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ORIGINAL

Open innovation to accelerate the adoption of artificial intelligence in the financial services industry

Innovación abierta para acelerar la adopción de inteligencia artificial en la industria de servicios financieros

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ABSTRACT

This case report examines the implementation of an open innovation program in a software development company, focusing on accelerating artificial intelligence adoption through strategic collaboration with startups. The situational analysis identifies the challenges faced by technology companies in sustaining the rapid pace of innovation driven by exponential technological growth and increasing competition. To address these challenges, several strategies are outlined in action plans aimed at enhancing artificial intelligence adoption and promoting open innovation in both product and process dimensions. The conclusion highlights that the synergy between open innovation and artificial intelligence presents an opportunity to establish a sustainable competitive advantage for financial services companies that embrace it.

Keywords: Open Innovation; Artificial Intelligence; Financial Services; Collaboration with Start-Ups; Technological Entrepreneurship.

RESUMEN

El presente reporte de caso explora la implementación de un programa de innovación abierta en una empresa de desarrollo de soluciones de software, con el objetivo de acelerar la adopción de inteligencia artificial a través de la colaboración efectiva con empresas emergentes (startups). El análisis de la situación permite determinar que las empresas tecnológicas experimentan dificultades para sostener el ritmo de innovación que demanda el crecimiento exponencial de la tecnología en un entorno cada vez más competitivo. En esta línea, se proponen distintas estrategias enmarcadas en planes de acción dispuestos para potenciar la utilización de la inteligencia artificial, de forma tal que permitan innovar abiertamente en las dimensiones de producto y proceso. La conclusión identifica que la sinergia entre innovación abierta e inteligencia artificial brinda la oportunidad de generar una ventaja competitiva sostenible para las empresas de la industria de servicios financieros que la adoptan.

Palabras clave: Innovación Abierta; Inteligencia Artificial; Servicios Financieros; Colaboración con Startups; Emprendimiento Tecnológico.

INTRODUCTION

The purpose of this case report is to propose an open innovation process for the company Santex so that, through collaboration with a startup, it can apply artificial intelligence to enhance the solutions it provides to its client Temenos. Achieving this goal requires providing this case report with a clear institutional framework on the key players that make up the Santex-startup-client relationship.

Santex is a technology-based company founded in the United States more than 20 years ago, which works closely with its customers to develop software solutions that enable them to achieve the digital transformation of their organizations. Committed to a massive transformation that proposes digital transformation to grow, connect, and scale, it aims to achieve the growth of its customers' businesses by taking advantage of the opportunities generated by the exponential growth of technology. To carry this out, the company operates with a strong people focus, developing a firm commitment to sustainability in its various dimensions: environmental, socioeconomic, and social.[1]

At the strategic level, it is important to highlight the importance of adopting artificial intelligence in the solutions they develop, for which they carry out research processes in partnership with other organizations. Likewise, another relevant objective is the process of internationalization towards emerging markets, including the Argentine market, from where it provides services to its global clients.[1]

In terms of organization, the adoption of a holacratic model ensures high levels of agility by allowing decisions to be made in a decentralized manner. The advantage conferred by this form of organization must be accompanied by technical excellence as a key value, without losing sight of the fact that it must be complemented by knowledge of technological architecture and project management in order to achieve customer satisfaction.[1]

Temenos, for its part, is a manufacturer of solutions for the financial industry. Its Engage product is designed to build customer relationships through conversations in a digital solution that integrates with banking platforms. Rodrigo Silva, Executive Vice President of Temenos for the Americas, believes that financial services companies must "invest significantly in next-generation tools, especially artificial intelligence (AI)".[2] Given market demand, Temenos faces the challenge of accelerating the adoption curve, a situation that is in line with the strategic objective of Santex, its technology solutions provider.

Finally, the startup Rocking Data, which specializes in artificial intelligence and machine learning, completes the list of key players in the proposed open innovation process. In this regard, it has an innovative profile and experience in the financial services industry, where it has provided various solutions to solve business problems aimed at reducing costs and extending the average customer lifecycle. In this sense, the organization shares a culture of collaboration with the other parties involved, a differentiating factor in achieving the results expected by the intervention plan.

Brief description of the problem

The massive emergence and exponential growth of artificial intelligence on the technology scene is a challenge for organizations such as Santex. This dynamic is occurring because financial services companies such as Temenos demand increasingly faster and more flexible responses to cope with an environment that can be characterized as volatile, uncertain, complex, and ambiguous.[3]

It is important to note that the high demand for solutions enriched with functionalities that use artificial intelligence requires constant evolution, which makes it difficult to keep pace with innovation. In this context, open innovation appears as an opportunity to establish new knowledge flows that will enable Santex to enhance its innovative capacity in this domain.

In line with the opportunity identified above, the creation of a strategic alliance with Rocking Data, a startup specializing in artificial intelligence, gives Santex the opportunity to enhance its open innovation processes while improving the products and services it offers to its customers in the financial services industry. The proposed path is not without problems and new challenges arising, among other causes, from the complexity of the resulting process and the potentially asymmetrical relationships that could be established between the participants.[4]

Background Summary

The association between open innovation and artificial intelligence has the potential to be synergistic and to adopt different perspectives. First, open innovation is relevant for "many organizations that lack the internal capacity, resources, and expertise to develop new innovations in artificial intelligence, so it will be crucial for them to leverage external resources and expertise through collaboration".[5] This view recognizes its viability for accelerating the adoption of artificial intelligence within a model characterized as "inside-out"[6] where external knowledge is incorporated into a company's value chain.

Second, artificial intelligence can contribute to improving open innovation processes by providing strong support in: "specifying the problem, developing a search algorithm, considering and elaborating matches, finding innovators and integrating them, and adapting incentive mechanisms and metrics to balance risk and reward".[5] In this case, the objective is no longer to achieve open innovation in a product or service by incorporating artificial intelligence, but rather to optimize the open innovation process through artificial intelligence with generative capacity.

The concepts outlined above outline that this case proposes working on an open innovation process in two

categories: product or service innovation, on the one hand, and process innovation, on the other.[7] In summary, the first case considers innovations to Temenos' Engage product in an open way. In the second, it discusses how the use of generative artificial intelligence brings improvements to the open innovation process.

Relevance of the case

The case analysis recognizes the importance of open innovation flows for technology-based companies as a way to face the high competitiveness of the sector and accelerate innovation in emerging technologies. Along these lines, it describes how open innovation processes can generate more value for customers, becoming an advantage to accelerate the implementation of artificial intelligence in financial products and services. It focuses on analyzing the various challenges and issues faced when developing a program of this type, proposing an intervention plan that ensures valuable implementation for all involved (Santex, a startup specializing in artificial intelligence, and its financial services client, Temenos). Additionally, it explores the opportunities that generative artificial intelligence offers for improving the open innovation process and enhancing the results obtained.

METHOD

Description of the situation

One of Santex's strategic objectives is to develop new capabilities in the field of artificial intelligence, integrating it into its internal processes and the solutions it implements for its clients. For Juan Santiago, CEO of Santex, artificial intelligence plays a leading role in his business strategy due to its disruptive capacity

disruptive nature, while also highlighting the need to always keep ethics in mind when discussing how or why artificial intelligence will be used.[8] This ambitious strategic objective is leveraged by growing customer demand for the advantages of artificial intelligence models applied to their respective value chains. In this regard, it is worth noting that Santex has launched an artificial intelligence laboratory[9] to work on research and development, as well as promoting integration with the entrepreneurial ecosystem through partnerships with various key players.

It is important to consider that the constant acceleration in the evolution of artificial intelligence means that companies must explore alternatives for collaboration outside their organizational boundaries with other specialized technology companies, through the use of open innovation. This is done to accelerate knowledge capture and achieve positioning in this relevant area, which cannot wait for the time needed to train increasingly specialized talent and requires heavy investment in infrastructure for processing large volumes of data. In addition to these internal factors, other external challenges arise related to the need to respond to the consolidation of the presence of large players at the global level, along with growing regulations and ethical concerns about the use of artificial intelligence.

In the case of financial services, the industry has not been exempt from experiencing growth in demand for artificial intelligence solutions to help improve activities in various segments of its value chain. Currently, the adoption of AI-based solutions has become widespread in back-office operations, middle-office operations monitoring, and front-office customer service.[10]

In recent years, machine learning-based implementations have become popular. These consist of predicting key behaviors and variables by drawing "conclusions from the statistical analysis of the data entered, through a process that automatically improves as more evidence is incorporated into the algorithm".[10] This predictive and machine learning capability has made it possible to respond to various key industry needs associated with improving efficiency, strengthening customer service, reducing risk, and increasing compliance with various policies and regulations in a highly regulated industry.

The contextual aspects and trends identified apply to the business environment of the Engage product, owned by Temenos, a solution that supports the part of the value chain that serves customers (front office). In this regard, Santex's strategic direction in relation to its desired positioning in the field of artificial intelligence has been preliminarily established, which is aligned with Temenos' objectives for the evolution of its product.

Context analysis

The PESTEL tool will be used to analyze the context of the Santex organization, which consists of evaluating political, economic, legal, social, technological, and environmental factors.

Political factors

- Political instability and the absence of stable and convergent public policies at different levels of government (national, provincial, local).
- Existence of political guidelines that propose a growing deregulatory impulse in different aspects of business and entrepreneurial activity.
- Promotion of changes in regulations and working conditions for the technology sector, with increasing conflict and judicialization of these changes.

- Proliferation of projects to regulate digital platforms and ecosystems.
- Slowdown in incentive policies and subsidies for technological innovation.
- Discussion of government control projects on internet access (at the international and national levels).

Economic factors

- Macroeconomic imbalances that hinder the realization of medium- and long-term investment opportunities (expectations regarding inflation and exchange rate fluctuations).
- Growing interest in venture capital investments in technology startups.
- Shortage and difficulty in retaining specialized talent.
- Increasing salaries for critical specialists and internationalization of tech profiles, leading to competition with professional services provided abroad.
- Subsidies and tax incentives for technology companies.

Social factors

- Integration of technology into everyday life, with widespread adoption of social media and collaborative economies.
- Ubiquitous access to connectivity and mobility.
- Dissemination and promotion of a culture of innovation and technological entrepreneurship.
- Growth in demand for personalized services.
- Consolidation of remote working or hybrid models that facilitate internationalization.
- Widespread adoption of interdisciplinary and diverse work approaches.
- Greater concern or awareness about privacy and personal data protection.
- Greater concern or awareness about the sustainability of technology services.

Technological factors

- Strong impetus to accelerate digitization in companies (post-pandemic).
- Widespread adoption of software as a service (SaaS) and cloud services.
- Exponential progress in artificial intelligence, mainly through the popularization of generative models and machine learning.
- Lower costs and increased capabilities for data storage, processing, and exploitation (Big Data) for decision-making.
- Increase in devices connected to the internet (Internet of Things) that enable data collection to understand behavior and improve services.
- Strong interest and improvement in user interfaces (UI) and user experience (UX) in technological solutions.
- Professionalization and strong adoption of cybersecurity practices due to the global increase in cyberattacks.

Ecological factors

- Increased energy consumption for data center infrastructure used by cloud services.
- Interest in extending product lifespans and circular economies.
- Concern among companies about covering their carbon footprint (carbon neutrality).
- Support for Corporate Social Responsibility focused on sustainability.
- Strong drive for innovation for sustainability.

Legal factors

- Growing international regulation of artificial intelligence on bias and algorithmic transparency.
- Introduction of the first regulatory law on artificial intelligence by the European Community, which establishes the protection of basic human rights related to facial identification, biases, and the risks posed by its use.
- Regulations of the Central Bank of the Argentine Republic (BCRA) imposing controls on artificial intelligence in financial services to prevent risks and biases (Communication A7724/2024 BCRA).
- Privacy and data protection laws, and legal restrictions on storing personal data abroad (Law 25.326).
- Disputes over the intellectual property of creations made with artificial intelligence, with bills pending to provide protection for creations assisted by AI.

Organizational diagnosis

Santex's organizational diagnosis includes the identification of strengths and weaknesses (internal), along with opportunities and threats (external), which will be considered for maximization (strengths and opportunities) and minimization (weaknesses and threats) in the design of the proposed intervention plan.

Weaknesses (internal analysis)

- Low diversification of services and industries, with clients mainly located in the financial services and healthcare segments.
- Difficulties in sustaining the pace of innovation in the face of exponential technological acceleration.
- Strong dependence on core of business from highly specialized highly specialized resources.
- Difficulties in retaining talent in a highly competitive market due to high demand.
- High cost of internal research and development, which requires intensive capital investment in technological infrastructure.

Strengths (internal analysis)

- Declaration of a massive transformation purpose to align organizational behavior.
- More than 20 years of experience in the market, achieving a position as technology experts.
- Entrepreneurial and innovative spirit with the ability to tackle major challenges.
- Ability to collaborate with clients from leading global brands and partnerships with institutions in the entrepreneurial ecosystem.
- Passion and innovation as drivers of its actions, made up of professionals with a global and multicultural orientation.
- Holacratic organizational structure that allows for more agile decision-making.
- Research capabilities in artificial intelligence through its own laboratory.
- Commitment to sustainability in its various dimensions: environmental, socioeconomic, and social (B Certification).
- Adherence to international quality (ISO 9000) and security (ISO 27000) standards.

Threats (external analysis)

- Technological obsolescence, which is occurring at an increasingly rapid pace due to the exponential acceleration of technology.
- Growing trend toward the commoditization of technology, which means that technological products are becoming increasingly standardized, making it difficult to differentiate them.
- Rapid changes in user preferences mean that solutions quickly lose their appeal.
- Strong competition with other global solution developers in the different geographical areas in which they operate.
- Growing regulations on data protection and artificial intelligence.
- Increase in cyberattacks on a global scale, which increase the cost of development to make them more secure.

Opportunities (external analysis)

- Expansion into new (emerging) markets where digitization is growing.
- Growth of software as a service (SaaS) and cloud services.
- Deepening the collaboration model with startups and other entities in the entrepreneurial ecosystem through open innovation flows.
- Expansion and lower cost of technological capabilities for processing large volumes of data (Big Data).
- Obtaining benefits from the Knowledge Economy Law and other incentive programs.
- Restoring customer confidence in outsourcing services.

Specific analysis according to professional career profile

The model in which a startup is able to establish relationships with an established company takes different forms, and the types of influence that an established company can exert on a startup can be divided into two: influence through equity (shareholding) or influence through technology and market access.[11]

The analysis of the present case addresses a model based on technology and market influence, whose objective is to bring innovation to Santex so that it can benefit "from an advantage over its competitors and extend its existing business to hot areas, benefiting from relationships with emerging companies to improve corporate innovation".[11] The creation of an out-in innovation flow between Santex and the proposed start-up analyzes two critical challenges: defining procedures for leveraging innovation in the established company and

managing potential intellectual property issues in innovations co-created with the start-up.[11]

The previous paragraph essentially adopts a corporate perspective. Therefore, it is relevant to incorporate into the analysis the perspective of the process from the position of the startup, which involves certain considerations on the part of the entrepreneurial team. Startups are often concerned that companies will steal their ideas or take forever to make critical decisions that are necessary for the startup to succeed.[11] Despite this phenomenon, startups are attracted to collaborating with corporate companies because of the potential they can achieve through interaction with them, gaining benefits such as "improved visibility and publicity or reputation, business development (entering new markets or gaining new customers), and obtaining market knowledge or access to key contacts".[12]

In summary, from the disciplinary approach to entrepreneurship, the importance of achieving a comprehensive analysis of the proposed open innovation process emerges, allowing for effective collaboration between Santex and an emerging company (Rocking Data). This collaboration must be permanently oriented towards improving the services that Santex provides to its client Temenos. This approach should resolve coordination problems (problems of interaction between network members and divergence of objectives) and incentive problems (disclosure of information, protection of intellectual property, and commercialization of the technologies produced), orienting them toward a win-win scheme for all involved.[13]

RESULTS

Introduction

The purpose of this section of the case report is to develop the implementation proposal in line with the diagnostic conclusion, which is relevant and current for Santex. Based on the development of the objectives (general and specific), it is pertinent to address the scope, required actions, necessary resources, time frame, and indicators that will allow the success of the proposed plans to be established.

The recognized SMART methodology will be used to define the general objective and specific objectives of the proposal. According to this methodology, the objectives must have the following characteristics: specific, measurable, achievable, relevant, and time-bound.[14]

General and specific objectives of the proposal

The general objective of this proposal is to develop and implement an open innovation program at Santex so that, through collaboration with startups specializing in artificial intelligence, it can accelerate the time to market of the artificial intelligence-based features of Temenos' Engage product by at least 30 % within 10 months.[15]

The specificity of the above objective is defined by clearly stating that the path to innovation is through open collaboration with startups, focusing actions on a single customer and product during the pilot stage (Engage). It also seeks to reduce the time to market for AI-based improvements by defining a time-to-market reduction indicator in relation to a traditional (closed) innovation process. Finally, the objective sets a time limit of 10 months, which represents a reasonable timeframe for providing a competitive response to the market.

Once the general objective of the proposal has been outlined, the specific objectives that will enable the action plans to be drawn up to achieve them will be determined:

- Specific objective number one: establish five relevant innovation challenges and their objectives for the Engage product, and identify and select three startups specializing in artificial intelligence capable of working on the challenges within two months of the program's start.
- Specific objective number two: develop a collaboration agreement with at least one of the selected startups that meets the requirement of providing solutions for at least two of the selected innovation challenges, within two months of the completion of their preliminary selection.
- Specific objective number three: implement an open innovation project with the selected startup that produces at least three AI-based features for the Engage product, reducing the demand for human agents for customer service by 30 % within six months of the collaboration agreement being signed.

Scope of the proposal

This proposal will enable Santex to complete a full iteration of an open innovation program, in accordance with the process described in the theoretical framework above. In this regard, it is vitally important that the company correctly complete the assessment and definition of its commitment to working with open innovation, while ensuring the support of senior management. On the other hand, the provision of the capital required for investments and expenses (budget) and its alignment with the organization's strategic objectives is an important aspect to consider during this preparation stage.

Once the preparatory phase has been completed, Santex must move forward with a process of defining the innovation objectives and then continue with the selection and negotiation of the partner. Once this has been completed, the necessary activities to form the alliance can be carried out. This milestone will enable

the launch and execution of the various innovation projects defined and the measurement of their results to determine the benefits of the program being implemented.[16]

In a final stage, it will be extremely important to use performance indicators to determine the feasibility of scaling the open innovation process to other processes, new customers, or Santex products.

The implementation of the aforementioned iteration will require the use of human, material (infrastructure), and economic resources necessary to deploy a program of this nature. Based on the types of resources listed, it is possible to draw up the following list, which considers those that are incremental to Santex's regular operations:

Human resources that will form an interdisciplinary cell with the following main roles:

- Product Manager / Product Owner
- Team Leader / Innovation Leader
- Development teams
- AI experts (machine learning) / Prompt engineer
- Software engineers – Software architects
- Data engineers – Data scientists
- UX/UI Designers
- Artificial Intelligence Security and Ethics Experts

Material resources (technological infrastructure) required for the modeling and implementation of AI-based solutions:

- Technological infrastructure (hardware) and cloud services.
- Machine learning solutions and platforms required for the defined architecture.
- Access to the database required for data ingestion and subsequent model training.
- Tools for managing and improving the productivity of the development life cycle (collaborative environments).

Financial resources for the acquisition of goods or services to implement the plan:

- Legal, commercial, and financial advisory costs during due diligence.
- Costs/fees for the commercial agreement to be entered into with the start-up.
- Costs of the technological infrastructure and services required.
- Licensing costs for specific modeling solutions.

Action plan for specific objective number one

The implementation of the first action plan will enable Santex to develop its innovation challenges in line with its strategic objectives, taking into account the evolution needs of its client Temenos' Engage product. It will also contribute to researching and understanding the entrepreneurial ecosystem and the various startups with which it can build a fit between Santex, an emerging company, and Temenos.[17]

Table 1. Action plan – Specific objective one

Activity	Week	Duration	Participants	Responsible	Success indicator
Identify innovation challenges through brainstorming activities	1-2	10	Santex innovation team Prompt engineer	Innovation leader	20 challenging ideas for the Engage product.
Select the most relevant innovation challenges	3	5	Innovation leader Prompt Engineer	Senior executives	10 relevant innovation challenges selected.
Evaluate and approve the selected innovation challenges	4	5d	Innovation leader Prompt engineer	Senior executives	5 innovation challenges approved and communicated
Define objectives for the various selected challenges	4	5d	Santex Prompt innovation team engineer	Innovation leader	3 objectives defined for each innovation challenge
Define and approve selection criteria for startups	5	5	Innovation leader	Senior management executives	Selection dimensions and weightings defined
Research startups available in the market aligned with the challenges	6-7	10	Santex Prompt innovation team engineer	Innovation leader	List and summary of at least 20 startups researched
Draw up a long list of candidate startups	7	3	Santex innovation team	Innovation leader	List of 10 candidate startups compiled.
Refine the long list and draw up a short list of 3 candidates	8	5d	Santex Innovation Team	Innovation leader	List of 3 candidate startups prepared.
Approve shortlist of preselected candidates	8	1d	Innovation leader	Senior executives Senior management	High-potential startups potential startups

In addition, artificial intelligence will optimize this stage through generative models, which can be used to filter, analyze, and select ideas during the development of innovation challenges. It will also be useful when defining selection rules and researching the market for candidate startups (as well as other players in the entrepreneurial ecosystem whose participation is required).

Action plan for specific objective number two

The second action plan is aimed at conducting negotiations with the startups on the shortlist of candidates for collaboration. This plan should provide the parties with all the necessary information (due diligence) to reach a fully informed agreement. This contract should regulate the relationship between the parties, defining the relationship model and its conditions. In line with what has been proposed so far, the approach used should remove any obstacles to effective collaboration and avoid the formation of asymmetrical relationships between participants. This process will end with the selection of the startup to accompany Santex in the innovation challenges related to accelerating the implementation of artificial intelligence in Temenos' Engage product.[18]

Table 2. Specific objective two

Activity	Week	Duration	Participants	Responsible	Success indicator
Conduct due diligence (commercial, legal, financial, and technological) on the selected startups	9-10	10	Legal, commercial, financial, and technological team	Senior management executives	Full report on the different dimensions with recommendations
Confirm startups eligible to enter into agreement	11	5	Legal, commercial, financial, and technology team	Senior management executives	Shortlist of eligible startups that meet due diligence requirements Relieve and align mutual expectations for the collaboration
Relieve and align mutual expectations for the collaboration	12	5d	Santex innovation team Startup teams	Innovation leader	Aligned collaboration expectations
Define the scope of collaboration activities	13	5d	Santex innovation team Startup teams Startup teams	Innovation leader	Innovation challenges and scope defined
Negotiate preliminary contract terms	14	10d	Legal, commercial, financial, and technology teams	Senior management executives	Term sheet validated by the parties
Drafting of the contract	15-16	10	Legal teams of the parties	Senior management executives	Draft written
Review and adjust the contract	17	9d	Legal teams of the parties	Senior executives management	Final adjusted contract
Signing of the collaboration agreement	17	1d	Legal representatives of the parties	Legal representative Legalrepresentatives of the parties	Signed contract enables collaboration

Action plan for specific objective number three

Table 3. Action plan – Specific objective three

Activity	Week	Duration	Participants	Responsible	Success indicator
Form an agile interdisciplinary team and define roles for the innovation project	18	5	Product leaders Developer Machine learning specialists from the startup	Product Manager	Agile team with defined roles and responsibilities
Development of the product roadmap	19	5d	Product Manager Client Temenos	Product Manager	Product roadmap developed
Initialize the product backlog with co-creation activities	20-21	10	Product Owner Developer is UI-UX Client	Product Manager	Co-created and prioritized backlog
Iteration implementation 0 – technological integration of predictive models	18	20	Product Owner Developer and machine learning specialists learning	Technical Leaders	Technology integration to start complete development.

Finally, the third specific objective will seek to achieve the deployment of collaboration through developments that will culminate in product improvement (increase) by Santex and Rocking Data. This approach will be completed by forming an agile cell or squad that will work on the Engage product in an interdisciplinary and collaborative manner. In this regard, different iterations will be addressed to build the product incrementally, using an experimental approach that will allow for regular customer feedback to develop a product that meets their needs.

Table 4. General Gantt chart for the implementation plan.

Implementation of iteration 1 – MVP	Month 6	20	Product Owner Developer is Machine learning specialists UI-UX Client	Product Manager	Initial functionality put into production for feedback data collection.
Implementation of iterations 2 to 5 for product increment development (each lasting 4 weeks)	Months 7-10	80	Product Owner Technical Lead Developer Machine learning specialists UI-UX Client	Product Manager	Delivery of three features that reduce the demand for human agents in customer service channels by 30 %.
Conducting retrospectives and evaluation of the partnership's results	Month 10	10	Product Manager	Senior management executives	Retrospective carried out.
Decision to continue / termination of the alliance	Month 10	10d	Product Manager	Senior management executives	Continuity assessed based on quantitative metrics quantitative metrics.

Roadmap (Gantt chart) for the intervention plan

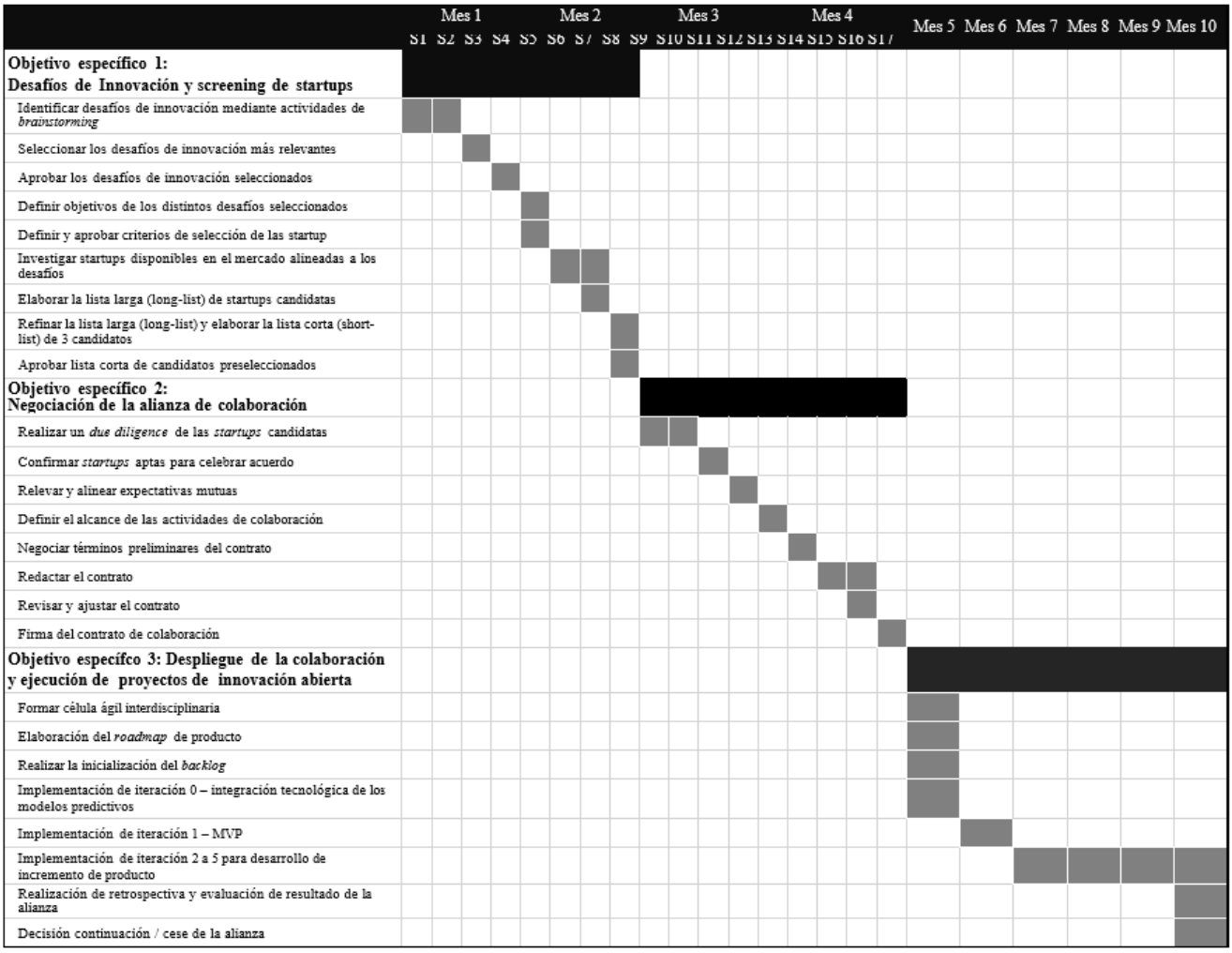

Figure 1. Roadmap

The following roadmap graphically represents how the timing between the different objectives should be coordinated in order to achieve the overall objective of the intervention plan.

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Evaluation or measurement of the proposal

The plans detailed above require frequent monitoring of indicators that allow us to understand whether the activities designed are generating the expected benefits. In this regard, it is possible to propose monitoring the following key performance indicators for the overall objective:

- Time to market for new features enhanced with artificial intelligence. Metric: Time to Market = launch date – feature launch date (expressed in days).
- Average technology transfer speed, i.e., from introduction to implementation. Metric: Transfer speed = integration date – integration start date (expressed in days).
- Share of revenue from the commercialization of innovations implemented as part of an open process. Metric: Share of open innovation revenue = (open innovation revenue / total revenue) x 100 (as a percentage).
- Cost savings compared to a traditional closed innovation process. Metric: Estimated closed innovation costs – actual open innovation costs (in currency).

CONCLUSIONS

Open innovation enables the accelerated implementation of emerging technologies such as artificial intelligence through effective collaboration with the entrepreneurial ecosystem. The opportunities offered by this innovation model are enhanced when customers require solutions to adapt quickly to changes in a business environment characterized by volatility, uncertainty, complexity, and ambiguity.

The synergy between open innovation and artificial intelligence can be leveraged by technology companies such as Santex to integrate external knowledge flows into their value chain. Overcoming the traditional paradigm of closed innovation allows for the construction of a timely foundation for generating a sustainable competitive advantage, which results in improved time to market and reduced research and development costs.

Collaboration with partners appears to be a predominant form of open innovation within the business ecosystem. However, the opportunity represented by this form of collaboration can be eroded by a lack of attention or capacity to resolve impediments to effective collaboration, generating asymmetrical relationships that undermine the objectives to be achieved.

The design of a robust open innovation process is important to maximize benefits for all parties in a win-win scenario. The interest in open innovation must be strongly promoted by senior management, who must provide input for the strategic alignment of action plans.

In line with the previous paragraph, action plans should be developed and carried out by talented, results-oriented, interdisciplinary teams. Developing a strong culture of innovation and collaboration is a key enabler for maximizing the benefits of this type of program.

Finally, artificial intelligence can play a multifaceted role in relation to open innovation. On the one hand, it has the capacity to become a relevant element in product innovations, allowing for increased quality and customer satisfaction. On the other hand, generative models can help the open innovation process through the correct application of prompt engineering to enhance the process. In either of its two dimensions, the link between open innovation and artificial intelligence looks promising and, given its early stage, offers ample opportunities to be discovered.

BIBLIOGRAPHIC REFERENCES

1. Universidad Siglo 21. Caso Santex. 2024.

2. Silva. Las cinco prioridades de la industria bancaria en Latinoamérica para 2024, según Temenos. DFSsud. 2024 Feb 16. https://dfsud.com/america/las-cinco-prioridades-de-la-industria-bancaria-en-la-latinoamerica-para

3. Taskan B, Junça-Silva A, Caetano A. Clarifying the conceptual map of VUCA: a systematic review. Int J Organ Anal. 2022;30(7):196-217.

4. Kantis H, Menendez C, Álvarez Martínez P, Federico J. Colaboración entre grandes empresas y startups: una nueva forma de innovación abierta. TEC Empresarial. 2023;17(1):70-93.

5. Kuzior A, Sira M, Brozek P. Use of artificial intelligence in terms of open innovation process and management. Sustainability. 2023;15:7205. Available from: https://doi.org/10.3390/su15097205

6. Chesbrough H. Reinventar la empresa en la era digital. Innovación abierta. Innovar con éxito en el siglo XXI. Madrid: BBVA OpenMind; 2015.

7. Instituto Andaluz de Tecnología. La respuesta está en la innovación. Sevilla: Ediciones Aeonor; 2012.

8. Santiago J. Esta empresa argentina creó una "liga del bien" para la inteligencia artificial. Infobae Profesional. 2023 Jul 28. Available from: https://www.iprofesional.com/tecnologia/385992-inteligencia-artificial-santex-crea-una-liga-del-bien

9. InfoTecnología. Santex creó su propio laboratorio de IA (inversión de U$S 1,5 millones). 2024 May 21. https://infotecnologia.info/startup/santex-creo-su-propio-laboratorio-de-ia-inversion-de-u-s-1-5-millones

10. Fernández A. Inteligencia artificial en los servicios financieros. Boletín Económico, Artículos Analíticos. 2019;(2):1-8.

11. Weiblen T, Chesbrough HW. Engaging with startups to enhance corporate innovation. Univ Calif Berkeley. 2015;57(2):66-90.

12. Bannerjee S, Beilli S, Haley C. Scaling together: Overcoming barriers in corporate-startup collaboration. NESTA; 2016. https://media.nesta.org.uk/documents/scaling_together_.pdf

13. Rodriguez J, Lorenzo A. Innovación abierta: Desafíos organizacionales de este modelo de gestión de la innovación para las empresas. Rev Galega Econ. 2010;19:1-13.

14. Doran GT. There's a S.M.A.R.T. way to write management's goals and objectives. Management Review. 1981;70(11):35-6.

15. Arvaniti EN, Dima A, Stylios CD, Papadakis VG. A new step-by-step model for implementing open innovation. Sustainability. 2022;14:6017. https://doi.org/10.3390/su14106017

16. Chesbrough HW. Open innovation: The new imperative for creating and profiting from technology. Boston: Harvard Business School Press; 2003.

17. El Maalouf N, Bahemia H. The implementation of inbound open innovation at the firm level: A dynamic capability perspective. Technovation. 2023;122:1-18.

18. Kantis H, Angelelli P. Grandes empresas, startups e innovación en América Latina: Promesas y desafíos. Washington D.C.: Banco Interamericano de Desarrollo; 2020.

FINANCING

None.

CONFLICT OF INTEREST

Authors declare that there is no conflict of interest.

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