

Redesign Music Photographer Vest: Camera Equipment Organization Solutions for High Mobility

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ABSTRACT

The recent surge in the number of music festivals in Indonesia has presented both opportunities and challenges for photographers documenting pivotal moments at these events. A diverse array of photographic tools, including cameras, lenses, spare batteries, and other accessories, often pose constraints in mobilizing and organizing equipment amidst crowds. This research endeavors to design a vest that enhances the work efficiency and mobility of photographers within a dynamic music festival environment. Employing a qualitative approach, this study utilizes data collection methods such as observations, interviews, questionnaires, and documentation within the active photography community. The design process employs the SCAMPER method, encompassing Substitute, Combine, Adapt, Modify, Put to Another Use, Eliminate, and Reverse, to ensure the resulting vest aligns with the photographers' needs. The findings indicate that vests with specialized compartment designs facilitate the organization of camera equipment, simplify access during work, and safeguard equipment from damage during crowd mobilization. This product is anticipated to serve as a practical solution that enhances the comfort and safety of photographers at music festivals. Furthermore, this research can serve as a reference for the development of analogous products in the future. The redesign was conceived as a critical response to the inadequacy of the previous design in meeting the evolving demands of users.

KEYWORDS

Redesign, Vest, Festival Music, Photographer, SCAMPER

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INTRODUCTION

The rapid expansion of the creative industry, particularly within the music sector, has substantially augmented the number of music festivals in Indonesia. According to data compiled by Kompas R&D, the number of music festivals has doubled in 2023 compared to 2022, resulting in a total of 67 large-scale festivals held between 2022 and 2024 (Nurizal, 2023). A music festival is an entertainment event that amalgamates musical performances with visual staging, artistic elements, and audience interaction, rendering it a complex creative production (Putri et al., 2024). Music festivals have evolved into experiential events that seamlessly integrate performance and audience engagement (Getz & Page, 2020).

However, photographing music festivals presents unique challenges due to dynamic environments, low-light conditions, and high mobility. Photographers are required to master technical aspects such as exposure, composition, aperture, shutter speed, and ISO, while simultaneously capturing decisive moments in unpredictable situations (Wijaya et al., 2023). Additionally, outdoor event photographers must carry various supporting equipment, including cameras, multiple lenses, batteries, memory cards, and protective gear, which increases physical workload and operational complexity (Rahman et al., 2022). Preliminary observations conducted within the Stage.id photography community in Jakarta indicate that the increasing frequency of music

festivals is directly proportional to the intensity and complexity of photographers' fieldwork.

Recent studies underscore the paramount significance of ergonomics in enhancing user performance, particularly in activities characterized by extended physical exertion. Ergonomic design methodologies can substantially mitigate fatigue and augment efficiency by optimizing load distribution and accessibility (Hadyan & Ikhwana, 2020; Nugroho et al., 2021). Furthermore, anthropometric considerations are indispensable in the design of wearable products to ensure user compatibility and comfort (Wibowo et al., 2022). The current state of the art demonstrates a paradigm shift from conventional carrying systems, such as backpacks, to wearable systems that provide expedited access, modular storage, and enhanced mobility in dynamic environments (Rahman et al., 2022).

Despite these advancements, existing solutions still exhibit limitations in terms of accessibility, weight distribution, and adaptability to high-mobility environments such as music festivals. Based on field interviews with Stage.id members, conventional camera bags are perceived as less efficient due to slower access to equipment and uneven load distribution. Consequently, there is a pressing need for an alternative wearable solution that incorporates ergonomic principles, accessibility, and functional organization. This study proposes a vest-based design featuring a multipocket system to address these challenges.

The novelty of this research lies in the integration of ergonomic principles, anthropometric considerations, and a multipocket configuration within a vest specifically designed for music festival photographers. Unlike previous studies that focus on either ergonomic load distribution or storage capacity, this research combines functionality, accessibility, and comfort into a single wearable system. Additionally, the use of breathable materials such as mesh fabrics is intended to enhance thermal comfort during prolonged use in outdoor environments (Setiawan et al., 2025).

This research is of significant importance as it addresses the growing demand for efficient and ergonomic equipment within the rapidly expanding music festival industry. Photographers frequently engage in extended work hours, ranging from 10 to 12 hours per day, necessitating a focus on comfort and efficiency to optimize performance and productivity. Consequently, this study endeavors to design an ergonomic multipocket vest that enhances accessibility, effectively distributes load, and augments user comfort during prolonged outdoor activities. The proposed design is anticipated to offer a practical and adaptable solution that aligns with the requirements of professional photographers operating in dynamic environments.

METHOD

In this study, data collection was tailored to meet the specific requirements of the research project titled "Designing the Vest for Festival Musicians to Arrange Camera Equipment." The data collection process encompassed the following stages: Observation, Interview, Questionnaire, and Documentation

The research methodology employed for the planning of the vest for a music festival photographer to arrange camera equipment is qualitative. Qualitative research methods are employed to gain a comprehensive and in-depth understanding of social phenomena (Bantang, 2022). Additionally, the design approach is supported by qualitative research methods that aim to delve into the needs, behaviors, and experiences of users through observation, interviews, and documentation. As stated by Sugiyono (2017), qualitative methods are effectively utilized to explore social phenomena and user needs within the product design process.

The initial phase of this study involved direct observation of the subjects' activities and conditions in the field. This observation sought to gain an initial comprehension of the working environment, user behavior, and challenges encountered during the utilization of photography equipment, particularly in outdoor settings such as music festivals. The observations were conducted at various music events in Jakarta, with a specific focus on photographers operating in dynamic and high-mobility environments.

Subsequently, online interviews were conducted via the Google Meet platform with selected participants based on their relevance to the research topic, specifically photographers actively engaged in music festival activities. The interviews were conducted in a semi-structured format,

enabling the researcher to delve into information in greater depth and flexibility, while simultaneously capturing the participants' experiences. A total of eight questions were prepared to guide the interview process.

The subsequent phase entailed the dissemination of questionnaires via Google Forms to respondents who aligned with the criteria for research subjects. The questionnaire comprised structured inquiries meticulously crafted to elicit comprehensive and quantifiable data. This methodology served as a validation mechanism for the insights gained from the observation and interview phases, thereby facilitating the identification of overarching patterns in user requirements. In total, the questionnaire comprised ten inquiries.

In addition, documentation was conducted during both the observation and data collection processes. This documentation comprised visual and written records pertaining to situations, activities, and the utilization of equipment by users in the field. The documentation served as supporting data for the analysis process and facilitated the researcher's acquisition of a more comprehensive and objective comprehension of real-world conditions.

Based on the results of observations and questionnaires distributed to photographers as respondents, a significant issue was identified: the absence of effective tools or media to assist photographers in managing and accessing their camera equipment while covering music festival events. These findings suggest that the need for practical, functional, and mobility-supporting tools among photographers has not yet been adequately met.

RESULT AND DISCUSSION

1. Research Procedure

This study employed the SCAMPER method as a creative design approach to develop an innovative photographer vest tailored to the needs of music festival coverage. SCAMPER is a redesign technique consisting of seven stages: Substitute, Combine, Adapt, Modify, Put to Another Use, Eliminate, and Reverse. These stages facilitate the systematic generation and refinement of product design ideas to produce solutions that better meet user requirements (Serrat, 2017).



Figure 1. Illustrates the Application of the SCAMPER Method in the Design Process

a. Substitute

At this stage, the standard materials and compartment configurations found in conventional tactical vests were replaced with customized compartments specifically designed to accommodate photography equipment. The dimensions of each compartment were adjusted to fit the primary camera gear used during music festival coverage.

b. Combine

The design integrates the functions of a tactical vest and a camera bag into a single product. Dedicated compartments are incorporated into the vest structure, enabling photographers to carry essential equipment without the need for an additional camera bag.

c. Adapt

The tactical vest concept, originally developed for military applications, was adapted to the field of photography. Adjustments were made to the shape, dimensions, and placement of compartments to accommodate cameras, lenses, batteries, memory cards, and other photography accessories.

d. Modify

Several modifications were implemented to improve functionality and user comfort. Large telephoto lenses, such as the 70–200 mm lens, require elongated vertical compartments to accommodate their

dimensions. Furthermore, all compartments were equipped with thick protective padding to minimize the risk of damage from impacts. Adjustable webbing straps were also added, allowing the vest size to be customized according to the user's body dimensions.

e. Put to Another Use

In addition to serving as storage for photography equipment, the vest was designed with an extra rear compartment that can be used to carry personal belongings and other supporting items required during event coverage.

d. Eliminate

Features and compartments considered irrelevant to photographers' needs were removed. The design focuses exclusively on accommodating essential photography equipment, thereby improving efficiency and reducing unnecessary weight.

e. Reverse

Unlike conventional camera bags where equipment is often stored on the sides or back, the main camera equipment compartments were repositioned to the front of the vest. This arrangement enables faster and more convenient access to equipment during dynamic shooting situations at music festivals.

Based on the seven SCAMPER stages, a photographer vest design was developed that emphasizes accessibility, mobility, equipment protection, and carrying efficiency. The application of SCAMPER provides a structured framework for transforming existing tactical vest concepts into a product that better supports photographers' operational needs in event documentation activities (Serrat, 2017).

2. Data Validation Tools

The values will be converted using the Likert validation method on a scale of 1-5, which includes the categories of poor, moderate, and excellent (see table 1).

Table 1. Product Suitability interval

Classification	Scale	Interval	Percentage	Category
Very Good	5	81% - 100%	Eligible	Pass
Good	4	61% - 80%		
Fair	3	41% - 60%		
Poor	2	21% - 40%	Not Eligible	Evaluation and Revision
Very Poor	1	1% - 20%		

3. Data from Empirical Studies

Music festival photographers frequently encounter the challenge of transporting equipment during extended work hours, typically spanning 10-12 hours per day for two to three consecutive days. The tactical vests and bags commonly used today are often deemed impractical due to uneven load distribution, restricted access, and associated discomfort. The equipment carried by photographers typically includes a camera, two to three lenses, batteries, a spare memory card, and other necessary equipment.

To address this issue, a photographer-specific vest is proposed. This vest should be constructed from robust, lightweight, waterproof, non-hot, and quick-drying materials. It should feature balanced compartments on both sides for lenses, batteries, and memory cards, complete with a protective cover for safety. A plain black design with mesh material on the back is also preferred.

4. General Concept

The overarching concept of this design is a music festival photographer's vest intended for the organization of camera equipment. This design process is systematically carried out from the identification of user requirements to the design implementation phase, adhering to the fundamental principles of product development (Swandhani & Bahri, 2025). By implementing a tactical system, this vest is equipped with a diverse array of compartments that accommodate the dimensions of each camera equipment. Consequently, it facilitates photographers' activities during performances or amidst a crowd of spectators. Through an innovative approach that builds upon existing products, this vest serves as a solution to the challenges frequently encountered by music festival

photographers, such as the absence of facilities that facilitate the convenient transportation of camera equipment. In the course of their duties, photographers often need to replace lenses, install camera filters, and also replace camera batteries. Therefore, supporting devices are essential that can simplify the process of capturing photographs.

5. General Concept of Design

In this study, the design process employs the SCAMPER methodology, a creative technique that facilitates innovative thinking within the design process. Beyond technical considerations, the vest's design also takes into account the interplay between space, body, and user activity, particularly in the context of utilizing products worn for extended periods and high mobility. This principle aligns with interior theory, which posits that design functions as a system of space and elements that must prioritize comfort, enhance movement efficiency, and facilitate user interaction with the environment (Wicaksono & Tisnawati, 2014). By integrating these two approaches, the vest's design is anticipated to serve not only as a storage medium for photographic equipment but also as a product that promotes the comfort of work and the efficacy of photographers' activities within a dynamic music festival setting. This method is applied in the design of a music festival photographer's vest to facilitate the setup of camera equipment. The process emphasizes three key elements: Substitute, Modify, and Put to Another Use.



Figure 2. SCAMPER-Based SMP Design Process

a. Substitute

The substitution stage focused on replacing the standard compartment configuration commonly found in conventional vests with compartments specifically designed for photography equipment used during music festival coverage. The materials selected for the vest were also adapted to meet durability, comfort, and functionality requirements. The vest was constructed using 1680D polyester and Cordura fabrics for strength and abrasion resistance, mesh material for improved ventilation, Velcro fasteners for flexibility, 6 mm wind foam for equipment protection, webbing straps and adjusters for size adjustment, D-rings for accessory attachment, and zippers for secure compartment closure.

b. Modify

At the modification stage, the size, shape, and placement of each compartment were adjusted according to the dimensions and frequency of use of the photographer's equipment. A dedicated compartment for a 70–200 mm lens was designed with a longer vertical shape and positioned on the left front side of the vest to accommodate its larger dimensions. Compartments for smaller lenses, such as 20–70 mm and 16–35 mm lenses, were positioned on the right front side with dimensions tailored to their respective sizes. Additional small compartments were incorporated to store memory cards and other accessories, while a separate front compartment was provided for personal belongings such as mobile phones. To ensure equipment safety, all compartments were lined with 6 mm wind foam to absorb shocks and reduce the risk of damage. Furthermore, adjustable webbing straps were integrated into the design to allow users to customize the vest fit according to their body size.

c. Put to Another Use

The vest was designed not only as a storage system for photography equipment but also as a multifunctional carrying solution. An additional rear compartment was incorporated to accommodate

personal belongings and supporting items required during event coverage. This additional storage capacity expands the functionality of the vest beyond camera equipment organization, enabling photographers to carry essential items in a single wearable system. As a result, the vest improves mobility, reduces dependence on separate carrying bags, and enhances operational efficiency during photography activities in dynamic event environments.

6. Design Requirements

The design of the music festival photographer vest was developed through a systematic product development process consisting of user needs identification, concept generation, design development, and product evaluation. This approach follows the product design and development framework proposed by Ulrich and Eppinger (2012), which emphasizes a structured methodology to ensure that products effectively meet functional, ergonomic, and technical requirements.

a. User Characteristics

The target users are photographers working in dynamic and crowded music festival environments. They frequently move between locations while carrying multiple photography accessories and require quick access to their equipment during event coverage. Therefore, the vest must support mobility, comfort, equipment protection, and efficient gear organization.

b. Product Requirements

Based on user needs, the vest was designed to combine the functions of a tactical vest and a camera equipment carrier. The product includes dedicated compartments for lenses, batteries, memory cards, camera filters, and other essential accessories. The compartment layout is designed according to the dimensions and frequency of use of the equipment to facilitate quick access during operation.

c. Material and Construction Requirements

The vest utilizes 1680D polyester, Cordura, and mesh materials due to their durability, strength, and suitability for outdoor use. Adjustable webbing straps are incorporated to accommodate different body sizes, while Velcro closures provide secure and rapid access to equipment. In addition, each compartment is lined with 6 mm wind foam to protect equipment from impact during movement and prolonged use.

d. Design Considerations

The design emphasizes four key considerations: (1) maintaining user mobility without restricting movement, (2) providing efficient compartment placement for rapid equipment access, (3) ensuring equipment safety through durable materials and protective padding, and (4) achieving ergonomic comfort through an adjustable fitting system.

e. Design Limitations

The vest is specifically intended for photographers covering music festivals and similar outdoor events. Storage capacity is limited to essential photography equipment and selected personal belongings. Furthermore, the design is restricted to the use of 1680D polyester, Cordura, and mesh materials, with Velcro closures and wind foam padding employed as the primary protection system.

7. Planning Concept

The mind map presented above serves as a visual representation of the systematic organization of recorded ideas and thoughts. These ideas are subsequently divided into distinct branches, each corresponding to specific categories and provisions. The primary objective of this mind map is to facilitate the research process by providing a comprehensive overview of the categorization of elements within the design of the photographer's vest. This systematic approach enables the description of each aspect of the design in a structured and organized manner.

Organizing, as defined by Fitriyanti and Oktariani (2024), encompasses the entire process of grouping individuals, tools, responsibilities, and authorities within an organization. This collective effort fosters cooperation and enables the organization to achieve its objectives effectively.

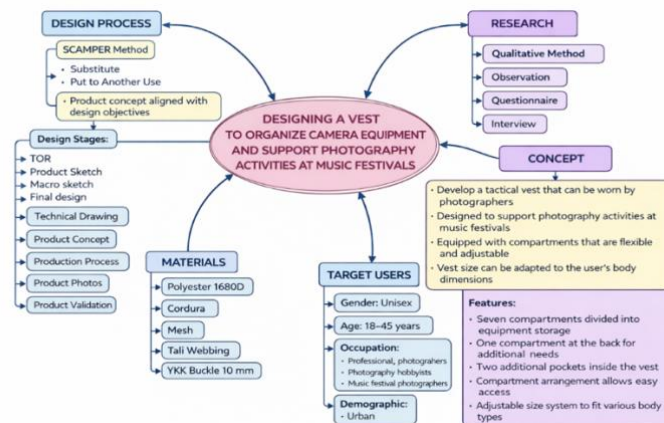


Figure 3. Mind Mapping for Planning Concept

8. Design Configuration

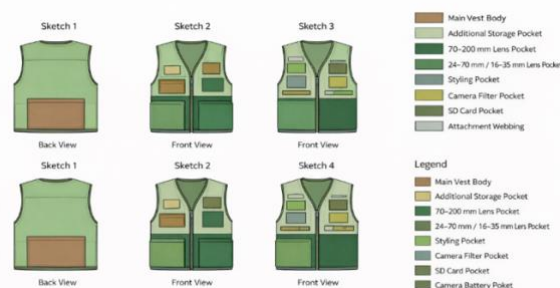


Figure 4. Design Configuration for Vest

Based on the selected design elements and sketches, a blocking system is presented that illustrates the various positions and configurations of the components comprising the photographer's vest. Each configuration is distinguished by distinct colors, providing a clearer visual representation of the arrangement and relationships between the vest's components. In the design of a music festival photographer vest, the functional aspect is paramount, but the visual aspect and design structure also play a crucial role in enhancing the product's readability and functionality. Every visual element, including shapes, lines, colors, and compositions, contributes to conveying the vest's function and character to its users. This principle aligns with the concept of nirmana, which emphasizes the integration of art and design elements in constructing a communicative and meaningful visual unity (Sanyoto, 2010).

9. Sketch Macro

Based on the insights of several photographers who frequently work at music festivals, alternative sketches 4 were selected for the design of this photographer-specific vest. This design meets the specific needs of photographers' activities when working in music festivals. The vest features seven compartments dedicated to carrying or using essential equipment during a music festival event.

On the front, on the right side, there is a compartment designed to store 70-200 size lenses, an SD card, a battery backup, and a bonus compartment for storing personal items such as mobile phones. On the left side, there is a compartment for storing 24-70 lenses, 16-35 lenses, and FX lens filters. Additionally, there is a large bonus compartment on the back of the vest that can accommodate other items.

Each compartment utilizes Velcro as a locking mechanism to ensure the safety and easy access of camera equipment, with the exception of the bonus compartment on the left side of the front, which employs a zipper for the lock.

The primary materials used in the design of this photographer's vest are Cordura (outer layer), Polyester 1680D (middle layer), and Air mesh (inner layer). The selection of 1680D polyester and Cordura materials is intended to ensure durability in outdoor environments. This aligns with the fundamental principles of product design, which emphasize the selection of materials based on their practical application in the field (Setiawan et al., 2025). Consequently, each compartment is coated with wind foam to safeguard the camera equipment from impacts.

Furthermore, this vest incorporates a tactical vest system, allowing for adjustable sizing through a webbing strap. It also features a D ring accessory that enables the attachment of additional equipment or the hanging of the vest itself (optional).



Figure 5. Sketch Macro Detail

10. Final Design

The design philosophy of this vest is “Tactical by Design, Photographic by Purpose.” This philosophy emphasizes a tactical, robust, functional, and ready-to-use character that is specifically tailored to support the needs of photographers in a dense and dynamic music festival work environment. The vest’s design prioritizes ease of access and organization, with a compartment layout designed to be structured according to the requirements of camera tools such as lenses, batteries, and filters. The selection of tactical styles in the vest’s design is not solely based on functionality but also on projecting a professional image of the photographer in the field. The use of strong visual elements and durable materials serves as a semiotic language to convey work readiness in challenging conditions. This aligns with (Swandhani et al., 2024) research, which asserts that design elements in a product play a crucial role in conveying specific messages or meanings to its users through a semiotic approach. The strategic placement of compartments enables photographers to quickly access their equipment. Through this approach, the vest not only serves as a technical complement but also reflects the photographer’s professional and agile role in documenting significant moments at a music festival event.



Figure 6. Final Design and Image Visible

11. Product Validation

The validation of field trials on the design of music festival photographer vests to adjust camera equipment was carried out by involving 5 photographers as participants who are representatives of the Stage.id community who often work at music festival events. The 5 photographers were the subjects of the VEST field trial and are described in the following table 2.

Table 2. Participants as Samples

No.	Respondent Name	Gender
1	Faris Labib	Male
2	Adnan Mahendra	Male
3	Andhika Surya Wijaya	Male
4	Risky Aditya Pratama	Male
5	Yusuf Alfarizi	Male

The validation was conducted using a questionnaire consisting of six evaluation indicators assessed on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). In addition to quantitative ratings, respondents were invited to provide comments and suggestions regarding the vest's functionality, comfort, accessibility, and overall performance. The collected data were used to determine the level of user acceptance and identify potential improvements to the design. The results of the validation are presented in the following section.

Table 3. Field Test Validation Results of the Photographer Vest Design

FIELD TEST INSTRUMENT EVALUATION									
NO	NAME	INDICATORS							AVERAGE SCORE
		1	2	3	4	5	5	6	
1	Faris	5	5	4	5	5	5	4.6	4.6
2	Adnan	4	5	3	5	5	5	4.5	4.5
3	Andhika	5	4	4	4	4	5	4.3	4.3
4	Risky	4	5	4	4	5	5	4.6	4.6
5	Yusuf	5	5	4	5	5	4	4.6	4.6
Total Score All Subjects:									22.5
Perfect Score:									25
Average Score:									0.9
Index:									90%
Criteria:									Excellent
Category:									Satisfactory
Action:									Pass
Total Score All Subjects:									22.5
Perfect Score:									25
Average Score:									0.9
Index:									Pass

CONCLUSION

The final design resulted in an ergonomic multi-pocket vest specifically developed for photographers working in dynamic outdoor environments, particularly during music festival coverage. The vest combines the functions of a tactical vest and a camera equipment carrier, featuring dedicated compartments for cameras, lenses, batteries, memory cards, and other essential accessories. Constructed from 1680D polyester, Cordura, and mesh materials, the vest provides durability, comfort, and adequate ventilation for prolonged outdoor use. Adjustable webbing straps allow the vest to fit various body sizes, while protective padding and secure closures help safeguard equipment from impact and accidental damage.

The design prioritizes accessibility, mobility, and user comfort through strategically positioned compartments that enable quick access to frequently used equipment. Field validation involving five photographers produced a feasibility index of 90%, indicating excellent user acceptance and confirming the vest's suitability for practical application during music festival coverage. These findings demonstrate that the proposed design offers an effective solution for improving equipment organization and operational efficiency in high-mobility photography activities.

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