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Identification and Modeling of SI-LAUT: Information System for Indonesian Maritime Resources Using Penta-Helix Model

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Abstract

Indonesia, as a country predominantly surrounded by the sea, holds significant potential in marine resources, fisheries, and other maritime fields. However, there is still a lack of awareness and understanding among the Indonesian population regarding these maritime aspects. Currently, there are various media and information sources related to this topic, ranging from websites and applications to supporting information systems. Nevertheless, users often struggle to find and comprehend this information easily and comprehensively. Existing information systems tend to be fragmented or operate independently, leaving many laypeople unable to fully optimize the existing potential. To address this, researchers aim to identify and model a comprehensive and integrated information system focused on marine and other maritime resources, known as SI-LAUT The research method employed in this study consists of literature review, stakeholder identification based on the Penta-Helix model, analysis of the existing system, and gap analysis in comparison to previous research that focused on the implementation of other maritime and marine information systems. The results of this research consists of a recommendation for an information system development model that can assist various stakeholders based on the Penta-Helix Model. These stakeholders include government bodies, entrepreneurs, academics, as well as the general public or other communities. The goal is to optimize the management and utilization of Indonesia's marine resources, ultimately positioning it as a global maritime powerhouse.

Keywords: SI-LAUT, marine, maritime, information system, penta-helix

1. INTRODUCTION

Indonesia, as one of the largest archipelagic nations in the world, holds significant potential to become a maritime hub [1]. This is not an unattainable goal, considering that geographically, Indonesia lies between two continents (Asia and Australia) and two oceans (the Indian Ocean and the Pacific Ocean) [2]. Additionally, Indonesia boasts an extensive maritime territory compared to its land area. Nearly 74% of Indonesia's total land area of 7.81 million square kilometers consists of oceans and the Exclusive Economic Zone (EEZ) [3]. With such vast

marine expanses, Indonesia undoubtedly possesses immense potential in marine resources and fisheries [4]. Therefore, the strategies and policies related to the world maritime axis conveyed by the President of the Republic of Indonesia during various forums such as the East Asia Summit, ASEAN Conference, and other international meetings present both opportunities and challenges for us collectively. These efforts aim to address global competition while optimizing the potential and wealth of marine and other maritime resources [5].

The potential of Indonesia's seas and maritime resources can be optimized through various approaches, including the identification of economic potential and the mastery of data and information related to Indonesia's marine environment. To facilitate easy identification, the economic potential of the marine sector is categorized into seven spectrums: fisheries, marine tourism, maritime transportation, offshore energy and mineral resources, marine industry, marine infrastructure, and marine services [6]. Meanwhile, the identification of other maritime potentials can be aligned with the National Research Master Plan (RIRN) in the maritime field, covering four aspects of maritime technology potential: territorial sovereignty in the 3T regions, conservation of the maritime environment, strengthening maritime infrastructure, and utilization of maritime resources. Additionally, the mastery of data and information related to Indonesia's marine environment is a crucial factor for optimizing the management and utilization of Indonesia's marine resources. This can subsequently be incorporated into national development strategies and policies [7].

The strategy for managing and utilizing marine resources refers to UUD 1945 Pasal 33, which states that land, water, and natural resources contained therein are under state control to be utilized for the prosperity of society at large. Furthermore, in their management and utilization, ethical exploration of marine potential must be observed, avoiding violations of norms or laws, excessive exploration, and ensuring the preservation of environmental conservation [8]. However, the management and utilization of these marine resources often lead to environmental damage. This occurs at various levels, from individual actions to community practices and corporate activities. Examples include the accumulation of waste, industrial waste disposal, oil pollution, heavy metal contamination, and large-scale exploitation of marine resources using hazardous chemicals [9]. If left unaddressed, this situation will become a problem and have implications for the sustainability of other marine and maritime ecosystems in the future. Therefore, it is essential for the state to play a role and take responsibility in enforcing laws and regulations to encourage both industries and communities to collectively safeguard these ecosystems and prevent the emergence of new issues [10].

On the other hand, the issues and challenges within Indonesia's marine and maritime ecosystems are quite diverse, spanning aspects related to the environment, economy, law, politics, and national defense and security [11].

However, one of the fundamental issues underlying these various problems is related to data, information, knowledge, and policies [12]. Based on the issue mentioned above, a Research gap has been identified. Although many websites, applications, and information systems have already been developed, the general public and other users are still unaware of these resources and find them challenging due to their lack of comprehensiveness and integration [13]. Consequently, the researcher is interested in designing and developing SI-LAUT, a system that leverages Indonesia's maritime resources. SI-LAUT will utilize the Penta-Helix model, considering perspectives from academia, business, community, and government. The approach will be based on an integrated information system, incorporating elements such as portals, wikis, search engines, social media, webinars, training, community development, marketplace, and funding. The goal is to explore and optimize Indonesia's maritime potential.

2. METHODS

The research method employed in this study is a literature review, which aims to analyze and synthesize existing research related to the implementation of marine and maritime information systems. Subsequently, the researcher proceeds with several other stages, including identifying the needs and challenges faced by various stakeholders, analyzing existing systems, and developing an integrated and comprehensive information system. The goal is to optimize Indonesia's marine and maritime wealth and potential within a system called SI-LAUT.

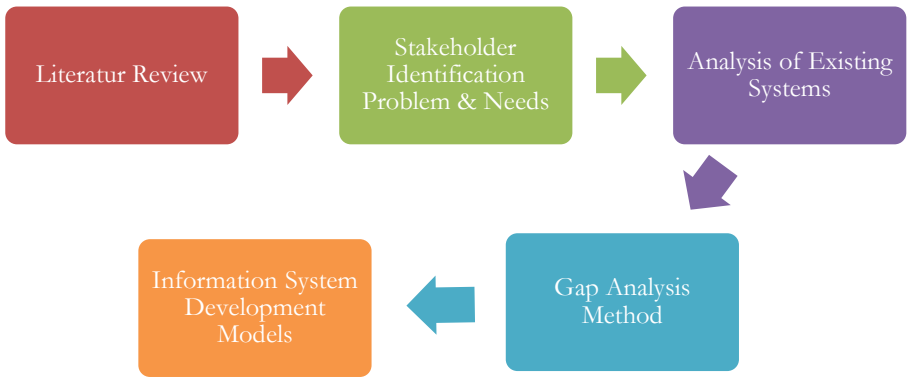

Figure 1. Research Methods

The stages of this research, as depicted in Figure 1, along with their detailed explanations, are as follows.

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2.1. Literature Review

In this stage, the researcher conducts a literature review of several previous studies focused on the implementation outcomes of information systems in the field of marine and maritime. Some of these studies include the following:

Table 1. Literature Reviews

No	Research	Focus
1	Stenly Ibrahim Adam, 2021[14]	addressing issues in marketing fishermen's catch in indonesia through a mobile application-based approach
2	Dhita Widhiastika dkk, 2021 [15]	this research develops an android-based mobile application for online buying and selling of fish, named fo-klik. the application directly connects sellers with consumers through a delivery system using drivers
3	Nabila Pratiwi Kiswanto dkk, 2020 [16]	automate the recording of fish catches. This application allows fishermen and port officers to report catch data efficiently and monitor the coordinates of fishing vessels
4	Indah Susilowati dkk, 2020 [17]	A study exploring the use of the Smart Fisherman Application (Nelpin) in the Pati Regency area, Central Java.
5	Oto Prasadi, Abdul Rohman Supriyono, 2019 [18]	The research aims to analyze the fisheries output system and design an integrated web-based information technology system in the specified area
6	Lidya Elsye Reniban, 2019 [19]	The objective of this research is to design an information system for the inventory of fishery resources that can enhance the performance of the Southeast Maluku Regency Government in disseminating and processing data related to fishery resources
7	Cahya Vikasari, 2018 [20]	The purpose of this endeavor is to implement real-time technology in the fish auction process. By utilizing this system, fish catch data can be recorded more effectively, and the auction process can be conducted in an open and transparent manner
8	Abdul Rauf dkk, 2018 [21]	The objective of this study is to map the potential coastal and marine resources in the Pangkep Regency area. This research employs Remote

No	Research	Focus
		Sensing technology and utilizes a Geographic Information System (GIS) approach
9	Alvin Maulana dkk, 2017 [22]	The aim of this study is to assess the coastal and marine resource potential in the Gunungkidul Regency area. Oceanographic parameters, including sea surface temperature, chlorophyll-a concentration, depth, and current velocity, are analyzed to delineate the tuna fishing grounds
10	Handi Nugroho dkk, 2015 [23]	The objective of this endeavor is to acquire accurate fish catch data through the utilization of electronic logbook technology. To address the challenges associated with manual logbook entries, an electronic logbook system was developed during the period from 2011 to 2014. This technology enables more efficient and precise recording of fish catch data

The research as shown in Table 1 focus pertains to the optimization of marine resource utilization in several regions of Indonesia through the application of technologies such as websites, e-mobile, e-logbooks, e-inventories, geographic information systems (GIS), and other related applications. Based on the literature review of the aforementioned references, the subsequent steps involve identifying the involved stakeholders, addressing the raised issues, and determining the requirements and solutions through further mapping analysis.

2.2. Stakeholder Identification Problems & Needs

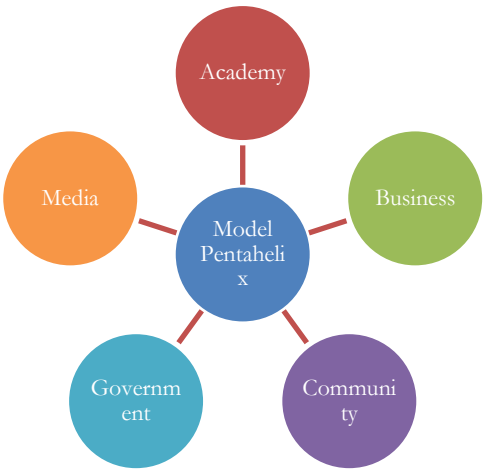

Figure 2. Penta-Helix Model

In this stage, the identification of stakeholders involved based on the pentahelix model [24] to understand the issues and needs of each stakeholder, the identification of stakeholders involved based on the pentahelix model as shown in Figure2.

2.3. Analysis of Existing Systems

In this stage, the researcher analyzes the existing systems (websites and applications) related to marine and maritime resources that already exist or are available.

2.4. Gap Analysis Methods

In this stage, the researcher employs the gap analysis method, which is an approach used to compare the actual condition of an organization with the desired or ideal condition [25].

2.5. Information Systems Development Models

In this stage, the researcher models the development of the SI-LAUT information system based on the results obtained from the process of identification, literature review, and analysis of existing systems.

3. RESULTS AND DISCUSSION

3.1 Stakeholder & System Requirements of SI-LAUT

This study yields several important findings regarding the identification of stakeholder needs and the modeling of a comprehensive marine resource integration system (SILAUT) as an effort to optimize and explore Indonesia's marine resources. The key outcomes are as follows.

Table 2. Stakeholder Identification Problems & Needs

Academy	Business	Community	Government	Media
references	bureaucratic access	education	rule	portals and wikis
data and information	business licensing	training	policy	webinars and training
field problem	business processes and supply chains	job vacancy	strategy	application

Academy	Business	Community	Government	Media
skill and competition	partners and workforce	business opportunities	work program	community development
infrastructure, cooperation and grants	market and marketing	social assistance	service	social media and search engines
seminars, publications and copyright	funding	community empowerment	information	marketplaces and funding

Table 2 presents the results of identifying the issues and needs of each stakeholder within the pentahelix model. These insights were gleaned from a comprehensive literature review and observations of current systems. A gap analysis followed, comparing the current and desired states of the system. The researcher then conducted a mapping analysis, drawing on available literature and websites. Stakeholder representatives validated these findings, translating needs into specific requirements for various user groups: academia, business, government, and the public. The functional and non-functional requirements of SILAUT are illustrated through four straightforward use cases, tailored to the distinct needs of each stakeholder.

Figure 3 presents the system requirements of SI-LAUT from an academic perspective, focusing on three critical areas: First, it emphasizes the need for academics to have robust access to literature, data, and relevant information that address specific research challenges and field inquiries. Second, it highlights the enhancement of academic skills and competencies through engagement in seminars, the publication of research findings, and the protection of intellectual property rights. Lastly, the figure stresses the importance of acquiring support for infrastructure development, collaborative efforts, and funding opportunities, which are crucial for academic success and innovation. In Figure 4, the system requirements of SI-LAUT from a business viewpoint are outlined. It underscores the necessity for businesses to efficiently navigate bureaucratic processes and secure permits. Additionally, the importance of building partnerships and strengthening the workforce to optimize business processes and supply chains is highlighted. The figure also suggests that expanding market reach and bolstering marketing efforts, including securing adequate funding, are vital for business growth and sustainability.

Figure 5 illustrates the system requirements of SI-LAUT from a community perspective. It focuses on providing access to essential education and training services, which are fundamental for community development and empowerment. The availability of job vacancies and business opportunities are also highlighted, promoting economic growth and social mobility. Moreover, the figure emphasizes

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the importance of social assistance programs and initiatives aimed at community empowerment, which are key to enhancing the quality of life and community well-being.

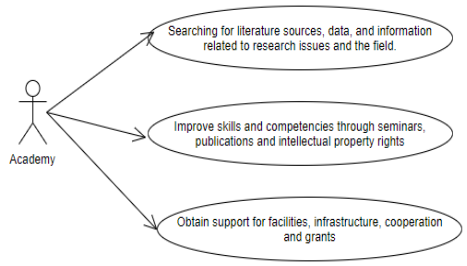

Figure 3. Stakeholder & System Requirements of SILAUT - Academy

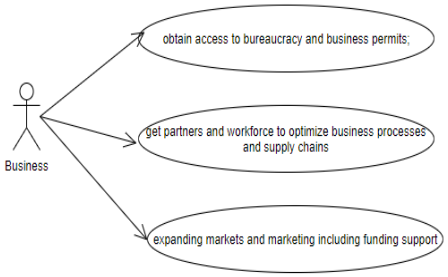

Figure 4. Stakeholder & System Requirements of SILAUT - Business

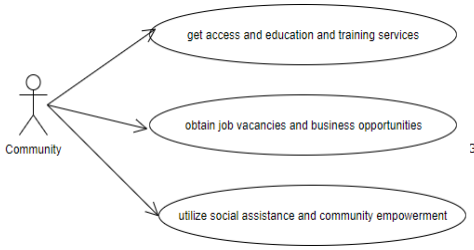

Figure 5. Stakeholder & System Requirements of SILAUT - Community

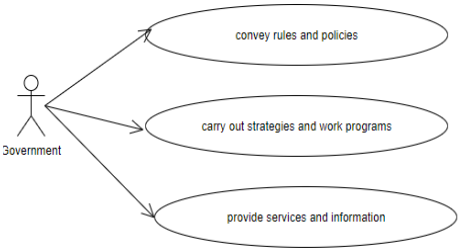

Figure 6. Stakeholder & System Requirements of SILAUT - Government

Figure 6 depicts the system requirements from a government perspective. It details the government's role in communicating clear rules and policies, implementing strategic plans, and executing work programs that align with the needs of businesses and communities. The figure also highlights the government's responsibility to provide reliable services and timely information to the public, ensuring transparency and fostering trust. Given the comprehensive stakeholder identification and system requirements analysis presented in Figures 3 to Figure 6, further refinement may be necessary to support continued development and adaptation. The initial scope of this study was limited to literature reviews, analysis of existing systems, and stakeholder validations, all of which provide a foundation for ongoing enhancement and expansion. This iterative process is essential for refining system requirements to meet the evolving needs of all stakeholders involved.

3.2 Result of Analysis from Existing System

3.2.1 Academy

Table 3 showcases several notable examples of existing systems within the academic sector, highlighting platforms dedicated to inclusive and sustainable socio-economic development. These platforms include official websites of independent research institutions and various Indonesian university websites that specialize in different academic fields. Firstly, the WRI Indonesia website stands out as a prime example of an independent research institution. It is committed to fostering inclusive and sustainable national socio-economic development. This institution collaborates extensively with government bodies, businesses, multilateral institutions, and civil society organizations. Its mission is to devise practical solutions that not only improve the quality of life for the Indonesian populace but also promote environmental sustainability.

Secondly, the academic focus shifts to maritime and marine sciences, a field of critical importance in Indonesia due to its extensive archipelagic nature. Prominent institutions include the Department of Marine Engineering at Institut Teknologi Sepuluh Nopember (ITS), Politeknik Pelayaran Surabaya, the Faculty of Fisheries and Marine Sciences at Brawijaya University, and the Department of Fisheries at the Faculty of Agriculture at Universitas Gadjah Mada (UGM). These institutions are pivotal in advancing maritime and marine sciences, contributing significantly to the academic and practical landscape of Indonesia. Thirdly, the Journal of Fisheries and Marine Sciences website serves a specialized role by managing research outputs and community service projects, along with other academic endeavors related to the maritime and marine sectors. This platform is essential for disseminating research findings and fostering academic collaboration in these crucial areas.

Table 3. Existing System of Academy Sector

Site Name	URL
WRI Indonesia	https://wri-indonesia.org
Dept. T Kelautan ITS	https://www.its.ac.id/tkelautan
Politeknik Pelayaran Surabaya	https://poltekpel-sby.ac.id
Fakultas Perikanan dan Ilmu Kelautan Universitas Brawijaya	https://fpik.ub.ac.id
Dept. Perikanan Fak. Pertanian UGM	https://fish.faperta.ugm.ac.i
Jurnal Perikanan dan Kelautan	https://jpk.ejournal.unri.ac.id/index.php/JPK/index

3.2.2 Business

Table 4 highlights several pioneering examples of existing systems in the business sector that are revolutionizing the aquaculture and fisheries industries in Asia. These examples showcase a range of technological innovations designed to enhance the sustainability and efficiency of aquaculture ecosystems, as well as to streamline the commerce and trading of marine products. Firstly, E-Fishery stands out as Asia's first Aqua-Tech startup, dedicated to building a sustainable aquaculture ecosystem. This innovative platform leverages technology to aid in the cultivation of fish and shrimp, enhancing productivity and sustainability. Additionally, the Aruna website represents an integrated fisheries commerce startup in Indonesia, aiming to establish a fair and equitable trading environment for fisheries and marine products.

Secondly, In Fistha offers a comprehensive digital solution for the financing, production, and trading of fisheries products. This application is pivotal in modernizing the fisheries sector. Trek Fish features advanced technology for tracing fishing activities, including the catches of fish, crabs, and lobsters, supported by the fishER software for enhanced data management. Furthermore, Sillo Maritime provides specialized maritime services, supporting oil and gas exploration and production with an emphasis on sustainability. Thirdly, Pasar Laut serves as an online marketplace for buying and selling fish, facilitating direct transactions between producers and consumers. Fishlog, a B2B marketplace, plays a crucial role in maintaining a cold chain network for national fisheries, ensuring the freshness and quality of marine products throughout the supply chain.

Table 4. Existing System of Business Sector

Site Name	URL
E-Fishery	https://efishery.com
Aruna	https://aruna.id
In Fishta	https://infishta.com
Trek Fish	http://www.trekfish.net
Sillo Maritime	https://sillomaritime.com
Pasar Laut	http://pasarlaut.com
Fishlog	https://fishlog.co.id

3.2.3 Community

Table 5, presented in the previous section, details various existing systems within the community sector, including blogging platforms and online publications. These platforms are instrumental in sharing stories and advocating for marine and environmental issues. By doing so, they amplify the voices of individuals and groups, bolstering collective efforts toward sustainability in Indonesia.

Firstly, Laut Sehat stands out as a pivotal platform akin to a specialized environmental Wikipedia, where individuals can share stories and champion causes related to marine and environmental conservation. This platform is crucial for empowering community groups and the broader public in Indonesia, fostering a sense of responsibility and action toward environmental stewardship. Secondly, Sahabat Laut Indonesia operates as the official website for a vibrant community of ocean enthusiasts. This platform facilitates robust discussions, knowledge sharing, and the promotion of marine conservation efforts. It serves as a hub for raising awareness and driving initiatives that protect Indonesia's marine ecosystems.

Lastly, Kesatuan Nelayan Tradisional Indonesia and Serikat Nelayan Indonesia represent the official websites for traditional fishermen's organizations. These platforms are dedicated to advocating for the livelihoods and future interests of traditional fishermen. They emphasize the vital role these communities play in sustainable fishing practices and environmental conservation, advocating for policies and practices that support the health of marine ecosystems and the well-being of those who depend on them.

Table 5. Existing System of Community Sector

Site Name	URL
Laut Sehat	https://lautsehat.id
Sahabat Laut Indonesia	https://www.sahabatlautindonesia.org
Kesatuan Nelayan Tradisional Indonesia	https://knti.or.id
Serikat Nelayan Indonesia	https://sni.or.id

3.2.4 Government

Table 6 highlights several key systems within the government sector, featuring websites that play pivotal roles in maritime governance and fishery management in Indonesia. Firstly, the website kkp.go.id is managed by the Ministry of Maritime Affairs and Fisheries. This portal serves as a comprehensive resource for disseminating information about regulations, policies, strategies, work programs, and services provided by the ministry. Additionally, maritim.go.id, which is affiliated with the Coordinating Ministry for Maritime Affairs and Investment, offers similar insights and information, focusing on overarching maritime and investment strategies.

Secondly, baketrans.dephub.go.id is the official site of the Bureau of Fishery and Quality Control under the Department of Transportation. This platform is dedicated to issues surrounding fishery inspection and quality control, ensuring compliance and enhancing the integrity of fisheries management. Thirdly,

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dkp.jatimprov.go.id and dkp.jatengprov.go.id represent the official websites for the Marine and Fisheries Agencies (DKP) in the provinces of East Java and Central Java, respectively. These sites, along with other provincial DKP websites, are directly linked to their respective provincial government portals, facilitating access to localized information and services related to marine and fishery sectors.

Table 6. Existing System of Government Sector

Site Name	URL
Kementerian Kelautan dan Perikanan	https://www.kkp.go.id
Kemenko Kemaritiman dan Investasi	https://maritim.go.id
Badan Karantina Ikan, Pengendalian Mutu	https://baketrans.dephub.go.id
Dinas Kelautan dan Perikanan Prov. Jatim	https://dkp.jatimprov.go.id
Dinas Kelautan dan Perikanan Prov. Jateng	https://dkp.jatengprov.go.id

3.3 IS Development Models of SI-LAUT

The development of the SI-LAUT information system employs the gap analysis method [25], a systematic approach to identifying discrepancies between the current operational state and the desired optimal state. This method comprises several crucial stages: criteria identification, data collection, comparative analysis, gap identification, analysis of underlying causes, and the formulation of recommendations [26]. Initially, the researcher delineates specific criteria based on the diverse stakeholders involved, aligning with the Penta-Helix model approach [27]. This preparatory step ensures that the analysis addresses the multifaceted needs of all parties involved. In the subsequent data collection phase, a comprehensive review and compilation of data from existing systems used by each stakeholder group including academia, business, community, and government—are undertaken.

Following data collection, a detailed comparative analysis is performed to assess the alignment between the current state and the established criteria. This analysis leads to the identification of gaps and a thorough investigation of their root causes [28]. This stage leverages various sources, including literature reviews, stakeholder feedback, problem assessments, and evaluations of existing systems [29]. The insights gained are crucial for understanding the limitations and opportunities within the current system. The culmination of this meticulous analysis informs targeted recommendations aimed at enhancing the SI-LAUT information system. These recommendations are designed to bridge identified gaps, address underlying

issues, and propel the system towards the envisioned state, ultimately improving functionality and user satisfaction.

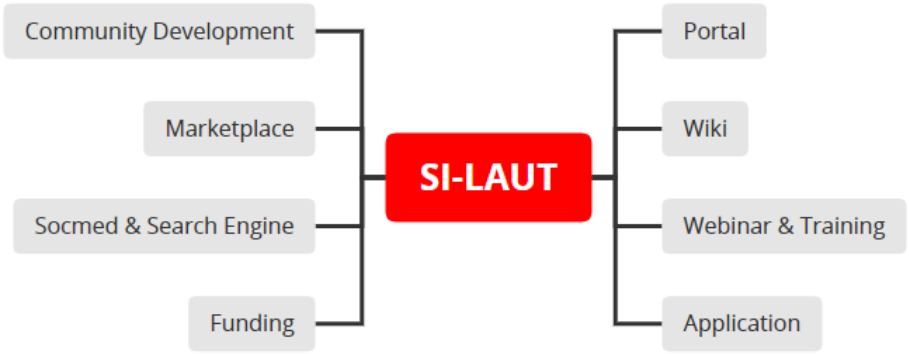

Figure 7. IS Development Models of SILAUT

Based on Figure 4, the development model for the SILAUT information system is a comprehensive framework created from an in-depth mapping of identification processes, literature reviews, and analyses of existing systems. This model is composed of several strategic components, each specifically designed to enhance the accessibility, functionality, and efficiency of information and services.

The Portal functions as a central digital gateway, providing streamlined access to a broad array of information and services. This single access point simplifies navigation and increases user efficiency, making it a vital component of the system. Adjacent to the portal, the Wiki component promotes collaborative content creation, enabling users to share and enrich information collectively. This not only enhances the quality of the content but also cultivates a dynamic and interactive online community, facilitating continuous knowledge exchange.

The Webinar & Training module supports professional development through a virtual event format, allowing individuals or groups to engage in educational sessions from any location worldwide. This module is tailored to boost professional skills and performance, making learning accessible and flexible. The Application aspect includes a versatile software package designed to meet various user needs. This component boosts operational efficiency and enhances user experience by offering customized functionalities that cater to different operational demands. Community Development addresses community engagement by improving living conditions through planned activities focused on empowerment and sustainable growth. These initiatives are designed to foster community resilience and long-term development.

The Marketplace serves as an online intermediary between sellers and buyers, facilitating e-commerce transactions. This platform simplifies the buying and selling process, thereby expanding market reach and accessibility for products and services. Social media & Search Engines (Socmed & Search E) are crucial for dynamic online interactions and rapid information retrieval, integral to modern digital communication. These platforms enable users to connect, share, and access information quickly, enhancing the flow of communication. Lastly, the Funding component is vital for gathering the financial resources needed to support various business and project needs. Effective funding strategies are essential for the development and scaling of initiatives within the SILAUT framework, ensuring financial sustainability and success.

3.4 Discussion

The development of the SILAUT information system as outlined in the previous sections reflects a comprehensive and strategic approach to addressing the multifaceted needs of various stakeholders within the Penta-Helix model. This system, crafted through a detailed gap analysis, identifies discrepancies between current and desired states across several domains—academic, business, community, and government sectors. Each identified component of the SILAUT model, from digital portals to community development initiatives, is designed to bridge these gaps. These components are not isolated solutions but are interconnected elements that enhance the systemic efficiency and effectiveness of information dissemination and operational processes.

In particular, the Portal and Wiki serve as foundational elements of this model, providing robust platforms for information access and collaborative content generation. The centralized portal facilitates the aggregation and retrieval of data, while the collaborative nature of the wiki fosters a dynamic community of content creators who enhance the platform's richness and utility. These tools are particularly vital in an era where the accessibility of accurate and comprehensive information directly correlates with the ability to make informed decisions and foster transparency.

The Webinar & Training module highlights an educational component crucial for ongoing professional development and capacity building. In a global landscape where continuous learning and adaptation are necessary, the ability to participate in and deliver educational content remotely is invaluable. This module not only broadens the reach of educational initiatives but also ensures that they are more inclusive, allowing individuals from remote or underserved regions to participate equally.

Community engagement through the Community Development component is particularly noteworthy for its focus on sustainable growth and empowerment. By

structuring activities that are geared towards improving living conditions and providing tools for self-reliance, SILAUT helps foster communities that are resilient and capable of contributing to their development. This approach is essential in ensuring that technological advancements and systemic improvements translate into tangible benefits at the community level.

Lastly, the financial sustainability and expansion capabilities of the SILAUT system are addressed through the Funding and Marketplace components. These aspects ensure that the system not only supports itself financially but also promotes economic activities that can sustain and expand its reach. The marketplace creates an economic ecosystem that benefits both sellers and buyers, while the funding strategies attract and manage the resources necessary to scale and adapt the system according to evolving needs.

Together, these components form a robust framework for the SILAUT information system, aiming to transform how services are delivered and how stakeholders interact within the digital ecosystem. The thoughtful integration of these components into a cohesive system exemplifies a forward-thinking approach to system development that prioritizes adaptability, sustainability, and inclusiveness.

4. CONCLUSION

Based on the objectives and thorough discussions of the research, the following conclusions about the development of the SI-LAUT information system have been drawn: The identification process utilizes the Penta-Helix model for comprehensive stakeholder engagement and to define both functional and non-functional requirements of the system. The methodology employed incorporates a literature review, analysis of existing systems, and gap analysis, setting a robust foundation for the initial development phase of the SI-LAUT model. This model is crafted to be an integrated information system encompassing various features such as portals, wikis, search engines, and more, aimed at enhancing the management and utilization of Indonesia's marine resources. Future research may explore deeper analyses using methodologies like UML, apply agile development techniques, and enhance UI/UX through user-centered design to improve usability and user experience.

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