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Empowering Serangan MSMEs Through AI Based Infographics For Global Digital Promotion

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Abstract.
This paper reports on a community service (pengabdian kepada masyarakat) initiative implemented by the Faculty of Economics and Business, Universitas Negeri Jakarta, aimed at strengthening the digital promotional capacity of micro, small, and medium enterprises (MSMEs) in Serangan Village, Bali, through AI-assisted infographic design. Fifteen participants from two craft sectors, pearl handicraft and woven handicraft (anyaman), were engaged, reflecting markedly different baseline levels of digital literacy: pearl-craft producers had prior but visually underdeveloped flyer-based promotion, while woven-craft producers had no previous exposure to structured visual promotional media. To accommodate this heterogeneity, the program combined group-based conceptual instruction on infographic design principles with individualized, one-on-one mentoring, followed by structured practice with generative AI platforms (ChatGPT, Gemini, Claude) for content ideation and prompt formulation, and hands-on infographic production using the Zawa AI application. All fifteen participants successfully produced at least one product-specific infographic by the end of the program. Pearl-craft entrepreneurs upgraded their existing promotional materials into more visually communicative infographics, while woven-craft entrepreneurs produced their first digital promotional assets altogether. Post-training evaluation recorded an overall participant satisfaction rate of 83 percent, categorized as high, with participants specifically crediting individualized mentoring as more effective than classical instruction alone. The program also produced a notable shift in participant perception, from viewing professional-quality design as inaccessible or costly toward recognizing AI as a practical, time-saving design assistant. These findings support the proposition that AI-assisted design tools, combined with tailored mentoring, can substantially lower technical and financial barriers to MSME digital promotion. The paper concludes by recommending that future program phases extend beyond static infographic production to include social media strategy, short-form video content, and independent-practice follow-up, in order to translate initial skill gains into sustained improvements in MSME competitiveness within local and global digital markets.

Keywords: *AI-assisted design; Infographic; MSME; Digital literacy; Community service.*

I. INTRODUCTION

Universitas Negeri Jakarta (UNJ) is committed to advancing human resource quality through education, research, and community service aligned with contemporary needs. As a higher education institution specializing in teacher training, science, technology, and the humanities, UNJ plays a key role in producing globally competitive graduates, with community-based research forming a core part of its mission. The Faculty of Economics and Business (FEB) at UNJ conducts community service programs aimed at empowering micro, small, and medium enterprises (MSMEs), with particular emphasis on tourism and community-based economic development.

One focus area is the MSME sector in Serangan Village, Bali, which is currently undergoing significant transformation to support sustainable tourism and local economic innovation. As of late 2025, Serangan's MSMEs have been engaged in several development initiatives. These include the Serangan Culinary Village, an initiative led by the Denpasar City Tourism Office and managed by the local customary village, intended to become a hub for local culinary MSMEs beginning full operation in March 2025.

Additional programs include the "Integrated Serangan Tourism Village" initiative, which promotes environmentally sustainable and low-carbon tourism development, and the "Green Hydrogen Village" project, which has supported community-based innovations such as fishermen's lighting systems and local handicrafts over the past two years. Efforts are also underway to strengthen the souvenir and tourism-service sectors, including training for 25 souvenir MSME operators, positioning Serangan as a comprehensive tourism destination. Despite these developments, Serangan's MSMEs continue to face challenges in effectively implementing digital marketing, constrained by limited technological infrastructure and insufficient technical assistance.

The FEB UNJ community service program therefore focuses on providing training and mentorship in digital marketing, product development, and technology adoption to strengthen MSME competitiveness at both local and global levels. Access to capital, including through People's Business Credit (KUR) schemes offered by regional banks such as BPD Bali, further supports this economic development. Profile of Serangan Village as an SISC UNJ Partner Serangan Customary Village was selected as the site for SICS Bali 2026 due to its strong socio-economic and cultural potential, particularly in community-based tourism. Known as "Turtle Island" for its Turtle Conservation and Education Centre (TCEC), the village also offers spiritual tourism (Pura Sakenan, Assyuhada Mosque), natural attractions (mangrove forests, beaches, water sports), traditional craft and boat-building education, and local culinary specialties.

Serangan received Third Place nationally in the 2023 Indonesian Tourism Village Award (ADWI) and ranked among the top 75 emerging tourism villages, Preliminary observations conducted through participatory discussions with local MSME operators, tourism village managers, and community members identified two priority issues for the initial phase of the program: Limited capacity among MSME operators to produce engaging and communicative visual promotional materials, such as infographics. Suboptimal utilization of digital technology and artificial intelligence (AI) in(Flynn, 2025) marketing and promotional activities.

Infographics may be defined as visual representations that transform complex information, data, or knowledge into graphic forms that are more comprehensible and engaging . As such, they constitute an effective medium for presenting data or concepts in a manner that is clear, concise, and readily retained (Hagler et al., 2025) The construction of an effective infographic requires the

simplification of information, the selection of appropriate visualizations, and the application of a coherent color palette that avoids overwhelming the viewer with excessive detail (Samra, 2021).

Its principal function is to communicate messages efficiently through the integration of text, imagery, graphics, and other visual elements (Hagler et al., 2025; Traboco et al., 2022). Infographic design has increasingly been employed as a means of facilitating readers' comprehension of news narratives and published scientific findings. Infographics serve an important function in synthesizing events or phenomena while attending to aesthetic considerations in mass media presentation (Ozdamli & Ozdal, 2018). Empirical research indicates that individuals are capable of retaining hundreds, if not thousands, of images following only brief exposure. Infographics thus facilitate the visualization of complex data and information, rendering content more legible and comprehensible, particularly where such content involves extensive text, substantial imagery, and critical numerical data (Hemalatha, 2023; Liu et al., 2025)

With advances in technology, infographics have assumed an increasingly significant role within marketing strategy. A notable recent development is the incorporation of artificial intelligence (AI) into the infographic design process (Dunlap & Lowenthal, 2016) . AI-assisted tools enable more rapid and highly personalized design, optimizing the selection of color, imagery, and graphical elements in accordance with the intended audience. This development enhances not only visual quality but also audience engagement and the overall effectiveness of message delivery (Davis et al., 2024).

Moreover, AI-based infographics are capable of anticipating audience responses to specific visual elements, thereby enhancing their relevance within digital marketing contexts (Murray et al., 2017). Contemporary infographics have been shown to attain higher Altmetric Attention Scores (AAS) on social media platforms relative to original research articles, rendering them more engaging and more readily disseminated. Owing to their capacity to convey information succinctly yet compellingly, infographics represent a highly effective mechanism for reaching broad audiences via social media . Accordingly, training in infographic design—including the application of AI-assisted techniques—is essential for producing well-structured, memorable, and widely accessible information (Dunlap & Lowenthal, 2016). Such training is furthermore consistent with Sustainable Development Goal (SDG) 8, concerning decent work and economic growth.

II. METHODS

This community service program was implemented from 29 June to 1 July in Sarangan Village, Bali, employing a participatory training and mentoring approach. The program design was informed by a preliminary needs assessment comprising field observations and discussions with local Micro, Small, and Medium Enterprises (MSMEs). This assessment revealed two principal challenges:

(1) limited proficiency in designing attractive and informative infographics for digital promotion,

(2) inadequate knowledge of Artificial Intelligence (AI)-based tools for enhancing the quality and efficiency of marketing content.

To address these challenges, the program adopted an experiential learning framework that integrated lectures, demonstrations, guided practice, and direct mentoring. The activities were carried out in four stages. The first stage comprised a needs assessment, in which the community service team conducted observations and discussions with MSME owners and managers to identify

their existing digital marketing practices, challenges, and training requirements. The findings from this stage informed the development of training materials tailored to participants' level of digital literacy.

The second stage consisted of interactive training sessions on infographic design and AI-assisted visual content creation. Participants were introduced to fundamental principles of infographic design, including visual hierarchy, typography, color selection, layout composition, and effective information presentation. The training further introduced several AI-powered design platforms, such as Canva AI and Adobe Firefly, demonstrating how these technologies can streamline the design process while yielding professional-quality promotional materials.

The third stage centered on hands-on practice and individualized mentoring, during which participants developed their own promotional infographics using AI-assisted applications. Facilitators provided tailored guidance to help participants transform existing promotional content into visually compelling digital marketing materials, offering continuous feedback throughout the design process to reinforce participants' understanding of both design principles and AI functionalities.

The final stage encompassed evaluation and reflection. Participants presented their infographic outputs and received feedback from the facilitators. The evaluation focused on participants' ability to apply infographic design principles, utilize AI tools effectively, and produce promotional materials suitable for digital marketing purposes. Discussion and reflection sessions were also conducted to capture participants' experiences, challenges, and recommendations for future training initiatives. The program is expected to yield several outcomes, including enhanced digital marketing competencies among MSME owners, improved capacity to produce high-quality infographic-based promotional content, a deeper understanding of AI applications in visual communication, and greater readiness to implement digital marketing strategies to expand market reach and strengthen business competitiveness. In addition, the program produced several supporting outputs, including activity documentation, educational videos, collaboration agreements between Universitas Negeri Jakarta and participating MSME partners, media publications, and community service reports, thereby ensuring the sustainability and dissemination of the program's impact.

III. RESULT AND DISCUSSION

This community service initiative was carried out in Serangan Village, Bali, and engaged fifteen participants representing micro, small, and medium enterprises (MSMEs) from two distinct craft sectors, which are pearl handicraft producers and woven handicraft producers. Although both groups operate within the same broader creative economy ecosystem, preliminary observation revealed that they occupied markedly different positions on the digital literacy spectrum, particularly with respect to their use of promotional media.



Figure 1. Pearl handicraft



Figure 2. Woven Handicraft

Pearl handicraft entrepreneurs had already incorporated flyers into their marketing practices; however, these materials were produced using conventional, largely manual design approaches. As a result, the flyers lacked visual appeal and did not adhere to established principles of effective infographic design—such as visual hierarchy, information chunking, and audience-oriented layout. Woven handicraft entrepreneurs, by contrast, had no prior exposure to infographic design at all and had not previously employed any structured visual promotional media. This disparity in baseline competence formed the empirical foundation upon which the program's mentoring strategy was constructed.Recognizing the heterogeneity in participants' digital literacy levels, the program facilitation team deliberately moved beyond a purely classical (lecture-based) instructional model. Instead, the team adopted a blended approach that combined group-based conceptual instruction with individualized, one-on-one mentoring (one-by-one mentoring).



Figure 3. One on one mentoring

This dual-track strategy was chosen for several pedagogical reasons. First, it allowed each participant to receive guidance calibrated to their existing skill level and specific business needs, rather than a uniform, one-size-fits-all curriculum. Second, for participants with no prior experience using AI-based applications, individualized mentoring provided a psychologically safer and more comfortable learning environment, reducing the anxiety often associated with adopting unfamiliar digital tools. Third, for participants who already possessed some design experience—albeit rudimentary—the one-on-one format created space for more advanced coaching aimed at elevating the quality of their existing promotional materials beyond simple, self-made designs.

The training program began with a conceptual module designed to establish a shared understanding of infographic design fundamentals before participants were introduced to any AI tools. This module covered the basic concept and definition of infographics as a communication medium, the functional role of infographics within marketing communication strategies and Core visual design principles, including color theory, typography, layout composition, and information sequencing. This foundational stage proved pedagogically necessary because a substantial proportion of participants initially conflated flyers and infographics as functionally equivalent media. The facilitation team addressed this misconception directly, emphasizing that infographics possess a distinct communicative advantage like the capacity to convey information more concisely, engagingly, and comprehensibly than text-heavy conventional promotional formats. This conceptual grounding was treated as a prerequisite for the subsequent, more technical phases of the training, which encompassed the fundamentals of infographic design, the practical benefits of AI-assisted design tools, the sequential stages of infographic production, and hands-on practice across multiple AI platforms.

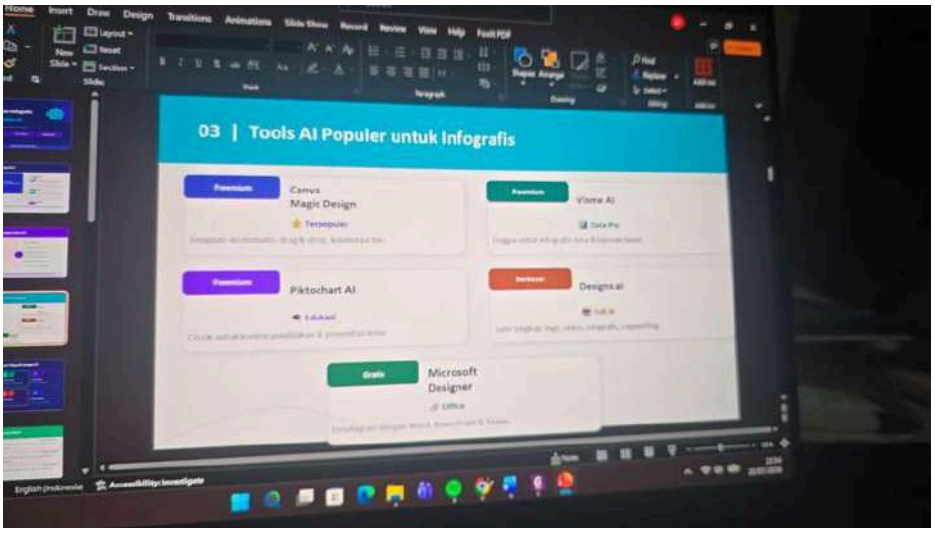


Figure 4. Some material that has been shared.

Following the conceptual module, participants were introduced to several generative artificial intelligence platforms with applicability to promotional content development, including ChatGPT, Gemini, and Claude. These platforms were employed to support participants in generating promotional ideas, constructing product narratives, formulating marketing slogans, and—critically—crafting effective prompts for downstream infographic generation.

This component of the training was deliberately designed to reframe participants' understanding of AI's utility. Rather than positioning generative AI merely as an image-generation tool, the facilitation team emphasized its broader function as a marketing communication assistant capable of supporting the entire ideation-to-execution pipeline, from strategic messaging to visual prompt formulation.

Applied Practice: Infographic Production Using Zawa AI Once participants had internalized both the conceptual and strategic dimensions of content creation, they proceeded to hands-on practice using the Zawa AI application for infographic production. The applied session was structured around a complete production workflow, guiding participants through:

1. Account creation and platform onboarding
2. Selection of appropriate design types/templates
3. Prompt formulation and input
4. Modification and refinement of visual elements
5. Export of finalized designs ready for deployment across social media and other digital platforms

Mentoring during this phase was delivered intensively and individually, ensuring that every participating MSME actor successfully produced at least one infographic design tailored to the specific characteristics of their own product line and business identity.

The mentoring intervention produced measurable improvements in participants' digital design competencies, with outcomes differing meaningfully across the two participant subgroups. Pearl handicraft entrepreneurs demonstrated the ability to transform their previously text-dominant flyers into more communicative infographics, incorporating icons, product visuals, and improved layout composition—effectively elevating an existing but underdeveloped promotional practice.

Meanwhile, Woven handicraft entrepreneurs, who had no prior experience with digital promotional media, successfully produced their first-ever infographic with AI assistance—representing not an incremental improvement but the establishment of an entirely new promotional capability. Taken together, these outcomes suggest that AI-based design tools can substantially lower the technical barriers to entry for visual content production, enabling MSME actors without formal graphic design backgrounds to generate professional-quality promotional materials.

Beyond the acquisition of technical skills, the program also produced a discernible shift in participants' perceptions of artificial intelligence as a business tool. Prior to the training, most participants held the assumption that producing high-quality promotional design required specialized graphic design expertise and a relatively significant financial investment—assumptions that likely contributed to their prior underinvestment in visual marketing materials.

Following direct, hands-on engagement with AI-assisted design tools, participants reported a revised understanding: that AI can substantially accelerate the content production process without compromising visual output quality. This perceptual shift is arguably as significant as the technical skill gains themselves, insofar as it addresses a psychological and attitudinal barrier that might otherwise have continued to inhibit digital adoption among this population. The findings collectively suggest that AI adoption represents a viable and effective pathway for supporting the digital transformation of MSMEs, particularly micro-enterprises operating under significant resource constraints.

Program evaluation was conducted through a post-intervention satisfaction questionnaire administered upon completion of the full training and mentoring cycle. The evaluation yielded an overall participant satisfaction rate of 83%, which the facilitation team classifies as falling within a high satisfaction category. Participants reported that the training content was comprehensible, relevant to their operational needs, and directly applicable to their day-to-day promotional activities. Notably, participants specifically identified the individualized mentoring component as a key contributing factor to their effective mastery of AI-based tools—rating it as more effective than classical, lecture-only content delivery in facilitating genuine technology adoption.

To better understand the drivers behind the 83% satisfaction score, a SWOT analysis was conducted across the four elements most directly shaped by the program design: the mentoring approach, the training facility, the hands-on practice component, and the knowledge participants gained. This analysis helps explain why satisfaction reached a high but not near-maximum level, and identifies concrete levers for improvement in future program cycles.

Table 1. SWOT analysis of Participant satisfaction score

Aspect	Strengths	Weaknesses	Opportunities	Threats
Mentoring Approach	Individualized one-on-one mentoring accommodated heterogeneous skill levels; participants explicitly rated it as more effective than classical instruction alone — a direct driver of satisfaction.	Limited mentor-to-participant time meant depth of individual attention was constrained by session length and facilitator availability.	A scalable mentoring model (peer mentors, recorded tutorials, WhatsApp follow-up groups) could sustain personalized support after the program ends.	Without continued mentoring access, participants may struggle to apply skills independently, risking a decline in perceived value over time.
Facility	Training was conducted directly within the village setting, keeping the learning context close to participants' actual business environment.	Village-based venues typically face infrastructure constraints (internet stability, device availability) that can slow AI-tool practice for less experienced users.	Partnering with local government/tourism-village infrastructure (e.g., Kampung Kuliner facilities) could improve connectivity and equipment access in future sessions.	Persistent infrastructure limitations could disproportionately affect participants with lower digital literacy, widening the skill gap between subgroups.
Hands-on Practice	Immediate, guided application using Zawa AI let every participant produce a tangible infographic within the	A single practice session may not have allowed enough time to explore advanced features or troubleshoot errors, particularly for	Additional practice sessions or take-home guided exercises could deepen tool fluency and independence from facilitator support.	Reliance on one AI platform exposes participants to platform risk (pricing changes, feature limits, discontinuation) that could

	session, reinforcing confidence and perceived competence.	the woven-craft group.		disrupt continued use.
Knowledge Gained	Participants demonstrated clearer understanding of infographic-versus-flyer distinctions and reported a shift toward viewing AI as accessible and time-saving.	Knowledge gains were measured through self-reported satisfaction rather than a tested competency check, so actual retention levels remain unverified.	A structured post-training assessment (short quiz, portfolio review) could validate learning gains and identify participants needing reinforcement.	Without reinforcement mechanisms, conceptual and technical knowledge may decay over time, especially among participants with no prior design background.

Overall, the SWOT profile suggests that satisfaction was driven primarily by the individualized mentoring approach and the tangible, immediate output of the hands-on practice session—both of which directly addressed participants' pre-existing anxiety about AI tools and design complexity. The factors most likely to have kept satisfaction below a near-perfect level are structural rather than pedagogical: facility/infrastructure constraints typical of village-based training, time limits on practice depth, and the absence of a formal knowledge-retention check. These are precisely the areas the recommendations in the Conclusion section are designed to address in subsequent program phases.



Figure 5. The participant take picture together with the mentor after session ends

IV. CONCLUSION

This program, implemented by FEB Universitas Negeri Jakarta under the proposal *"Empowering Serangan MSMEs through AI-Based Infographics for Global Digital Promotion,"* set out to close two priority gaps identified among MSME partners in Serangan Village: weak visual-promotion skills and minimal exposure to AI-assisted design tools. Both were meaningfully addressed: all fifteen participants produced at least one product-specific infographic, pearl-craft entrepreneurs upgraded existing but underdeveloped flyers into more communicative designs, and woven-craft entrepreneurs created their first digital promotional material altogether. The 83% satisfaction rate and participants' shift away from viewing professional design as costly or inaccessible support the proposal's premise that AI tools, paired with individualized mentoring, can lower the technical and financial barriers to MSME digital promotion.

These results also feed directly into the proposal's planned outputs mass-media dissemination, a documentation video, a formal UNJ–Serangan partnership record, and applied student involvement and align with its broader goal of strengthening the village's competitiveness in local and global digital markets as it undergoes tourism-led transformation. That said, the evaluation captured self-reported satisfaction rather than independently verified design quality or business outcomes, and the fifteen-participant, two-sector sample limits generalizability; the durability of these gains also depends on participants' continued, unsupported access to and use of the AI tools introduced. Building on the proposal's own roadmap toward program continuity, the team recommends that the next phase extend beyond static infographics into social media strategy, short-form video content, and independent-practice follow-up — supported by simple, measurable indicators to track whether these initial skill gains translate into sustained improvements in MSME competitiveness.

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