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Implementation of Metapolije as a mapping tool for marketing distribution data

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Abstract

Information regarding marketing distribution data plays a crucial role for business actors in formulating their future business strategies. Marketing distribution data enables companies to perform market segmentation more accurately. By understanding the characteristics and preferences of consumers in each segment, companies can tailor their products and marketing messages to meet specific consumer needs. MetaPolije serves as an alternative solution for mapping marketing distribution data. MetaPolije is a web-based platform designed to facilitate user access. It was developed using the Scrum software development method, which consists of four main phases: planning, sprint, sprint review, and sprint retrospective. MetaPolije provides information about the profiles of objects in a given area, along with comprehensive demographic data for that area. The data visualization displays maps down to the sub-district level, which is customized according to partner requests. Similarly, the various categories of objects shown can be adjusted based on user partner requirements. The demographic data displayed comes from the Sidoarjo Regency Statistics Agency (BPS). Therefore, whenever the Sidoarjo Regency BPS releases the latest population data, the MetaPolije platform updated also. The information presented on the MetaPolije platform can be utilized by policymakers to better understand consumers and for crafting marketing strategies that are more suitable and relevant based on existing data. By utilizing MetaPolije, businesspeople gained better data visualization regarding the types of businesses currently present in a particular area. With the support of available demographic data, it can assist in making subsequent decisions related to appropriate business development policies moving forward.

***Keywords**: Marketing distribution data, Demographic data, MetaPolije, Scrum development framework, Sustainable marketing*

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1. Introduction

In the ever-evolving world of marketing, understanding marketing distribution data has become crucial for business practitioners. Marketing distribution data can be defined as information that describes the distribution of products or services in a specific market. This information not only includes the physical locations of sales points but also encompasses various other aspects, such as consumer demographic characteristics, their preferences, and purchasing behaviour (Shah & Murthi, 2021a). This allows companies to gain a deeper understanding of the market and formulate more effective marketing strategies.

The collection of marketing distribution data can be carried out through various methods, including surveys, interviews, and direct observations in the field (Aguinis et al., 2021). Once the data is collected, the next step is analysis to identify patterns, trends, and insights that can be used to inform marketing decisions (Buhalis & Volchek, 2021a). For example, if the data shows that consumers in a particular location prefer to buy certain products at specific times, the company can plan tailored marketing campaigns to boost sales in that area.

Marketing distribution data plays a crucial role in formulating subsequent business strategies (Varadarajan, 2020a). Therefore, every business strategy decision made is data-driven. Marketing distribution data enables companies to perform market segmentation more accurately (Du et al., 2021a). By understanding the characteristics and preferences of consumers in each segment, companies can tailor their products and marketing messages to meet specific consumer needs. By knowing where products sell best and the characteristics of consumers, companies can allocate their resources more effectively (Kotras, 2020a). By offering the right products, in the right locations, and at the right times, companies can enhance customer satisfaction and loyalty.

2. Literature review

Data visualization in marketing based on Geographic Information Systems (GIS) and traditional Customer Relationship Management (CRM) systems is an important aspect of business analysis and decision-making. Some tools used for GIS-based data visualization include ArcGIS, Tableau, Google Maps Platform, and QGIS. Meanwhile, traditional CRM tools equipped with data visualization include Salesforce, HubSpot CRM, and Zoho CRM. Both GIS-based tools and traditional CRM systems play significant roles in marketing data visualization. GIS tools focus more on location analysis, while CRM provides context for analyzing relationships with customers. By integrating these two aspects, companies can gain deeper insights and make more informed decisions in their marketing strategies.

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MetaPolije serves as an alternative solution for mapping marketing distribution data (Purbaningtyas et al., 2024). MetaPolije is a support platform for analyzing marketing distribution data that has been developed since 2023. The advantage of MetaPolije is designed to present the results of data analysis that are both textual and geo-spatial in an integrated manner, which is not found in similar marketing data analysis applications. Initially, this platform relied on metaverse support for geo-spatial data; however, due to suboptimal implementation during early stages, the MetaPolije platform was revised and rebuilt using the Google Maps API Library.

MetaPolije is developed as a web-based platform, making it easier for users to access. It not only displays visualizations of object locations in map format but also provides a complete profile of those objects (Purbaningtyas et al., 2024). This latest version of MetaPolije is more adaptive to user needs. This adaptability is because the settings for category data and the completeness of object profile data can be managed and adjusted based on user input. The latest version of MetaPolije also includes more comprehensive and adequate demographic data support. By displaying data related to objects in a given area, decision-makers can use this information as supporting data to determine subsequent marketing strategy decisions, linked to the characteristics of the existing objects and the demographic data in that area.

A deep understanding of the demographics of society is one of the key factors in an effective marketing strategy (Chou et al., 2020a). Demographic data, which includes information about age, gender, education, income, occupation, and other socio-economic factors, serves as the foundation for making sound business decisions. In the context of marketing, demographic data is not just numbers; it also contains valuable insights that can influence how companies design and implement their marketing strategies (Sheth & Parvatiyar, 2021a).

The importance of demographic data lies in its ability to provide a clear understanding of the target market (Andrus et al., 2021a). Every product or service offered by a company has different consumers. By analyzing demographic data, companies can identify the consumer groups that are most likely to be interested in their products. Thus, demographic analysis not only helps in understanding who the consumers are but also in formulating a more appropriate and relevant approach.

Demographic data also enables companies to segment the market more effectively (Yoseph et al., 2020). Market segmentation is the process of dividing the overall market into smaller parts, where each part consists of consumers with similar characteristics or needs (Pallant et al., 2022). By using demographic data, companies can group consumers based on specific criteria, such as income or education level. This segmentation not only makes marketing more efficient but also increases conversion opportunities and consumer satisfaction (Ilias & Shamsudin, 2020).

Additionally, demographic data plays a crucial role in determining the appropriate distribution channels and marketing tactics. Each demographic segment may have different preferences regarding the types of media or communication channels used. Furthermore, selecting distribution channels that align with the demographic

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characteristics of the target market can also positively impact sales effectiveness (Dash et al., 2021).

Demographic data enables companies to predict trends and changes in consumer behaviour (Lim et al., 2023). Naturally, the demographics of society continue to evolve over time. Changes in population size, migration, and lifestyle trends can influence purchasing patterns. By understanding this data, companies can be better prepared to anticipate shifts in consumer needs and preferences. Through the proactive use of demographic data, companies can maintain the relevance of their products and services in the market.

The use of demographic data in marketing also contributes to inclusivity and diversity in business strategies (Moinuddin et al., 2024). By paying attention to diverse demographic characteristics, companies can develop marketing programs that reflect inclusive values while reaching various community groups. This not only enhances brand image but also contributes to social welfare by ensuring that products and services are accessible to all segments of society.

As explained at the outset, there has been an improvement in the redevelopment of the MetaPolije platform. The change lies in the utilization of the Google Maps API Library, as opposed to the previous Metaverse-based system. This is also part of an effort to optimize the sustainability of the MetaPolije platform's usage. In addition to the accuracy level and the acceleration of GIS data support updates, the speed of GIS data access has also been a consideration in the development of the latest version of the MetaPolije platform. Furthermore, the allocation of memory resources required when running the MetaPolije platform from the user's side has also been taken into account. The Google Maps API Library requires significantly less memory resource compared to Metaverse.

3. Method

The stages of developing the MetaPolije platform refer to the Scrum software development method (Hema et al., 2020). Scrum is a framework used to manage projects with high complexity, allowing teams to work collaboratively and adaptively (Nyembe et al., 2023). The stages of Scrum can be divided into four main phases: planning, sprint, sprint review, and sprint retrospective.

The first stage in the Scrum method is sprint planning. During this stage, the types of work to be done are planned. This includes gathering partner requirement data, adjusting the application to meet partner needs, conducting technical guidance assistance for application use, and implementation. Data collection of partner needs is conducted through surveys and direct interviews with user partners. The results of this data collection serve as the basis for the implementation team to make adjustments and updates to the MetaPolije platform that has already been developed. Once the MetaPolije platform has been tailored to meet the needs of the partners, technical guidance is provided for

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users. This facilitates users in utilizing the MetaPolije platform independently. Each of these sprint phases requires 2-4 weeks for completion.

At the sprint execution stage, the team enters the execution phase. In this phase, the team is also expected to remain adaptable to any changes that may arise. Success in this stage greatly depends on good collaboration among team members and effective communication with partners. The first sprint involved a survey and interviews with partners using the MetaPolije platform, resulting in the need for additional features on the platform to manage category data according to the partners' requirements. Data mapping of objects is not only created globally but can also be narrowed down to several smaller areas beneath it. Furthermore, a dedicated page needs to be added to describe in detail the object data present in the MetaPolije database. The overall results obtained from the survey and interviews serve as the basis for adjustments to the MetaPolije platform. Technical guidance activities for the MetaPolije platform are conducted in two sessions. The first session is aimed at small groups divided by user level on the platform. This session is also used to address any bugs that arise. The second session is intended for all partners in general.

After completing the sprint period, the team enters the Sprint Review stage. In this stage, the team demonstrates the products or features that have been successfully completed during the sprint. This meeting involves all stakeholders, including end users (operators) and management, to provide feedback on the team's work results. The input received from user partners includes the need for additional features to display a collection of documentation photos of objects in a carousel format, thereby facilitating users to view objects in a short amount of time.

The feedback given during the Sprint Review is crucial as it can offer new insights into the needs and expectations of the stakeholders. Additionally, this stage allows the team to evaluate whether the sprint goals have been achieved and to make adjustments if necessary for upcoming sprints. The final stage in the Scrum cycle is the Sprint Retrospective. The purpose of this stage is for reflection and continuous improvement. User input for the addition of a photo collage feature in carousel format has been implemented on the MetaPolije platform. By applying the Scrum development method, any discrepancies between the system and the partners' needs can be detected earlier. This can minimize the potential for greater losses that could arise in the future.

4. Findings and discussion

The homepage presents an overview of Sidoarjo Regency in a map format that is divided down to the sub-district layer. The general information displayed includes the boundaries of Sidoarjo Regency as well as population distribution data based on gender and specific age group ranges. Additionally, data on the distribution of the productive age population engaged in agriculture, industry, and services is also included. This allows companies to

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gain a deeper understanding of the market and formulate more effective marketing strategies (Buhalis & Volchek, 2021b; Shah & Murthi, 2021b)

The subsequent menu displays accessible to users differ between general users and admin users. It was the admin-level users who played a crucial role in determining how complete the data visualization presented. Admin users have the authority to manage master data, including master categories, master sub-districts, master objects, master age groups, and master population activities. The data configured by the admin ultimately determines how the object data is presented to general users. Therefore, the more complete and detailed the data managed by the admin, the better the data visualization for general users when utilizing this MetaPolije platform. This information also facilitates decision-making for users regarding the marketing strategies to be adopted subsequently (Varadarajan, 2020b).

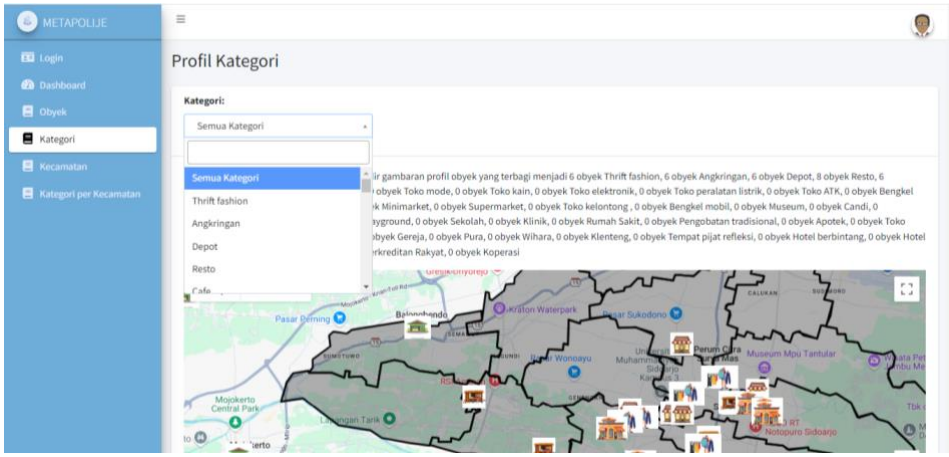

Figure 1. *Data processing category page*

The provided map area layer extends to the sub-district layer. However, during the initial data collection, this was conducted down to the village level solely for the purpose of mapping the area. Meanwhile, the demographic data sourced from the Central Bureau of Statistics (BPS) is only available up to the sub-district level. However, this does not pose a problem, as the conditions depicted at the sub-district level are already capable of illustrating the situation of the villages within its jurisdiction. The data at the sub-district level displayed is also dynamic, following the data from the Central Bureau of Statistics (BPS) of Sidoarjo Regency. This means that each time the BPS releases the latest population data, the MetaPolije platform will also be updated.

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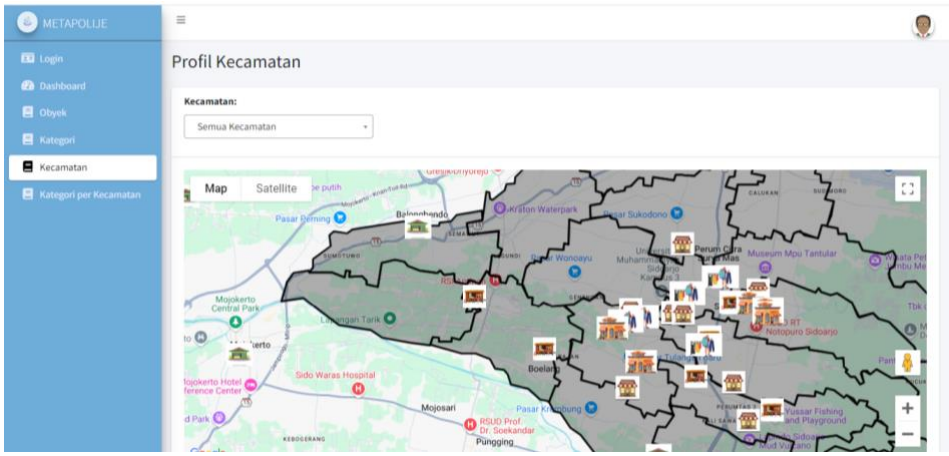

Figure 2. *Sub-district page*

For the object data itself, it is obtained from entries made through the provided forms. The detailed completeness of each object data includes position data and profile data of the object itself. Through this information, the public had a better understanding of the profile of the targeted object.

Figure 3. *Object profile detail page*

For general users, the MetaPolije platform can be utilized as part of the basis for future marketing strategy decision-making. This is because through MetaPolije, various types of objects in a selected area can be viewed, complete with demographic data for that area (Du et al., 2021b). By applying MetaPolihe for mapping marketing distribution data in a certain area, it becomes possible to identify the types of businesses present in that area. With the support of demographic data in the region, decision-makers can determine which business strategies are appropriate for development in that area (Kotras, 2020b).

When there is a user who wants to start or expand their business in the culinary field by utilizing the MetaPolije platform as a supporting tool, the user only needs to select a similar type of business (with various sub-level categories available on the platform). Subsequently, the platform displays data on active culinary businesses and similar types based on their geographical distribution. The platform can show data regarding the

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number of similar culinary businesses located in a specific area. If the user is interested in further exploring the data in the displayed area, they simply need to click on that area, and detailed demographic data for that area be presented. By reviewing the available demographic data, the user can obtain recommendations for culinary business options that can be developed in that area (Andrus et al., 2021b). This is done by considering the lifestyle commonly found in that area based on factors such as age, gender, and the productivity level of the population based on their professions (Chou et al., 2020b). By taking into account competitors in similar businesses and the available demographic data in that area, the user had a better decision-support database to determine what type of culinary business to develop next, along with the development strategy (Sheth & Parvatiyar, 2021b).

5. Conclusion

Demographic data plays a crucial role in the distribution of marketing data. Through a deep understanding of consumer characteristics and needs, companies can formulate more efficient and effective marketing strategies. MetaPolije serves as a solution for the decision-making support tools related to marketing distribution. MetaPolije offers a comprehensive set of features, is easy to use, and provides engaging data visualizations. MetaPolije supplies complete information on the profiles of objects in a given area, supported by comprehensive demographic data for that area. This allows policymakers to obtain the right data to determine which products should be marketed in a particular area by examining the existing data.

In the future, the MetaPolije platform can be developed by displaying demographic data in graphical format. Additionally, features could be added to allow direct interaction with contacts from each available object. This would further enhance the positive user experience when using MetaPolije.

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