is more competitive than ever before. Today, the mantra is that adopting disruptive technologies in companies' operations is imperative for corporate survival (Konopik et al., 2022). Just technological innovations, without the overall company's business model innovations, do not guarantee business success (Blaschke et al., 2017). Considering this, it is worth noting that digital business transformation is far more than the implementation of digital technologies (Verhoef et al., 2021), as it spans a company's internal and external environments, encompassing the entire business ecosystem. A business ecosystem is a dynamic network of entities that interact to create and exchange sustainable value for participants (Panetta, 2017).

The world is today in the fourth industrial revolution (Industry 4.0) (Hermann et al., 2016), and fast approaching the fifth industrial revolution (Industry 5.0) (Barata & Kayser, 2023; Raja Santhi & Muthuswamy, 2023). Industry 4.0 is primarily technologically driven, while Industry 5.0 is socio-technically driven (Barata & Kayser, 2023, p. 785), with the humanisation of technological disruptions distinguishing them. As automation, digitisation, digitalisation, and digital transformation of industry 4.0 and 5.0 are disrupting and transforming companies' business processes and activities, it is necessary to adjust, disrupt, and transform internal audit functions' ways of working as well. Consequently, change is an inevitable characteristic of the digital age. The adoption of digital technologies changes the company's overall business model and associated risks. As an internal monitoring mechanism of corporate governance, the internal audit function must innovate to respond to these changes and assess whether companies' governance structures are undertaking innovation and transformation initiatives in the best possible manner. The internal audit function's digital journey "has the greatest impact when its approach and outcomes are aligned with an organisation's purpose," enabling it to achieve positive change (Deloitte, 2023, p. 2). The most significant risks for the modern internal audit function are risks of inaction and reaction, as internal auditors need to be proactive and future-focused to disrupt the internal audit function's existing business model by transforming governance and infrastructure, technology, resources, and methodologies – build the next-generation internal audit function (Protiviti, 2023). The next-generation internal audit function can be described as an agile, highly competent, and technologically driven function that can quickly recognise significant risks and changes in the organisational risk profile, promptly include them in the internal audit function's plans, and provide the assurance the function delivers.

What internal audit functions that have fully adopted the vision of the next-generation function have in common is an agile, holistic approach that focuses on the overall and joint transformation of their governance, organisational, methodological, and technological aspects. This is also supported by Deloitte's (2023) stance that the 'digital' journey for the internal audit function is the adoption and integration of digital assets and capabilities, including technologies, talents, and ways of working, for disrupting existing processes, in combination with a cultural shift and a mindset of experimentation, innovation, and challenging the status quo. The first step toward the next-generation internal audit function is to develop a shared vision and then chart a path toward realising it (Deloitte, 2018a). Those functions are highly

valuable assets for their internal and external stakeholders, as they effectively and efficiently provide their products and services, including stronger assurance, impactful advice, and more valuable insights and foresight (Deloitte, 2018a; 2023; PricewaterhouseCoopers, 2019a). The primary purpose of the next-generation internal audit function is “to keep pace with change, create value, remain relevant, and enhance impact and influence” (Deloitte, 2018a, p. 13).

Therefore, the main research questions of this paper are as follows:

- Is it possible to propose and design a unique digital business model canvas for the internal audit function?
- What are the specifics, characteristics, current state, and developmental perspectives of the internal audit function's business model innovations?

The research objectives of the paper are:

- to propose a unique canvas or a template for designing the internal audit function's digital business model
- to design an ideal or a next-generation internal audit function's digital business model based on the literature review of the most recent developmental trends in internal auditing at a global level
- to empirically investigate the current state and characteristics of internal audit functions' business models, and their innovations, in the financial sector
- to assess the applicability and suitability of the theoretically proposed business model canvas for the internal audit function in the real world by developing the contemporary internal audit function's digital business model for the financial sector, and by assessing the level of its digital compliance with the theoretically designed ideal digital business model
- to formulate recommendations and provide guidelines for implementation and improvement of the internal audit function's business model innovations.

To answer the defined research questions and achieve the proposed research objectives, extensive theoretical research is conducted in the first stage of the research by applying appropriate scientific methods, including induction, deduction, analysis, synthesis, description, classification, specialisation, and comparison. The theoretical research aims to develop an ideal or next-generation digital business model for the internal audit function, which will then serve as a key cornerstone for the empirical research in the second stage. Several steps will be taken to theoretically propose the ideal internal audit function's digital business model:

- Firstly, the chosen canvas or template that consists of nine elements and related questions for designing companies' business models by Osterwalder & Pigneur (2010) will be customised to fit the specifics of the internal audit function.
- Secondly, based on the literature review and answering the questions defined in the business model canvas adapted to the internal audit function, an ideal or next-generation internal audit function's digital business model will be designed. It will comprise the latest trends and perspectives for developing next-generation internal audit functions globally.

This theoretical research results form a cornerstone for conducting the empirical research. In the qualitative empirical research, driven by interpretivism and abduction, primary data will be collected through in-depth interviews with chief audit executives, who are key representatives of the four selected case internal audit functions established and organised within financial sector institutions in the Republic of Croatia. Data will be analysed using a flexible pattern-matching technique with nested template and narrative analyses within a cross-sectional case study design. The main aim of the empirical part of the research is to assess the applicability and suitability of the theoretically proposed business model canvas for the internal audit function in the

real world by developing the contemporary internal audit function's digital business model for the financial sector, and by assessing the level of its digital compliance with the theoretically designed ideal business model. The aim is also to empirically investigate the current state and characteristics of internal audit functions' business models, and their innovations, in the financial sector.

The adoption and usage of digital technologies, as well as the innovation of some fragmental part of internal audit functions' ways of working, have received a significant attention in the existing scientific literature, but overall digital business models of internal audit functions and their innovations have received little, or no attention (Pizzi et al., 2021; Dobrowolski et al., 2022). This paper aims to address the identified gap by holistically examining and theoretically and empirically researching the internal audit function's digital business model innovations.

The remainder of the paper is structured as follows. After the introduction, in section two, a brief theoretical background on the company's digital business model resulting from a digital business transformation process is provided, which serves as a cornerstone for the proposition of the internal audit function's digital business model canvas. Based on that canvas and a comprehensive literature review, an ideal or next-generation internal audit function's digital business model is designed and presented in section three. Section four explains the research philosophy, strategy, and methodology used to address the research questions and achieve the research objectives, following by presentation of data collection process, research instrument, sampling, and a brief overview of the four chosen case internal audit functions. Furthermore, in section five, the empirical research results are presented and discussed. Finally, section six concludes the paper, gives an overview of the main research results and conclusions, describes the main contributions, states limitations, and provides directions for future research.

Theoretical Background

In this part of the paper, a brief theoretical review of the company's digital business model and its transformation or innovation process is provided. Based on that theoretical background and a comprehensive literature review, the second part proposes a unique digital business model canvas for an internal audit function.

Business model innovation driven by digital transformation

For a successful company's digital business transformation, it is of utmost importance to strategically plan and operationally run this process of the entire company's activities, and holistically include all business functions within the company, in contrast to implementing separate transformation projects for individual functions (Ivančić et al., 2019; Verhoef et al., 2021; Tomičić-Pupek et al., 2023). Digital transformation is a multidisciplinary concept, which includes external drivers (digital technology, digital competition, and digital customer behaviour), three phases (digitisation, digitalisation, and digital transformation), and strategic imperatives of digital transformation (digital resources, organisational structure, growth strategy, metrics, and goals) (Verhoef et al., 2021, p. 890). This is in line with the statement of Konopik et al. (2022, p. 2) that the digital transformation process is a sequence of sensing changes, seizing opportunities, and transforming the resource base. Additionally, Konopik et al. (2022) identified a set of relevant organisational capabilities. They developed a conceptual framework that includes seven elements relevant for managing digital transformation: (1) strategy and ecosystem, (2) innovation thinking, (3) digital transformation technologies, (4) data, (5) operations, (6) organisational design, and (7) digital transformation leadership. As digital transformation affects the entire business architecture, the (re-)design of a

business model is vital, and the company's governance structures need to take a systematic approach in this direction (Blaschke et al., 2017). Digital transformation relates to "change and creation of new business models with the help of digital technologies, introducing new (digitally enhanced) products, and making a significant shift in organisational capabilities, way of how people work, but also, a major change in culture and values companies have" (Spremić, 2018, p. 17). The result of a successful digital transformation process is a digital business model.

Numerous definitions of 'business model' exist (Foss & Saebi, 2018), but one of the most suitable is that of Osterwalder & Pigneur (2010). According to Osterwalder & Pigneur (2010, p. 14), "a business model describes the rationale of how an organisation creates, delivers, and captures value." An architecture for creating, delivering, and capturing value is not a list of organisational mechanisms that enable that, but is a definition and mapping of the integrated functional relations among those mechanisms and activities (Foss & Saebi, 2018, p. 13). Spremić (2017, p. 111) defines a 'digital' business model construct as "a way of adapting business methods and models to the conditions of a digital economy to find sustainable sources of income and value added of a new business model that intensively uses digital technology." Innovation of a business model involves changing elements and/or the architecture of the business model (Foss & Saebi, 2017, p. 213). These innovations can range from incremental changes within existing business models (i.e., evolution and adaptation) to more radical disruptions or other forms of innovation (Foss & Saebi, 2018, p. 12). According to Blaschke et al. (2017, p. 123), two instruments are crucial for the successful innovation of a business model: an expressive business model representation and a suitable methodology. Blaschke et al. (2017) emphasise that a business model representation should capture both the company's own operations and the broader network of business relationships in which it operates. Osterwalder (2004, p. 42) has proposed a business model ontology that includes four pillars of a business model:

- product – the company's core activities and a bundle of products, services, and value propositions it offers to customers on the market
- customer interface – targeted segments of customers a company wants to offer value propositions to, means of the company to get in touch with its customers, and links that a company establishes between itself and its different customer segments
- infrastructure management – arrangement of infrastructural and logistical activities and processes, business partners, and different types of cooperative agreements with other companies necessary to efficiently offer and commercialise value propositions
- financial aspects – cost and revenue structures, and overall sustainability of the business model.

These four pillars can be further divided into nine related building blocks of a business model (Osterwalder, 2004; Osterwalder & Pigneur, 2010):

- customer segments (CS) – the company aims to reach or serve different (one or several, small or large) groups of people or organisations
- value propositions (VP) – the company seeks to solve customer problems and satisfy customer needs with a bundle of products and services (benefits) that create value for them
- channels (CH) – ways a company communicates with and reaches its customers to deliver value propositions (communication, distribution, and sales channels)

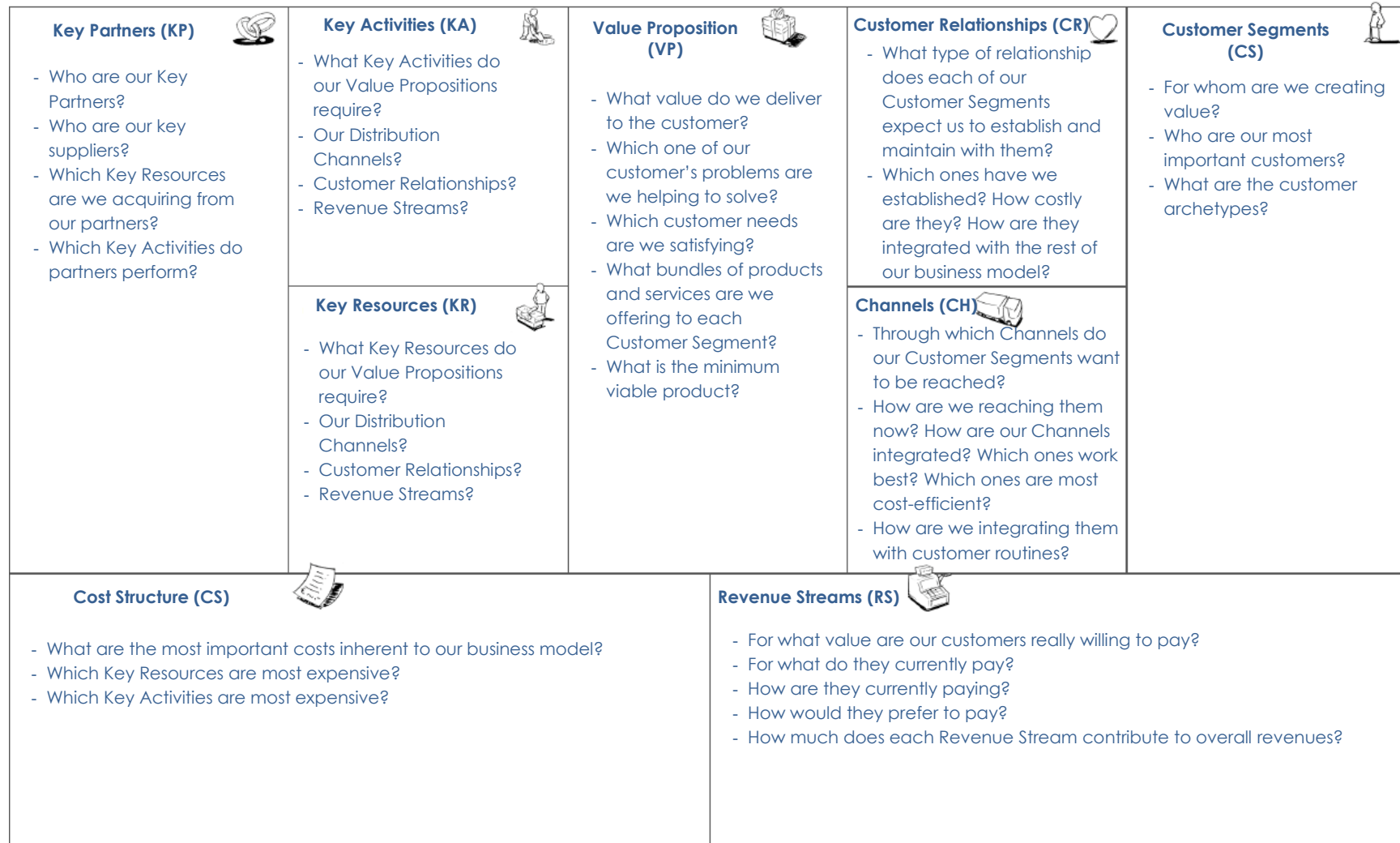
- customer relationships (CR) – types of relationships (personal/automated) a company establishes with specific customer segments
- revenue streams (RS) – the cash a company generates from value propositions successfully offered to a customer segment (costs must be subtracted from revenues to create earnings)
- key resources (KR) – the most important assets (physical, financial, intellectual, or human) of a company required to offer and deliver value propositions to customer segments (to make a business model work)
- key activities (KA) – the most important things a company must do to make its business model work (number of key internal activities and processes necessary for delivering value propositions to customer segments)
- key partnerships (KP) – the network of suppliers and partners that make the business model work (some activities are outsourced, and some resources are acquired outside the company)
- cost structure (CS) – all costs incurred to operate a business model (business model elements result in the cost structure).

This business model canvas, presented in Figure 1 (Osterwalder, 2004; Osterwalder & Pigneur, 2010), is among the most popular representations of business models (Blaschke et al., 2017). The business model canvas is a way to understand strategy and an interesting tool for capturing a business model on one page (Saint, 2013; 2014). The business model canvas should be seen as a shared language for describing, manipulating, visualising, assessing, and changing business models to create new strategic alternatives (Osterwalder & Pigneur, 2010, pp. 12, 15). Namely, even if you keep the business model canvas behind the scenes, it remains a powerful tool for ensuring you understand your customers, know what they need, focus on the right activities, and have the resources and distribution channels to deliver what they need (Saint, 2014). It is a template for designing an internal audit function that meets organisational needs.

SAP has developed an iterative multi-step procedure for designing innovative business models entitled *SAP Business Model Development and Implementation* (further in text: BMDI), which considers two levels of the company's business model (Blaschke et al., 2017): (i) the network view, which describes the value creation of a whole business network (company, customers, partners, and global competition), and highlights the entirety of the business network and its interrelations; and (ii) the enterprise view, which describes the value creation of a single company in a business network, shows how the network's value creation relates to, and is implemented by, the business model elements of the company.

Considering this, Osterwalder & Pigneur's (2010) business model canvas represents the enterprise view within the BMDI context. BMDI starts with a representation of the current business model, as a baseline, and proceeds using these four iterative steps: (1) analyse and improve, (2) challenge and change, (3) test and verify, and (4) evaluate and decide (Blaschke et al., 2017). In complementing these two views — network and enterprise — this paper suggests considering additional dimensions of companies' business models, including intra-organisational and functional perspectives. Garner (2015) also confirms the usefulness of that view in practice, as it enables strategic planning by business function by providing an overview of each function's activities. The business model canvas represents a shared language across business functions and provides a snapshot of a company's business model portfolio (Garner, 2015). Besides that, the business model canvas has many other practical applications (Garner, 2015).

Figure 1
The Company's Business Model Canvas Representation and its Nine Building Blocks



Source: Osterwalder & Pigneur (2010, pp. 16-44)

Digital business model canvas adapted for the internal audit function

Every business function of a company, through its activities and cooperation with other functions, creates, delivers, and captures value, which cumulatively contributes to the creation, delivery, and capture of the company's overall organisational value. It is, hence, important to consider and strategically plan for creating, delivering, and capturing the value of a single business function, which can best be done by developing its business model. Given the role, importance, and specifics of internal audit as a strategic infrastructural function of a company, it is necessary to develop its (digital) business model. Every company exists to satisfy and fulfil its customers' needs and expectations, and the internal audit function is no exception. It all starts with understanding who the customers of a company or function are, which is why Osterwalder's and Pigneur's (2010) business model canvas is a powerful tool for designing the strategic direction of an internal audit function that meets and fulfils the needs and expectations of its stakeholders (Saint, 2014).

Based on definitions of business model and digital business model of a company (Osterwalder, 2004; Osterwalder & Pigneur, 2010; Blaschke et al., 2017; Spremić, 2017, 2018; Foss & Saebi, 2018), in this paper, the internal audit function's (digital) business model is defined. The internal audit function's business model provides a rationale for how it creates and delivers value to its stakeholders and contributes to value added and to improving the company's business activities within which it is established and organised. Similar to that definition, the internal audit function's digital business model represents a rationale of how the internal audit function, in a digital economy era, creates and delivers value to its stakeholders, and contributes to creating value added and improving companies' business activities, which is established and organised by using information and communication technologies.

After defining the internal audit function's business model, its elements need to be articulated, and the overall design template developed. The internal audit function's business model canvas or template is a one-page representation of the elements that form its business model, with predefined questions to guide the construction of those elements. In this paper, the internal audit function's business model canvas consists of nine elements, originally forming companies' business models (Osterwalder, 2004; Osterwalder & Pigneur, 2010), which are adapted to the specifics of internal auditing (Figure 2) and defined as follows:

- customer segments (CS) – the internal audit function aims to create value and serve different internal and external stakeholders of a company
- value propositions (VP) – the internal audit function seeks to solve stakeholders' problems, and satisfy stakeholders' information needs, with the bundle of 'products and services' or engagements that create value added to them
- channels (CH) – ways the internal audit function communicates with and reaches its stakeholders to deliver Value Propositions (communication and distribution channels, meetings, digital platforms, other technologies, etc.)
- customer relationships (CR) – types of relationships (personal/automated) that the internal audit function establishes with specific Customer Segments
- revenue streams (RS) – financial resources allocated to the internal audit function by the company's governance structures (primarily the board), and the final value added that the internal audit function creates for the company and its stakeholders or Customer Segments from Value Propositions that enable the function's continual survival and success in the company

- key resources (KR) – the most important assets (human, financial, and technological) of the internal audit function required to offer and deliver Value Propositions to Customer Segments (to make a business model work)
- key activities (KA) – the most important things the internal audit function must do to make its business model work (number of key internal activities and processes necessary for delivering Value Propositions to Customer Segments)
- key partnerships (KP) – the network of partners and other stakeholders that make the business model work (some activities are insourced, some are outsourced, and some resources are acquired outside the internal audit function or even outside the company)
- cost structure (CS) – all costs incurred to operate a business model (business model elements result in the cost structure).

The internal audit function's business model canvas or template (Figure 2) is developed by customising elements of the company's business model canvas and related questions (Figure 1) to suit the internal audit function.

When initially designing internal audit functions' business models, or afterwards when analysing and re-designing (innovating) them, it is important to follow the predefined sequence of steps for business model design (1 – 9), as shown in Figure 2. The internal audit function's business model development needs to start with clearly defining customer segments (1), and value propositions (2), that need to be reached, communicated, and distributed via appropriate channels (3), and by developing partnership customer relationships (4). This needs to result in revenue streams (5), which, in the context of the internal audit function, means creating value for key functions' stakeholders, thereby enabling the function's continuous survival and success. Afterwards, key resources (6) need to be defined for fulfilling key activities (7) in cooperation with key partners (8) to achieve the internal audit function's purpose, which all leads to the cost structure (9) of the overall business model that needs to be optimised. These nine elements are grouped into four pillars of a business model, as stated earlier (Osterwalder, 2004, p. 42):

- product – the internal audit function's Value Propositions
- customer interface – the internal audit function's Customer Segments, Channels, and Customer Relationships
- infrastructure management – the internal audit function's Key Resources, Key Activities, and Key Partnerships
- financial aspects – Cost Structure and Revenue Streams that enable overall sustainability of the internal audit function's business model.

Figure 2
The Internal Audit Function's (IAF's) Business Model Canvas Proposition

<p>Key Partners (KP)  8</p> <ul style="list-style-type: none"> - Who are the key partners of the IAF? - Which IAF's engagements are outsourced and in what extent? - Which key resources is the IAF acquiring from its partners? - How are internal audit teams formed and who are members of the team (insourced, outsourced, etc.)? - What is the attitude of the company's governance structure towards the IAF? 	<p>Key Activities (KA)  7</p> <ul style="list-style-type: none"> - Which key activities do the IAF's value propositions require? - Which key activities are necessary for adding value to the company and delivering the IAF's engagements' results to its stakeholders and for developing relationships with them? <p>Key Resources (KR)  6</p> <ul style="list-style-type: none"> - Which key resources do the IAF's value propositions require? - Which key IAF's resources are necessary for adding value to the company and delivering the IAF's engagements' results to its stakeholders and for developing relationships with them? 	<p>Value Proposition (VP)  2</p> <ul style="list-style-type: none"> - What values does the IAF delivers to its stakeholders? - Which one of stakeholders' problems, expectations, and needs is the IAF helping to solve, satisfy, and fulfil? - What bundles of 'products and services' or engagements is the IAF offering to each stakeholder? 	<p>Customer Relationships (CR)  4</p> <ul style="list-style-type: none"> - What type of relationships does the IAF establishes and maintains with each of its stakeholders and which ones they expect? - How are they integrated with the rest of the IAF's business model elements and how costly are they? <p>Channels (CH)  3</p> <ul style="list-style-type: none"> - What channels and digital platforms does the IAF uses, and which do IAF's stakeholders prefer and want to be reached through? - Which channels work best? - Which ones are most cost-efficient? How is the IAF integrating these channels with stakeholders' routines? 	<p>Customer Segments (CS)  1</p> <ul style="list-style-type: none"> - For whom is the IAF creating value? - Who are the most important IAF's stakeholders? - What are their needs and expectations for information and IAF's 'products and services' or engagements? - Have their needs and expectations changed since the start of the company's digital business transformation process?
<p>Cost Structure (CS)  9</p> <ul style="list-style-type: none"> - What are the most important costs inherent to the IAF's business model? - Which key resources are most expensive? - Which key activities are most expensive? - Which channels are most expensive? 		<p>Revenue Streams (RS)  5</p> <ul style="list-style-type: none"> - How much financial resources are allocated to the IAF by the company's governance structures? - What is final (added) value that the IAF creates to the company and its stakeholders? - Does this value added affects the improvement of business activities and the creation/structure of company's revenues, and in what way? - What value, that the IAF creates and delivers to its stakeholders, ensures its survival in the company? - What does the survival and success of the IAF depends on in the future? 		

Source: Author's preparation according to Osterwalder & Pigneur (2010, pp. 16-44)

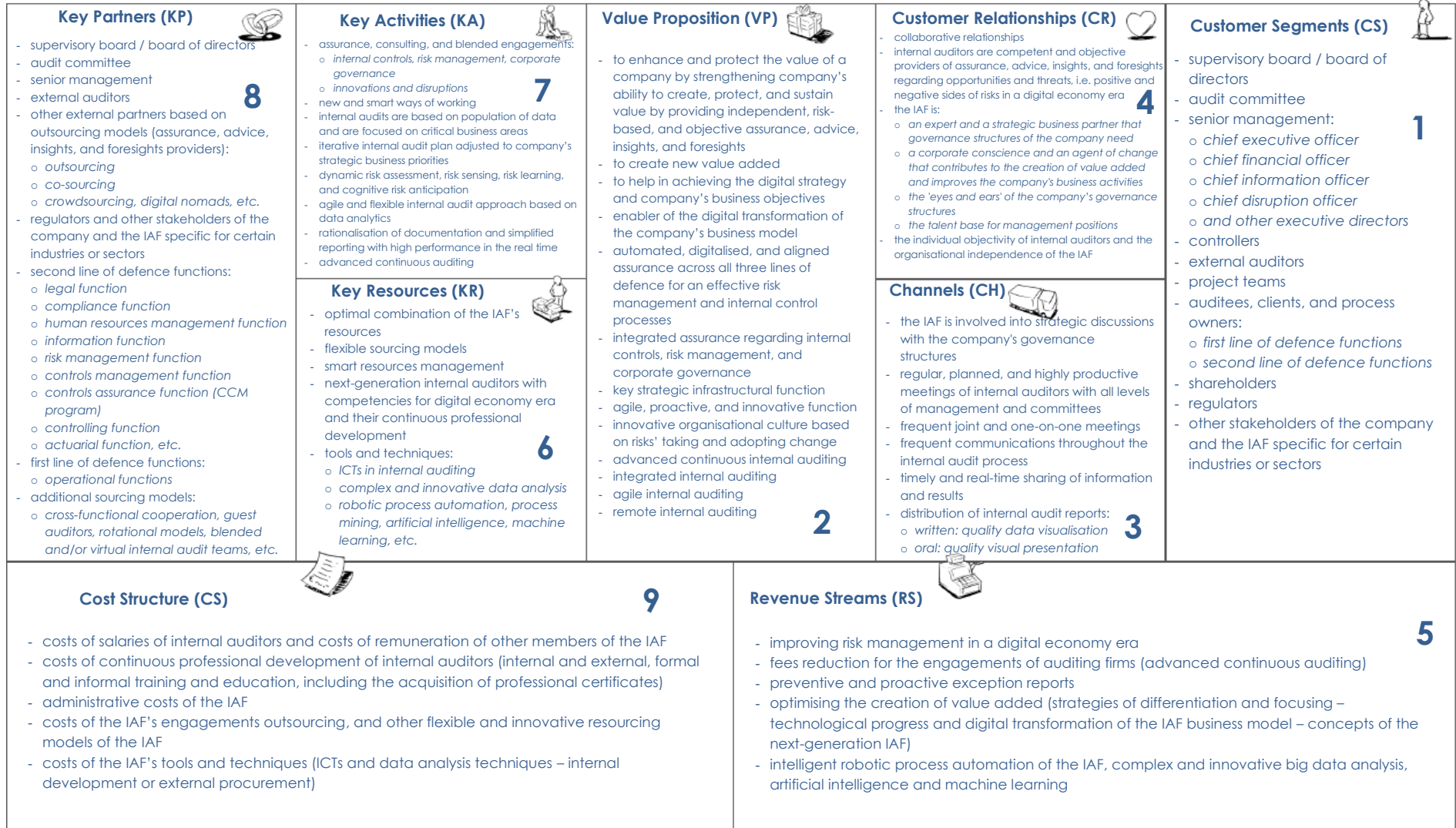
Developing the Next-Generation Digital Business Model for the Internal Audit Function

In this paper, based on a comprehensive critical review, analysis, comparison, and synthesis of scientific and professional literature related to internal auditing, digital transformation, and business models (Ramamoorti & Weidenmier, 2004; Flowerday et al., 2006; Teeter et al., 2010; Saint, 2013; 2014; Mahzan & Lymer, 2014; Bumgarner & Vasarhelyi, 2015; Laslett & Hardy, 2015; Palvalin et al., 2015; Dai & Vasarhelyi, 2016; Deloitte, 2018a; 2018b; 2020; Marty et al., 2017; Wu et al., 2017; Cong et al., 2018; Ježovita et al., 2018; Li et al., 2018; Moffitt et al., 2018; PricewaterhouseCoopers, 2018; 2019a; 2019b; 2020; Protiviti, 2023; Sanglier, 2018; Smidt et al., 2018; Christ et al., 2019; Font et al., 2019; Wright, 2019; Christ et al., 2020; Betti & Sarens, 2021; Betti et al., 2021; Pizzi et al., 2021; Tušek et al., 2021; Dobrowolski et al., 2022; Betti et al., 2024; Ismail et al., 2024; Lenz et al., 2024; The IIA Global, 2024; Wagener et al., 2025), a next-generation internal audit function's digital business model is developed, shown in Figure 3. In other words, based on the literature review and the answers to the questions related to each business model element shown in Figure 2, an ideal or next-generation internal audit function's digital business model is designed (Figure 3).

This means that the canvas shown in Figure 2 serves as a foundation for theoretically designing a business model that is, in its core, an ideal view of an internal audit function, based on the most recent global developmental trends in the internal auditing field that are grouped into predefined elements of the business model canvas (Figure 3). This is a more sophisticated and strategic view of functional-level business model innovation within a company, which is lacking in previous studies.

This newly designed, ideal internal audit function's digital business model enables internal auditors to collaborate with other key partners, clients, and customers to create and deliver value propositions aligned with the specifics of the company's activities in the markets where it operates. Creating, delivering, and capturing the most appropriate value propositions is enabled by key activities and an optimal combination of key resources that, together, create more value and improve companies' activities. The adoption and implementation of technological innovations and disruptions will create the desired effects only if the digital transformation of the internal audit function is tailored to the company's business state and conditions and is strategically planned and operationally implemented. Thus, it is necessary to implement a comprehensive, balanced, and integrated digital transformation of governance and organisational aspects, methodological approaches, and enabling technologies of the internal audit function, which represent cornerstones or pillars of the next-generation internal audit function. The next-generation internal audit function should effectively answer the following question of the company's governance structures: '*Can you tell us something we do not know*' (PricewaterhouseCoopers, 2020, p. 1). It is assumed that precisely this type of digital business model (as shown in Figure 3), and similarly developed digital business models of the next-generation internal audit function, will enable future internal auditors to think critically, supported by correct information and technologies, and be able to answer previously stated ('*can you tell us something we do not know*'), as well as similar increasingly complex issues effectively and efficiently.

Figure 3
The Next-Generation Internal Audit Function's (IAF's) Digital Business Model



Source: Author's preparation

Methodology

Research approach

The results from the first, theoretical stage of the research form a framework for conducting the qualitative empirical research in the second stage. The results of the theoretical analysis are a customised canvas or a template for designing the internal audit function's business model (Figure 2), and an ideal or next-generation internal audit function's digital business model (Figure 3). The applicability and suitability of those theoretically proposed and designed concepts for use in internal audit functions in the real world aim to be investigated through primary, qualitative empirical research and further modification to align with the specifics of internal auditing. Besides that, the purpose of the qualitative empirical research is to investigate the current state and characteristics of internal audit functions' business models and their innovations in the financial sector. This is achieved by developing a contemporary digital business model for the internal audit function in the Croatian financial sector and assessing its level of digital compliance against the theoretically designed ideal digital business model.

The qualitative empirical research in this paper is primarily driven by interpretivism and abduction, with primary data collected through in-depth interviews with a sample of selected representatives of case internal audit functions in the financial sector. This means a multiple-case study design is adopted. Data are analysed using a flexible pattern-matching technique with nested template and narrative analyses within a cross-sectional case study design. These chosen philosophical, strategic, and methodological approaches suit best the research in this paper, as the process of internal audit function's digital business model innovation or digital transformation is still relatively new phenomenon that has recently started to be researched at the global level, mainly from a professional point of view (e.g., PricewaterhouseCoopers, 2018; 2019a; Christ et al., 2019; Protiviti, 2023; Betti & Sarens, 2021; Betti et al., 2021; Pizzi et al., 2021; Dobrowolski et al., 2022; Betti et al., 2024; Ismail et al., 2024), while in the Republic of Croatia is still not researched enough. Therefore, a unified stance is necessary to explore the internal audit function's digital transformation or innovation of its business models.

To collect primary data through semi-structured, in-depth individual interviews, it was necessary to design an interview template as the primary research instrument. The interview template was designed based on a critical review, analysis, comparison, and synthesis of existing relevant literature, in particular selected existing empirical research (e.g., Osterwalder & Pigneur, 2010; Kane et al., 2019; Deloitte, 2018b; PricewaterhouseCoopers, 2018; 2019a; Sanglier, 2018; Christ et al., 2019; Ivančić et al., 2019; Christ et al., 2020), as well as the researcher's critical thinking guided by the primary purpose of the research. It is important to emphasise that the data used in this paper were collected as part of a broader research project on the digital transformation of internal audit functions, which forms part of the author's doctoral dissertation (Halar, 2022). Questions were adjusted to the specifics of the internal audit function and to the phenomenon of its digital business-model innovations. The interview template included these themes:

- basic information regarding the company, internal audit function, and individual characteristics of the respondent
- current state and characteristics of internal audit function's business model elements and their innovations (these questions are synthesised in elements of the internal audit function's business model canvas shown in Figure 2)
- concluding remarks regarding future perspectives of the internal audit function's business model innovations.

For analysing qualitative data in this paper, as stated earlier, flexible pattern matching techniques with nested template and narrative analyses of multiple case studies of internal audit functions were used (King, 2012; Brooks et al., 2015; Sinkovics, 2018; Sinkovics et al., 2019; Bouncken et al., 2021). A flexible pattern-matching approach can be described as an iterative process of comparing predicted or a priori theoretical patterns, designed based on a literature review, with observed empirical patterns developed from collected empirical data (Sinkovics, 2018, p. 468; Bouncken et al., 2021, p. 255). "By combining deduction with induction in logic, flexible pattern matching is well suited for exploration and theory development" (Bouncken et al., 2021, p. 251), which aligns with the purpose of the research in this paper. Given numerous criticisms of qualitative studies, particularly regarding their replicability and rigour, it is precisely the pattern-matching framework that strikes a balance between two extremes: strict standardisation and complete anarchy (Bouncken et al., 2021, p. 252). The application of the pattern matching logic "will result in a more rigorous and structured research process and write-up as it requires systematic planning, including as much advance conceptualisation work as possible, and detailed documentation throughout the entire project" (Sinkovics, 2018, p. 468). The flexible pattern matching technique consists of these steps or phases (Bouncken et al., 2021, p. 256):

- *the deduction of a set of theoretical patterns from prior studies* (in the current research this is represented by theoretically proposed customised canvas or template for designing the internal audit function's business model based on the popular Osterwalder's & Pigneur's (2010) company's business model representation, and development of an ideal or a next-generation internal audit function's digital business model – Figure 2 and Figure 3)
- *the formation of actual observed patterns through the lens of these theoretical patterns* (in the current research, this is represented by analysing collected qualitative empirical data based on the theoretical findings and the researcher's critical thinking guided by the primary purpose of the research), and
- *the comparison between them that enables the emergence of new patterns* (in the current research this is represented by developing contemporary digital business model of the internal audit function in the financial sector (Figure 4), modification and replacement of theoretically proposed elements of the internal audit function's business model with the introduction of new elements specific to internal audit functions, strategic directions and operational directions, which replaced revenue streams and cost structure, i.e. theory modification (Figure A1 and Figure A2 in the Appendix)).

Data

In the Republic of Croatia, the establishment and organisation of the internal audit function, as an internal monitoring mechanism of corporate governance, is mandatory by law in public and financial sector companies, organisations, and institutions (Ježovita et al., 2018; Tušek et al., 2021; Tušek et al., 2025), while this is not the case with the non-financial private sector. Consequently, the population of internal audit functions in companies, organisations, and institutions in the Republic of Croatia is unknown. Considering this, and to best achieve the research aims of this paper, internal audit functions in the financial sector in the Republic of Croatia are assessed as the most appropriate for conducting the research for several reasons. The financial sector is chosen because the establishment of internal audit functions in financial sector institutions is mandatory by law on the national level, it comprises institutions with domestic and foreign ownership, and this sector is a leader when it

comes to digitally transforming its business activities (Tušek, 2017; Werth et al., 2020; Halar & Tušek, 2024; Porfírio et al., 2024), compared to the public and non-financial private sectors. In the financial sector, internal audit is one of the control functions in banking institutions or a key function in non-banking financial institutions, and a third line of defence in effective risk management and control processes (Tušek, 2017; The IIA Global, 2019; 2020; Tušek et al., 2025). Furthermore, the financial sector, including internal audit functions within financial sector institutions, is highly regulated. Two types of regulators that oversee financial institutions are prudential and supervisory regulators (The IIA Global, 2019, p. 4).

The total number of institutions in the Republic of Croatia in the financial sector that are obliged to establish and organise an internal audit function is shown in Table 1.

Table 1

Overview of Financial Sector Institutions in the Republic of Croatia in 2020

Companies, organisations, institutions	Number
Banking institutions	23
Insurance companies	15
Investment companies	6
Leasing companies	15
Factoring companies	4
Pension insurance companies	2
Pension funds	40
Pension fund management companies	5
Investment funds	135
Investment fund management companies	23
Other institutions (REGOS, ZSE, SKDD, HUUO)	4
TOTAL NUMBER	272

Source: Author's work according to HANFA (2021) and HUB (2023)

As can be seen from Table 1, in the Republic of Croatia, the total number of financial sector institutions was 272 as of December 31st, 2020, and, by law, they must have established internal audit functions. Despite that, there is no publicly available data on the number of financial institutions that have established internal audit functions as a separate organisational unit. Some institutions are outsourcing their internal audit activities, while others have delegated them to an internal auditor or to a consulting company that provides services to multiple institutions (HANFA, 2021; HUB, 2023). Therefore, the population of internal audit functions in the financial sector institutions in the Republic of Croatia is also unknown. Given that, for data collection, random sampling was not a feasible option; purposive sampling based on the researcher's assessment was used, while research objects and subjects needed to satisfy several conditions (Tkalac Verčič et al., 2014, pp. 81-83), as elaborated below.

Banking institutions account for 71 % of the Croatian financial sector by asset size, followed by pension funds (17 %), insurance companies (6 %), and all other financial intermediaries (6 %) (HUB, 2023, p. 5). Banking institutions cannot fully outsource their internal audit functions under the Croatian Credit Institutions Act (Official Gazette, No. 159/2013, 19/2015, 102/2015, 15/2018, 70/2018, 40/2020, 146/2020, 151/2022 & 145/2024). Moreover, banking institutions are leaders in the financial sector regarding digital transformation of their business models (HUB, 2023; Werth et al., 2020; Porfírio et al., 2024), followed by insurance companies (Werth et al., 2020). Given the importance of banking institutions and insurance companies to the Croatian economy, as well as their leading role in digitally transforming and innovating business models, their internal

audit functions are chosen as the most suitable for conducting the research and achieving the research objectives.

To determine the current state and characteristics of internal audit functions' business models, and their innovations, in real-world scenarios, the objects of the multiple case study strategy design were internal audit functions established and organised in the financial sector institutions, primarily banking institutions and insurance companies, in the Republic of Croatia. This means that the research is conducted on the intra-organisational or functional level within a company. Subjects of the research, or primary respondents, who were the most competent on the research topic, were internal audit practitioners at the highest seniority level within internal audit functions. For conducting interviews, a purposive sample was selected based on the researcher's assessment, and respondents had to meet several conditions (Tkalac Verčić et al., 2014, pp. 81-83). These conditions were that internal auditors needed to:

- have a high position or a seniority level in the internal audit function
- use information and communication technologies to fulfil their individual responsibilities in the internal audit function
- be members of internal audit functions established and organised in institutions that were in the process of digital business transformation.

In the end, four chief audit executives from four selected cases, internal audit functions in banking institutions and insurance companies have been considered. From a methodological point of view, this was valuable for contextualising case studies and the transformative experiences within internal audit functions in banking institutions and insurance companies (Werth et al., 2020, p. 161). An overview of selected case internal audit functions is provided in Table 2.

Qualitative data were collected in the first quarter of 2021 through real-time in-depth interviews via Google Meet and Microsoft Teams. The interviews were audio-taped, and notes were taken during the interviews as well. The interviews lasted between 60 and 100 minutes. Data were transcribed, processed, and analysed using *Microsoft Word* and *Microsoft Excel*. The interview template was not sent to research participants in advance; they received only a short overview of the research objectives in the invitation letter email. All potential participants who were primarily selected from the sample and invited to participate in the research agreed to and participated.

As can be seen from Table 2, in order to better investigate the current state and specifics of internal audit functions' digital business models, and their digital transformation process, in the financial sector, the sample included two internal audit functions established and organised in credit institutions, i.e. from the banking financial sector, and two internal audit functions established and organised in insurance companies, i.e. from the non-banking financial sector. Institutions where case internal audit functions are established have a long tradition of doing business, all of which are public-interest entities and large entrepreneurs under the Croatian Accounting Act (Official Gazette, No. 85/2024 & 145/2024). Two of the case internal audit functions needed to be initially established in the institutions under the law (legal obligation), while two functions were initially established voluntarily as an internal monitoring mechanism of corporate governance. Internal audit functions are appropriately positioned within the overall organisational structure of institutions to ensure organisational independence, and internal auditors are individually objective. Chief audit executives, as primary respondents, have adequate knowledge of their internal audit functions and completed university studies in accounting, finance, and management.

Table 2
Overview of Four Case Internal Audit Functions

Criteria	Case 1	Case 2	Case 3	Case 4
Information about the institution				
Industry	banking	banking	insurance	insurance
Ownership	majority foreign ownership	majority foreign ownership	majority domestic ownership	majority foreign ownership
Classification (Accounting Act)	PIE – public interest entity	PIE – public interest entity	PIE – public interest entity	PIE – public interest entity
Year of foundation	1978	1977	1974	1993
Number of employees	4600	3700	2200	750
Information about the internal audit function				
Reason for establishment	voluntary	legal obligation	voluntary	legal obligation
Year of establishment	1991	1998	2007	2006
Position in the organisational structure of a company	administratively reports to CEO; functionally reports to supervisory board/audit committee	administratively reports to CEO; functionally reports to audit committee	administratively reports to CEO; functionally reports to supervisory board/audit committee	Administratively reports to the CEO; functionally reports to the supervisory board
Number of employees	35	38	5	2
Information about individual characteristics of the respondent				
Seniority level	chief audit executive	chief audit executive	chief audit executive	chief audit executive
Education level	University graduate study	University graduate study	University graduate study	University graduate study
Field of education	finance	management	accounting	accounting
Work experience (use of ICT in IAF)	15 years	4 years	10 years	9 years

Source: Author's work

Results and Discussion

To empirically investigate the current state and characteristics of internal audit functions' business models, and their innovations, in the financial sector, respondents needed to answer questions about nine elements of the previously theoretically proposed internal audit function's business model canvas (Figure 2). By analysing qualitative empirical data using flexible pattern-matching, template, and narrative analysis techniques, and applying critical thinking, this paper proposes modifications to the previously proposed basic business model canvas elements for the internal audit function, as shown in Figures 2 and 3. The matches and mismatches between theoretical and observed patterns, as well as the emergence of unexpected patterns, provide the opportunity for further theorising about the research results, where mismatches between patterns may represent an opportunity to revise or expand existing theory, or to develop an entirely new theory (Bouncken et al., 2021, p. 257). Specifically, revenue streams and cost structure elements are replaced with strategic

direction and operational direction elements. In that way, the pillar '*financial aspects*' is replaced with the pillar '*strategic and operational direction*'. The main reason for this revision and innovation of the canvas is to customise it to better align with internal audit as a strategic infrastructural function of the company, organisation, or institution, which does not directly generate revenues. The element 'revenue streams' did not, as such, apply to the business model of the internal audit function. So, when this element was replaced with the strategic direction element, the cost structure element needed to be expanded to include budget, the plan for internal audit activities, resource allocation, and internal audit function performance evaluation.

Element '*strategic direction*' can be defined as a desired future state and purpose of the internal audit function in a company, organisation, or institution, which seeks to satisfy and fulfil expectations, needs, and demands of stakeholders in the best possible way, by delivering key value propositions through appropriate channels, and by creating appropriate professional relationships, following the professional technical and ethical internal auditing guidelines. Element '*operational direction*' can be defined as methods and actionable steps through which defined strategic direction is operationalised, i.e. by which the available, limited internal audit function's resources are directed to performing key internal audit activities, whose objects are the most critical company's business areas determined based on risk assessment, and cooperation with key partners, to achieve the defined strategic direction. In other words, operational direction represents a roadmap for achieving strategic direction. Therefore, four pillars and nine elements of the modified internal audit function's business model canvas are as follows (see Figure A1 in the Appendix):

- Product – the internal audit function's Value Propositions (VP)
- Customer interface – the internal audit function's Customer Segments (CS), Channels (CH), and Customer Relationships (CR)
- infrastructure management – the internal audit function's Key Resources (KR), Key Activities (KA), and Key Partnerships (KP)
- strategic and operational direction – the internal audit function's Strategic Direction (SD), and Operational Direction (OD).

Considering these modifications, the Appendix shows the modified canvas for designing the internal audit function's business model (Figure A1), as well as the modified ideal or next-generation internal audit function's digital business model, with new elements – strategic direction and operational direction (Figure A2). The characteristics of the strategic and operational direction elements in Figure A2 are based on a comprehensive literature review.

Based on the collected qualitative empirical data on business model elements and applying flexible pattern-matching techniques with nested template and narrative analyses, the author first designed business models for the internal audit functions of all four analysed cases. Because the objective of this research was not primarily to show the characteristics of every individual case internal audit function's digital business model (and its elements), but to study in general the state and characteristics of the contemporary internal audit function's digital business model for the financial sector, the individual case internal audit function's business models (case 1, case 2, case 3, and case 4), therefore, are not shown separately in the paper.










After that, the author developed a contemporary digital business model for the financial sector's internal audit function by analysing, comparing, and synthesising the key characteristics of the four individual case internal audit functions' business models. In this paper, qualitative characteristics of the contemporary internal audit function's digital business model for the financial sector in the Republic of Croatia are presented in Figure 4.

As can be seen in Figure 4, the most important customer segments or clients and users of the internal audit engagements' results in the financial sector, for whom internal auditors create value added, are the supervisory board, audit committee, senior management, i.e., governance structures of the institution, as well as auditees, clients, process owners, and regulators. Key value propositions that the internal audit function creates and delivers to its key customer segments are to enhance and protect the value of an institution by strengthening its ability to create, protect, and sustain value through independent, risk-based, and objective assurance, advice, insights, and foresight. Regarding channels, the internal audit function is involved in strategic discussions with the institution's governance structures. Internal auditors participate in regular, planned, and highly productive meetings with all levels of management, boards, and committees. They are informed in real time about all activities at the institution's level, periodically or weekly. Internal auditors frequently communicate with auditees and clients, proactively sharing information and results through a range of basic and advanced technologies. Auditees implement recommendations promptly, with no delays. The results of internal audit engagements are communicated via traditional written reports, high-quality data visualisations, and quality oral presentations. Internal auditors have established honest, professional, collaborative, and transparent customer relationships, ensuring appropriate levels of individual objectivity of internal auditors and organisational independence of the internal audit function. To deliver the expected value propositions to key customer segments through the most appropriate channels while establishing the right relationships, it is essential to have a clear strategic direction. Besides informal strategic directions, according to which the internal audit function should operate and transform in line with the institution's business activities and business transformation, in the financial sector, the trend is to formulate formal digital functional strategies. These functional strategies are integral to the institution's overall corporate strategy and are communicated to all relevant stakeholders.

Key resources of the internal audit function are human resources and their competencies, for the digital economy era. It is also essential to have the optimal combination of human, material, financial, and time resources for conducting engagements, as well as an appropriate digital management strategy. In the financial sector, to fulfil their individual responsibilities, internal auditors primarily use basic and advanced technologies, while new and innovative technologies are increasingly being adopted. Internal auditors are increasingly applying them to perform simple and complex analyses of data populations, as more innovative data analysis approaches emerge. Key activities of the internal audit function in the financial sector include assurance, consulting, and blended engagements, with a scope that covers internal controls, risk management, corporate governance, innovation, and disruption. Internal auditors need to strive to conduct continuous, agile internal audit engagements remotely. In that process, their key partners are supervisory board, audit committee, senior management (chief executive officer, chief financial officer, chief information officer, and other executive directors), second line of defence functions, including risk management and control function, compliance function, actuarial function, legal function, controlling function, information function, corporate cyber security function, human resources management function, first line of defence functions, etc.

Figure 4

Characteristics of the Contemporary Internal Audit Function's (IAF's) Digital Business Model in the Financial Sector

<p>Key Partners (KP) </p> <ul style="list-style-type: none"> - supervisory board - audit committee - senior management: <ul style="list-style-type: none"> o chief executive officer o chief financial officer o chief information officer o and other executive directors - second line of defence functions: <ul style="list-style-type: none"> o risk management and control function o compliance function o actuarial function o legal function o controlling function o information function o corporate cyber security function o human resources management function o etc. - first line of defence functions: <ul style="list-style-type: none"> o operational functions - external partners based on outsourcing models (assurance and advice providers): <ul style="list-style-type: none"> o outsourcing o co-sourcing o etc. - regulators <p style="text-align: right;">8</p>	<p>Key Activities (KA) </p> <ul style="list-style-type: none"> - assurance, consulting, and blended engagements: <ul style="list-style-type: none"> o internal controls, risk management, corporate governance o innovations and disruptions - new and smart ways of working - internal audits are based on population of data and are focused on critical business areas - iterative internal audit plan adjustments to company's strategic business priorities - dynamic risk assessment - agile and flexible internal audit approach based on data analytics - rationalisation of documentation and simplified reporting with high performance in the real time - continuous internal auditing <p style="text-align: right;">7</p> <p>Key Resources (KR) </p> <ul style="list-style-type: none"> - optimal combination of the IAF's resources - smart IAF's resources management - internal auditors with competencies for digital economy era and their continuous professional development - tools and techniques: <ul style="list-style-type: none"> o basic, advanced, and new and innovative ICTs in internal auditing o simple, complex, and innovative data analysis <p style="text-align: right;">6</p>	<p>Value Proposition (VP) </p> <ul style="list-style-type: none"> - to enhance and protect the value of an institution by strengthening institution's ability to create, protect, and sustain value by providing independent, risk-based, and objective assurance, advice, insights, and foresights - to create new value added - to help in achieving the overall corporate strategy, including digital strategy and business objectives - enabler of the digital transformation of the institution's business model - automated, digitalised, and aligned assurance across all three lines of defence for an effective risk management and internal control processes - assurance regarding internal controls, risk management, and corporate governance - key infrastructural function - agile, proactive, and innovative function - innovative organisational culture based on risks' taking and adopting change - continuous internal auditing - integrated internal auditing - agile internal auditing - remote internal auditing <p style="text-align: right;">2</p>	<p>Customer Relationships (CR) </p> <ul style="list-style-type: none"> - honest, professional, collaborative, and transparent relationships - internal auditors are competent and objective providers of assurance, advice, insights, and foresights regarding opportunities and threats, i.e., the positive and negative sides of risks in a digital economy era - the IAF is: <ul style="list-style-type: none"> o an expert and a strategic business partner that governance structures of the institution need o a corporate conscience and an agent of change that contributes to the creation of value added and improves the institution's business activities o the 'eyes and ears' of the company's governance structures o the talent base for management positions - the individual objectivity of internal auditors and the organisational independence of the IAF <p style="text-align: right;">4</p> <p>Channels (CH) </p> <ul style="list-style-type: none"> - the IAF is involved in strategic discussions with the institution's governance structures - regular, planned, and highly productive meetings of internal auditors with all levels of management and committees - frequent joint and one-on-one meetings - frequent communications throughout the internal audit process - timely and proactive sharing of information and results - implementation of recommendations during internal audit process - distribution of internal audit reports: <ul style="list-style-type: none"> o written: quality data visualisation o oral: quality visual presentation <p style="text-align: right;">3</p>	<p>Customer Segments (CS) </p> <ul style="list-style-type: none"> - supervisory board - audit committee - senior management: <ul style="list-style-type: none"> o chief executive officer o chief financial officer o chief information officer o and other executive directors - auditees, clients, and process owners: <ul style="list-style-type: none"> o first line of defence functions <ul style="list-style-type: none"> ▪ operational functions o second line of defence functions (other control/key functions) <ul style="list-style-type: none"> ▪ risk management and control function ▪ compliance function ▪ actuarial function - information function - governance bodies at the level of the group/parent company - regulators <p style="text-align: right;">1</p>
<p>Operational Direction (OD) </p> <ul style="list-style-type: none"> - available budget of the IAF - plan for acquiring and allocating human, material, and time resources of the IAF - plan, structure, and allocation of financial resources of the IAF (salary costs, costs of continuous training, and education of internal auditors, costs of tools and techniques, and other administrative costs) - nature and plan of the IAF's activities - plan for evaluating the performance of the IAF and human resources (quality assurance and improvement program) <p style="text-align: right;">9</p>		<p>Strategic Direction (SD) </p> <ul style="list-style-type: none"> - informal strategic direction according to which the IAF should operate and transform in line with the business activities and business transformation of the institution - formal digital functional strategy that is an integral part of the overall corporate strategy - avoiding or minimising costs (strategies of low-cost or cost leadership) - optimising the creation of value added (strategies of differentiation and focusing) - strategic direction should be focused on talent management of the IAF - intelligent robotic process automation of IAF, complex and innovative big data analysis, artificial intelligence and machine learning <p style="text-align: right;">5</p>		

Source: Author's work

The reliance and coordination of all three lines of defence functions for effective risk management and controls are more important than ever. For the limited or scarce resources of the internal audit function to be directed to engagements that cover the most critical business areas, with the support of key partners, to achieve strategic direction, it is of utmost importance to have operationalised appropriate operational direction.

To investigate the current state and characteristics of internal audit functions' business models, and their innovations, besides developing the contemporary internal audit function's digital business model for the financial sector, and showcasing its main characteristics, the current state of business model innovations is investigated by assessing digital compliance level of the contemporary internal audit function's digital business model for the financial sector with the ideal digital business model (shown in Figure A2 in the Appendix). To determine and quantify the digital compliance level of the contemporary internal audit function's digital business model for the financial sector with the ideal one, based on the collected data, the author developed and conducted these methodological steps (Table 3):

- Firstly, the compliance level of each empirically shaped contemporary internal audit function's business model (case 1, case 2, case 3, and case 4) with theoretically shaped ideal or next-generation internal audit function's digital business model (Figure A2 in the Appendix) was compared and graded.
 - The compliance of each element of the case internal audit functions' business models with the elements of the ideal business model was determined by assigning points from 1 (complete non-compliance) to 5 (complete compliance).
 - Given there are nine elements of the business model, the sum of the points given to all elements gives the total number of points for each business model, with the maximum number of points being 45.
 - To assess the level of compliance of the overall business model with the ideal, the total number of points for each business model was divided by the maximum number of points (45), and then multiplied by 100 to obtain the percentage of compliance.
 - The level of compliance of the contemporary internal audit function's business model with the ideal or the next-generation digital business model was assessed and determined based on the scale shown in Table A1 in the Appendix.
- Secondly, the achieved points for all four case internal audit functions' business models were summed up, and the total sum was divided by four to obtain the average points. This result was then divided by the total number of points (45 points) and multiplied by 100 to determine the average level and percentage of compliance.

Table 3

The Level of Compliance of the Contemporary Internal Audit Function's Digital Business Model in the Financial Sector with the Ideal or the Next-Generation Digital Business Model

Case	Business model elements	Points (1-5)	Total – case	% case compliance
Case 1	Customer segments	4	37	82,22 %
	Value propositions	4		
	Channels	4		
	Customer relationships	4		
	Strategic direction	4		
	Key resources	4		
	Key activities	4		
	Key partners	4		
	Operational direction	5		
Case 2	Customer segments	4	38	84,44 %
	Value propositions	5		
	Channels	4		
	Customer relationships	4		
	Strategic direction	4		
	Key resources	4		
	Key activities	4		
	Key partners	4		
	Operational direction	5		
Case 3	Customer segments	4	29	64,44 %
	Value propositions	3		
	Channels	3		
	Customer relationships	3		
	Strategic direction	3		
	Key resources	3		
	Key activities	3		
	Key partners	3		
	Operational direction	4		
Case 4	Customer segments	3	26	57,78 %
	Value propositions	3		
	Channels	3		
	Customer relationships	3		
	Strategic direction	2		
	Key resources	3		
	Key activities	2		
	Key partners	3		
	Operational direction	4		
TOTAL FINANCIAL SECTOR		/	(130/4) = 32,50	72,22 %

Source: Author's work

As can be seen from Table 3, the contemporary internal audit function's digital business model in the financial sector in the Republic of Croatia is at a good level of compliance with the theoretically developed ideal digital business model (financial sector average points are 32,50, thus, achieving 72,22 % compliance with the ideal internal audit function's business model). In other words, it can be classified into digitally active functions. This means that a contemporary internal audit function in the financial sector actively implements digital innovation or transformation processes in some elements of the business model. It is necessary to align and improve the transformation of the business model's overall elements, as some are not at the same level of digital development or maturity. When case internal audit functions are

divided into the banking and non-banking financial sectors, contemporary business models in the banking sector can be classified as digitally proactive, while those in the non-banking sector can be classified as digitally conscious or active internal audit functions. To conclude, a good level of compliance is currently satisfactory for internal audit functions in the financial sector. This holds because digital transformation processes within the internal audit function are aligned with those at the institution's level. So, once the financial institution reaches a higher level of digital maturity, the internal audit function will need to transform accordingly. Internal audit functions should be proactive and encourage digital transformation of the financial institutions' business activities. This is aligned with the conclusion that internal audit functions within companies, organisations, and institutions that are digital leaders have made better progress with their innovation and transformation initiatives (Protiviti, 2023). The processes of internal audit functions' business model innovations in the analysed cases characterise changes and disruptions in organisational, governance, methodological, and technological ways of working, which align with the vision of the next-generation internal audit function. Furthermore, results from global empirical research also show that only a minority of internal audit functions are optimally digitally developed or at the highest digital maturity level (PricewaterhouseCoopers, 2018; 2019a; Protiviti, 2023).

Conclusion

In the Industry 4.0 and Industry 5.0 era, a company's, organisation's, and institution's governance structures need to define and design their overall (digital) business model and continually assess and redesign it. This is known as business model innovation or transformation enabled by digital technologies. The digital transformation process needs to include all business functions of a company, organisation, or institution, as well as the development of their business models. It is also handy to design the internal audit function's digital business model to summarise, on one page, the rationale for how this strategic infrastructural function creates, delivers, and captures value for its stakeholders, and contributes to improving the company's, organisation's, or institution's activities. The business model enables the development of the internal audit function's strategic and operational directions in detail, so that the chief audit executive can demonstrate the relevance of the function to the company's, organisation's, or institution's governance structures.

As a result of extensive theoretical and qualitative empirical research and data analysis conducted in this paper, a modified business model canvas for the internal audit function was proposed and developed based on Osterwalder & Pigneur's (2010) popular business model representation. This modified canvas consists of nine elements, including: customer segments, value propositions, channels, customer relationships, strategic direction, key resources, key activities, key partnerships, and operational direction. The objective of proposing a modified canvas was to tailor it to the specifics of internal audit as a strategic infrastructure business function.

Based on qualitative empirical research and analysis of four case studies of internal audit functions in the financial sector in the Republic of Croatia, it can be concluded that the process and level of internal audit functions' digital business model innovations are aligned with institutions' digital business transformations and their business model innovations. The results also revealed that institutions' digital business transformation processes positively impact internal audit functions' activities and business model innovations. To determine the current state and characteristics of internal audit functions' digital business model innovations, as well as the level of their digital compliance with the latest global trends in the digital transformation, the

contemporary internal audit function's digital business model in the financial sector was empirically shaped, and then its compliance with the ideal business function was assessed. The representative contemporary internal audit function's business model in the financial sector in the Republic of Croatia is classified as digitally active, indicating a good level of compliance with the theoretically developed ideal digital business model.

The most important recommendation based on this study is to conduct a holistic digital transformation of all elements of the internal audit function's business model in an integrated, proactive, and synergistic manner. This transformation needs to be aligned with the company's, organisation's, or institution's digital business transformation and business model innovations. The internal audit function's business model need not fully align with the next-generation digital business model. The digital maturity level of the internal audit function's business model must align with that of the company, organisation, or institution. Also, it is critical that the chief audit executive clearly articulates to internal audit practitioners the necessity of continually and proactively tracking changes in internal auditing practices at the global level, and developing awareness of all new and innovative trends in governance, organisational, methodological, and technological aspects.

The paper's contributions are manifold. A unique digital business model canvas for the internal audit function was proposed, representing the paper's first contribution. This is, to the best of the author's knowledge, among the first attempts to holistically view, investigate, and analyse elements of the internal audit function's digital business model, state their characteristics, and propose a customised digital business model canvas for the internal audit function. Authors Pizzi et al. (2021, pp. 1-2) state that, while a significant number of papers have analysed the relationship between digital transformation and external auditing, no similar research has been conducted in the field of internal auditing. This study fills this gap, contributes to the scientific debate, and increases knowledge of this important topic by conducting theoretical and qualitative empirical research, which constitutes the second contribution. The applicability and suitability of the proposed digital business model canvas for the internal audit function were tested in practice in the financial sector. The business model canvas, adjusted for the internal audit function, has proven extremely applicable and suitable for developing, describing, analysing, and synthesising the internal audit function's core activities, targeted customer interface, infrastructure management, and strategic and operational directions in the financial sector, which represents the third contribution. The research results also confirmed that the company's digital business transformation process has a positive impact on the internal audit function's ways of working and its business model innovations. The fourth contribution is that the process and level of the internal audit function's digital business model innovation, or its digital transformation, needs to be aligned with the overall company's digital business transformation process. In the end, the fifth contribution presents formulated recommendations and guidelines for implementing and improving the internal audit function's business model innovations. As a result, this study can serve as a roadmap for developing and innovating the internal audit function's digital business model. It significantly enriches prior research on digital transformation in internal auditing by incorporating elements of business models that have not been used in this form before, thereby opening an entirely new research stream.

The current research is not without its limitations, mainly related to the type and specifics of the qualitative research conducted, in which primary data were collected through interviews. One limitation is the small number of cases studied, which limits the

generalisability of the research results. This was tried to be minimised by forming a sample that included relevant institutions (banking institutions and insurance companies), and their internal audit functions from the financial sector, as well as by applying appropriate data analysis techniques, but in the end, the sample used is not representative of the overall Croatian financial sector. Furthermore, research was conducted in the Republic of Croatia, including financial institutions with a majority foreign ownership. However, it is important to note that the financial sector, and primarily banking institutions and insurance companies, in the Republic of Croatia differs from that in other countries.

Regarding future research directions, it would be helpful to expand the number of case studies of internal audit functions in financial sector institutions when conducting qualitative research, and to include cases from the public and private non-financial sectors in the Republic of Croatia. Based on the results of this research, it would be worthwhile to conduct quantitative research using a survey method to collect the data. To test and assess the results and conclusions obtained in this paper, the same research could also be conducted in countries with similar as well as different legal, economic, and technological environments, and corporate governance practices, by comparing results cross-nationally and cross-culturally.

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Appendix










Table A1

A Scale for Assessing the Level of Compliance of the Contemporary Internal Audit Function's Business Model with an Ideal or a Next-Generation Digital Business Model

%	Compliance level	IAF's classification	Description
0,00 – 49,99 %	complete non-compliance	digitally lagging the internal audit function	<i>Strategies, plans, and operational efforts for IAF's digital business model innovations are not formalised, and initiatives are managed ad hoc or reactively. Non-reacting to the company's digital transformation initiatives. Risk-averse. Non-adoption of changes. Providing independent and objective assurance and advice regarding a limited traditional (non-digital) company's business activity.</i>
50,00 – 59,99 %	sufficient compliance	digitally conscious internal audit function	<i>Strategies, plans, and operational efforts for IAF's digital business model innovations are not fully developed, although multiple digital initiatives are underway, and their objectives are understood. Reacting slowly to the company's digital transformation initiatives. Slowly embracing changes. Collection of point solutions. Providing independent and objective assurance and advice, and providing independent, risk-based, and objective assurance, advice, and insights regarding a traditional (majority non-digital) company's business activities.</i>
60,00 – 74,99 %	good compliance	digitally active internal audit function	<i>Strategies and plans for IAF's digital business model innovations have been developed, and IAF has a proven track record of delivering limited engagements on the company's digital initiatives. Supporting operational activities are in place. Digital initiatives are typically focused on discrete aspects of the customer segments. Reacting and aligning IAF's business model to the company's digital transformation initiatives. Clear strategy. Agile. Effective at change delivery. Providing independent, risk-based, and objective assurance, advice, and insights regarding a limited (digital) company's business activity.</i>
75,00 – 89,99 %	very good compliance	digitally proactive internal audit function	<i>Strategies and plans for IAF's digital business model innovations have been developed, and they are adjusting to changes in organisational-wide digital transformation initiatives. Proactive operational activities are in place. Digital aspects are in place and managed organisation-wide quantitatively. High levels of automation have been achieved. The IAF has a proven track record of adopting new and innovative ICTs, delivering engagements on the company's digital initiatives, and proactively aligning its business model with the company's digital business transformation initiatives. High level of automation. Low-cost base. Hyper scalable. Providing independent, risk-based, and objective assurance, advice, and insights regarding the overall (digital) company's business activities.</i>
90,00 – 100,00 %	complete compliance	digitally innovative internal audit function	<i>Strategies and plans for IAF's digital business model innovations have been developed, and they are part of the overall digital corporate strategy. Proactive operational activities are aligned with the organisation-wide digital business transformation activities. The IAF has a proven track record of disrupting its traditional business models and supporting the company's business model. Digital aspects of strategic plans are continually improved based on lessons learned and predictive indicators. Innovative. Disruptive. Providing independent, risk-based, and objective assurance, advice, insights, and foresight regarding the overall (digital) company's business activities. Suggest approaches for upscaling the company's digital maturity and innovating its business model.</i>

Source: Author's preparation based on PricewaterhouseCoopers (2019a) and Protiviti (2023)

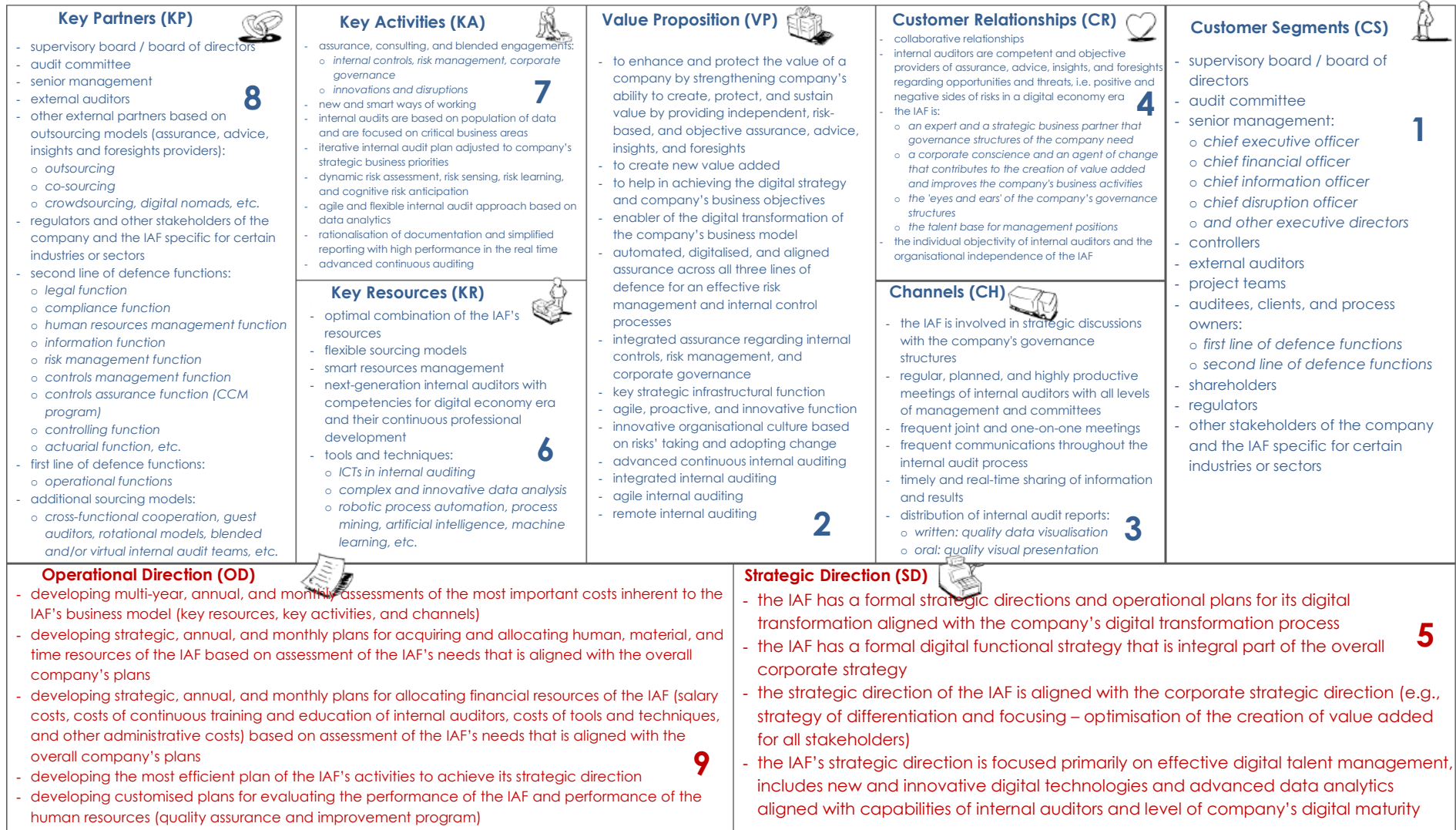
Figure A1
The Modified Business Model Canvas for the Internal Audit Function (IAF)

<p>Key Partners (KP)  8</p> <ul style="list-style-type: none"> - Who are the key partners of the IAF? - Which IAF's engagements are outsourced and in what extent? - Which key resources is the IAF acquiring from its partners? - How are internal audit teams formed and who are members of the team (insourced, outsourced, etc.)? - What is the attitude of the company's governance structure towards the IAF? 	<p>Key Activities (KA)  7</p> <ul style="list-style-type: none"> - Which key activities do the IAF's value propositions require? - Which key activities are necessary for adding value to the company and delivering the IAF's engagements' results to its stakeholders and for developing relationships with them? <p>Key Resources (KR)  6</p> <ul style="list-style-type: none"> - Which key resources do the IAF's value propositions require? - Which key IAF's resources are necessary for adding value to the company and delivering the IAF's engagements' results to its stakeholders and for developing relationships with them? 	<p>Value Proposition (VP)  2</p> <ul style="list-style-type: none"> - What values does the IAF delivers to its stakeholders? - Which one of stakeholders' problems, expectations and needs is the IAF helping to solve, satisfy and fulfil? - What bundles of 'products and services' or engagements is the IAF offering to each stakeholder? 	<p>Customer Relationships (CR)  4</p> <ul style="list-style-type: none"> - What type of relationships does the IAF establishes and maintains with each of its stakeholders and which ones they expect? - How are they integrated with the rest of the IAF's business model elements and how costly are they? <p>Channels (CH)  3</p> <ul style="list-style-type: none"> - What channels and digital platforms does the IAF uses, and which do IAF's stakeholders prefer and want to be reached through? - Which channels work best? - Which ones are most cost-efficient? How is the IAF integrating these channels with customer routines? 	<p>Customer Segments (CS)  1</p> <ul style="list-style-type: none"> - For whom is the IAF creating value? - Who are the most important IAF's stakeholders? - What are their needs and expectations for information and IAF's 'products and services' or engagements? - Have their needs and expectations changed since the start of the company's digital business transformation process?
<p>Operational Direction (OD)  9</p> <ul style="list-style-type: none"> - What are the most important costs inherent to the IAF's business model? - Which key resources, activities, and channels are most expensive? - What is and how to develop the best plan for acquiring and allocating human, material, and time resources of the IAF? - What is and how to develop the best plan for structuring and allocating the financial resources of the IAF? - How to develop the best plan of the IAF's activities? - How to develop the best plan for evaluating the performance of the IAF and performance of the human resources (quality assurance and improvement program)? 		<p>Strategic Direction (SD)  5</p> <ul style="list-style-type: none"> - Has the IAF formal strategic direction and operational plan for its digital transformation aligned with the company's digital transformation process? - Has the IAF formal digital functional strategy and is it integral part of the overall corporate strategy? - What is the strategic direction of the IAF – strategy of low-cost or cost leadership, strategy of differentiation and focusing, or something else? - What is the final value (added) that the IAF creates to its stakeholders? - Is the strategic direction of the IAF focused on effective digital talent management, does it include new and innovative digital technologies and advanced data analytics? 		

Source: Author's preparation and modification according to Osterwalder & Pigneur (2010, pp. 16-44)

Figure A2

The Modified Ideal or Next-Generation Internal Audit Function's (IAF's) Digital Business Model



Source: Author's preparation