

A Conceptual Fath Business Model: Digital Platform for Accessible, Private, and Open-Weights Artificial Intelligence Inference

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Abstract: The purpose of this paper is to develop a conceptual business model, called Fath, including a digital platform and Application Programming Interface (API) infrastructure, to solve key challenges regarding data privacy, vendor lock-in, and high inference costs faced by three Customer Segments (CS): (a) Privacy-First Enterprises and Small and Medium-Sized Businesses (SMEs), (b) High-security government agencies and corporations, and (c) AI Startups and cost-focused developers and researchers. Key pains include the prohibitive cost of proprietary APIs and the technical complexity of self-hosting open-source Large Language Models (LLMs). The paper adapts Design Thinking (DT) methodology that include conducting a literature review on Fourth Industrial Revolution (4IR) trends, benchmarking competitors such as OpenAI and AWS using the Business Model Canvas (BMC) framework and conducting surveys to define problems. An initial business model prototype was designed using the Environment Map (EM), BMC, and Value Proposition Canvas (VPC), followed by validation against market needs. Key findings indicate a significant gap for a "privacy-first," cost-effective inference provider. This paper establishes a validated business model where Fath serves as a gain creator by offering drop-in API compatibility with open-weights models. A Strategy Canvas (SC) is created to compare Fath against incumbent players, highlighting its relevance in solving *extreme* pains related to data sovereignty. Future work includes developing a detailed business plan and deploying the high-fidelity digital platform prototype.

Keywords: Fath, Open-Weights AI, AI Inference, Business Model, Data Privacy, Technopreneurship, API Economy, Large Language Models, Design Thinking.

I. INTRODUCTION

Organisations have undergone a major operational transformation as a result of the fast-paced development of Artificial Intelligence (AI) during the Fourth Industrial Revolution (4IR) within the digital economy. Many organisations are now integrating technologies such as Large Language Models (LLMs) to automate processes, increase productivity, and support decision-making [2]. Schwab observed that 4IR is being driven by the growth of digital technologies that are changing business models and creating new avenues for innovation [1]. This transformation is reinforced by the Malaysian government through the National Artificial Intelligence Action Plan (NAIAP) 2026–2030 [4], the MyDigital Blueprint [5], and the 13th Malaysia Plan (13MP) [6], all of which focus on developing entrepreneurial capabilities, improving digital infrastructure, and creating a high-value innovation economy.

While there has been improvement towards AI solutions, most organizations rely on private vendors who offer these solutions, which leads to issues for organizations. Startups and small to medium enterprises (SMEs) find API-based solutions cost prohibitive while the use of proprietary systems creates a vendor lock-in scenario and restricts their flexibility. Furthermore, there is much concern regarding data privacy, data security and digital sovereignty for all organizations as they deal with sensitive data [2].

With the flexibility and independence from the dominant providers that open-source AI models offer, there is still a significant requirement for technical capability and adequate infrastructure resources to provide the successful hosting of Open-Source Large Language Models in production. This situation raises the question of why there is a disparity between availability of Open Source LLMs and their real-world applications, particularly among small-to-medium enterprises (SME) and smaller development teams.

This situation is in line with the United Nations Sustainable Development Goals (SDGs) which support SDG 8 (Decent Work and Economic Growth) and SDG 9 (Industry, Innovation and Infrastructure) as they focus on promoting an inclusive approach to economic growth and innovation-based infrastructure [3].

To meet this need, this project proposes a multi-sided Fath digital business model that will provide an Open Source LLM Hosting platform with Inference-as-a-Service. This platform will connect enterprises, developers, infrastructure providers and open-source communities to deliver and deploy AI to their customers in a secure, scalable and cost-effective manner. This solution will lower the barriers to adoption of AI and provide strong support for local innovation, thereby addressing Malaysia's NAIAP 2026–2030 [4], MyDigital [5], and 13MP [6] objectives and helping build a more competitive and inclusive AI emerging ecosystem.

II. OBJECTIVES

This paper aims to establish an Open-Source Large Language Models (LLMs) Hosting multi-sided digital platform business model that will address the key issues with deploying Artificial Intelligence (AI) and provide services including the following:

- A. To create an online platform to enable enterprises, developers, and organizations to deploy and manage open-source LLMs in a secured, scalable, and cost-effective manner.
- B. To offer an inference-as-a-service model that provides users with the ability to utilize applicable AI features without advanced infrastructure/technical capabilities.
- C. To present a versatile deployment solution for execution of AI that provides flexibility and customization that supports the concept of sovereignty over data; and reduces an organization's reliance on a proprietary solution.
- D. To provide a trusted environment to facilitate collaboration and innovation between enterprises, developers, infrastructure providers, as well as contributing open-source members in the AI ecosystem.
- E. To establish the market opportunity for open-source AI Hosting platforms by exploring and addressing issues related to high operational expenses, vendor lock-in, or issues related to the privacy of personal data; as well as creating sustainable revenue streams.
- F. To establish Fath's Business Model using the Business Model Canvas (BMC) and Value Proposition Canvas (VPC), creating a sustainable and competitive framework aligned with the principles of the Blue Ocean Strategy.
- G. To develop a high-level digital platform prototype that allows users to deploy models, manage APIs, monitor performance, and access AI services efficiently.

III. METHODOLOGY

According to [7] states that Design Thinking (DT) is a methodology that employs a human-centred approach to solving complex or ambiguous problems. Using [7] DT methodology as a framework, this paper will focus on five specific stages which are empathize, define, ideate, prototype, and test. These five stages will provide a systematic framework for developing Fath by ensuring that all the proposed solutions will meet the actual needs of the respective target users.

The empathize stage was utilized to identify the needs, challenges, and expectations of each of the customer segments involved such as enterprises, developers, and infrastructure providers. According to [7], businesses must completely identify and understand their users before they can develop successful and relevant solutions. This approach helps to uncover the main problems like high operational costs associated with existing Artificial Intelligence (AI) platforms, vendor lock-in and data privacy issues associated with existing AI platforms.

The intent of the define stage is to analyze the data collected from previous steps within the innovation process to distil down to the specific core problems each customer segment faces. These problems are framed in terms of job-to-be-done, extreme pains, and essential gains. At this stage, tools such as the Business Model Canvas (BMC), created by [8], are introduced to structure an understanding of customer segments and value propositions. The BMC aids organisations in visualising how value is created, delivered and captured, thus resulting in improved clarity when defining problems and solutions.

Formulating solutions to the defined issues is accomplished in the ideation stage through multiple possible solutions. Brainstorming techniques are used to consider various ways to solve the defined issues, leading to Fath, an open source LLM hosting platform as a multi-sided digital solution such as software. In the same way, a Value Proposition Canvas (VPC) is developed at this stage to ensure that the proposed solution will successfully alleviate customer pains and create core gains for customers. According to [9], the VPC is an effective tool to aligning the product or service with the customer's needs; therefore, creating a stronger alignment between the proposed platform and customers.

During the prototype phase of a product development process, a conceptual design for a digital platform will be developed where key functions of the platform will be defined, including but not limited to how models are deployed, managing APIs and monitoring performance; an Environment Map (EM) that will help identify external factors such as: market forces, competitive forces, technological factors and macroeconomic factors will also be created to determine whether the proposed business model has both practical viability and competitive viability in the current marketplace.

The validation phase will include receiving input from potential end-users regarding the proposed business model through various forms of qualitative market research including surveys or interviews with individuals who fit into the different market segments identified for the platform; the goal of this phase is to assess the feasibility, usability and acceptability of the platform; the data obtained from this phase will then be used to further improve the proposed business model through an iterative process. A Strategy Canvas will be developed at this time showing the comparison of the proposed solution to existing platforms, highlighting the unique value proposition of the solution and/or anything that gives it a competitive edge over other platforms [7]. Therefore, this iterative process will ensure that the developed business model is in line with the marketplace and meets the needs of the potential user base and current industry standards.

IV. LITERATURE REVIEW

A. Open-Source AI and Large Language Models (LLMs)

Open-source AI has emerged as a widely adopted alternative to proprietary AI systems, offering flexibility, transparency, and reduced dependency on large technology providers. These models allow organisations to customise AI systems according to their specific needs while retaining control over their data and infrastructure. Despite these advantages, open-source LLMs present significant operational challenges. Organisations must possess advanced expertise to manage infrastructure, optimise model performance, and ensure scalability—a barrier that particularly affects non-technical businesses [10].

Furthermore, the operational costs of open-source LLMs are substantial, encompassing high energy consumption, large-scale infrastructure, and ongoing maintenance. As noted by Devansh (2025), the minimum annual cost of self-hosting an open-source LLM can range from USD 125,000 to USD 190,000 [11], making it practically difficult for startup businesses to implement without external support. In alignment with national priorities, the NAIAP 2026–2030 specifically identifies the need for accessible and affordable AI infrastructure, while Malaysia's Budget 2026 and the 13th Malaysia Plan (13MP) allocate resources toward digital capacity building for SMEs and underserved communities [4, 6]. These policy directions reinforce the need for platforms that bridge the access gap by providing simplified, scalable, and cost-effective access to open-source LLMs.

B. Data Privacy, Security and Vendor Lock-In

Data privacy is a major concern in this digital era, especially for the organizations that handle sensitive data such as personal data and financial data. Users always need to send their personal data to the server to use the platform. This behaviour increases user's suspicions about their personal data has been misused by others. According to [12], the models may accidentally capture and use sensitive information in the system while generating the text. This raise user's concern about their data privacy.

In addition, vendor lock-in is a major limitation of current AI solutions. Many organizations that rely on the current APIs find difficulty to switch to other providers because of some issues such as high migration cost and compatibility. This resulting to a flexibility reduces and limits the long-term strategic control.

Nowadays, organizations are having a full control over how and where their data is processed. They increasingly prioritizing data sovereignty which aligns with the global regulatory development and start to aware about the digital ethics. As a result, the demand for AI solution that ensure a good privacy and security increase within the industry.

C. Application Programming Interfaces (APIs) Economy and Technopreneurship

The API Economy is defined as the use of Application Programming Interfaces (APIs) to allow easy integration between the services and digital platforms which make up modern society. In today's digital ecosystem, companies must harness the power of artificial intelligence (AI) without creating their own technology stack from scratch. Therefore, APIs are essential in this new digital era.

When combined with AI, API-based services such as inference-as-a-service (IAS) allow for faster and easier development of applications that use LLMs. Unfortunately, many current API providers charge high sales prices which can prohibit the development of these types of applications by small or startup developers.

Technopreneurship is critical to solving these issues by utilizing technology to develop innovative, scalable and sustainable business models. Organizations utilizing AI, cloud computing and API technologies in combination with each other provide technopreneurs with a significant opportunity to disrupt their respective industries. An open-source LLM hosting platform will help to support the API economy by providing access to affordable API-based AI services, decreasing the complexity of developing AI applications and enabling innovation within a wide range of business sectors.

D. Business Model Innovation: BMC, VPC and Design Thinking

The Business Model Canvas also referred to as BMC and the Value Proposition Canvas called VPC, have both become popular for developing and analysing businesses. According to [3] the BMC allows businesses to visualize how they create, deliver and capture value for the nine building blocks of their business models. The building blocks includes customer segment, value proposition, revenue streams and many more. The VPC focuses specifically on the alignment between customer needs and the products or services provided, thereby ensuring the provided solutions can solve a real-world problem.

According to [7], design thinking complements both frameworks as it provides a user-centred human-based design process, which includes understanding user needs, defining user problems, generating design and innovation ideas, prototyping and testing through feedback. In the AI Platform space, these frameworks provide the identification of unmet needs within the marketplace, user-centric solution design and scalability and sustainability of business model.

In addition, several existing competitors in the AI platform industry can be analysed using the BMC framework, such as OpenAI and Amazon Web Services (AWS). These companies primarily target developers and enterprises by offering AI inference services through APIs. Their value propositions focus on high performance, scalability and ease of integration. Their revenue streams are mainly based on pay-per-use or subscription models, while key resources include advanced cloud infrastructure and proprietary AI models.

V. INITIAL BUSINESS MODEL (BM)

The initial Fath’s multi-sided business platform Business Model was developed through a collection of literature reviews conducted (see Fig. 1)

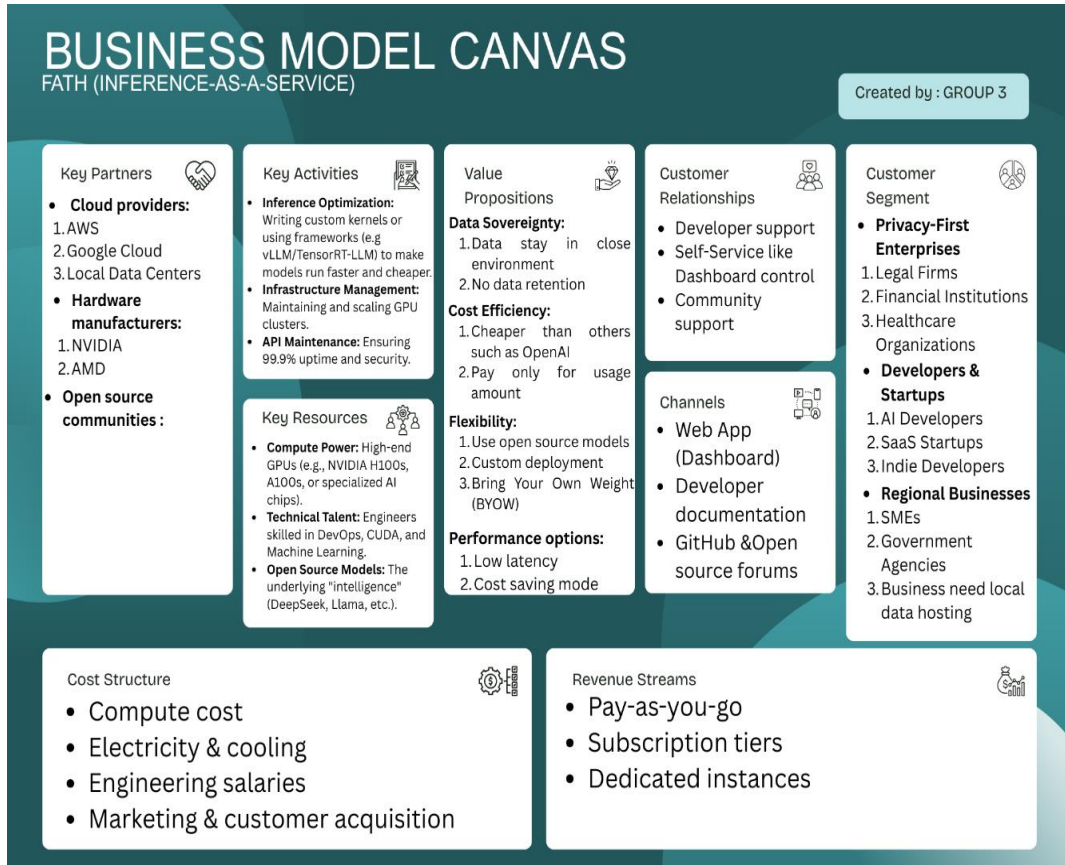


Fig. 1: Initial Fatah multi-sided business platform Business Model using BMC framework

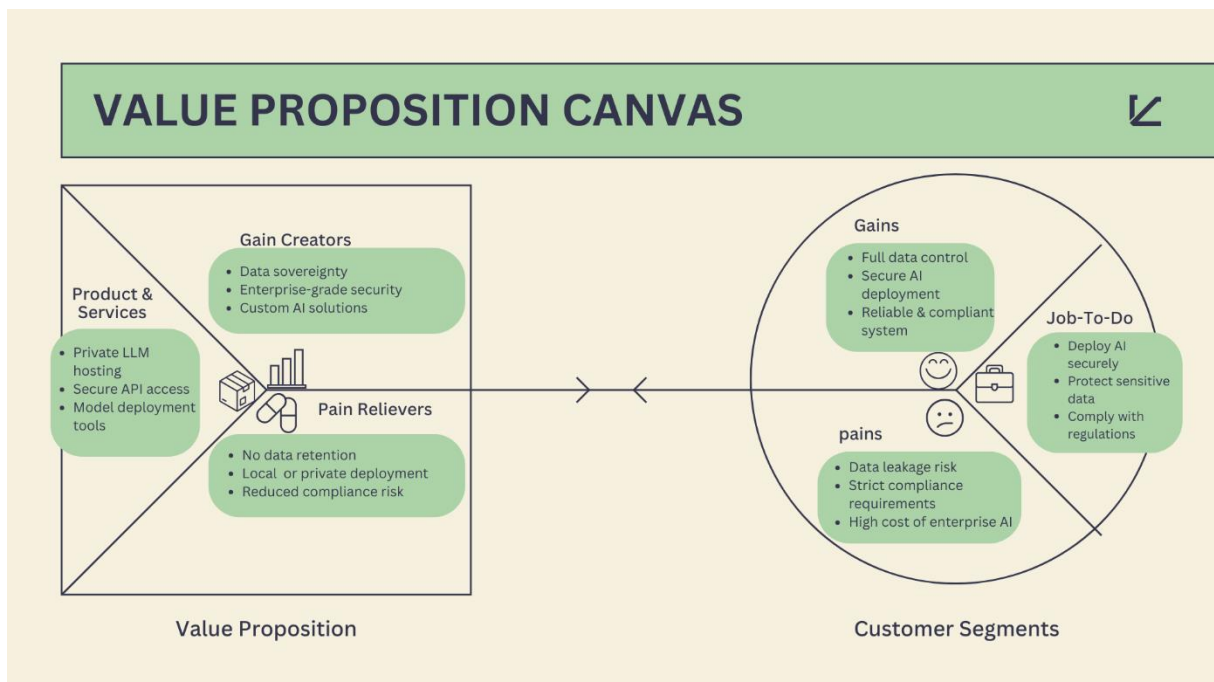


Fig. 2: VPC for Privacy-First Enterprises

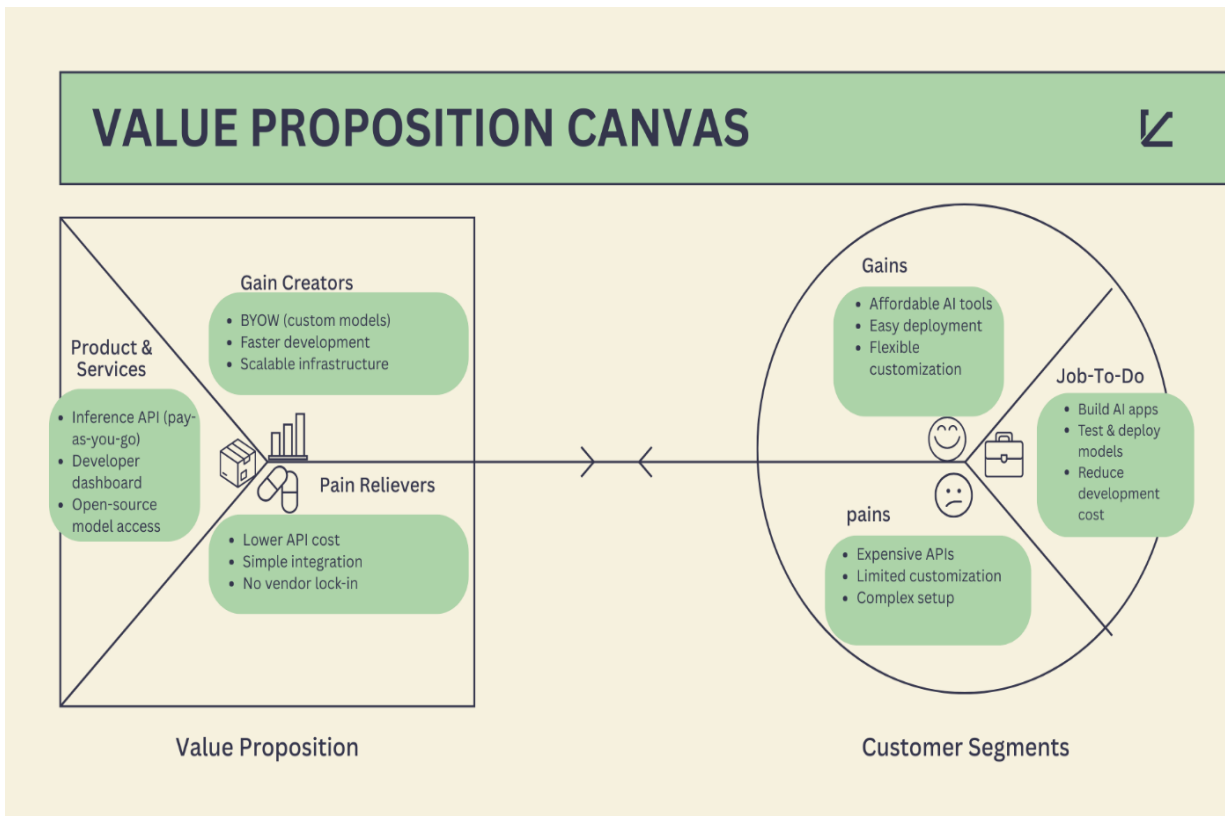


Fig. 3: VPC for Developers & Startups

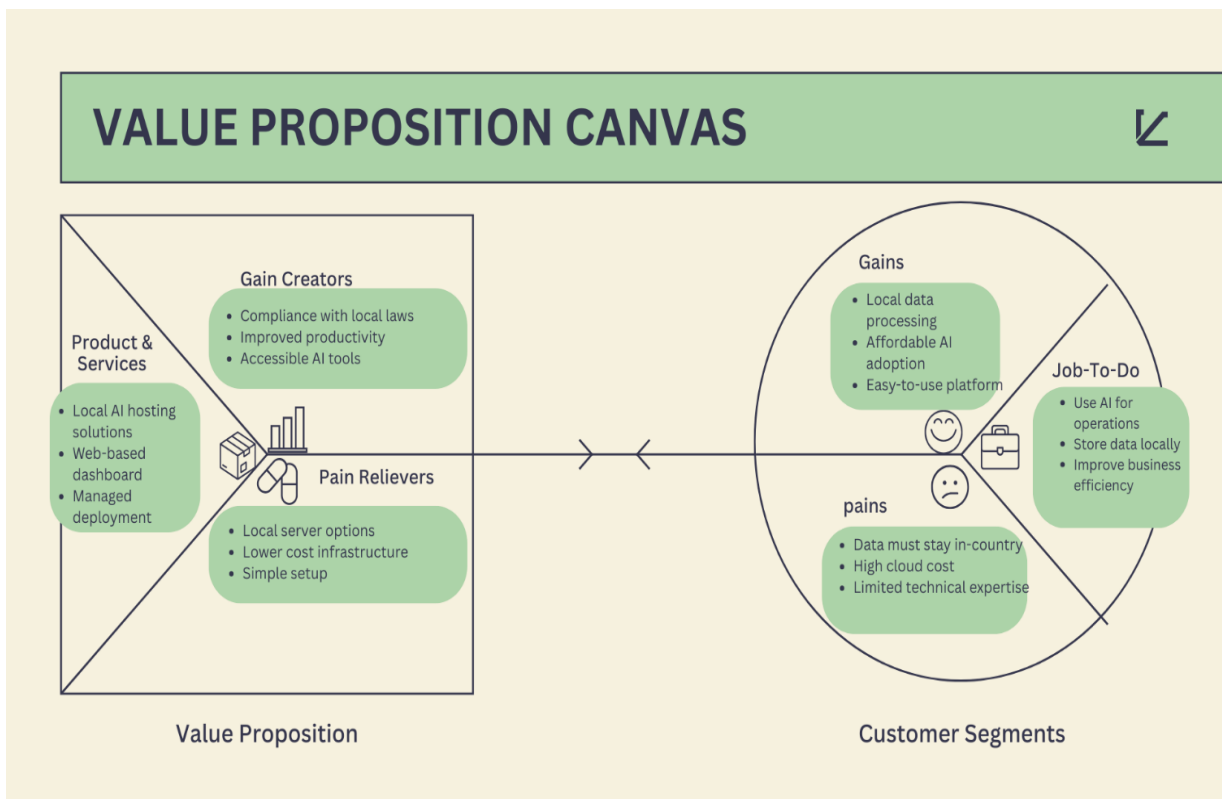


Fig. 4: VPC or Regional Businesses

VI. CONDUCT VALIDATION OF INITIAL BM & KEY FINDINGS

A. Conduct Validation

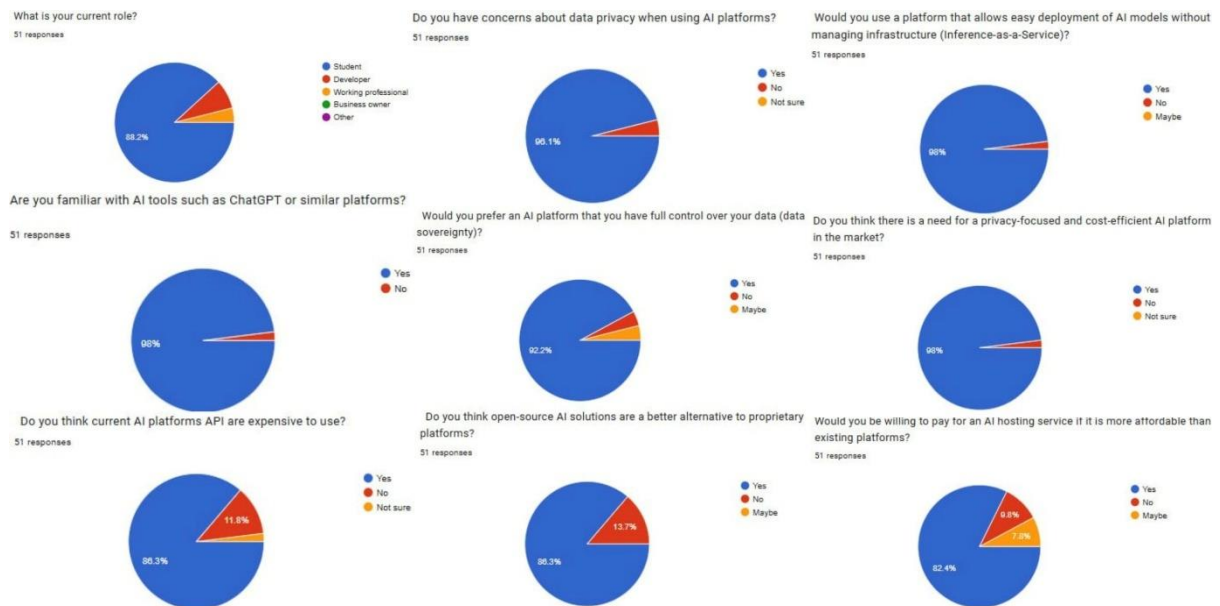


Fig. 5: Pie Chart of Survey Results

A survey of 51 participants found that 88.2% of them are students, indicating that our primary target market consists of learners who have some experience using Digital Tools. The majority, about 98% of respondents, were familiar with AI platforms like Chat-GPT, suggesting enough knowledge and willingness to use/try-out AI-based solutions. This validates the intent of the proposed platform regarding ease of access and use since the various users have current knowledge/experience with AI technology; thus, there is a minimum amount of education on onboarding the users to the platform.

Regarding to user concerns and needs, privacy was considered most important; 96.1% of respondents expressed concern with privacy issues, while 92.2% preferred to have full control over their data. This further validates one of the pain points of the business model, since any Privacy-related features added to the platform are critical to the success of the platform. Additionally, 98% of respondents indicated that there is a demand for a Privacy-focused and cost-effective AI solution, indicating a clear gap in the current solution offerings within the market that can be addressed through the proposed platform.

The results confirmed strong feasibility and revenue potential also from a business standpoint. Current AI APIs are seen as expensive by 86.3% of respondents, while the same percentage of respondents have a preference for open-source alternatives, demonstrating a demand for lower-cost and more flexible solutions. In addition, 82.4% of respondents would be willing to pay for an AI service as long as it costs less than the other options currently available. This creates a positive indication for using a competitive pricing strategy as well as producing an indication that the proposed platform will have strong potential adoption if it can provide value through lower cost, greater privacy and user-friendly deployment.

B. Key Findings

Key Findings Summary:

High AI Readiness: 98% of respondents are already familiar with AI tools, indicating low barriers to adoption and strong market readiness.

Privacy is Critical: 96.1% expressed concerns about data privacy, and 92.2% prefer full control over their data, confirming privacy as a core requirement.

Strong Market Demand: 98% believe there is a need for a privacy-focused and cost-efficient AI platform, validating a clear gap in the market.

Price Sensitivity: 86.3% perceive current AI APIs as expensive, and many prefer open-source alternatives, highlighting demand for affordable solutions.

Willingness to Pay: 82.4% are willing to pay for an AI service if it is more affordable, supporting a viable revenue model.

Ease of Use Preference: 98% would use a platform that simplifies AI deployment (Inference-as-a-Service), emphasizing the importance of convenience and accessibility.

These findings confirm that the initial BM's focus on **privacy, affordability, and accessibility** is well-aligned with user needs, while also highlighting the importance of emphasizing **data control and simplified deployment** as key elements in the final value proposition.

VII. VALIDATED BM – BMC FRAMEWORK

A. Validated Business Model

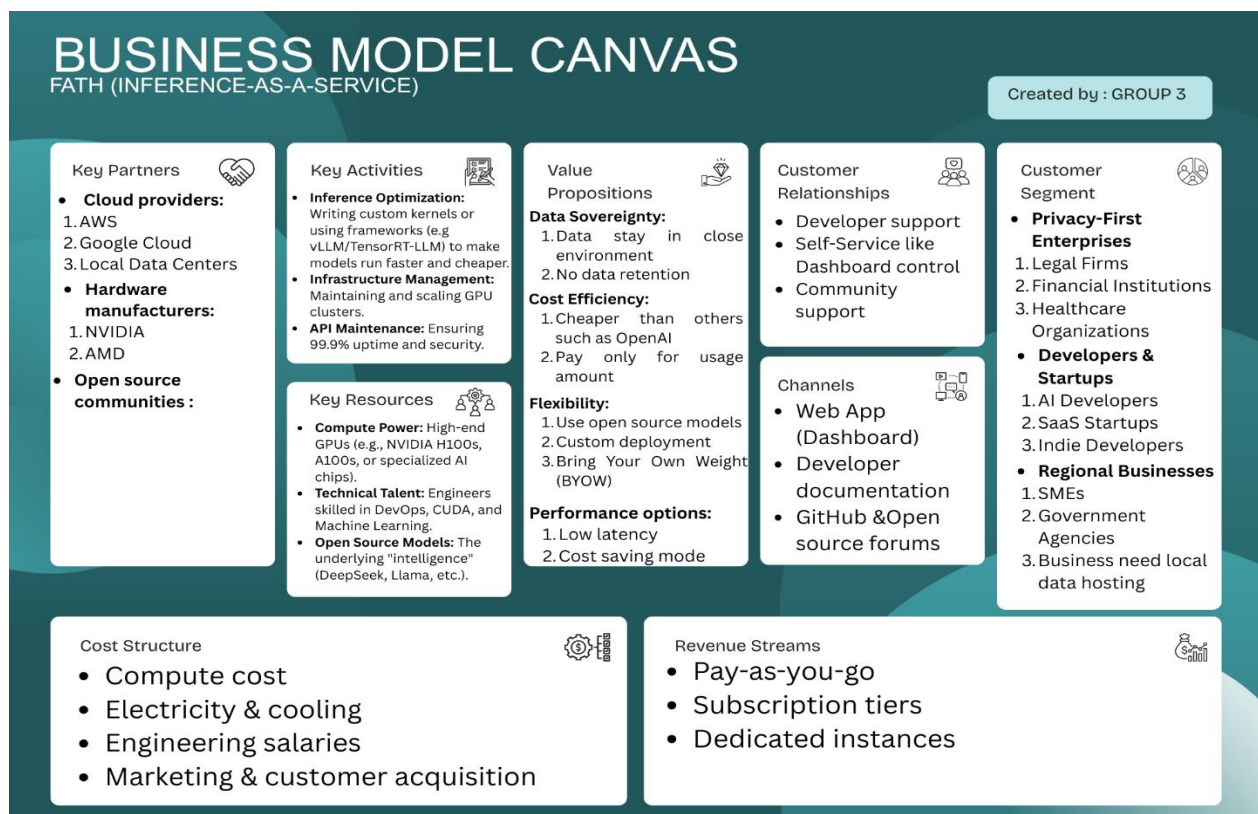


Fig. 6: Validated Fath multi-sided business platform Business Model using BMC framework

Based on the survey conducted, it is found that most of the respondents are already familiar with artificial intelligence platforms, indicating a high level of awareness and readiness to adopt AI-based solutions. In addition, the findings highlight major concerns among users, particularly in terms of data privacy and the high cost of existing AI platforms. These insights strongly support the relevance of the proposed Open-Source LLM Hosting platform (Fath). Minor refinements were made to improve alignment with user needs while maintaining the core structure of the Business Model Canvas (BMC). The nine building blocks of the BMC are further discussed below

I. Customer Segments

The customer segments in this study refer to the groups of users and organisations that the platform aims to serve. There are three main groups identified, which are privacy-first enterprises, developers and startups, and regional businesses. Privacy-first enterprises include legal firms, financial institutions, and healthcare organisations that require strict data protection. Developers and startups consist of AI developers, SaaS startups, and independent developers who need flexible and affordable AI solutions. Regional businesses include SMEs and government agencies that require local data hosting to comply with regulations.

II. Value Propositions

The value propositions represent the core offerings of Fath that address the needs of each customer segment. The values delivered are as follows:

- a. **Privacy-first enterprises:** Fath provides a secure AI hosting environment where data remains within the user's control, with no data retention. This ensures compliance with strict regulations and reduces the risk of data leakage while enabling organisations to deploy AI safely.
- b. **Developers and startups:** The platform offers a cost-efficient and flexible solution through pay-as-you-go pricing and access to open-source models. Developers can easily deploy, test, and customise models using features such as Bring Your Own Weights (BYOW), allowing greater control over development.
- c. **Regional businesses:** Fath enables local deployment of AI solutions, ensuring that data is stored within the country. This helps organisations comply with local regulations while benefiting from affordable and easy-to-use AI tools to improve their operations.

III. Customer Relationships

In order to maintain strong relationships with its users, Fath provides developer support, self-service dashboard control, and community-based support. These approaches allow users to manage their AI deployment independently while still having access to assistance when required. This is particularly effective as most users are already familiar with digital platforms.

IV. Channels

The channels describe how Fath reaches and delivers value to its customers. The platform primarily uses a web-based application which is dashboard, developer documentation, and GitHub or open-source forums. These digital channels are suitable as they align with the behaviour of users who are already engaged with online AI tools and communities.

V. Key Activities

The key activities of Fath focus on ensuring efficient and reliable AI services. These include inference optimization to improve speed and cost efficiency, infrastructure management to maintain and scale GPU resources, and API maintenance to ensure system reliability and security. These activities are essential to support scalable AI deployment.

VI. Key Resources

The key resources required for Fath include high-performance computer power such as GPU clusters, technical talent including AI engineers and DevOps specialists, and access to open-source models such as LLaMA and DeepSeek. These resources are crucial to ensure the platform can deliver secure, scalable, and efficient AI services.

VII. Key Partners

The key partners of Fath include cloud providers such as AWS, Google Cloud, and local data centres, hardware manufacturers such as NVIDIA and AMD, and open-source communities. These partnerships provide the necessary infrastructure, technology, and continuous innovation required to sustain the platform.

VIII. Cost Structure

The cost structure includes compute costs, electricity and cooling, engineering salaries, and marketing and customer acquisition. These costs are essential to maintain platform performance and scalability. Given that users are highly sensitive to pricing, efficient cost management is important to ensure competitiveness.

IX. Revenue Streams

Fath generates revenue through pay-as-you-go usage, subscription tiers, and dedicated instances for enterprise users. This model is supported by the survey findings, where a majority of respondents indicated willingness to pay for AI services if they are more affordable than existing solutions.

B. Business Environment Map (EM)

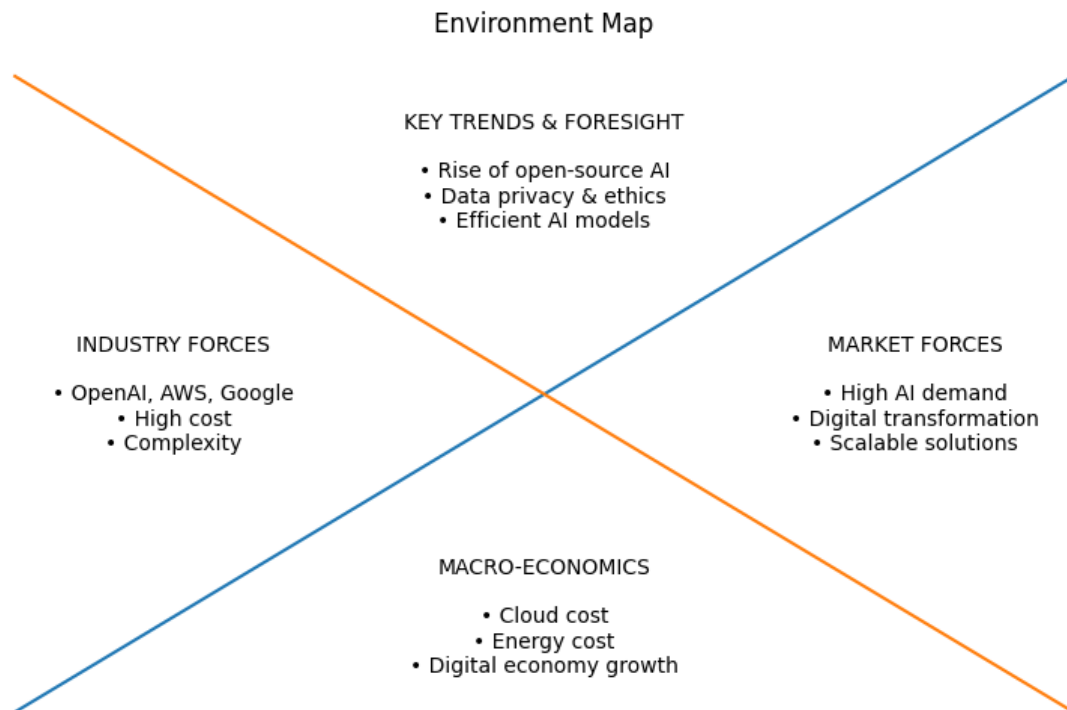


Fig. 7: Environment Map

- I. **Market Forces:** As organisations pursue digital transformation strategies today, the demand for Artificial Intelligence (AI) and large language models (LLMs) has greatly increased due to both types of technology being included as features within many business processes to enhance performance or support decision-making. Schwab (2016) [1] suggests that digital technologies form the cornerstone of innovation in the Fourth Industrial Revolution (4IR), thus leading to drastic changes in how global industries will be innovated and created through technological advancements. This enhanced global demand presents significant market potential for companies seeking AI-enabled infrastructure solutions, especially those that offer low-cost, fully scalable deployment options. Therefore, the demand also requires alternative deployment strategies including those found in open-source AI hosting models to provide users with far greater levels of flexibility and access to AI applications and tools than what currently exists with proprietary offerings.
- II. **Industry Forces:** The Artificial Intelligence (AI) industry is highly competitive, dominated by proprietary providers such as OpenAI, Amazon Web Services (AWS), and Google Cloud, which offer advanced capabilities but are often associated with high costs and limited flexibility. While AI delivers significant business value, its implementation can be complex and expensive for many organisations, particularly startups and SMEs, as highlighted by [2]. In the Malaysian context, the Thirteenth Malaysia Plan (13MP), which continues the nation's development agenda beyond 2025, emphasizes digital transformation, innovation, and the adoption of advanced technologies such as artificial intelligence to strengthen economic competitiveness. This national direction encourages businesses to adopt more scalable and cost-efficient digital solutions. Therefore, the proposed platform Fath aligns with the 13MP by offering open-source LLM hosting services that reduce operational costs, avoid vendor lock-in, and support data sovereignty, thereby providing a more flexible and accessible alternative for enterprises, startups, and regional businesses.
- III. **Key Trends & Insights:** A major trend within the AI sector is increased prevalence of open-source models, along with increased importance of digital ethics and data privacy. Companies have become increasingly cognizant of their data processing and storage practices, resulting in an increased demand for data sovereignty solutions. Additionally, new technological advances such as model optimizing and quantizing allow AI models to operate on smaller, less costly hardware, reducing companies' infrastructure needs. The trends identified above validate the relevance of the new platform, as they represent a shift toward AI solutions that are transparent, flexible, and increasingly efficient.

IV. Macroeconomics Forces: There are many economic issues, including cloud computing costs and energy and infrastructure costs that effect the ability of companies to deploy AI. Many companies may find it challenging to have high performance computing resources available, especially when they are using proprietary platforms that have high-cost pricing models. On the other hand, the world economy is working hard to develop digital initiatives that promote the use of advanced technology and products, to increase the overall growth of the economy. According to the [3] sustained development will be much more likely to occur if there are resources available through innovation and digital infrastructure. The platform being proposed has a great deal of upside potential for promoting this growth through low-cost and scalable AI solutions, particularly for start-ups and developing companies.

C. Strategy Canvas

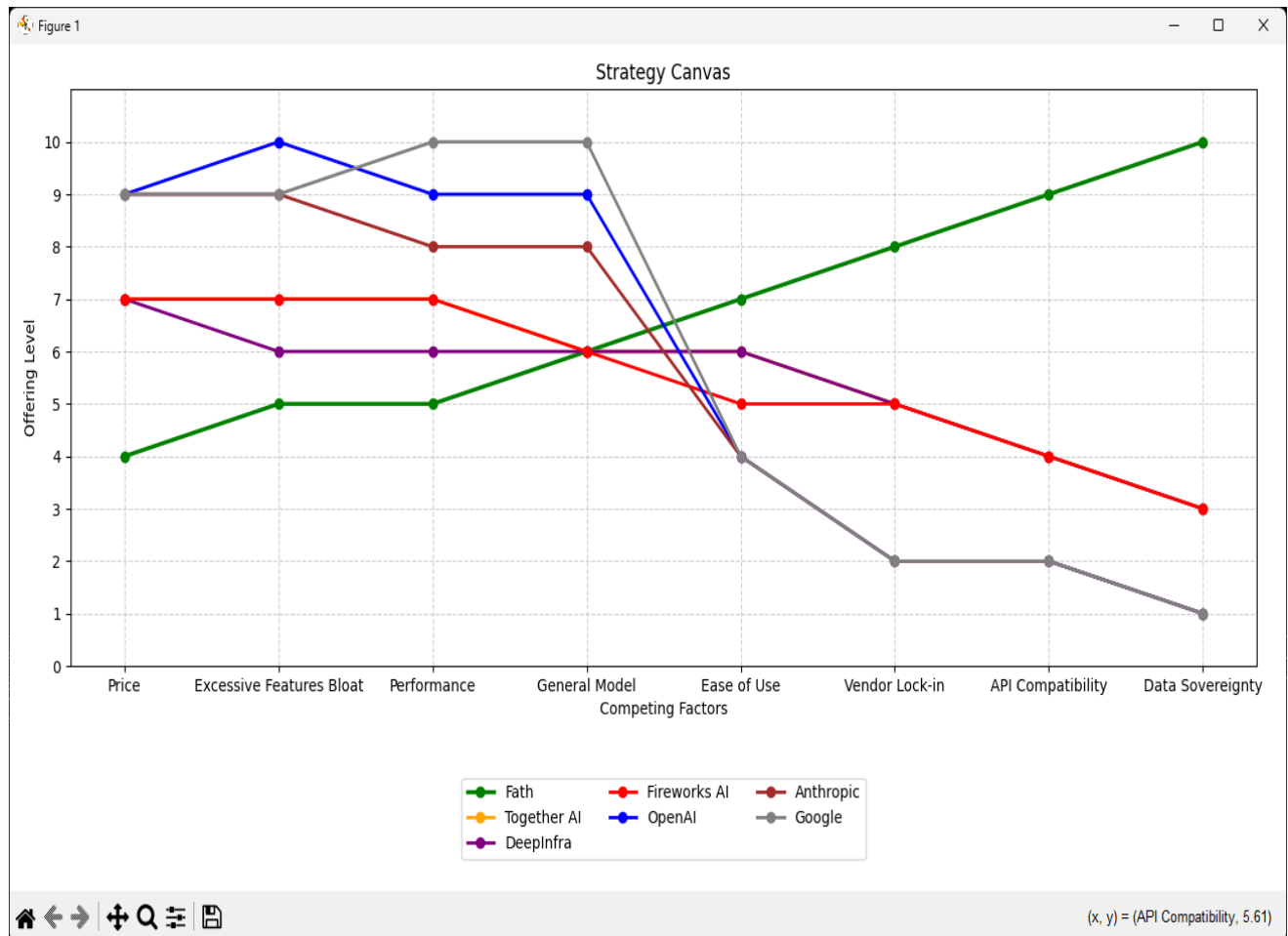


Fig. 8: Strategy Canvas

The strategy canvas highlights a clear divergence between Fath and its competitors across the key market factors of price, feature bloat, performance, general model capability, ease of use, vendor lock-in, API compatibility, and data sovereignty. Proprietary providers such as OpenAI, Anthropic, and Google achieve very high levels in performance and advanced model capability, but this comes with significant trade-offs—high feature complexity, strong vendor lock-in, and very low emphasis on data sovereignty and flexibility, as reflected by the sharp decline in their value curves toward the latter factors. Other Artificial Intelligence (AI) infrastructure competitors maintain relatively balanced but flat value curves, offering moderate performance and openness without strong differentiation in cost efficiency, simplicity, or control. In contrast, Fath forms a distinct and rising value curve by deliberately reducing feature bloat and complexity while sustaining solid performance and usability, and significantly increasing value in price efficiency, API compatibility, and especially data sovereignty, where it clearly leads the market. This repositioning shifts the basis of competition away from feature-heavy, closed ecosystems toward a more streamlined, privacy-first, and cost-efficient deployment approach, allowing Fath to capture an underserved segment that prioritizes control, flexibility, and independence, and ultimately enabling it to operate in a less crowded and more strategically advantageous space within the AI hosting industry.

D. High Fidelity Prototype of Digital Platform

The digital platform includes a dashboard utilizing Business Data Analytics (BDA) to show users their token consumption patterns and cost savings compared to competitors. AI-driven load balancing is embedded in the backend to route requests to the least latent GPU node. Key functions include: One-click model deployment, API key rotation for security, and automated compliance reporting logs for auditors.

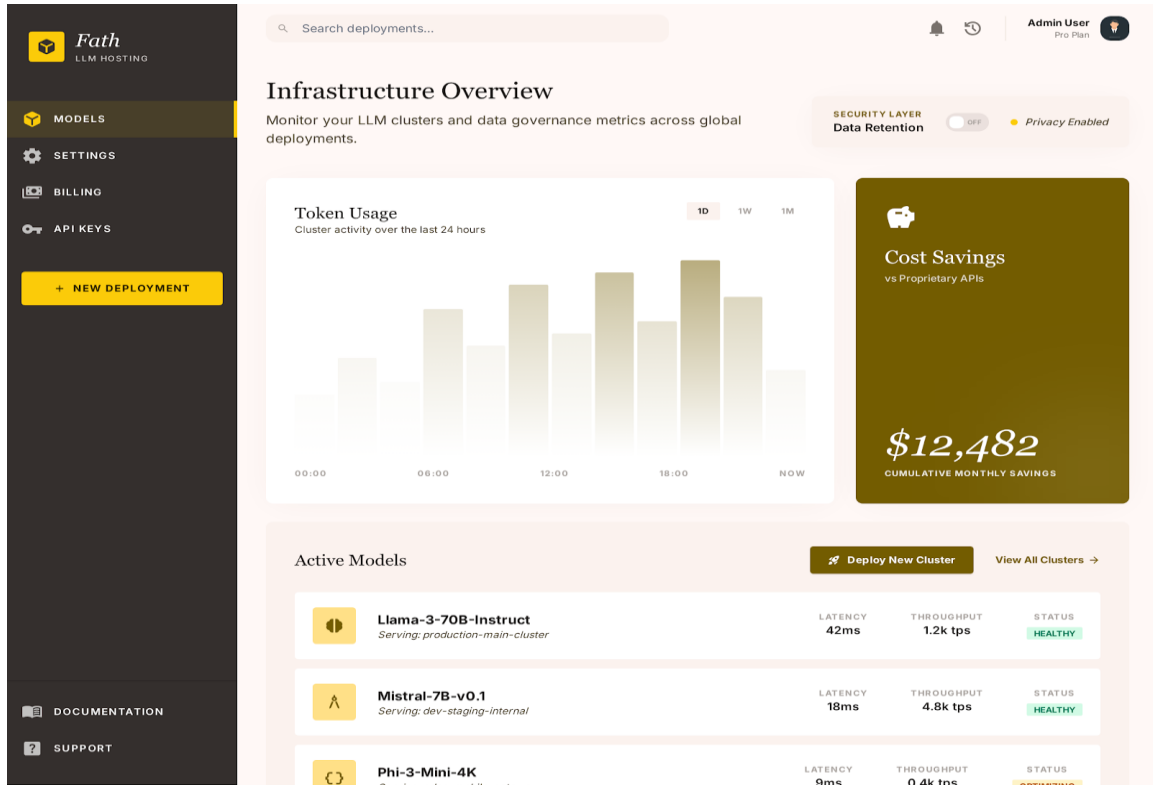


Fig. 9: Prototype

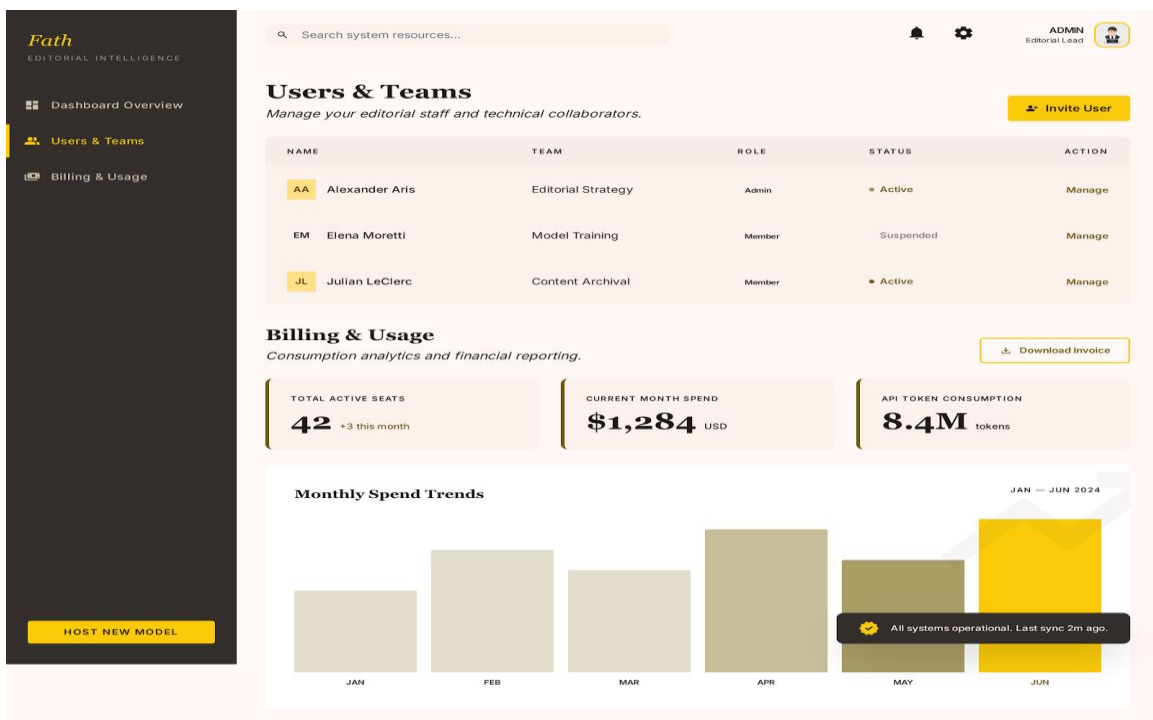


Fig. 10: Prototype of admin dashboard

VIII. CONCLUSION AND FUTURE WORKS

In conclusion, this paper has shown many different challenges faced by three customer segments in adopting Artificial Intelligence (AI) solutions such as AI startups, small and medium enterprise (SMEs) that want to be careful with their data and research professionals within the academic community. The primary challenges include the high operating costs associated with proprietary API technology, the issue of vendor lock-in, the issue of flexibility and the growing number of questions about data privacy and data sovereignty. These challenges prevent an organization from using Large Language Models (LLMs) effectively. Additionally, the research conducted using a design thinking approach resulted in developing and validating a conceptual business model called "Fath". The model creates an option for organizations to utilize LLMs in a way that aligns with their respective goals, while still providing a privacy-first, low-cost, technologically simple and open-source infrastructure for providing AI inference services. Overall, the Fath business model offers organizations several unique features such as hosting their data for data sovereignty, the ability to modify the model weights for flexibility, and reasonably priced services.

Further, the model includes an easy-to-use digital platform that will enable organizations to easily adopt the model and to significantly reduce the complexity of implementing the model's technology. Therefore, the exploratory study demonstrates that the Fath business model has a high degree of relevance to solving the extreme levels of pain and satisfying the essential gain needs of the organizations included in the target customer base, while also contributing to the digital transformation and innovation of the entire ecosystem of AI.

Over the coming months we will create a detailed business plan. This will include things like sales forecasts, which groups we are going to sell to and how we are going to grow as an organization. Additionally, we will continue to develop our platform with improvements in security, performance of the machine learning model and the ability to form long lasting, beneficial relationships with our partners which enables us to maintain our competitiveness and continue our growth far into the future.

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