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Business Model Canvas applied to institutional digital repositories

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ABSTRACT

Introduction: In the era of the knowledge economy, information management is a challenge for institutions regarding long-term digital preservation, metadata management, and copyright standards for open access. The DSpace repository was created for the management and dissemination of content produced by an institution; however, its implementation requires the involvement of various collaborators and task organization, which can be structured through a business model for complex organizational systems. **Objective:** To structure a Business Model Canvas for the digital repository of the Federal University of Vale do São Francisco. **Methodology:** A literature review was conducted on business models and the Business Model Canvas applied to digital repositories, along with an analysis of official documents from public agencies. For the practical execution of the research, the Business Model Canvas method was used, following these steps: 1) identification and understanding of the nine blocks that make up the method; 2) delimitation of the order of filling; 3) gathering of preliminary information; 4) comparison with models applied to digital repositories; 5) adaptation and application to the context of the RIU; 6) structuring of the RIU/Univasf Business Model Canvas. **Results:** The model is presented as a practical tool to clarify the proposal and understanding of the business, facilitating conceptual communication between managers and stakeholders. **Conclusion:** It is suggested that the structured Business Model Canvas for the Univasf digital repository be reapplied in the implementation process and validated in subsequent research.

KEYWORDS

Business management. Information management. Digital preservation. Digital repositories.

Modelo de Negócios Canvas aplicado a repositórios digitais institucionais

RESUMO

Introdução: Na era da economia do conhecimento, o gerenciamento da informação é um desafio para as instituições no que se refere à preservação digital a longo prazo, à gestão de metadados e às normas de direito autoral para acesso aberto. O repositório DSpace foi criado para gestão e difusão de conteúdos produzidos por uma instituição, porém, sua implementação exige atuação de diversos colaboradores e organização de tarefas, e pode ser estruturada por meio de um modelo de negócios para sistemas organizacionais complexos. **Objetivo:** Estruturar um Modelo de Negócios Canvas para o repositório digital da Universidade Federal do Vale do São Francisco. **Metodologia:** Foi

realizada uma revisão da literatura sobre modelo de negócios e *Business Model Canvas* aplicada a repositórios digitais e análise de documentos oficiais de órgãos públicos. Para execução prática da pesquisa, utilizou-se o método *Business Model Canvas*, seguindo-se as etapas: 1) identificação e compreensão dos nove blocos que compõem o método; 2) delimitação da ordem de preenchimento; 3) levantamento de informações prévias; 4) comparação com modelo aplicado a repositórios digitais; 5) adaptação e aplicação ao contexto do RIU; 6) estruturação do *Business Model Canvas* RIU/Univasf. **Resultados:** Apresenta-se o modelo como ferramenta prática para clarificar a proposta e o conhecimento do negócio, e facilitar a comunicação conceitual entre os gestores e *stakeholders*. **Conclusão:** Sugere-se que o Modelo de Negócios Canvas estruturado para o repositório digital da Univasf seja reaplicado no processo de implantação e validado em pesquisas posteriores.

PALAVRAS-CHAVE

Gestão de negócios. Gestão da informação. Preservação digital. Repositórios digitais.

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1 INTRODUCTION

The management and preservation of digital information is a constant challenge for organizations operating in different market niches, especially considering the successive advances in digital technologies for the generation and distribution of information content.

This scenario is particularly true for universities and research institutes, whose core activities generate a wide range of technical and scientific information that requires technological tools for storage, preservation, maintenance of content integrity and, above all, easy access. To this end, institutional digital repositories, which require a planned process for their implementation and execution, are a strategic alternative to meet this challenge.

In this paper, the case of the Federal University of the São Francisco Valley (Univasf) is presented to explore the use of the Canvas Business Model applied to the planning of institutional digital repositories. Univasf was created by Law No. 10,473 of June 27, 2002, to bring public higher education to the semi-arid region, operating in three states of the Northeast: Bahia, Pernambuco and Piauí. Although it is still a young institution, Univasf has a substantial academic output in undergraduate, graduate and postgraduate courses in both face-to-face and distance learning modalities.

As such, it is important to offer subsidies for the management and greater visibility of the university's production, both locally and nationally, made possible by the creation of a digital repository. In this sense, based on a study of the literature on business models and their applications, the aim is to structure a canvas business model for the Univasf Digital Repository (Repositório Digital da Univasf - RIU), helping in its implementation, management, and maintenance process.

2 LITERATURE REVIEW

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To understand the interrelationship between digital repositories and business models, it is important to survey the theoretical background of the topics that make it possible to structure the Canvas Business Model applied to repositories.

2.1 Digital Repositories

The global movement for open science, knowledge sharing and digital preservation is materialized through the technology of digital repositories. The digital repository is the tool that, in addition to connecting users to quality scholarly information produced by the academic community, prevents technological obsolescence by ensuring the use of information now and in the future through a set of long-term preservation policies, such as selecting the file format according to the digital object so that it is accessible today and suitable for future access or can be easily migrated. In other words, the repository service is concerned with the sustainability and long-term digital preservation of scholarly literature (Roy, 2021).

The Institutional Digital Repository System (DSpace) chosen for the deposit and sharing of scientific content at Univasf is based on the Open Archival Information System (OAIS) and Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) protocols, whose structure allows the registration of digital objects by including the collection, storage, retrieval of information and interoperability between information systems (Kuramoto, 2010).

In Brazil, the scientific information ecosystem has been achieved by institutions joining the DSpace repository and the integration between different institutional repositories through the Brazilian Portal of Scientific Publications and Data in Open Access (Oasisbr) of

the Brazilian Institute of Information in Science and Technology (Instituto Brasileiro de Informação em Ciência e Tecnologia - IBICT).

The documents available on the Open Access Scientific Publications Portal - oasisbr are automatically collected by the aggregator in Portugal, as well as by the Rede de Repositorios de Acceso Abierto a la Ciencia - LA Referencia. This network is made up of ten Latin American countries, and Brazil's scientific production currently accounts for 70% of the total documents available in this aggregator. Thus, it is the Latin American and European dissemination of Brazilian scientific production (Amaro, 2019, p. 24).

The digital repository is simple from an operational perspective, but when it is implemented within a university, which is a complex system, it requires the allocation of technical, financial, material and human resources, and the cooperation of different collaborators distributed over several campuses, highlighting the need for a business model for an open information system that covers all the requirements. In this sense, it is important to study the use of business models in different areas of organizations and activities, especially in a non-profit social context and with different perceptions of value, as is the case with institutional repositories in higher education institutions (HEIs).

2.2 Recent business model approaches applied to open information systems

In the era of the knowledge economy, where digital transformations operate the rules of how products and services should be delivered to users, new rationales are required to create value for customers, different from the industrial era, where the needs of those who consumed the products and services offered in the market were not considered (Teece, 2009; Silva, 2015). As a result, the advancement of information technologies and the opening of the global market have brought about changes in the paradigms of the business sector, leading companies (economic or social) to develop innovation strategies aimed at sustainability, adding both economic, social and environmental value to their business model. These changes are designed to meet the needs of a complex ecosystem that involves not only the end consumer, but also the specifications of government legislation, the participation of suppliers, the adoption of new technologies, and society as a whole.

In the area of public services, innovation has been consolidated with the implementation of digital technologies and through a series of regulations to make the data and information produced in public institutions and companies more transparent, through a Brazilian policy for open government, such as the Access to Information Law (Law No. 12,527/2011), the Open Data Policy (regulated by Decree No. 8,777/2016 and Decree No. 9,903/2019). Su et al. (2021) state that the integration of public services and digital technology for the application of innovation has become an important issue in the era of the digital economy, due to the transparency and also the economic value of data.

Thus, a business model for the provision of a digital repository system applied to higher education institutions meets both current expectations for the availability of transparent public services, where information is easily accessible through Internet search engines, and serves as an input for the development of new businesses in society. In this sense, Silva (2015) designed a business model for digital repositories, based on which the value proposition of the service is centered on digital preservation for the current and future use of information by users.

In more recent work on business models applied to big data with different stakeholders, including end users, the value proposition is mutual co-creation as a key element of the model, as it considers the needs and participation of stakeholders in the collaboration of

products and services, as noted by Su et al. (2021). Gyurka et al. (2019) confirm this thinking about innovation in public services, emphasizing that co-creation democratizes the process of creating new solutions by involving users in the identification of problems and specifications for solutions.

However, what characterizes a business model? In the literature, a business can also be understood as a system that aggregates different functions, and the model is the description of the future system. Therefore, the business model is defined, from the point of view of the creators Osterwalder and Pigneur, as "[...] the possibility of visualizing the description of the business, of the parts that make it up, in such a way that the idea about the business is understood by those who read it in the way that the owner of the model intended" (SEBRAE, 2013, p. 12). In this sense, a comprehensive view of the concept of business model brought by Silva (2015, p. 7), based on the idea of Osterwalder and Pigneur (2009), states that a business model "describes the logic of how an organization creates, delivers and captures value".

Therefore, the value proposition in the model concerns the delivery and capture of value. The way the offer is received by the customer is the delivery of value, and the feedback on how the customer perceives what is being delivered is the capture of value. In a context with multiple collaborators, the value proposition of products or services is based on co-creation, which "seeks the involvement of customers in the creation or development of products and services" (SEBRAE, 2013, p. 30).

For example, in the field of public health information platforms, value creation is built on effective interaction with the platform, and co-creation and sharing are emphasized as the value proposition of this online platform (Su et al., 2021). In the case of this study, which aims to gather information from different categories of stakeholders to structure a business model for a digital repository system at a public university, the Canvas Business Model emerges as a strategic resource that, through its established categories, provides requirements for communicating the intended model.

2.3 Business Model Canvas as a strategic tool for business models

The business model is a critical stage in entrepreneurship. It allows the entrepreneur and the team to understand what the company is and how it works at a macro level, and it allows them to locate, manage and evaluate the knowledge they have about the company.

Organizational knowledge is thus the basis for creating and feeding a business model with information that enables the implementation of a new business or the improvement of an existing one. It is the "[...] knowledge necessary for the operation of its processes and for achieving conformity of products and services" (ABNT, 2015. p. 8). To stimulate organizational knowledge and encourage creativity and the generation of new ideas for business models, authors point to the use of design thinking techniques in organizations.

According to Orofino (2011, p. 90), "Design Thinking is considered a tool for knowledge creation, as it can be an ally in solving complex problems and an agent of change that makes it possible to understand current global challenges". The author lists Design Thinking techniques and methods that enable the generation of organizational knowledge for business models, such as brainstorming (meeting with people from different backgrounds to enhance creativity, brainstorming); Crowdsourcing (participatory design, identifying collaborative environments for collective learning); Ideation (creative process of ideas); Empathy Map (empathy map, understanding customer behavior, concerns, and aspirations); Customer Insights (thinking about the business from the customer's perspective); Visual Thinking (expressing ideas through drawing) (Orofino, 2011). All of these techniques provide an understanding of what is desired for the business, thus enabling the creation of a business model that can guide its implementation.

The Business Model Canvas is in line with the strategy of visual thinking, since its main objective is to represent on a single chart the planning of a company, its entire business and the ways to make it happen, and to allow this chart to be tested, evaluated and redesigned according to the needs of the company.

The Business Model Canvas has emerged as an innovation in entrepreneurship and business modeling. This strategy was developed by Osterwalder and Pigneur (2011) as a tool for describing, analyzing and designing business models, both for companies that want to create a new market, making it possible to assess its feasibility of implementation, and for those that want to operate in markets that are already established but not satisfactorily served, and need to reformulate their structure to serve customers.

The tool aims to make it easier for everyone to visualize and understand the business, and to support the innovation process so that entrepreneurs can develop and test new opportunities for their business. According to Murray and Scuotto (2015), it is a way to map the entrepreneur's journey, focusing on the key aspects of their own business. By using the canvas business model, entrepreneurs tend to be more responsive to market changes and become market-oriented entrepreneurs, which contributes to business success.

The Chart is a free space to imagine the future business creatively, allowing them to think up innovations that can create a unique Value Proposition. From this visual map of the business, the entrepreneur is invited to validate these hypotheses with clients. Only after the uncertainties have been reduced by validating the hypotheses is the Business Model defined which would be the input for planning and execution (SEBRAE, 2013, p.11).

Osterwalder and Pigneur (2011) established nine categories of information to think about and record visually when composing a business model using the Canvas tool:

Chart 1. Categories of information for the Business Model Canvas

<i>BUSINESS MODEL Canvas</i>	
Value Proposition	What does the business have to offer the customer? The essence of the business, what will solve problems and meet customer needs.
Customer Segments	Who is the business aimed at? People, organizations, etc., who may be interested in the business or who the business wants to reach.
Channels	How will the business reach the customer? Means of communicating with the client, publicizing and selling the business.
Customer Relations	What strategies will be used to win over the customer? Establishing a relationship with each customer segment, offering advantages and benefits that they will gain by purchasing or using the business.
Key Activities	What will it take to get the business up and running? Describe the main activities for running the business.
Key Partnerships	Who makes it possible to run the business? List the suppliers and employees responsible for the business activities.
Key Resources	What elements are needed to run the business? List material, human, and infrastructure resources.
Revenue Sources	How will the business generate income from clients? List ways of generating income and what will be paid by the different customer segments.

Cost Structure	What will be spent on running the business? A description of the costs involved in running the business.
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Source: Own elaboration, based on Osterwalder and Pigneur (2011)

For Osterwalder and Pigneur (2011), value creation is the essence of innovation. **A value proposition is more than the product or service**, it is the soul of the company, the difference that is offered to the customer and allows them to be satisfied. This value can be reflected in innovation, a differentiated form of service, accessibility, personalization of products and services, among others. Defining the value proposition of a business is not always an easy task, especially when the business is not based on financial motivations. In this value definition step, organizational knowledge and the use of design thinking techniques to enable this knowledge become fundamental.

Based on the company's value proposition, a company may target a specific audience or different types of customers. To plan how to serve and deliver products and services, it is necessary to identify all possible customer segments and market niches that exist for the company. **Identifying customer segments also becomes an important basis for defining how to bring the product or service to them, i.e., establishing channels**, which are ways of communicating, presenting the value of the company, evaluating the customer, providing support, etc. All these channels connect the company to its customers and strengthen the relationship with them.

This relationship is one of the main points for maintaining the business, and it is essential to define how the relationship with the customer will be or how it will be improved. The service will be direct or indirect, personal or computerized, and these choices will affect whether the customer remains interested, consumes, and uses the product or service. Maintaining a good relationship avoids choosing the competition over your business; it creates customer loyalty, and this is made possible through relationship strategies by offering a service of unparalleled quality, benefits, and advantages that cannot be found elsewhere. Customers need to feel a part of the business.

Once you know the value of your company, your customers and how to reach them, it is important to define the activities that the company carries out in order to be fully functional, the key activities that are carried out in the company and that allow it to be competitive in the market.

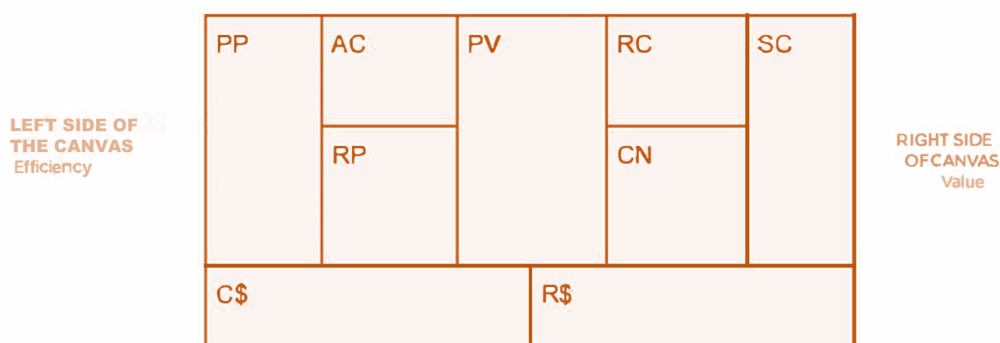
Carrying out these activities requires a team, whether internal or external, suppliers, employees, people, or groups of people who are responsible for all or part of the business. Partnerships are important to save resources, reduce risks and share knowledge (Osterwalder; Pigneur, 2011).

Every business needs resources, be they financial, material or human, which drive the business and allow the team involved to carry out its actions. **All these resources have to be listed, and their costs have to be delimited**, creating the cost structure of the business, which reflects the viability and sustainability of the proposed model. **How the business will generate profit, where the financial resources** will come from in terms of customer relationships, how the business will be charged, are also essential decisions in this process, which includes pricing and measuring profit. Some possible sources of revenue mentioned in the authors' proposal are direct sales, subscription fees, rentals, etc.

In order to visually represent all the points discussed, the authors propose a chart divided into nine blocks, strategically grouped to correlate the elements that make up the business structure:

Figure 1. Business Model Canvas chart

Figure 1. Business Model Canvas chart



Source: Osterwalder and Pigneur (2011). PV (value proposition), SC (customer segments), CN (channels), RC (customer relationships), AC (key activities), PP (key partnerships), RP (key resources), C\$ (cost structure), R\$ (revenue sources).

The authors focus on the value proposition as the foundation of the entire model and the essence of the business. The right side of the chart represents the relationship with the customer and the market as the reason for all the value the company proposes; the left side represents the infrastructure needed for the business to function efficiently. The chart aims for a systemic view of the business, understanding the whole through analysis and interaction of the parts.

Possible uses of the canvas model include: 1) establishing current and future business planning; 2) illustrating how the business makes financial sense; 3) making the transition from business to market change; 4) designing and aligning employees, showing their role and enabling them to broaden their vision of the business; 5) personal assessment as a professional to operate in the market; 6) transforming plans into executable processes; 7) capturing ideas and solutions for projects, among others (Osterwalder; Pigneur, 2011).

The practicality and simplicity of the Canvas business model tool, as well as its generic nature, allow it to be applied to a wide range of markets, even those not directly oriented to financial profit, such as social enterprises that work with symbolic values, as pointed out by Carter and Carter (2020), who analyzed the possibility of applying the model to the art market. For Osterwalder and Pigneur (2011, p. 264), "the application of Canvas is by no means limited to for-profit companies. It can easily be applied to nonprofit organizations, charities, public sector entities, and charitable social enterprises."

Qastharin (2015) reinforces that the business model leads the company to innovation, and it's no different for the social enterprise, as all organizations seek to generate some kind of revenue to support their activities, with only different entrepreneurial characteristics. For the author, the only difference between a traditional commercial enterprise and a social enterprise is the focus of the organization, which is on causes and services that have an impact on society.

Social enterprises or non-financially motivated projects that want to use the Canvas Business Model may find it difficult to identify certain points in the chart, such as the value of the proposal and information related to financial resources. To meet this need, many authors have raised the possibility of adapting the Canvas to meet the requirements of companies in different segments, such as Sparviero (2019), who presents a proposal for an adaptation aimed at social enterprises, the Social Enterprise Model Canvas.

Regardless of the company's objectives and name, the creation of a diagram model such as the Canvas allows the company to be defined, organized, and innovated, as well as directing actions for implementation. In this sense, the tool is considered strategic for use in the most diverse types of projects that require planning, such as the implementation of digital

repositories, as observed in the research by Silva (2015), in which there are initial guidelines for composing a Canvas business model for digital repositories.

In the words of Silva (2015), digital repositories aim to address the challenge of data management by making it accessible to the interested community through the planning and implementation of information preservation and management strategies. Digital repositories, as platforms that contain and make available information, need to determine what kind of information and access they will provide as value to their client public, who will be able to access the information, what the infrastructure and basic resources will be for its implementation and maintenance in a network. We therefore propose to present the structure of the Business Model Canvas by Osterwalder and Pigneur (2011), applied to the planning of digital repositories.

3 METHODOLOGY

To design the study, a literature review of business models and the Business Model Canvas was conducted with an eye toward their application to digital repositories. Document analysis was also used to examine the university's policies for implementing the repository.

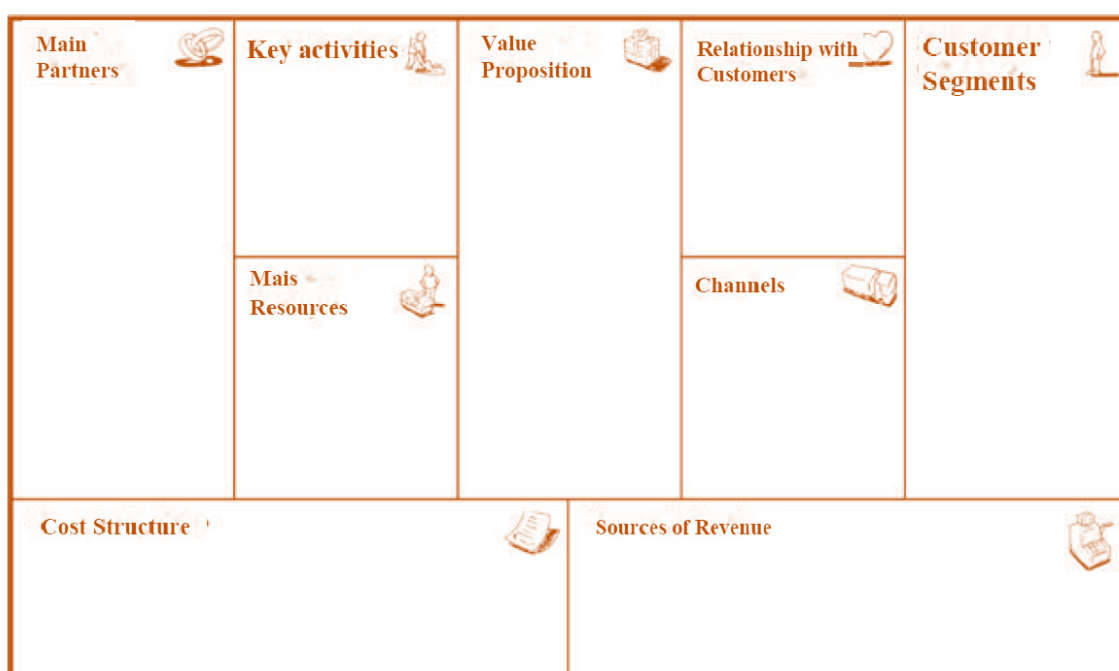
The research on the application of the Business Model Canvas to digital repositories is still in its infancy. So far, the work of Silva (2015) has been identified, which served as a basis for expanding the information on the Business Model Canvas methodology for business models in digital information services.

In the context of this research, we have the Institutional Repository of the Universidade Federal do Vale do São Francisco (RIU/Univasf), currently being implemented, which is an open access database designed to collect, store, organize, preserve and disseminate, in a single place, the academic production (technical-scientific, artistic and cultural) generated in digital format by teachers, technical-administrative staff and students of the institution (UNIVASF, 2018). This tool was chosen because two of the authors, as professional librarians, coordinated the working group that created this repository.

To carry out the research in practice, the Business Model Canvas method of Osterwalder and Pigneur (2011) was used, along with the proposal of Silva (2015), which brings specific approaches to the field of digital repositories. The following steps were taken:

1. Identification and understanding of the 9 (nine) blocks that constitute the Business Model Canvas by Osterwalder and Pigneur (2011), as well as the relevance of their arrangement for the correlation of business information:

Figure 2. Composition of the *Business Model Canvas*



Source: Osterwalder e Pigneur (2011)

1. Define the order of completion to guide the collection of information and organizational knowledge. The blocks were completed based on an understanding of the literature as follows: Value Proposition, Customer Segments, Channels, Customer Relationships, Key Activities, Key Partnerships, Key Resources, Revenue Sources, and Cost Structure.
2. Gather preliminary information for the blocks of the business model canvas from the digital repository being explored.
3. Compare the information gathered with the generic BMC model for digital repositories by Silva (2015).
4. Organizational knowledge, adaptation, and application of the information to the RIU/Univasf context.
5. Fill in the corresponding blocks and create the RIU/Univasf business model canvas.

Based on these stages, it was possible to present the Business Model Canvas in the context of the implementation and operation of an institutional repository, as presented in the following section.

4 RESULTS AND DISCUSSION

After triangulating data from different sources, the information about collaborators, their activities, and functions, summarized in Chart 2, was systematized in an institutional digital repository in the context of a university, such as Univasf.

Chart 2. Relationship between collaborators and digital repository

Employees	Categories	Interests	Features
Users	Students Teachers Technicians General public	Deposit and access to quality information produced by research programs	Platform for the storage and dissemination of information with the provision of statistical indicators
Administration Professionals	IT analysts Librarians	Technical customization to adapt the tool Maintaining and providing an environment for hosting the server and taking information security measures Managing the platform and preparing tutorials and rules for use	To meet user demands regarding the publication and retrieval of research results
Distribution Users	Dean's Offices Training Division	Approving open access policies and rules for using the tool Promote professional training and qualification	
Professionals	Lyrasis, in collaboration with the Brazilian Institute of Information on Science and Technology (IBICT)	Promote the DSpace software in Brazil, responsible for the basic customization of the tool for implementation in teaching and research institutions	Integrate local information into a national and international system network

Source: Adapted from Su *et al.* (2021)

The chart depicts organizational knowledge within the repository, an overview of how the business is perceived by managers, recognizing its main components, which represents the initial basis for composing a business model.

4.1 Organization of Univasf's Digital Repository

The digital repository has, among other purposes, the function of providing scholarly visibility and ensuring the accessibility of productions over time. RIU Univasf is currently being implemented by a Working Group (WG) made up of staff from the Integrated Library System and the institution's Information Technology Department to guide innovations in digital preservation, open access, data management and curation.

The platform aims to preserve the memory of the institution's scholarly production; disseminate Univasf's technical-scientific, artistic and cultural production published in different communication channels; increase the visibility of Univasf's intellectual production; provide reliable statistical information on the intellectual production deposited and accessed in the RIU; and contribute to the integration of systems that adopt norms and standards from the Open

Access model, at national and international levels, for the dissemination of publicly accessible knowledge (UNIVASF, 2018).

The implementation of this information environment requires a software structure and an information architecture of a specific operational nature for the preservation of digital objects, with functions for the capture, distribution, and preservation of intellectual production, as well as for the customization, management, and data load migration phases. The software used is DSpace (a joint project of the MIT Libraries and the Hewlett-Packard Company - HP), provided free of charge by the Lyrasis Foundation. Free, open-access software uses Dublin Core metadata and provides the information architecture necessary to build these platforms.

The architecture of the repository is structured into communities (campuses), sub-communities (courses) and collections (types of documents) to facilitate visibility and access to the documents deposited in RIU Univasf.

Considering the ongoing implementation process, it is essential to structure a business model that makes it possible to think about organizational knowledge, evaluate and rethink the actions already carried out, and guide the progress of the process based on the established model.

Digital repositories represent an innovation in the way scholarly information is communicated and managed. Silva (2015, p. 42) points out that "the value proposition of digital repositories can be as vast as the benefits they offer to their users." When it comes to the RIU in the university context, the essence of this tool can be highlighted as the preservation and dissemination of institutional production.

This value is aimed at the internal customer segment, the academic community itself, which is responsible for feeding its productions into the platform. This audience has a unified, long-term means of storing their publications with integrity and reliability, which, when made accessible, increases the visibility of the university and its members. This benefit is significant because it bridges the gap between the university and society, which becomes aware of what is being produced by the public institution in terms of teaching, research, and community outreach activities.

Another value of digital repositories such as RIU is the possibility of open access to academic and scholarly productions for the general community. Although there are still some confidentiality and privacy parameters on the platform, publications in various fields should be freely accessible, free of charge and in digital form.

One of the main challenges in managing the repository is certainly the relationship with the customer (internal community), precisely because the self-archiving policy is dominant in its business model. More than ever, the customer must feel part of the company and responsible for providing it with the information and content that make up its value proposition. An initial and ongoing process of raising awareness and explaining the value, objectives, and activities of the digital repository to the customer is necessary to ensure collaboration in its full operation.

In this sense, the establishment of communication channels and forms of relationship with the internal and external community becomes a crucial stage. As far as the RIU is concerned, all institutional channels (portals, emails, social networks, etc.) should be used to make the public aware of the existence and implementation of the platform. Lectures and training sessions should be included in the implementation phases to raise awareness of the importance of self-archiving publications produced by teachers, students and technicians, and to provide guidance on the standards for using the repository. In addition, providing ongoing technical assistance and support, guaranteeing the credibility and integrity of the deposited publications, making educational content available, and providing ongoing indicators and data for institutional management are strategies for strengthening the relationship with the digital repository's user community.

As a technological innovation in information, the RIU requires a multidisciplinary team for its structuring, involving information professionals, information and communication technology professionals, and members of the institutional management in teaching and research who have knowledge of information, data management, open access, open archives, and web systems. The partner's technical team is responsible for the installation, customization, and maintenance of the repository at the institution. Other business activities include the creation of metadata for documents (journal articles, books, theses, dissertations, etc.) and policies for operations, preservation, repository populating, storage permissions, and copyright.

Human resources are one of the key points for the smooth running of the repository at the university, as it requires the support of senior management and the technical expertise of technology professionals for practical implementation. Without these pillars, there can be no efficient implementation and management of digital repositories. Another basic resource is a network, software, and Internet infrastructure that can host the platform. Since this is a non-profit project with a social focus, the financial resources associated with the RIU, and university repositories in general, come from the institution itself and from government agencies that fund teaching, research, and extension.

The costs are divided into: initial costs (installation of the software on the Univasf server, customization of the IT languages, training, and qualification of human resources, especially the IT staff); implementation costs (convincing interested communities, technical support for the project and support for users, mediated deposit of content and migration of content from other systems); and future costs (maintenance, information security, digital preservation and migration of content from other systems).

In this sense, based on the above and the literature analyzed, the result of applying the Business Model Canvas to the RIU Univasf Digital Repository is systematized in Chart 3:

Chart 3 . Modelo de Negócios Canvas Repositório Digital - RIU Univasf

Sharing Models of Repositories Curated by Open Access Journals					
Main partnerships	Key activities	Value Proposition	Customer relations	Customer segments	
<ul style="list-style-type: none">-University academic community-Teaching and research managers, course Coordinators-Librarians and Library System staff-Information Technology Department-Journal editors-Specialized software providers (IBICT)- Repository networks	<ul style="list-style-type: none">-Install free software to manage repositories-Storing and managing data-Reviewing, editing and validating metadata-Drawing up digital preservation plans for academic, artistic and cultural memory	<ul style="list-style-type: none">-Long-term preservation of institutional production in a single location-Open and free access to academic productions-Dissemination and visibility of the university, researchers and their scientific, artistic and cultural productions	<ul style="list-style-type: none">-Technical support and training in the use of the platform-Provision of production indicatorsSelf-archiving service-Tutorials and instructional videos-Protection of intellectual property-Centralized portal for books, articles, etc.-Protocol for publishing documents and interoperability-Intellectual Integrity-Librarian assistance	<ul style="list-style-type: none">-Univasf academic community-Teachers-Researchers-Students-Administrative technicians-Course coordinators-Teaching and research managers-Community in general	
	Key features		Channels		
	<ul style="list-style-type: none">-Human resources (information and IT professionals)-Specialized software-Internet server-Academic production-Room, computers, furniture-Training-Technical maintenance		<ul style="list-style-type: none">-Institutional website-Repository portal-Institutional e-mail-Repository e-mail-Library System social networks-Lectures/ trainings		
	Cost Structure		Sources of income		

-Hiring instructors to train the team	-Institutional resources
-Paying staff and scholarship holders	-Ministry of Education (MEC)
-Updating and maintaining the software	-Research and government funding agencies
- Data storage/server	
-Paying for energy, water, internet, and server environment (fixed costs)	

Fonte: Dados da pesquisa (2023)

Based on the planning of the Canvas model, the following actions have already been developed for the implementation of RIU Univasf:

- **Value Proposition:** a transparent system that supports the collection, curation, and reuse of institutional production.
- **Key partnerships:** the Office of the Dean of Personnel Management for annual training for library staff and IT analysts; the Information Technology Department for technical maintenance of the DSpace *software*; and external collaborators, DSpace specialists and the Northeast Repositories Network (RENERE) with study groups on digital collection management, institutional repositories, research data and DSpace for IT staff.
- **Key activities:** action plan and execution of the project; reinforcement of the training of the professionals involved; preparation of the server for installation and parameterization of DSpace; translation of warning notifications; integration between DSpace and the institutional network for registration of new users and with the Oasisbr Portal for the collection of Univasf data; validation of processes and administrative tasks for archiving and for access to collections; preparation of tutorials for users; availability of the *website*¹.
- **Main resources:** 4 (four) librarians; 3 (three) information technology professionals and 1 (one) administration assistant; 1 production and homologation server.
- **Cost structure:** own institutional funding.
- **Sources of income:** funds from the Federal Government for Univasf's People Development Program (PDP).
- **Customer relations:** management and digital curation service; persistent identifier for locating the publication on the internet.
- **Customer segments:** provide a repository to aggregate the publications of the communities (postgraduate programs, graduate courses, research groups, extension projects) linked to Univasf.
- **Channels:** *website* and institutional *e-mail* for the repository.

The activities planned based on the organization of the Canvas business model have been worked on by the group implementing the repository. Meanwhile, some difficulties related to customizing the DSpace *software* to a more up-to-date version have delayed making the tool available to the community. The repository is currently undergoing final adjustments for proper dissemination and use by the academic community.

Another important process, which has not yet been carried out and which also presented difficulties, was the migration of data for the purpose of automatically loading materials from

¹ <https://repositorio.univasf.edu.br/>

other systems in operation at the institution to feed the RIU, such as the Pergamum *software*, already used by the SIBI.

In addition to these obstacles, it is important to highlight the lack of commitment for the university's administration and some sectors, such as the undergraduate and graduate from Dean's Offices, to prioritize the implementation of the RIU as an important institutional service. On the other hand, there was no presentation of the Canva model to Univasf's senior management to raise awareness of the need to transform the repository proposal into a new university library service with the allocation of financial resources for information management. This is a recognized limitation, which will be mitigated in the study by presenting the benefits of the tool to management to give greater visibility to institutional production, but which brings costs in the form of investments to streamline processes for uploading data on local publications, curatorial activities, and specialized technical maintenance for the information service (Lavoie, 2022).

Bryant *et al.* (2021) and Boté-Vericad *et al.* (2024) have recommended institutional investment in digital curation as one of the future directions of research in academic repositories, as it supports the collection, transparency, access, reuse, and use of persistent digital identifiers that are very useful in the environment made up of many information networks. Acquisition of digital identifiers such as the *Digital Object Identifier (DOI)* for publications and the *Open Researcher and Contributor ID (ORCID)* for researchers, organizations, etc. make their data easily machine-readable, interoperable between systems and validate the identification of authorship, avoiding the manual work of entering metadata by users and library staff, which are prone to errors.

Finally, it is known that Brazilian universities, like Univasf, have faced recurrent budget cuts, which have weakened their mission to democratize knowledge in open access, however, the provision of qualified data and information requires institutional investment.

5 CONCLUSION

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The Canvas Business Model, structured for the digital repository, was applied in the process of implementing Univasf's institutional repository and made it possible to develop the actions needed to identify the internal strengths, carry out a detailed analysis of the opportunities and solve the central problems and capture the business value for the new information service venture.

The application of the Canvas model made it possible to validate it as a useful tool for obtaining information on evaluating the new business, as well as clarifying the proposal and the knowledge of the business for the group of entrepreneurs, particularly those involved in implementing and managing the repository. It is recommended that the Canva business model be used in the conceptual communication of the proposal to the *stakeholders* to increase the likelihood of understanding about the venture among the partners.

The next phase is to replicate the model for the problem of low self-deposit rates and automatic metadata migration.

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