DOCCHECK: An Online Annotating Tool for a Capstone Document

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***Abstract*—** DOCCHECK: An Online Annotating Tool for a Capstone Document is a web-based system aimed to digitalize and streamline the process of capstone document checking. The system was created to lessen the printing expenses of the students under the Computer Studies Department, specifically the Bachelor of Science in Information Technology and Bachelor of Science in Information Systems students, pursuing a capstone project as one of the major requirements for graduation. The system also gives a solution to the laborious process of scheduling consultations with the students' advisers and other faculty involved in the checking process. The system was used starting in their third year in the course until their capstone document was ready for hardbound. The primary objective of this system was to enable advisers, panelists, subject teachers, and grammarians to annotate PDF documents uploaded by the assigned capstone leaders, while also allowing the capstone leaders to view these annotations. The system was developed using the iterative processes of Agile Methodology with PHP, Javascript, CSS, and MySQL database server. The system's overall acceptability using the ISO 25010 software quality standard was rated as "excellent" with a grand mean of 4.66.

***Keywords*—** Online, Annotation, Tool, Capstone Document

I. INTRODUCTION

Printing capstone documents is costly and environmentally unsustainable for students, especially those in Bachelor of Science in Information technology (BSIT) and Bachelor of Science in Information Systems (BSIS) programs who must repeatedly print revisions for adviser review. This process is also time-consuming for both students and faculty, adding pressure to their workloads. Given the increasing reliance on digital learning, the researchers propose DOCCHECK: An Online Annotating Tool for a Capstone Document that allows students to upload their capstone documents for advisers to review and provide feedback digitally. This solution minimizes printing costs, streamlines the review process, prevents document loss, and enhances accessibility, benefiting both students and faculty.

II. OBJECTIVES OF THE STUDY

The main objective of this study is to develop a DOCCHECK: An Online Annotating Tool for a Capstone Document.

Specifically, this study aims to:

a. create a database to store the capstone leader profile, the adviser profile, the panelist profile, the grammarian profile, the subject teacher profile, the research coordinator profile, annotation, and capstone documents;

b. create an interface for capstone leader to manage the capstone documents;

c. create an interface for adviser, panelist, subject teacher, grammarian, to annotate the capstone documents;

d. create an interface for the research coordinator to view

the annotations; and

e. be evaluated by ISO/IEC 25010.

III. CONCEPTUAL FRAMEWORK

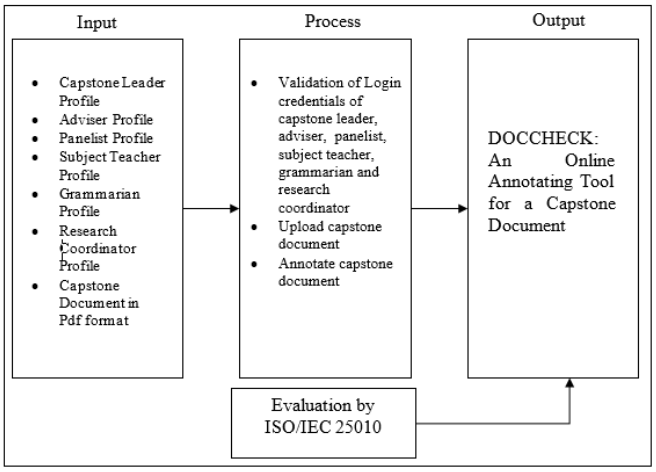

Fig. 1 Conceptual Framework of the Study

The input, process, and output operations of the system's data flow are included in the conceptual framework. In the input, the profile information of capstone leader, adviser, panelist, subject teacher, grammarian, and research coordinator is needed, specifically their log-in credentials, which are the username and password. Another input is the capstone document in pdf format to be uploaded by the capstone leaders. The process is simple, which includes validating the login credentials of the capstone leader, adviser,

panelist, subject teacher, grammarian, and research coordinator. After this, the users can log in to the system, and the capstone leader can upload the original pdf document, while the adviser, panelist, subject teacher, and grammarian can annotate the document. The annotating process for the adviser and subject teacher can happen after the concept or title defense and any time before the pre-oral, final defense, or even after the final defense. The panelist and grammarian can annotate a week before the pre-oral, during the pre-oral, a week before the final defense, during the final defense, and even after the final defense until the documents are ready for hardbound

With all this, the output is the annotating tool itself, which is DOCCHECK: An Online Annotating Tool for a Capstone Document. Finally, the system was evaluated using ISO/IEC 25010 to assess its effectiveness and ensure it met the standards.

III. LITERATURE REVIEW

In the study of Brat Rapid Annotation Tool, a web-based annotation system utilizing a WYSIWYG graphical interface was introduced, ensuring that the original text remains unchanged while allowing annotations through linked textboxes [1]. This is relevant to the proposed system, as it maintains the integrity of the uploaded capstone document while enabling advisers and panelists to provide feedback. In the study of TeamTat, a Collaborative Text Annotation Tool, the research focused on web-based document annotation, allowing multiple users to annotate PDF documents collaboratively [2]. This aligns with the proposed system's goal of facilitating online collaboration among advisers, panelists, and capstone leaders. In the study of DART, a Lightweight data-to-text Annotation Tool, the system simplifies annotation using a text field [3]. Similar to the proposed system's feature that enables faculty members to input comments. In the study of the Impact of Online Annotation Tools on Students' Academic Performance, findings highlighted how these tools enhance learning through digital collaboration [4], directly supporting the proposed system's objective of improving the capstone document review process through online interaction. Lastly, in the study of the Capstone Archiving Management System, the focus was on digitally archiving capstone projects for easier access [5]. While similar, the proposed system differs by archiving capstone documents solely for checking and annotation rather than for permanent storage. Integrating features from these studies, the proposed web-based annotation tool uniquely enables digital collaboration among faculty and students, allowing multiple document versions to be stored and reviewed efficiently.

IV. METHODOLOGY

DOCCHECK: An Online Annotating Tool for a Capstone Document is a web-based platform designed to streamline the capstone document review process for BSIT and BSIS students. It allows capstone leaders to upload PDF documents, which advisers, panelists, subject teachers, grammarians, and research coordinators can annotate by typing comments and suggestions. The system eliminates the need for repeated printing, saving time and costs while providing a convenient, digital solution for both students and faculty. By enabling virtual access, DOCCHECK removes scheduling conflicts and enhances efficiency in reviewing capstone documents before the final hardbound submission.

Agile methodology is a flexible, customer-centric approach to software development that emphasizes iterative progress and adaptability to changing requirements. It breaks projects into smaller components to enable rapid response to changes and streamline the development process by eliminating unnecessary steps. Agile focuses on delivering software incrementally, incorporating user feedback, and adapting to evolving needs, making it more efficient than traditional project management methods [6].

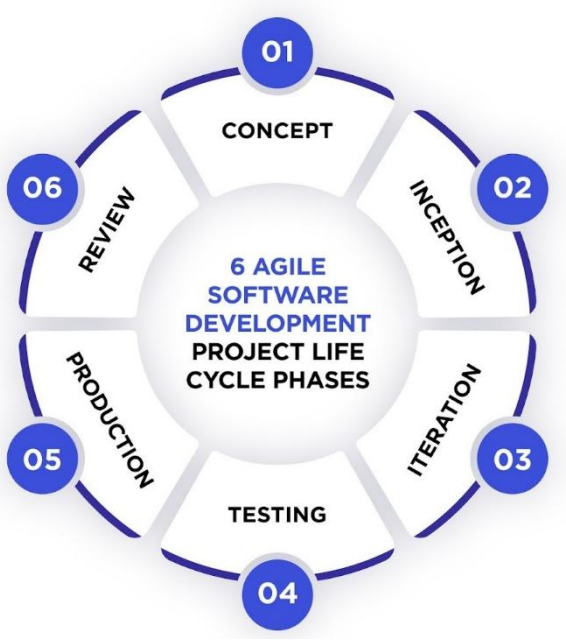

Fig. 2 Agile System Development Life Cycle

Concept

The researchers began by gathering essential requirements through an interview with the system's end user, the Research Coordinator of the Computer Studies Department at Iloilo Science and Technology University, Miagao Campus. This step ensured that the system would be tailored to the needs of the stakeholders involved in the capstone document review process.

Inception

In this phase, the team leader assigned specific roles and responsibilities to the project members to facilitate smooth development. Key roles, including document manager, programmer, and system designer, were designated to ensure efficient task distribution and workflow management. This phase also involved identifying the necessary tools and technologies required for development.

Iteration

The development phase commenced by utilizing the information gathered in the previous phases. The researchers set up the system's database using MySQL to store necessary data. The programmer began coding the system's core functionalities in PHP and JavaScript, ensuring that the system could handle document uploads, annotations, and user interactions. CSS was used to design and refine the system's user interface for a seamless user experience. After building the basic functionalities, additional features were progressively added to enhance system performance.

Testing

Following the system's development, rigorous testing was conducted to evaluate its functionality and usability. The primary goal was to ensure the system met its objectives, such as enabling capstone leaders to upload documents and view annotations while allowing faculty members to provide feedback. The system was tested for errors, and any issues detected were promptly resolved. Faculty members and students from the Computer Studies Department participated in user testing to assess the system's efficiency and usability. Their feedback was collected for further improvements, and the ISO 25010 standard was used to evaluate the overall system quality.

Production

Once testing was successfully completed, the system was prepared for deployment. The researchers selected a hosting service and purchased a domain to make the platform accessible online. They ensured that the system was fully functional, free of errors, and user-friendly before officially launching it for stakeholders to use.

Review

After deployment, the researchers focused on maintaining and improving the system to ensure its long-term success. They continuously monitored its performance, ensured that it remained accessible online, and implemented necessary updates based on user feedback. The goal was to maintain an efficient and reliable platform that facilitates the capstone document review process without disruptions.

V. RESULTS AND DISCUSSION

A. Create an interface for capstone leader to manage the capstone documents

Capstone leaders could manage their documents in the system.

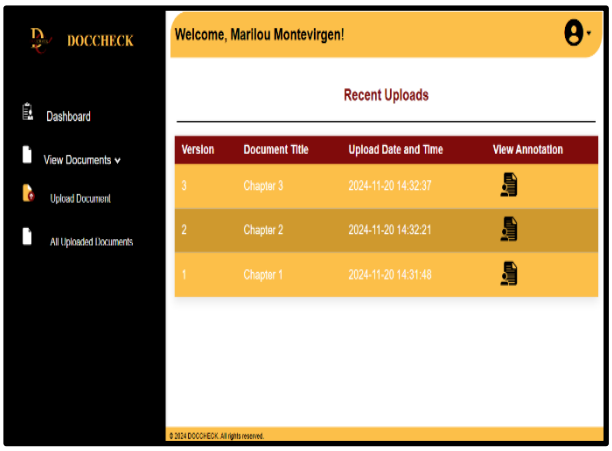

Fig. 4 Capstone Leader Dashboard

Capstone leaders in the system could manage their capstone documents through their dashboard. They were able to upload their capstone documents in PDF format and view the annotations made by their adviser, panelist, subject teacher, and grammarian. Once a document was uploaded, the respective faculty members could access it and provide annotations. After completing the annotation process, the faculty would submit their feedback, which would automatically be reflected on the capstone leader's dashboard for review.

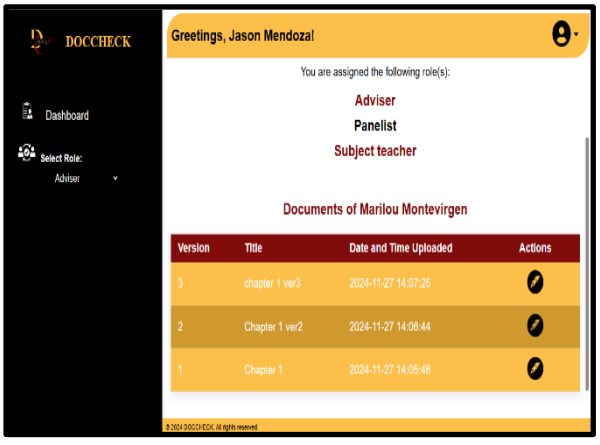

Fig. 5 Adviser, Panelist, Subject Teacher, and Grammarian Dashboard

B. Create an interface for adviser, panelist, subject teacher, grammarian, to annotate the capstone documents

Faculty involved in the process of capstone checking, specifically the adviser, panelist, subject

teacher, and grammarian, could annotate the capstone documents.

The faculty responsible for reviewing capstone documents could annotate the uploaded files directly through their dashboard. Once a capstone leader uploaded a PDF document, it would automatically appear on the faculty's dashboard, allowing them to access, review, and annotate it. After completing their annotations, they could submit their feedback, which would then be visible to the capstone leader.

C. Create an interface for the research coordinator to view the annotations

The research coordinator of the Computer Studies Department could view the annotations happening between the faculty and the capstone leaders on the documents.

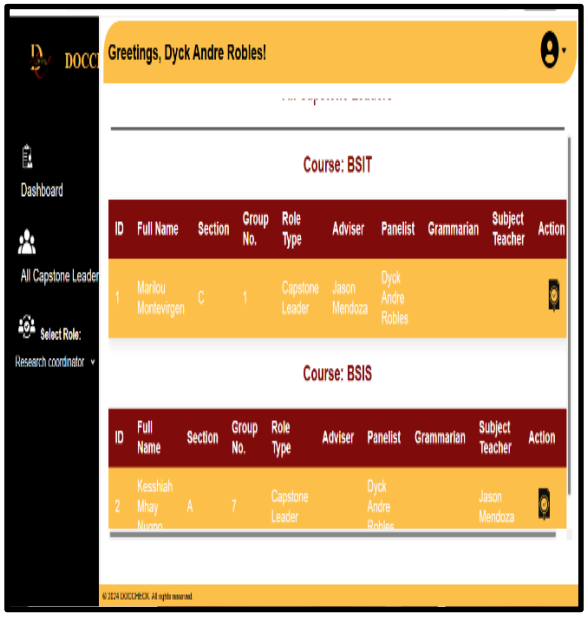

Figure 6. Research Coordinator Dashboard

As the person in charge of the research-related processes in the Computer Studies Department, the research coordinator could oversee the activities of both the faculty and capstone leaders, particularly the annotation process of capstone documents. Through the dashboard assigned to them in the system, the research coordinator could monitor the uploaded documents and track the annotations made by the faculty.

D. Be evaluated by ISO 25010

The system was evaluated using the ISO 25010 software quality standard to measure its overall acceptability. Five (5) IT experts and ten (10) system users from the Computer Studies Department had participated in evaluating the system.

Table 1-Result for Evaluation of IT Experts based on ISO/IEC 25010

Characteristics	N	Mean			Description
Functional Suitability	5	4.4			Very Good
Performance Efficiency	5	4.67			Excellent
Compatibility	5	4.5			Excellent
Usability	5	4.63			Excellent
Reliability	5	4.6			Excellent
Security	5	4.67			Excellent
Maintainability	5	4.84			Excellent
Portability	5	4.6			Excellent
Overall Result	5	4.63			Excellent

Table I presents the evaluation results of the system, assessed by five (5) IT experts using eight criteria: functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability. The system received the following mean scores and standard deviations: functional suitability (M=4.4), performance efficiency (M=4.67), compatibility (M=4.5), usability (M=4.63), reliability (M=4.6), security (M=4.67), maintainability (M=4.84), and portability (M=4.6). Based on these results, the system was rated as "Excellent." The findings indicate that the system met ISO standards and was deemed high-quality and highly effective in fulfilling user objectives.

Table 2 - Result for Evaluation of System Users based on ISO/IEC 25010

Variables	N	Mean			Description
Functional Suitability	10	4.8			Excellent
Performance Efficiency	10	4.8			Excellent
Usability	10	4.72			Excellent
Overall Result	10	4.77			Excellent

Table 2 presents the evaluation results of the system, assessed by ten (10) system users using three criteria from ISO 25010 standard: functional suitability, performance efficiency, and usability. The system received the following mean scores and standard deviations: functional suitability (M=4.8), performance efficiency (M=4.8), and usability (M=4.72). Based on these results, the system was rated as "Excellent." The findings indicate that the system met ISO standards and was deemed high-quality and highly effective in fulfilling user objectives.

VI. CONCLUSION

The study found that DOCCHECK: An Online Annotating Tool for a Capstone Document is effective in simplifying the capstone document checking process. Faculty members, including advisers, panelists, subject teachers, and grammarians, agreed that the system is more convenient than manually reviewing hard copies, allowing them to manage their schedules better while fulfilling their responsibilities. Capstone leaders also benefit from the system by saving money on printing and eliminating the need for frequent consultations with advisers, as they can upload documents for review anytime and receive feedback directly through the system.

REFERENCES

[1] Saklofske, J. (2019). brat Rapid Annotation Tool. Web-based annotation and visualization tool. *Renaissance and Reformation*, *42*(2), 180–189. https://doi.org/10.7202/1065133ar. Retrieved from https://jps.library.utoronto.ca/index.php/renref/article/view/32993

[2] Islamaj, R., Kwon, D., Kim, S., & Lu, Z. (2020). TeamTat: A collaborative text annotation tool. *Nucleic Acids Research*, *48*(W1), W5–W11. https://doi.org/10.1093/nar/gkaa333. Retrieved from https://academic.oup.com/nar/article/48/W1/W5/5834578

[3] Chang, E., Caplinger, J., Marin, A., Shen, X., & Demberg, V. (2020). *DART: A lightweight quality-suggestive data-to-text annotation tool*. Retrieved from http://arxiv.org/abs/2010.04141

[4] Benitez, C., Quinones, A., Gonzalez, P., Ochoa, C., & Vargas, A. (2020). The impact of online annotation tools on students' academic performance in a distance university program. *Turkish Online Journal of Distance Education*, 167–177. Retrieved from https://dergipark.org.tr/en/doi/10.17718/tojde.728153

[5] Doromal, W. G., & Soberano, K. T. (n.d.). *Capstone archiving management system with citation and reference generator*. Retrieved from ijres.org/papers/Volume-11/Issue-9/1109128133.pdf

[6] Kasbe, M. (2023, April 26). *What is Software Development Life-Cycle(SDLC) & what are agile methodologies !?* Cloud Native Study. Retrieved from https://maheshkasbe.hashnode.dev/what-is-software-development-life-cyclesdlc-what-are-agile-methodologies