



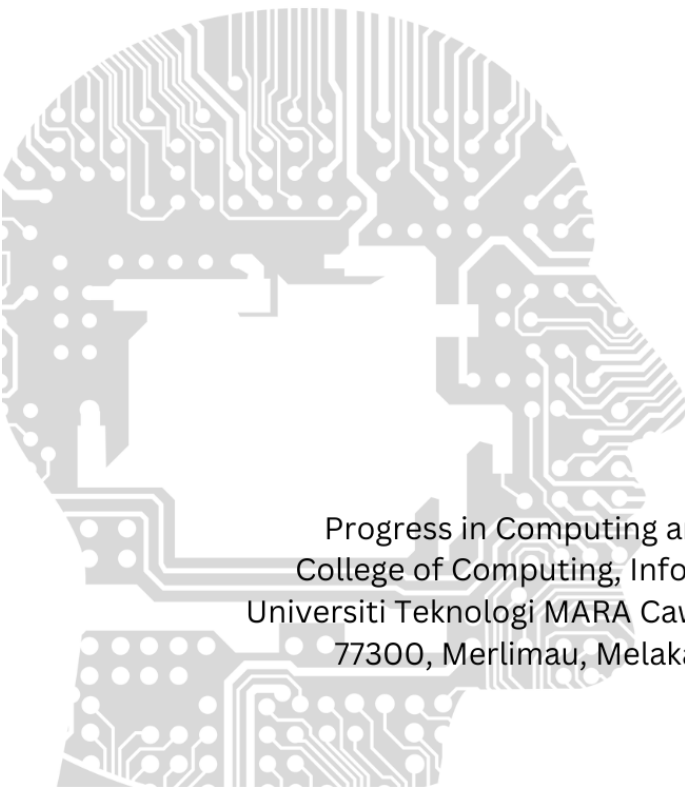
Cawangan Melaka

# PCMJ

Progress in Computing and Mathematics Journal

**volume 1**

<https://fskmjebat.uitm.edu.my/pcmj/>



Progress in Computing and Mathematics Journal  
College of Computing, Informatics, and Mathematics  
Universiti Teknologi MARA Cawangan Melaka, Kampus Jasin  
77300, Merlimau, Melaka Bandaraya Bersejarah

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Progress in Computing and Mathematics Journal  
volume 1



UNIVERSITI  
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Cawangan Melaka

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College of Computing, Informatics, and Mathematics  
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# **PCMJ**

**Progress in Computing and Mathematics Journal**

## **volume 1**

# PREFACE

Welcome to the inaugural volume of the **Progress in Computing and Mathematics Journal (PCMJ)**, a publication proudly presented by the College of Computing, Informatics, and Mathematics at UiTM Cawangan Melaka.

This journal represents a significant step in our commitment to fostering a vibrant research culture, initially providing a crucial platform for our undergraduate students to showcase their intellectual curiosity, dedication to scholarly pursuit, and potential to contribute to the broader academic discourse in the fields of computing and mathematics. However, we envision PCMJ evolving into a beacon for researchers both nationally and internationally. We aspire to cultivate a space where groundbreaking research and innovative ideas converge, fostering collaboration and intellectual exchange among established scholars and emerging talents alike.

The manuscripts featured in this first volume, predominantly authored by our undergraduate students, are a testament to the hard work and dedication of these budding researchers, as well as the guidance and support provided by their faculty mentors. They cover a diverse range of topics, reflecting the breadth and depth of research interests within our college, and set the stage for the high-quality scholarship we aim to attract in future volumes.

As editors, we are honored to have played a role in bringing this journal to fruition. We extend our sincere gratitude to all the authors, reviewers, and members of the editorial board for their invaluable contributions. We also acknowledge the unwavering support of the college administration in making this initiative possible.

We hope that PCMJ will inspire future generations of students and researchers to embrace research and innovation, to push the boundaries of knowledge, and to make their mark on the world of computing and mathematics.

## **Editors**

**Progress in Computing and Mathematics Journal (PCMJ)**  
**College of Computing, Informatics, and Mathematics**  
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## RENTAL BIKE SERVICES WITH REAL TIME CHAT ASSISTANCE

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### Article Info

### Abstract

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Having a rental bike service is important for visitors who decides to ride around the tourist spot such as Malacca. This system is developed because of unavailability of a rental bike system to accommodate visitors of Malacca that want to travel around the Malacca city without having to walk. The objective of this project to design and develop a website of bike rental services with real time chat function. Then, to evaluate the chat function in the website. For webhosting configuration, Hostinger is used as a webhosting partner to deploy the website. Then, Cloudflare is used to deploy the code for chat widget, where it is integrated with Telegram bot. Methodology that will be applied within this tool such as creating vehicle rental website with user friendly interface and easy administration handling need to be created to ease tourists to rent vehicles to tour around Malacca. As a result, one of the answers to this problem is the project of bike rental website with chat widget function. The expected outcome will be the chat assistance enables users to have better user experience in terms of quality of service and fast actions, protect rental providers product from any unmentioned damages and having implementing location sending function in this project, rental providers able to respond quickly to distress calls. This all rounding methodology to create rental bike services system with real time chat widget service that can provide good user experience

**Keywords:** Rental bike services; chat widget

### INTRODUCTION (HEADING 1)

Tourist can walk around with their own foot to visit interesting places around such as historical landmarks and popular restaurants. Yet, travelling around by foot may be exhausting for some places that are may be too big although have good walking infrastructure. When tourist visit hill stations and rural villages that are often only accessible by motorbike due to its mobility (A. K. Nishad, A. Chowdhury ,2021). Tourists often encounter challenges when using bicycle rental services, particularly in unfamiliar locations. They may require assistance with finding the nearest rental station. Real-time chat assistance can bridge the gap between tourists and rental services,

providing immediate support and guidance when needed. This not only enhances the tourist experience but also ensures the safety and reliability of the service.

In addition, tourist could be in unfamiliar location while cycling. When they unfortunately stumble into some incidents such as punctured tire or broken chain, real time chat assistance may not be that helpful. Hence implanting function for sender to send location is the best solution so that rental provider can pinpoint the user location and come to rescue.

## LITERATURE REVIEW (HEADING 1)

Cycling is prioritized and promoted as a sustainable and efficient means of transportation in bicycle-friendly cities. These cities often invest in extensive infrastructure, such as dedicated bike lanes, bike-sharing programs, and secure bike parking facilities. Cycling integration into urban planning addresses not just environmental concerns, but also promotes healthier lifestyles and generates a sense of community engagement. Nations such as Netherlands have the TOD concept in the densely populated Western Netherlands with the bicycle as a feeder mode. This created a spatial model of a belt with compact bicycle towns along railroad lines. In the process, the railroad reinforced by local and national policies since then helped create cycling-based rather than walking-based fifteen-minute cities that generated larger catchment zones (Jan Ploeger and Ruth Oldenziel, 2022).

Although an institutional support framework exists and the benefits bicycles offer for the quality of urban living are widely recognized, in many cities not enough progress has yet been made on policy to position this modality as an essential alternative to public transportation, and even less for urban tourism (Procopiuck, M., 2020).

## Digitalization of Rental Services (Heading 2)

The digitalization of rental services has transformed how consumers gain access to and use numerous commodities and services. Digital platforms have emerged as significant facilitators in the rental market, connecting consumers with a diverse range of products on a short-term basis. In the transportation business, for example, firms such as Uber and Lyft have disrupted the old taxi industry by providing a digital platform for on-demand rides. Furthermore, the digitization of rental services has facilitated the growth of the sharing economy. Similarly, to other digital platforms, its prosperity is built on two pillars: the



"network effect" and "growth before profits" (Srniczek, 2017), which is based on rapid and widespread new product launches (C. Capineri, A. Romano, 2021). These platforms leverage technology to create trust between users through user reviews, secure payment systems, and identity verification.

## **Webhosting**

Web hosting is service that offers a data storage server for the deployment of websites (Ramamurthy, A., et al, 2020) that enables individuals and organizations to make their websites accessible on the internet. It involves storing website files, data, and content on servers connected to the internet, allowing users to access the hosted website by entering its domain name into a web browser. There are four types of known web hosting. Shared hosting stores multiple websites on each server. The websites also share the server's resources, such as RAM and a processor. Shared hosting is the least expensive of all hosting options and is great for small businesses, beginners, first-time website owners and hobbyists. Next, dedicated hosting is where with admin and root access to the web server, this hosting plan gives the owner of the website complete control. Website owners can set up their favorite operating system and security technologies. Compared to other solutions, dedicated hosting is more expensive. Virtual private server (VPS) hostings are more capable of adding and deleting resources, such as more disk space or CPU cores, system memory, and more disks (Potter J, 2021). Scalability is the main trait for VPS hosting. Cloud hosting uses virtualization technology to combine resources from several servers that are supplied in the cloud rather than relying just on one on-premises server. Website owners can manually scale resources up or down with this flexible hosting option based on their use requirements.

## **Content Delivery Network**

A Content Delivery Network (CDN) is a geographically distributed network of servers that work together to deliver web content, such as text, images, videos, and scripts, to users based on their geographical location.

Infrastructures of CDN are edge servers, request routings and origin servers. Edge servers are positioned thoughtfully at the edge of CDN points of presence, which are often one or two hops away from end consumers. Points of presence include things like datacenters, internet exchange points, and ISP networks. Multiple edge servers can be found within a point of

presence. Then, request routing component distributes requests among edge servers. It also monitors network state and edge server load. The three primary categories of request routing strategies are application layer routing, anycast routing, DNS-based routing, and combinations of these (S. Hao, 2018). Origin servers continue to fulfill most requests for dynamic web contents (such as personal webpages and online social networks) even when CDN services are used. This is because dynamic contents are created on demand using information that a content owner is unable to share with a CDN, such as end user data.

## **Chat Widgets Usage in Website**

One of the benefits of using chat widget on the website is increased consumer interaction. The chat widget functions as a real-time communication channel, allowing visitors to communicate with businesses right away. This creates a sense of immediacy by allowing users to inquire about items or services, seek advice, or clarify issues without delay. Then, live chat services are crucial in a time when it's difficult to stand out from the competition and draw more users to websites, develop customer connections and increase customer experience (McLean and Osei-Frimpong, 2019). Next, the chat widget plays a pivotal role in generating leads and conversions. Businesses can use websites to sell their goods online, build trusting relationships with clients, and research consumer behavior for company strategy (Anh & Tien, 2021). By proactively engaging website visitors, businesses can capture potential leads and guide them through the sales funnel.

## **METHODOLOGY (HEADING 1)**

The goal of methodology is to provide more precise and in-depth information about the proposed project so that people can understand the development process. Although the waterfall process was employed in this chapter, every phase included clarification. Additionally, it will demonstrate the model phase, technique, and tools used with a particular component for this project. This methodology report details the methods used to develop the bike rental services and the functionality of the chat widget for my final year project. Within this chapter, there will be discussion about the methodology that is being used, from the planning, requirement analysis, design, implementation development, testing and

Table 1: Project Methodology Framework

Phases	Activities	Technique	Deliverable
Planning	<ul style="list-style-type: none"> <li>- Identify available resources.</li> <li>- Estimate project costs.</li> <li>- Define project goals and scope.</li> </ul>	<ul style="list-style-type: none"> <li>- Analyze and collect information from journals, internet and multiple resources.</li> <li>- Cost estimation and budgeting.</li> </ul>	Project proposal of chapter 1 and chapter 2.
Requirement analysis	<ul style="list-style-type: none"> <li>- Identify project components.</li> </ul>	<ul style="list-style-type: none"> <li>- Surveys on shops and online resources.</li> </ul>	<ul style="list-style-type: none"> <li>- Software and hardware requirements.</li> </ul>
Design	<ul style="list-style-type: none"> <li>- Design system architecture.</li> </ul>	<ul style="list-style-type: none"> <li>- Design flow chart and system architecture.</li> </ul>	<ul style="list-style-type: none"> <li>- Chapter 3: Project architecture and flow chart system.</li> </ul>
Implementation and development	<ul style="list-style-type: none"> <li>- Develop the project according to the diagram in the design phase which includes hardware and software requirement.</li> </ul>	<ul style="list-style-type: none"> <li>- Installation terminal</li> <li>- Install the required configured script and software.</li> <li>- Modify the programming code.</li> </ul>	<ul style="list-style-type: none"> <li>- System source code.</li> </ul>
Testing	<ul style="list-style-type: none"> <li>- Perform integration testing</li> <li>- Seeking for the functionality of</li> </ul>	<ul style="list-style-type: none"> <li>- Integration testing techniques.</li> <li>- Testing the functionality of the system</li> </ul>	System test results.

	the system and the system performance.	Website: fskmjebat.uitm.edu.my/pcmj	
Documentation	- Related data will be documented.	- Documentation templates.	- Project report.

## RESULT AND DISCUSSION (HEADING 1)

Below is the result of the rental process of the website. Table 2 shows the functionality of the bike rental website from the customer side. Table 3 shows the functionality of admin's side receiving order. The testing for functionality included ensuring that the project was operating as intended in every logical way. The functionality testing involved the flow of the rental process from both customer and admin side, the bicycle model management, and the chat widget functionality with use of Telegram. Functionality testing was conducted, and the results indicate that it passed and produced the desired results. Figure 1 shows the user interface of the bike rental service website. Figure 2 shows the user interface of the Telegram bot OkayBikeBot. The future project recommendations would be hosting both website and Telegram Bot in a single webhost. Also, plans to add notifications to the admin so admin can know the bike have been returned by the user.

Table 2: User Renting Bicycle functionality.

Test Case	Expected Result	Actual Result	Pass/Fail
Enter Login credentials	Enter correct Login credentials	Enter correct Login credentials.	Pass

Enter incorrect Login credentials 3 times.	Message Box appear “Maximum login attempts reached. Try again later after 60 seconds.”	The message box appears after fail login three times.	Pass
Click on the bike model in the homepage.	Brings user to bike details page	Brings user to bike details page	Pass
Click on Rent Now in bike details page.	Brings user to Checkout page	Brings user to Checkout page	Pass
Click on Rent Now but without log in first	User prompted to Login	User prompted to Login	Pass
Click on Confirm Payment after filling in payment credentials	Message Box appear “Paid Successfully, Your Invoice Number is xxxx, Thank You for Renting With Us.”	The message box appears and an invoice is generated.	Pass
Click on Confirm Payment without filling in payment credentials	Message Box appear “Please Fill out this Field”	The message box appears after left out the box empty	Pass

Table 3: Admin Handle Booking functionality

Test Case	Expected Result	Actual Result	Pass/Fail
Click on Telegram Logo on the Bike Rental Website.	Enter admin homepage after Enter correct Login credentials.	Enter admin homepage after Enter correct Login credentials.	Pass
Click on New Bookings located at Bike Booking sidebar	Shows new bookings page titled Manage New Bicycle Bookings	Shows new bookings page titled Manage New Bicycle Bookings	Pass
Click on the View on Manage New Bicycle Bookings page.	Show booking details page that shows purchase details that says booking status ‘Not Processed Yet’	Show booking details page that shows purchase details that says booking status ‘Not Processed Yet’	Pass
Click on Start Booking Process button	Message Box appear “Bookings Successfully Under Processed”	The message box appears	Pass

Click on the View on Manage Under Bookings Bicycles page.	Show booking under process details page that shows purchase details that says booking status 'Under Booking Process'	Show booking under process details page that shows purchase details that says booking status 'Under Booking Process'	Pass
Click on the Confirm Booking Process button	Message Box appears "Booking Success!"	The message box appears after clicking the button	Pass
Click on the View on	Invoice generated with status shown	Invoice generated with status shown	Pass
Manage Successfully Rented Bicycles page.	"Rent Successful"	"Rent Successful"	

Table 4: Telegram Bot 'OkayBikeBot' functionality

Test Case	Expected Result	Actual Result	Pass/Fail
Click on Telegram Logo on the Bike Rental Website.	Redirect User to 'LetsGoBot' Telegram Bot	Redirect User to 'LetsGoBot' Telegram Bot	Pass
Click on "My bike is damaged"	Bot asks user to send image of the damage bike and their location	Bot asks user to send image of the damage bike and their location	Pass
Send image and location after click "My bike is damaged"	Bot tell user "OK, help will be on the way. Click /start to start another conversation"	Bot tell user "OK, help will be on the way. Click /start to start another conversation"	Pass
Click on "I'm lost"	Bot ask user to send user's location	Bot ask user to send user's location	Pass
Send location after clicking on "I'm lost"	Bot tell user "OK, help will be on the way. Click /start to start another conversation"	Bot tell user "OK, help will be on the way. Click /start to start another conversation"	Pass
Click on the /exit button	Bot tell user to "Click the button below to return to website"	Bot tell user to "Click the button below to return to website"	Pass

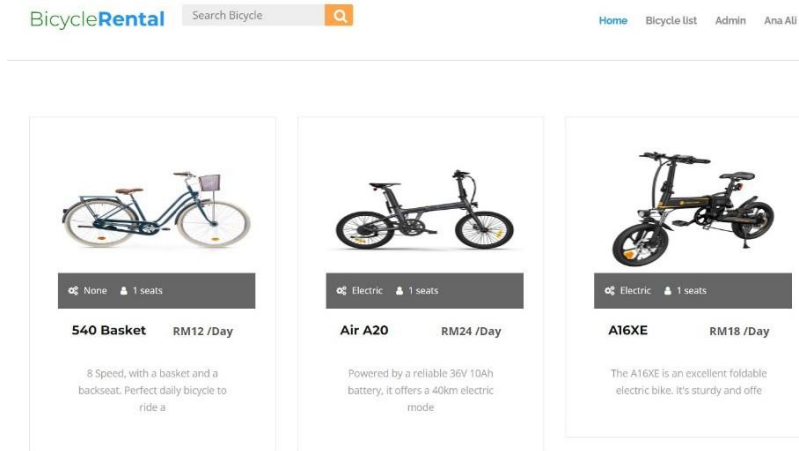


Figure 1: user interface of the bike rental service website

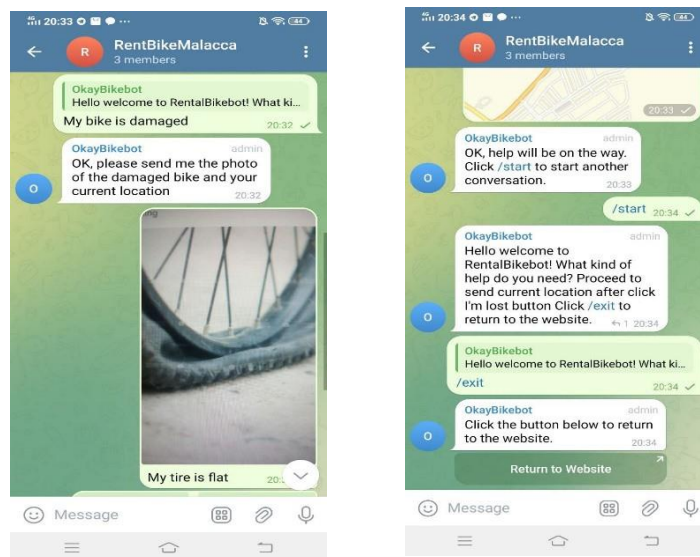


Figure 2: user interface of the Telegram bot OkayBikeBot

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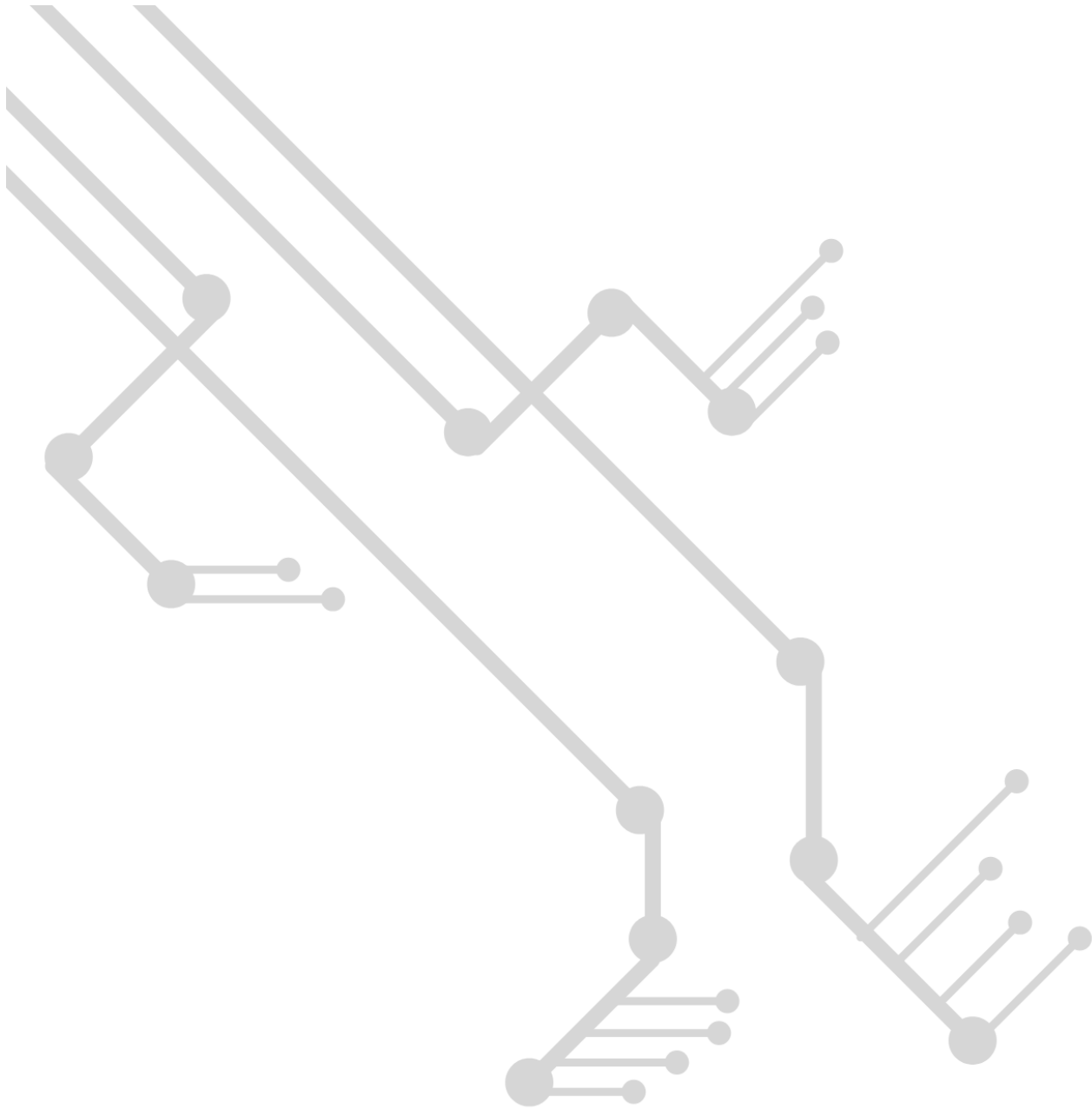
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