



Designing a Web-based Information System for Coworking Space BIKINBIKIN Creative Hub using Personal Extreme Programming Method: Kalla Hospitality Case Study

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ABSTRACT: This research aims to develop a web-based information system for BIKINBIKIN Creative Hub in Nipah Park, Makassar, related to information access and service management through digital transformation. The designed system provides relevant information and facilitates the reservation process for visitors. The method used is Personal Extreme Programming (XP), which supports flexible and adaptive development. The results show that the system is equipped with interactive features that present information informatively about services and facilities. Testing was conducted through two stages: first, backbox testing that assesses internal quality resulting in 100% of features functioning according to specifications; second, ISO 25010 testing that assesses external quality, with results of 90% functional suitability, 90.3% usability, optimal performance efficiency, and good portability in various browsers. From these results it can be concluded that the information system developed has met the expected criteria. However, the management of BIKINBIKIN Creative Hub needs to improve operational service management through informative content strategies and the presence of friendly receptionists to increase visitor engagement and satisfaction.

KEYWORDS: Coworking Space, Information System, Personal Extreme Programming (XP).

INTRODUCTION

Information systems have a major influence on the development of information technology in organizations and society. The digital era has changed the business paradigm and encouraged innovation for a better change, where almost all fields now utilize computer technology (Ngamvichaikit, 2024). Medium and small enterprises are also adopting technology as a key to promoting their products and services through the internet, especially websites, which helps reach a wider market (Opoku et al., 2024). The role of information technology in industry continues to increase, as evidenced by projections that global spending on IT will reach \$5 trillion by 2024, driven by the need for organizational efficiency amid economic uncertainty (Orlando, 2019). The evolution of modern work culture has changed the concept of workspace, with coworking spaces emerging as a flexible solution that offers a relaxed atmosphere, internet, and collaborative spaces (Dell'Aversana & Miglioretti, 2024). Coworking spaces provide facilities that combine conventional offices with creative spaces, attracting freelancers, startups, and students to collaborate (Cabral & Winden, 2024). The coworking space industry in Indonesia, including in Makassar, is growing along with the revival of the creative sector, although people still often equate coworking spaces with coffee shops (Nurhasanah, 2023).

One of the coworking spaces in Makassar is BIKINBIKIN Creative Hub, a project of Kalla Hospitality located in Taman Nipah, providing a collaboration space with complete facilities for various activities (Taufik, 2019). Built as a basecamp inside a shopping center, BIKINBIKIN Creative Hub offers complete facilities, a creative environment, and a relaxed atmosphere, making it an ideal destination for students, workers, and young people looking for a place to gather, discuss, or complete academic assignments. The venue provides facilities for various activities, such as seminars, workshops, work meetings, and office space rentals. Visitors can take advantage of facilities such as printers, photocopiers, a library (in collaboration with *Kedai Buku Jenny*), food and beverage services, meeting rooms, amphitheaters, exhibition halls, and offices, which support various activities (Fajriani, 2019).

BIKINBIKIN Creative Hub not only facilitates individual collaboration, but also builds broader social networks, with a modern, cozy, and comfortable design that inspires creativity. For young people who prioritize flexibility, this place is highly relevant, especially in the digital era where nomadic lifestyles are increasingly in demand (Yang et al., 2019). However, despite its comprehensive facilities, BIKINBIKIN Creative Hub faces challenges in terms of service and information dissemination, mainly due to limited access to accurate information and ineffective front office staff. In the absence of an official website, searching for

information by internet users through Google is difficult, while hundreds of millions of searches are made every day for various information needs (Sostek et al., 2024). To provide accurate and reliable information, it is necessary to increase public awareness of the BIKINBIKIN Creative Hub through more targeted efforts.

This information system is expected to be a relevant solution in providing clear and easy access to information related to the coworking space BIKINBIKIN Creative Hub. The system is designed as the official website of BIKINBIKIN, as proposed by Kalla Hospitality stakeholders. In addition to improving the visitor experience, the system also supports BIKINBIKIN's continued growth as a center for creativity and collaboration in Makassar, as well as strengthening BIKINBIKIN's business foundation to attract more visitors and support the local creative ecosystem. Based on the problems identified, the Personal Extreme Programming (PXP) method was chosen to design this information system, given its fast, flexible, and responsive approach to changing needs, allowing the system to be optimally customized to disseminate coworking space information more effectively (Aurellia, 2023). Advances in information technology are driving digital business, allowing businesses to reach a wider market efficiently, without the need for physical assets such as stores or printed brochures (Mishra & Agarwal, 2024). Information systems enable the collection, processing and dissemination of information that is relevant to users (Melzner et al., 2023), and websites are becoming the main tool for providing in-depth information access, without time and territory limits, and increasing business branding (Jelassi & Martínez-López, 2020).

Previous research using the Personal Extreme Programming (PXP) method shows several advantages and disadvantages that are relevant to the design of the BIKINBIKIN Creative Hub information system. For example, research by Lestari et al., (2023) who developed a university profile website and research by Anjelina, (2023) who built a coworking space lending system using PXP, both highlighted the flexibility and ability of the system to adapt to changing needs. However, the main challenge faced is the dependence on one developer which can hinder the process if there are obstacles and the limited features that still need to be developed further. This research is in line with the goal of BIKINBIKIN Creative Hub's information system which wants to address the problem of accessing information more efficiently through the use of PXP, however, it still has to overcome performance challenges and further feature development, in order to provide an optimal experience for visitors and maximize system functions.

The proposed information system design is expected to meet the identified needs and provide practical solutions for the management of BIKINBIKIN Creative Hub, especially in improving promotional strategies and the effectiveness of front office staff services. With a web-based system, BIKINBIKIN Creative Hub can more easily adapt and compete in the digital era, strengthen its visibility, and attract wider visitors, especially in Makassar. The system will support efficient information management and improve accessibility for visitors looking for a creative collaboration space.

METHOD

In this research, the development model used is Personal Extreme Programming (PXP), which consists of the stages of requirements, planning, iteration initialization, design, and implementation. The process includes three main phases: unit testing, coding, and refactoring, followed by system testing and retrospective. This model was chosen for its flexibility in handling changing requirements and focus on periodic testing to ensure system quality and functionality.

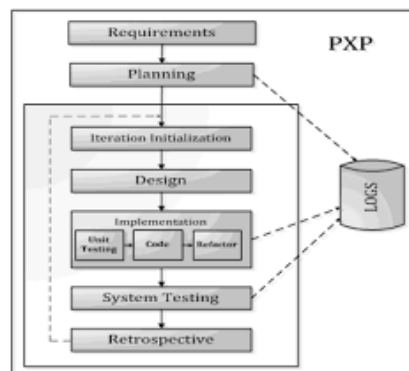


Figure I. The Personal Extreme Programming (PXP) Method



A. Requirements Stage

Requirements is the initial stage in the Personal Extreme Programming method, where the identification of barriers to access to information and services at BIKINBIKIN Creative Hub is carried out through a process of observation and interviews with relevant stakeholders as well as several surveys through questionnaires to visitors or individuals who have visited Nipah Park to find out how far their knowledge of a coworking space, especially BIKINBIKIN Hub.

1. Problem Analysis

The results of interviews and observations show that membership registration and space reservations at BIKINBIKIN Hub are still done manually, which results in limited information on physical and social media that is less informative. This causes confusion among visitors and increases the risk of data errors. The lack of staff presence also reduces visitors' direct access to information, creating significant shortcomings in information access and service efficiency. Therefore, the development of a more informative information system and better service management is required to improve customer satisfaction.

2. Needs Analysis

Requirements analysis is done through user stories, which describe system requirements from the user's perspective in a language that is easy to understand. Researchers gathered two users, namely managers (stakeholders) and visitors (customers), resulting in eight user stories that include detailed features and specifications.

Table I is the user stories obtained.

Table I. BIKINBIKIN Hub Information System User Story

ID User	User Story
US-01	As the manager, I would like to update the vision, mission and history of BIKINBIKIN Hub.
US-02	As a manager, I want to manage user testimonials.
US-03	As a manager, I want to manage price and service information.
US-04	As a visitor, I wanted to understand BIKINBIKIN Hub's vision, mission, history and services.
US-05	As a visitor, I would like to see other users' testimonials.
US-06	As a visitor, I would like to know the details of prices and services.
US-07	As a visitor, I would like to access the BIKINBIKIN location map.
US-08	As a visitor, I would like to contact the admin for information or reservations.

B. Planning Stage

At this stage, the list of tasks is compiled according to the needs identified through user stories, by prioritizing the main tasks in a structured manner with 3 iteration stages, namely: design, implementation and testing. The estimated processing time can be seen in the following Table II.

Table II. Iteration Task List

Iterations	Task List	Estimation
Iteration 1	System Design	2 Weeks
Iteration 2	System Implementation	3 Weeks
Iteration 3	Testing	14 Days

C. Iteration Initialization

The first step in starting each iteration is to select the task that will be the main focus of that iteration. The duration of an iteration usually lasts between 1 to 3 weeks, depending on the type of project being executed.

D. Design Stages

This design stage was the first iteration. This design consists of two main parts. First, the design of the system workflow using UML diagrams, which includes use case diagrams and activity diagrams to model the interaction between users and the system

according to predetermined needs. Second, the design of the system interface prototype was done using the Framer tool to ensure an optimal user experience.

E. Implementation Stage

This implementation stage is the second iteration with 3 stages, namely unit testing, coding and refactoring. For unit testing, researchers used 2 methods, namely testing through blackbox testing and run code. Built using the React framework, Framer tools, serverless backend and Visual Studio Code as a code editor. Coding is done by the author as an individual developer. The implementation process is divided into 2 stages, namely code implementation and site publication with a focus on frontend development.

F. Testing Stages

At this stage, testing of the system and functionality of the results of the development of a web-based information system for the BIKINBIKIN Hub coworking space service that is integrated with digitization. Researchers use the black-box testing method to test internal system functionality and ISO 25010 characteristic testing, to assess external system functionality, which includes four main characteristics: functional suitability, usability, performance efficiency and portability.

RESULT AND DISCUSSION

A. First Iteration

In the first iteration, researchers designed the structure and workflow of the system by creating use case diagrams and activity diagrams. In addition, user interface (UI) design was done using the Framer tool to ensure an intuitive and visually appealing design that meets the functional needs of the system.

1. Use Case Diagram

There are 4 main features that will be implemented in the use case diagram design, including: the main page that presents a summary of the service, access to FAQs that contain answers related to research problems, a feature for reservations through the admin contact link, and an interactive map to facilitate location search. As well as the admin control panel provided through the live framer tool. The use case diagram is shown in Figure II below:

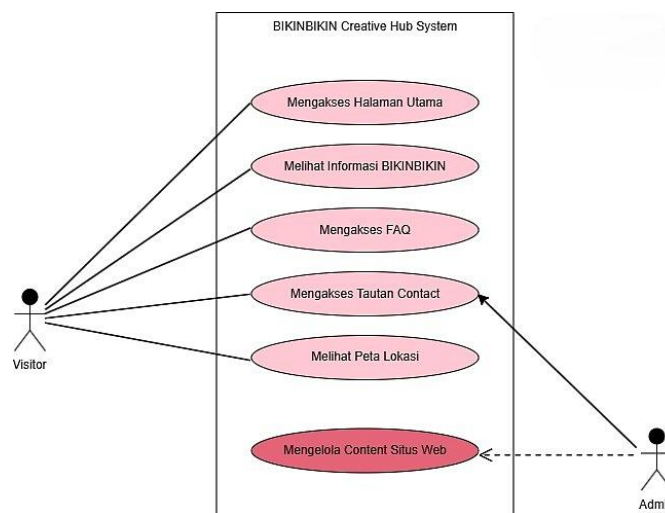


Figure II. BIKINBIKIN Hub System Use Case Diagram

2. Activity Diagram

The activity diagram design describes the sequence of activities between Admin and visitors in the BIKINBIKIN Hub information system. Admin activities include opening the site, managing content, and updating information to ensure users get the latest content. Meanwhile, visitor activities begin with accessing the main page and continue with requests for information related to the BIKINBIKIN Hub, FAQ, contacts, and location maps. The activity diagram can be seen in Figure III below:

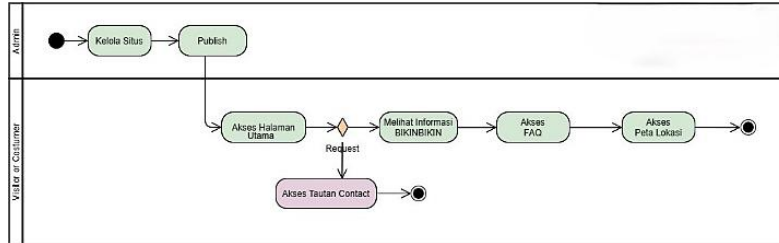


Figure III. BIKINBIKIN Hub System Activity Diagram

3. Prototype Design

The results of the system diagram design above can be poured into the results of the user interface prototype design in Figure IV below:

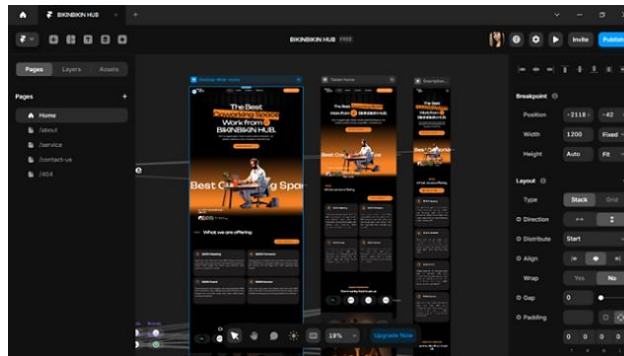


Figure IV. BIKINBIKIN Hub User Interface Prototype Design

B. Second Iteration

In the second iteration, the author presents the results of the user interface implementation of the web-based BIKINBIKIN Creative Hub information system. The process of uploading files from localhost to the GitHub repository is done without using Git, but manually. Netlify provides a Continuous Deployment feature that is integrated with GitHub. With the Continuous Deployment feature, any changes made to the GitHub repository will be automatically published, thus facilitating an efficient and integrated workflow. Netlify also provides tools to manage domains, SSL certificates, and site performance optimization directly through the dashboard. The following are the results of the information system implementation:

1. Main Page Implementation

The results of the main page implementation contain concise information about coworking spaces such as achievements, facilities and services, price lists and facilities for membership and space reservations, user review videos and FAQ features around questions that have been identified as common questions about BIKINBIKIN Hub services and features that make it easy to contact the admin. The implementation of the main page can be seen in Figure V below:



Figure V. BIKINBIKIN Hub Main Page Implementation

2. Profile Page Implementation

The results of the implementation of a page containing information about the BIKINBIKIN Hub coworking space profile in summary such as history, vision, mission, founder, gallery of creative and collaborative spaces, and the BIKINBIKIN Hub operational process. The implementation of the profile page can be seen in Figure VI below:



Figure VI. BIKINBIKIN Hub Profile Page Implementation

3. Service and Facilities Page Implementation

The results of the implementation of a page containing information about BIKINBIKIN Hub services and facilities such as what services BIKINBIKIN Hub offers, service facilities, description of service information, as well as prices and procedures for reservation and membership registration. The implementation of the services and facilities page can be seen in Figure VII below:

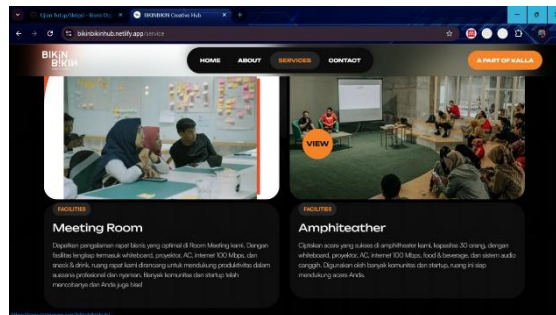


Figure VII. BIKINBIKIN Hub Service and Facilities Page Implementation

4. Contact Page Implementation

The results of the implementation of a page containing BIKINBIKIN Hub contact information such as admin contacts, email, operating hours, interactive maps, and complete social media accounts. The implementation of the contact page can be seen in Figure VIII below:

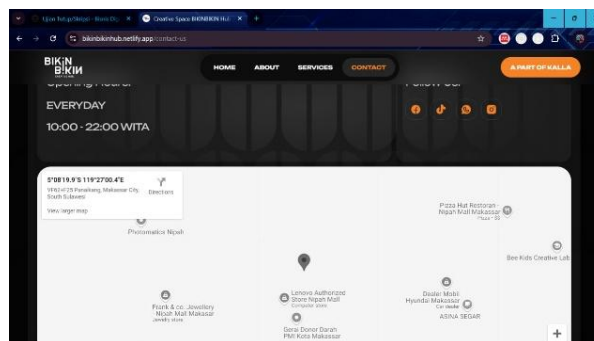


Figure VIII. BIKINBIKIN Hub Contact Page Implementation



C. Third Iteration

At the last iteration stage, this is the result of testing the BIKINBIKIN Hub information system, with 2 stages of testing the quality of the system internally and externally. The following are the test results based on their functions:

1. Black-Box Test Result

The Blackbox Testing results in Table III show that there are a total of 12 test scenarios. All scenarios were successfully implemented, with the following results:

Table III. Blackbox Testing Result

Page	Scenario	Esxpect	Validity
Home	Navbar and background	As per design	Successful
	ex and hero images	Appears correctly	Successful
	Access button	Navigate to the right page	Successful
	Success story	Displayed	Successful
	FAQ Function	Display the answer according to design	Successful
Profile Page	Navbar and background	Featuring	Successful
	Profile information	Navigate to the right page	Successful
	Footer function	As designed	Successful
Service Page	Navbar and background	Displayed correctly	Successful
	Detailed service information	Displayed correctly	Successful
Contact page	interactive map, operating hours and contacts	Displayed correctly	Successful
	forms function	works fine	Successful

$$\text{Successful Testing} = \frac{12}{12} \times 100\% = 100\% \tag{1}$$

From the Blackbox Testing calculation above, a total percentage of 100% is obtained. Therefore, it can be concluded that the BIKINBIKIN Creative Hub coworking space information system is very feasible and can be used properly.

2. Functional Suitability Test Result

Testing the functionality aspects of the system is done using test cases to assess the performance of features in the system. There were 16 questions that were validated by two system/media expert lecturers. The validation results are recorded with a check mark in the 'Yes' column if the function operates correctly, and 'No' if there is a problem. The criteria for fulfilling the functional suitability aspect is achieved if all functions in the system can operate as expected without experiencing errors (Usman et al., 2020). As shown in Table IV.

Table IV. Recapitulation of Functional Suitability Test Results

System/Media Experts	Number of Implementation Features			
	Features	Successful	Completeness	Correctness
Validator 1	16	16	1	1
Validator 2	16	16	1	1

After testing the functionality sample using test cases, the following assessment percentage was obtained:

$$\text{Feature Completeness} = \frac{16}{16} \times 100\% = 100\% \tag{2}$$



$$\text{Feature Correctness} = \frac{16}{16} \times 100\% = 100\%$$

From testing with test cases, the Feature Completeness and Feature Correctness values are 100% each, indicating that all designed features have been successfully implemented and are functioning properly. This shows that the BIKINBIKIN Hub information system is acceptable, with a score of 1 for both aspects.

4. Usability Test Result

Usability testing includes three main aspects: understandability, learnability, and operability. Testing was conducted through 15 respondents from the business and visitor side, with the scores obtained compared to the maximum score to calculate the percentage of feasibility of each aspect. Usability testing uses a USE questionnaire with a Likert scale. The results of the usability score percentage are then interpreted with the score interpretation criteria table as shown in Table V.

Table V. Recapitulation of Usability Test Results

Aspects	Total Item	Maximum Value	Acquisition Value	Percentage	Interpretation
Understandability	3	225	205	91%	Very Feasible
Learnability	3	225	185	81%	Very Feasible
Operability	3	300	287	95.67%	Very Feasible
Final Grade	10	750	677	90.26%	Very Feasible

$$\text{Percentage Score} = \frac{\text{Total Score}}{\text{Maximum Score}} \times 100\% \quad (3)$$

$$\text{Percentage Score} = \frac{677}{750} \times 100\% = 90,26\%$$

Table VI. Score Interpretation Criteria (Usman et al., 2020)

Percentage	Interpretation
0% - 20%	Very Unfit
21% - 40%	Less Feasible
42% - 60%	Decent Enough
61% - 80%	Worth
81% - 100%	Very Feasible

Usability testing based on the ISO 25010 standard showed excellent results. The understandability aspect reached 91% (score 205/225), indicating an intuitive interface design. Learnability was 82%, indicating the software is easy to learn but can still be improved. The operability aspect recorded 95.67% thanks to high responsiveness. The final score of 90.26% indicates high usability with potential for improvement in learnability.

5. Performance Efficiency Test Result

Testing the performance efficiency of each website page, which is measured using the GTMetrix tool. This test includes page load time, overall performance score, technical optimization, and grade. These results provide an overview of the performance efficiency of each page, as show in Table VII.

Table VII. Recapitulation of Performance Efficiency Test Results

Page	Time	Performance	Optimization Technical	Grade
Home	2.1s	73%	95%	B
About	2.6s	69%	95%	C
Service	2.1s	76%	93%	B



Contact	2.2s	72%	95%	B
Average	2.0s	72.5%	94.5%	B

From testing using GTMetrix, the average page load time was 2.0 seconds with an overall score of 72.5%. The Home, Service, and Contact pages received a grade B, while the About page needs improvement (load time 2.6 seconds, grade C). In general, the system runs efficiently but needs optimization on some pages.

6. Portability Test Result

Portability Test Results Portability testing is used to measure the ability of the system to be transferred from one environment to another. Testing is done by observing the results of the output generated by using mobile and desktop versions. Testing is done using BrowserStack tools on Windows, Ios, Android, and macOS operating systems, as show in Table VIII.

Table VIII. Recapitulation of Portability Test Results

Browser	Desktop	Mobile
Google Chrome	Pass	Pass
Internet Explore	Pass	Pass
Mozile Firefox	Pass	Pass
Safari	Pass	Pass
Opera	Pass	Pass

Portability testing with Browser Stack showed the system passed in all popular browsers, both on desktop and mobile, demonstrating the high compatibility essential for a consistent user experience.

D. Retrospective

Barriers in accessing information and services at BIKINBIKIN Creative Hub are caused by several main factors, namely the lack of information available online, especially with the absence of an official website, which makes it difficult for visitors to find accurate information about the services offered. In addition, the lack of informative promotions makes the public unaware of the existence of this coworking space, resulting in very low public awareness of the existing services. Another factor is the lack of staff ready to serve at the front office, which makes it difficult for visitors to get immediate assistance or information while on site. This creates an impression of a lack of professionalism in service, which impacts the visitor experience (Haubrich, 2021).

The final stage evaluation of the development of the BIKINBIKIN Hub coworking space information system using the Personal Extreme Programming (PXP) model involves a comprehensive assessment of the entire system development cycle in the retrospective phase. This stage serves as a critical reflection to identify advantages and disadvantages during implementation. The evaluation results show that the system has met most of the planned functional needs, although there are some technical obstacles that need to be overcome but this does not have a significant effect.

CONCLUSIONS AND SUGGESTIONS

The implementation of Personal Extreme Programming (PXP) in information system development provides significant benefits, including increased development efficiency, accelerated decision-making through real-time data, and improved collaboration between developers and stakeholders. PXP also supports risk identification and mitigation, which contributes to service quality. System testing is conducted through backbox testing and evaluation based on the ISO 25010 standard, which facilitates the identification and rectification of issues, ensuring the system meets user needs. Although there were challenges in development, in-depth efforts and research resulted in an optimized system. To improve the performance and attractiveness of BIKINBIKIN Creative Hub, it is recommended that stakeholders strengthen communication and marketing strategies. Steps that can be taken include increasing informative content on social media and training front office staff to provide a positive experience. Development of an informative and interactive website, as well as promotion through online advertising and collaboration with local influencers, are also highly recommended. By implementing these suggestions, it is expected that access to information and quality of service will improve, thus maintaining visitor interest and satisfaction.



ACKNOWLEDGEMENT

Thank you to Mr. Firman and Mrs. Nola as stakeholders of BIKINBIKIN Hub, Kalla Hospitality for allowing the author to build an information system in this research.

REFERENCES

1. Anjelina, Y. "Rancang Bangun Sistem Peminjaman Coworking Space Berbasis Website menggunakan MERN Stack Technology pada Gedung Lembaga Kemahasiswaan Universitas Lampung". Universitas Lampung (2023).
2. Aurellia, I. A. Dela. "Design and Build a Mobile-Based Pet Care Information System with Personal Extreme Programming Method". Proceedings of the First Mandalika International Multi-Conference on Science and Engineering 2022, MIMSE 2022, Informatics and Computer Science, (2023):102, 89.
3. Cabral, V., & Winden, W. van. "Exploring the coworking space as an innovation intermediary: a case study in Amsterdam". International Journal of Knowledge-Based Development, 14(1), (2024): 87–111.
4. Dell'Aversana, G., & Miglioretti, M. "Coworking spaces for remote workers: an inclusive solution? Advantages and challenges from affiliated workers' perspectives". Review of Managerial Science, (2024):1–30.
5. Fajriani, N. "BIKINBIKIN Creative Hub Resmi Hadir di Nipah Mall". Accessed On March 15, 2024.
6. Haubrich, G. F. "Mediation Matters: The Role of Staff in Coworking Constitution". The Flexible Workplace: Coworking and Other Modern Workplace Transformations, (2021):157.
7. Jelassi, T., & Martínez-López, F. J. "Strategies for e-business: Concepts and cases on value creation and digital business transformation". Springer (2020).
8. Lestari, I., Rhodiyah LD, K., & Alfani Putera, M. I. "Rancang Bangun Research Profile Company Pada Universitas XYZ Menggunakan Metode Personal Extreme Programming". Jurnal Sistim Informasi Dan Teknologi, 5(1), (2023):50–56. <https://doi.org/10.37034/jsisfotek.v5i1.182>
9. Melzner, J., Bonezzi, A., & Meyvis, T. "Information disclosure in the era of voice technology". Journal of Marketing, 87(4), (2023): 491–509.
10. Mishra, R. K., & Agarwal, R. "Impact of digital evolution on various facets of computer science and information technology". Digital Evolution: Advances in Computer Science and Information Technology, (2024):17.
11. Ngamvichaikit, A. "Technology Driven Marketing Research in a Digital World: Implications for the Role and Scope of Marketing Research". International Journal of Trade, Economics and Finance, 15(2), (2024):69–76.
12. Nurhasanah, T. "Pergeseran tipologi fungsi bangunan studi kasus: coworking space Eduplex dan restoran Upnormal". Pais, 1(1), (2023):29–36.
13. Opoku, E., Okafor, M., Williams, M., & Aribigbola, A. "Enhancing small and medium-sized businesses through digitalization". World Journal of Advanced Research and Reviews, 23(2), (2024).
14. Orlando, F. "Gartner Forecasts Worldwide IT Spending to Grow 9.3% in 2025". Accessed On February 13, 2024.
15. Sostek, K., Russell, D. M., Goyal, N., Alrashed, T., Dugall, S., & Noy, N. "Discovering datasets on the web scale: Challenges and recommendations for Google Dataset Search". (2024).
16. Taufik, M. "Nipah Mall Hadirkan BIKINBIKIN Creative Hub". Accessed On March 22, 2024.
17. Usman, T. H., Islamiah, N., & Amrullah, M. A. I. "Pengembangan Aplikasi Absensi Pegawai Tenaga Kependidikan Universitas Negeri Makassar Berdasarkan Lokasi Berbasis Android". Jurnal MediaTIK, 3(3), (2020).
18. Yang, E., Bisson, C., & Sanborn, B. E. "Coworking space as a third-fourth place: changing models of a hybrid space in corporate real estate". Journal of Corporate Real Estate, 21(4), (2019):324–345.

Cite this Article: Zefanya V., Rakib M., Aris V. (2025). Designing a Web-based Information System for Coworking Space BIKINBIKIN Creative Hub using Personal Extreme Programming Method: Kalla Hospitality Case Study. International Journal of Current Science Research and Review, 8(1), 01-10, DOI: <https://doi.org/10.47191/ijcsrr/V8-i1-01>