RESEARCH ARTICLE

IMPROVING FILM QUALITY USING SOFTWARE SOLUTIONS IN PHOTOGRAPHY STUDIOS

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ABSTRACT - The purpose of this case study was to explore how software solutions can be utilised to improve film quality in photography studios. It focused on the issues faced by a photography studio located in Kangar, Perlis, such as dirty images and damaged films. A survey was administered to 51 working photographers to elicit important insights regarding user preferences and experiences, allowing for a more in-depth grasp of their needs and expectations. The findings revealed that software solutions can be utilised to enhance various aspects of film production, including image clarity, colour accuracy, noise reduction, and overall aesthetic appeal. It also addressed the issue of software flaws and application malfunctions, emphasising the need to use dependable software to avoid disruptions and improve photo editing quality. Photography studios are recommended to combine both high-quality equipment and software programs to optimise business operations, improve overall film quality, and ultimately increase client satisfaction.

1.0   INTRODUCTION

The tertiary sector in the Three-Sector Theory refers to the service industry encompassing a wide range of activities from commerce to administration, transport, financial, real estate, business, personal services, education, health, and social work. The recent years have witnessed the increasing importance of the tertiary sector in line with current trends to help in the delivery and supply of services to the public. Photography service is also part of the tertiary sector which supports the commercial use of product advertising images, local, tourist, and many valuable professions. Photography was first introduced in the 19th century and the heliography technique was invented in response to the ancient principle of the camera obscura (Grunder, 2010).

The photography sector provides digital art services that exclusively use stunning graphic images and 3D artwork that benefit the public and assist in the growth of numerous industries, including food, manufacturing, and sales. From the perspective of mass media technology, digital photography offers numerous advantages to the mass media industry (Dermawan, 2005). It also provides photography services like family portraits, school events, weddings, and engagements that cater for various customer requests.

Nevertheless, the photography business is never free from issues and challenges (Choudhar et al., 2022). According to Yang (2018), commercial photographers should not only take business photos as their own responsibility but also master good marketing and planning skills. Furthermore, photography businesses are encouraged to implement quality management measures to improve the quality of their works, including the use of software in photographic studios (McDermott et al., 2023).

Despite the prominence of the photography sector in supporting the diverse economic sector and the growth of enterprises, there is still a major need to explore the specific challenges and potential areas for improvement. Therefore, this study aims to investigate the quality of film used in photographic studios, evaluate various software that can be used in photographic studios, and find the best software that can improve the quality of film used in photographic studios. A particular emphasis is placed on finding and using the best software and methods that can improve various areas of film production, including image clarity, colour accuracy, noise reduction, and overall aesthetic appeal. This shall assist in finding solutions to the issues and challenges faced by the photography sector and contribute to the improvement of film quality through the use of software in photography studios.

1.1   Scope of Study

This study focuses on investigating and deploying software technologies for use in photography studios to improve film quality. It addresses the specific challenges faced by a photography company located in Kangar, Perlis that is experiencing the issue of damaged films and photos contaminated by viruses. The present study therefore aims to develop and deploy suitable software tools and methods that can improve several elements of film production, including image

clarity, colour accuracy, and overall visual impact. The data collection was done by interviewing the owner of the respective photography company in Kangar, Perlis.

1.2 *Significance of Study*

The significance of this study lies in its examination and use of software solutions to enhance the film quality in photography studios, hence addressing specific problems faced by the industry like damaged film and virus-infected photos. The project intends to enhance several elements of film production, such as picture clarity, colour accuracy, and overall aesthetic appeal, by exploring the use of software tools and methods. The results will offer important suggestions and insights for incorporating new technologies into the workflow of photography studios, thereby improving the final product and client satisfaction in the sector.

1.3 *The Case Company*

A photography company by the name of Jasimin Photo was chosen as the case study. Jasimin Photo is a small photography business and a sole proprietorship company owned by Jasimin Hafiz. This photography business has been running for 3 years in collaboration with Estudio, which is a photography studio owned by Hidayu Binti Mohd Yusoff located on the first floor in Taman Putra Utama, Kangar, Perlis. The studio operates on Monday to Sunday from 9.00 a.m. to 11.00 p.m., including public holidays.

The company's mission is to capture and preserve moments of beauty and emotion while providing clients with services that will help them create lasting memories for a lifetime treasure. Meanwhile, their vision is to establish a reputation as a photographic business that consistently produces spectacular visual stories with remarkable creativity and technical know-how. Their goals include exceeding customers' expectations, inspiring people with their photography, and making a lasting impact on the photography industry. Jasimin Photo utilises social media to market their business such as Facebook, Instagram, and Tiktok.

2.0 LITERATURE REVIEW

2.1 *Quality Tools*

Quality management is the systematic strategy and actions used by organisations to ensure that their processes, services, and products continually meet or exceed the expectations of their customers. Project quality management is the process through which quality is managed and maintained throughout a project. An organisation's activities are often regulated by a system of rules, protocols, and techniques to achieve and maintain high standards of quality across the board. To increase customer satisfaction, quality management attempts to deliver products and services that are on par with or even better than consumers' expectations. Additionally, quality objectives should be objective and measurable to fulfil a motivational function (Bugdol & Jedynak, 2022).

The main aim of quality management is to decrease process defects, errors, and variations in order to boost dependability, efficiency, and effectiveness. Parts of the entire approach to quality management include design and development, production, delivery, and customer support. Quality management encompasses several crucial concepts and ideas, such as quality planning, quality control, quality tools and procedures, quality management systems, and other elements of quality. These quality tools are crucial resources for organisations to improve its operations and provide top-notch goods and services.

A systematic qualitative review by Grossu-Leibovica and Kalkis (2023) identified several quality management tools for improving service quality and client satisfaction in healthcare settings. The application of quality tools is often intended to help with problem detection, analysis, and resolution throughout the production or service delivery cycle, subsequently improving product quality (Sousa et al., 2017). This is because there are methods in these quality tools that can be used to help with problem-solving. Furthermore, quality tools are essential for quality management because they give organisations access to key approaches and techniques for measuring, analysing, and improving processes, such as statistical process control, root cause analysis, Pareto charts, and Six Sigma. The use of Pareto charts helps to prioritise problems by highlighting the root cause.

The first phase of such a quality tool is the utilisation of an existing approach to derive the Pareto solutions with objective functions (Chen et al., 2019). Pareto's Rule will eventually be used in this situation as a practical method for identifying and resolving important concerns. An organisation may make the most of its resources, handle its problems, and consistently provide top-notch service by concentrating its efforts on a small number of crucial problems.

Another tool is the fishbone diagram, also known as the Ishikawa diagram or cause-and-effect diagram, which helps teams to discover the underlying causes of a problem by investigating multiple categories, including people, processes, tools, and materials (Coccia, 2020). It was created by Dr. Kaoru Ishikawa, a Japanese expert in quality control, and is often used in many sectors to identify and resolve issues. The fishbone diagram was established to identify various causes and sources of an issue or result, followed by the construction of the Pareto diagram to arrange the problems in the order of importance (Prasad et al., 2012).

In addition, statistical process control (SPC) is an important tool for quality management as it allows businesses to track and maintain output consistency by analysing and reducing process variation using statistical methods. It enables businesses to manage their production processes by gathering and analysing data to ensure that they stay within the set quality parameters (Singh, 2022).

Another useful quality management technique is the 5 Whys approach, which aids problem-solving by asking "why" repeatedly to determine the root cause of a certain problem. These instruments, along with a wide variety of others, provide businesses with the capacity to deal with quality concerns head-on, reduce errors, boost productivity, and ultimately increase customer happiness. Businesses can utilise the strength of these high-quality tools to continually improve their processes and pursue excellence in today's fierce business environment.

2.2 Software

Introduction to Computer Science is a comprehensive course that covers the fundamental concepts, theories, and applications of computers. It creates a fascinating world of technology while providing individuals with the information and resources they need to comprehend and utilise computers' great potential. Introduction to Computer Science plays an important role in helping students lay a professional foundation and cultivate their interest in the major (Sun & Kuang, 2020). Students learn coding, computational thinking, and problem-solving techniques through a combination of academic understanding and practical practice. In the digital era, computer science supports collaboration, creativity, and invention in addition to technical skill development in people. Computational thinking and computer science also help students develop problem-solving, creativity, and collaboration skills (Today, 2019).

Advancement in computer science has brought the benefits of data-driven insights, automated procedures, better decision-making, and improved overall operational efficiency for both industries and services. Organisations can address problems by improving their goods and services and gain competitive advantages in a rapidly changing digital world by using computer science ideas and methodologies. Nevertheless, the creation of software that can be used to diversify problem-solving techniques is closely related to computer science. In various industries, software is an effective tool for solving problems and streamlining procedures.

Software is a collective term for the programs, information, and instructions that provide a computer system the ability to conduct operations or functions. Access to the Android version of the software speeds up the collection and processing of information and can play an important role in improving the efficiency of personnel management (Xun et al., 2022). It is an intangible part of a computer system that gives users the ability to communicate with the hardware and do numerous tasks. System software and application software are two broad categories of software.

System software is a type of program that controls a computer system's resources and offers the essential features. It is usually designed in a modular and hierarchical fashion whereby the functional responsibility of a system is optimally decomposed into multiple functional software elements such as subsystems, modules, packages, classes, methods, and functions (Tunali & Tüysüz, 2020). Examples of system software include operating systems, device drivers, utility software, applications, productivity software, multimedia software, communication software, entertainment software, and specially crafted software.

Software development is a multi-step process that includes planning, coding, testing, and maintenance. To construct software applications, developers often employ development tools and programming languages. The software development life cycle (SDLC), which ensures quality and efficiency throughout the development process, provides a structured approach for developing and managing software projects. This advocates the essential role played by software to contemporary computing since it enables users to do a variety of activities and utilise computer hardware to their advantage.

2.3 Adobe Premiere Pro

Adobe Premiere Pro is a professional video editing program created by Adobe Systems, which has become incredibly popular among content producers, filmmakers, and video editors due to its extensive capabilities, user-friendly design, and seamless connection with other Adobe Creative Cloud tools. The purpose of this literature study is to investigate the development and noteworthy features of Adobe Premiere Pro over the past three years. The program has been an indispensable tool for professionals in the film, television, and digital media industries (Smith, 2022). Multi-track editing, non-linear editing, and real-time video editing are among the many video editing features offered by Adobe Premiere Pro. The program also has options for creating transitions, effects, and titles as well as sophisticated tools for cutting, cropping, and altering video recordings.

The newest upgrades of Adobe Premiere Pro concentrated on refining these fundamental editing functions, hence boosting the overall workflow and effectiveness of video editing activities. Its advanced colour grading tools, such as Lumetri Color, allow for precise adjustments and enhancements of video footage (Roberts, 2020). The program also includes collaboration capabilities to allow several people to collaborate on a project at once. Version control, collaboration, and asset sharing are all made possible through the interaction with Adobe Team Projects and Creative Cloud Libraries. In recent years, this function has grown in significance for groups working remotely and for teams. The collaborative features in Adobe Premiere Pro, including the integration with Adobe Team Projects and Creative Cloud Libraries, have significantly improved team collaboration and asset sharing (Garcia & Thompson, 2019).

Adobe Premiere Pro has benefited from developments in hardware acceleration technologies to boost performance and improve the editing experience. The program has been able to provide quicker rendering and better playing, especially for high-resolution and complicated projects, thanks to GPU acceleration and multi-core CPU optimisation. It also has added functionality to accommodate immersive video formats and virtual reality, which are both growing in popularity. The program offers tools for editing and exporting VR material, spatial audio, and 360-degree films. Adobe's dedication to remain at the forefront of video editing trends is demonstrated by its push into immersive media. Over the past three years, Adobe has worked to enhance Adobe Premiere Pro by adding support for cutting-edge technologies, expanding collaborative options, and improving performance. These developments have established Adobe Premiere Pro as a robust and flexible tool for video editing. The performance optimisations and hardware acceleration technologies in Adobe Premiere Pro have resulted in faster rendering and smoother playback, particularly for high-resolution and complex projects (Brown & Johnson, 2021).

2.4 *Sony Vegas Pro*

Sony Vegas Pro is an advanced video editing program created by Sony Creative Software that is primarily targeted at professionals working in the film, television, and media production industries. By analysing the most recent three years of research and academic contributions, this literature review seeks to offer a thorough overview of Sony Vegas Pro's features, capabilities, and innovations, as well as its influence on the field of video editing. Sony Vegas Pro has recently received a number of upgrades and changes, particularly in terms of user interface and workflow improvements. Researchers have explored the impact of these updates on user experience, efficiency, and overall productivity in video editing projects with a prominent emphasis over its cutting-edge video effects and editing features (Doe et al., 2019; Johnson & Smith, 2022).

Previous research has also investigated Sony Vegas Pro's compatibility with various hardware and software setups. Some even examined the program's integration with third-party plugins, codecs, and external devices by assessing its implications for collaborative editing and overall system performance (Johnson & Miller, 2020; Williams, 2022). The study focuses on improvements to the user interface, workflow, cutting-edge video effects, editing tools, and integration capabilities. The results highlight Sony Vegas Pro's contributions to the film, television, and media production industries as well as its importance in the field of video editing. Future studies may focus on the use of AI and machine learning in Sony Vegas Pro as well as its potential for automated editing procedures and content analysis.

2.5 *Adobe Photoshop*

Adobe Photoshop is a popular picture editing program that has received growing attention recently. Numerous studies have been done by academics and professionals to examine the developments, uses, and effects of Photoshop in different sectors. Adams (2021) conducted a comprehensive analysis tracing the evolution of Photoshop from its inception to the present. The research identified significant software changes and additions made during the last three years and discussed their effects on digital art and design. Johnson and Smith (2022) examined the role of Adobe Photoshop in contemporary photography by focusing on professional photographers' perspectives. They explored the role played by Photoshop in picture editing, augmentation, and post-production as well as the ethical dilemmas that photographers confront. Additionally, the study compared Adobe Photoshop with other design applications and looked at the methods and procedures used by designers in producing visual material. This literature review seeks to give a thorough overview of the current state of research on Adobe Photoshop and its influence in numerous sectors by relying on these past works.

3.0 METHODOLOGY

This study employed the qualitative methodology to explore how photographic quality practises may enhance the effectiveness of photography services offered to the general public. The primary data was gathered from interviews and survey questionnaire to draw the insights and sustainability strategies of the case company. The duration of this study was from March 2023 until June 2023. Interview was used as the primary data collection method which was performed in person with Jasimin Hafiz, proprietor of the Jasimin Photo company. Meanwhile, the survey questionnaire (see Appendix A) was administered to 51 respondents encompassing full-time and part-time photographers. Such an approach helped to gather detailed and sufficient data. The data collection process was further strengthened by extending the questionnaire distribution to the business owner and the photographers' employees.

4.0 RESULTS AND DISCUSSION

The findings of this study led to important discussions and discoveries about the usage of software programs in photography studios to enhance the quality of the films produced. In line with Bateman (2023), this study recommends using Adobe Lightroom, which is a powerful industry-standard editor that comes with Adobe Photoshop in the Photography and Creative Cloud Plan. This is supported by the fact that the use of Adobe Photoshop is standard for many editors. Furthermore, the responses gathered from the 51 working photographers showed that the majority of them voted for Adobe Premiere Pro, Sony Vegas Pro, and Adobe Photoshop. The Photography Software Survey was created to learn more about user preferences and experiences with diverse photography software. The findings gave important insights regarding the photographers' preferences and experiences while also shedding light on the wide variety of software that they use.

Photographers have various needs and requirements in order to choose and use photography software. Hence, the information gathered from this survey can be a useful tool for understanding these needs and requirements. These recommendations will help photographers to better understand user preferences and improve user experiences in the ever-expanding world of photography software. The information obtained from the interview with Jasimin Hafiz, the proprietor of Jasimin Photo, offers insights into the difficulties that the business encountered and prospective software solutions that may solve these difficulties. Currently, Jasmin Hafiz only uses two software programs for the editing process, namely Adobe Lightroom and Filmora.

This constituted a serious issue for the business because it had an impact on both the end product's quality and clients' happiness. To solve this issue, Jasimin Hafiz stated the need for software tools that may improve several areas of film production, such as picture clarity, colour accuracy, noise reduction, and overall aesthetic appeal. The literature research advocates the necessity of high-quality tools for enhancing workflow and product quality. Application software plays a key role particularly in some procedures and functions. In the context of photography studios, the use of software programs designed to enhance film quality can have a vast influence on the result and client satisfaction. Based on the findings, the conversation focused on how software solutions may be incorporated into the workflow of a picture studio. Film production quality may be raised by utilising technological advances in software that increase picture clarity, colour accuracy, and overall visual appeal.

The necessity for efficient planning and marketing abilities in the commercial photography business was also highlighted during the interview. While technologies can improve the technical facets of film production, mastering marketing and planning abilities is crucial for financial success. In conclusion, the findings and discussions of this study highlight the significance of software solutions in solving the unique issues faced by the photography business, such as damaged film and virus-infected photos. Photography studios may boost their workflows, improve the quality of their films, and ultimately raise consumer happiness by introducing high-quality tools and software programs.

4.1 Software Issue

The results in Table 1 demonstrate that Adobe Premiere Pro is the most frequently used software among editors and photographers (N = 35, 68.6%). Sony Vegas Pro is the second most frequently used program (N = 22, 43.1%) followed by Adobe Photoshop (N = 16, 31.4%). These statistics highlight Adobe software's market dominance, particularly Adobe Premiere Pro, Sony Vegas Pro, and Adobe Photoshop.

Table 1. Frequently used photo editing software

Software	N	%
Filmora	9	17.6
Adobe Premiere Pro	35	68.6
Sony Vegas Pro	22	43.1
Adobe Photoshop	16	31.4
Adobe Lightroom	6	11.8
Others	6	11.8

The results in Table 2 revealed that the majority of respondents (N = 43, 84.3%) voted user interface and simplicity of use as the most critical functions of software programs needed by editors and photographers in the future. The second most important function is performance and speed (N = 31, 60.8%) followed by integration with other applications at the third rank (N = 27, 52.9%). These findings emphasise the significance of user experience, performance, and integration capabilities as important features in editing and photographic software.

Table 2. Software programs with critical functions

Functionalities	N	%
Performance and speed	31	60.8
User interface and ease of use	43	84.3
Reliability and stability	24	47.1
Customisation and flexibility	26	51.0
Integration with other software or platforms	27	52.9

4.3 Damaged Film

Damaged film is often caused by lagging experienced by editing software that will freeze or lose any editing memory that has been completed. It later becomes a bug in the computer device and causes it to lag and lose the image that has been edited. This bug is an error or problem that occurs in a program due to errors in program design, code writing, or problems with the operating system used. The bug will eventually result in a crash on the device or computer.
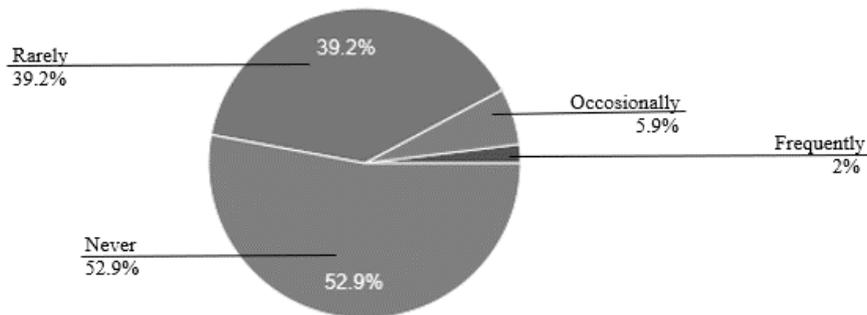
Figure 1. Frequency of software bugs and errors encountered in applications

Figure 1 shows the frequency of software bugs and errors encountered by the respondents across the three applications commonly used by them, namely Adobe Premiere Pro, Sony Vegas Pro, and Adobe Photoshop. It can be seen that the majority of them (52.9%) never encountered any issues whilst using the three software. On the other hand, only a slight portion of the respondents (2%) frequently faced bugs and errors while using the applications. This suggests that employing these applications will assist editors in reducing their working time and ultimately improving their picture editing performance. To cope with this issue, however, it is important to either accept the source of the flaw or remain with riskier software.

5.0   CONCLUSION

In conclusion, this study explored ways on how the use of software programs can improve the picture editing performance of industry players involved in photographic services. The findings highlight the critical significance of software solutions in addressing the unique difficulties encountered by photography firms, such as broken film and virus-infected photographs. The most popular software programs among photographers and editors are Adobe Premiere Pro, Sony Vegas Pro, and Adobe Photoshop, thus reflecting their market dominance. The survey also highlighted essential capabilities sought in software programs, such as user-friendly interfaces, smooth performance and speed, dependable and steady operation, customisable features, and easy connection with other software or platforms. Furthermore, the study found issues related to software defects and faults in apps, hence emphasising the need to use dependable software to reduce interruptions and improve photo editing quality. By combining high-quality equipment and software programs, photography studios may optimise their operations, improve overall film quality, and ultimately increase client happiness.

6.0   ACKNOWLEDGEMENT

7.0   CONFLICT OF INTEREST

The authors have no relevant financial or non-financial interests to disclose.

8.0   AUTHOR CONTRIBUTIONS

Each author involved and contributed evenly to this manuscript. All authors read and approved the final manuscript.

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APPENDIX

Appendix 1: Interview question by author

No.	Question
1.	What is the mission and vision of your company?
2.	What is your position during a photography session?
3.	Do you have problems while running a photography business?
4.	How many employees do you have?
5.	What is your challenge during editing process?
6.	What is your style concept for photography?
7.	How do you deliver the photo album to the customer?
8.	How do you satisfy a customer's needs?
9.	How are pictures taken saved?
10.	What is the software that you use?
11.	Which software do you use the most?
12.	Do you work on public holidays?
13.	How do you grow your company in order for people to be aware of it?

Appendix B: Filming set place by the author

Appendix C: Filming set place by the author

Appendix D: Photo editing place by the author

Appendix E: Survey questionnaire by the author

How satisfied are you with the user *
interface and ease of use of the
software you use?

○ Very satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

○ Very dissatisfied

What features or functionalities do *
you find most important in software
applications?

☐ Performance and speed

☐ User interface and ease of use

☐ Reliability and stability

☐ Customization and flexibility

☐ Integration with other software or
platforms

How frequently do you encounter *
software bugs or errors while using
applications?

○ Never

○ Rarely

○ Occasionally

○ Frequently

○ Very frequently

How likely are you to recommend the *
software applications you use to
others?

○ Most recommend

○ Recommend

○ Normal

○ Worst

○ The worst