JOIN (Jurnal Online Informatika)
Volume 7 No. 1 | June 2022: 89-96
DOI: 10.15575/join.v7i1.825

p-ISSN: 2527-1682
e-ISSN: 2527-9165

E-Commerce For Village Information System Using Agile Methodology

Leni Fitriani[1], Prayoga Hakim[2], R. Mujahid Al Haq[3]
[1,2,3]Department of Informatics Engineering, Institut Teknologi Garut, Indonesia

Article Info

Article history:

Received October 31, 2021
Revised April 06, 2022
Accepted April 19, 2022
Published June 30, 2022

Keywords:

Agile
E-Commerce
Information System

ABSTRACT

With the entry into the era of Industrial Revolution 4.0, the development of digitization of various aspects at the village level began. The level of use of mobile devices in the commercial transactions of society is now a massive number of users. It happens not only in large transactions but also in small transactions. With the community's high interest in the use of smartphone devices, this is a different opportunity to explore the potential of each village by helping the community, tiny and medium enterprises in conducting transactions, sales, and marketing online through the village government website. The village information system itself requires an e-commerce feature on its page to help small and medium enterprises in the area to sell products online through a simple page display. This research aims to design and develop new features of the village system that plays a role in the field of e-commerce with the Direct Message transaction method. The system development methodology used is Agile with Scrum as a framework. The Agile Model is a short-term development model that requires rapid adaptation and development to changes in any form. This e-commerce feature is for local communities, especially Micro, Small, and Medium Enterprises, so their products' marketing reach is even more outstanding while being recorded in the village system.

Corresponding Author:

Leni Fitriani,
Department of Informatics, Institut Teknologi Garut
Jl. Mayor Syamsu No. 1, Garut 44151, Indonesia.
Email: leni.fitriani@itg.ac.id

1. INTRODUCTION

E-commerce or electronic commerce is a place for buying and selling goods via the internet. In addition to buying and selling, users usually take advantage of sources of information to compare prices or view the latest products previously offered [1][2][3]. Purchases can be through e-commerce itself or by visiting traditional stores. So, the existence of the internet provides an overview of how companies do business between customers or suppliers to think about marketing and logistics functions. Therefore, The purpose of e-commerce can be understood as e-business. Given the community's high interest in using smartphones, this is another opportunity to explore the potential of each village by helping the community., especially SMEs in conducting transactions, sales, and marketing online through the village government website [4].

The village government website is now being developed, called Sisdesa. Although Sisdesa itself is a village information system, this system requires an e-commerce feature on its page to help MSMEs in the area to be able to sell products online through a simple page display [5][6][7]. The E-Commerce Sisdesa was built using the Agile method using the Scrum approach in its development. Scrum is a framework for developing, delivering, and managing complex products. Scrum can also be defined as a framework in which people can solve complex adaptive problems while at the same time providing products of the highest possible value productively and creatively [8][9]

e-ISSN 2527-1682
p-ISSN 2527-9165

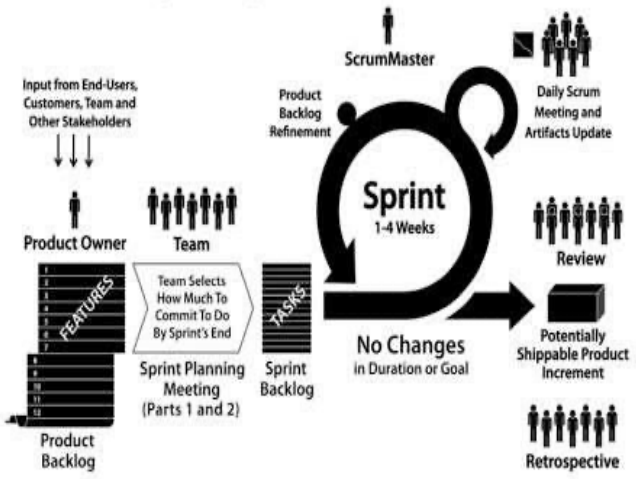

Figure 1. Stages in Scrum [9]

Several previous studies include the first research on sales applications in small and medium businesses Alya Store [10]. A second study on the influence of e-commerce on small and medium micro enterprises in Sri Lanka [11]. Third research on the implementation of e-commerce in franchise systems [12]. The fourth research on small and medium business perspectives on e-commerce technology [7]. Fifth is research on applying agile methodologies to the financial industry [13]. Sixth research on the influence of agile methods in software development [14]. Seventh research on the application of agile methodologies in the public sector [15]. The gap analysis of the study is the difference in the methods used and the place of case studies, and the concept of the e-commerce application used.

This study aims to design an e-commerce structure with village product management features by displaying a product catalog and implementing direct messages as a transaction method. With the addition of e-commerce to the village system, it is hoped that facilitating every village with e-commerce services; and Assisting the process of online product marketing.

2. METHOD

Based on the literature study and supported by existing theories, a WBS (Work Breakdown Structure) [16][17] was prepared by following the stages of the agile methodology, as shown in Figure 2.

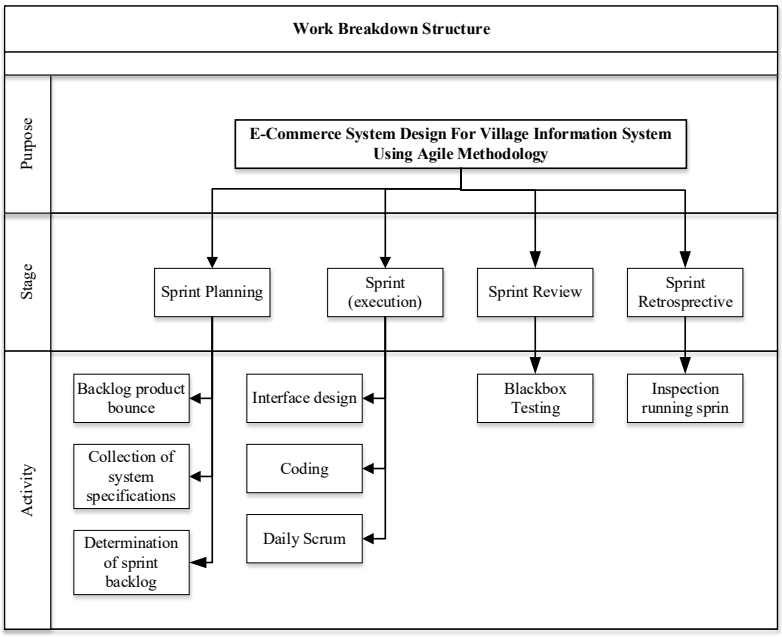

Figure 2. Work Breakdown Structure

The product backlog stage involves activities, namely, making business processes from interviews with related parties and mapping them using business processes. Then the following action identifies actors who will be described using case diagrams, then determines business activities to be carried out. Next, illustrated with an activity diagram, create a system structure that will be related to a class diagram. Finally, identify system requirements by determining the requirements for the application to be developed and recorded in the product backlog.

The next stage is a sprint, in which there is a sprint planning activity, namely planning work and determining the time limit in processing the product backlog items and making a Sprint backlog. The Sprint backlog contains details of work to complete the product backlog. Furthermore, the Daily Scrum is a discussion activity about the work that has been done and carried out and the problems encountered during the job. Then the Sprint Review presents an informal product demo form to explain what was achieved during the Sprint by the team. And lastly, a retrospective sprint is carried out as a form of reflection so that the next Sprint is even better by discussing what the team should stop, start, and keep doing during the Sprint.

3. RESULTS AND DISCUSSION

3.1. Sprint Planning

This first stage consists of identifying business processes, identifying actors who will be included in the Product Backlog, identifying system specifications, and determining the Sprint Backlog.

Business Process Identification is an activity to describe the user's design of activities the system will carry out. For example, the following is a village e-commerce business process presented in the form of an Activity Diagram:

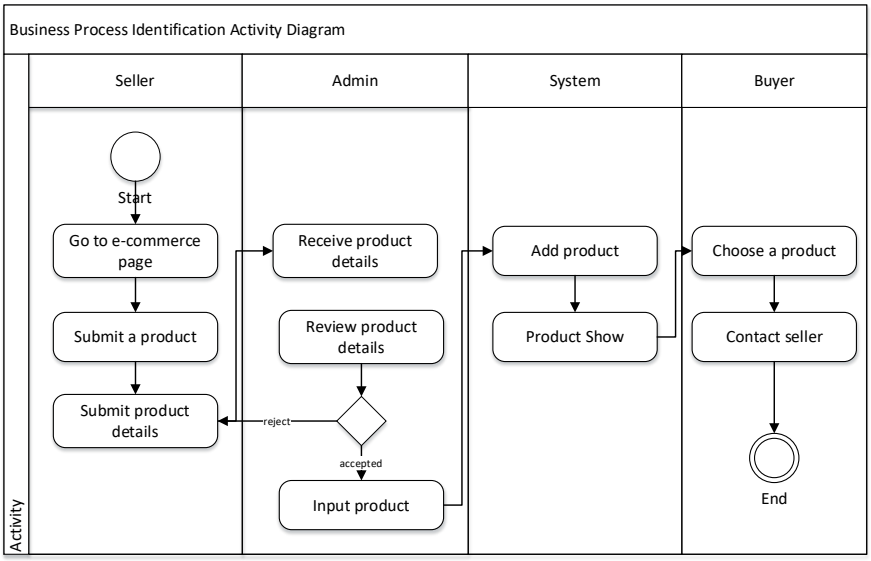

Figure 3. Business Process Identification Activity Diagram

Actor Identification this stage contains the analysis of each target involved with system activities. For example, in Sisdesa e-commerce, several actors are involved, including the admin as a system operator, played by village employees whose job is to input and edit the system. In addition, some users can act as both sellers and buyers.

Table 1. Actor Identification

No.	Actor	Aktivitas
1.	Admin	1. Login 2. Product Management (Add, Remove) 3. Logout
2.	Seller	1. Accessing sisdesa e-commerce 2. View the product line 3. Make transactions
3.	Buyer	1. Accessing sisdesa e-commerce 2. View the product line 3. Make transactions 4. Conduct transactions between sellers and buyers

The three interactions are illustrated in the use case diagram presented in Figure 3.

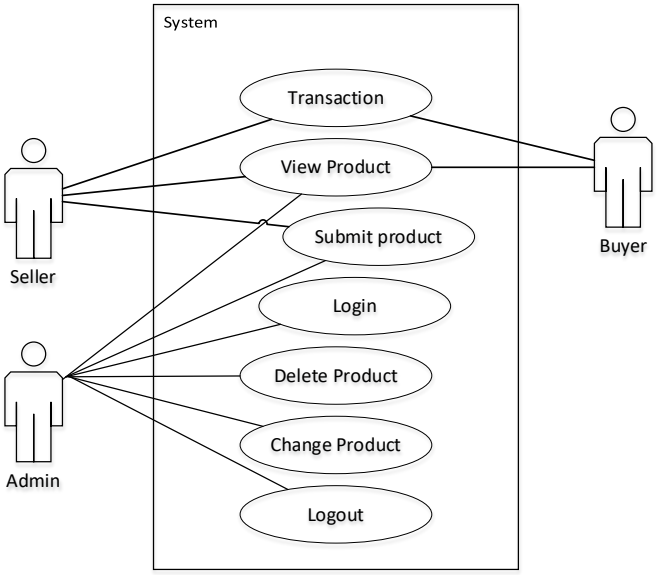

Figure 4. Use Case Diagram

3.2. Sprint (Execution)

After the planning phase is complete, the activity continues with the execution of the Sprint. In this stage, what has been planned in the previous step begins to be implemented into code and design, starting from the Interface design, Coding itself, and the Daily Scrum, which is carried out every day to determine the daily goals of the team members.

Interface design. This stage produces an interface layout plan that will later interact between users and the village e-commerce system. Here is the interface plan:

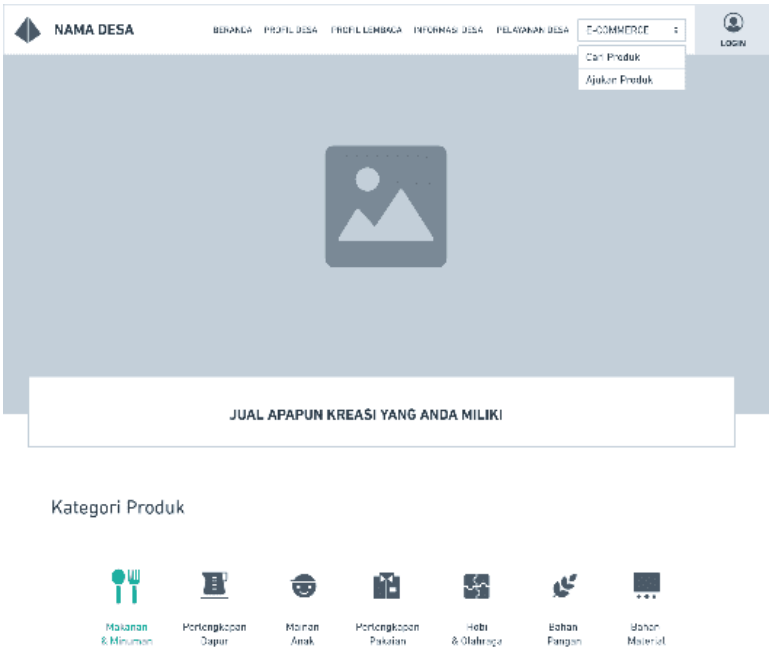

Figure 5. Interface design

Coding. The layout design provided is written in a programming language at this stage. Our team focuses on working on the village e-commerce front-end with several contributions in backend development, resulting in a user experience following the feel of rural people who like simplicity. From the results obtained, the estimated time required to complete the design display for each page is as follows:

Table 2. Estimated time for front-end e-commerce sisdesa

No.	Page	Estimated Lead Time (Days)
1.	Login	1
2.	Main page	2
3.	Category	4
4.	Product details page	2
5.	Product submission page	2
6.	Terms and conditions page	1
7.	*Dashboard* admin	6
8.	*Footer*	1

Daily Scrum. It is a 15-minute activity carried out every day to measure the development team's progress in project completion. During this time, the team will collaborate to determine what to do for the next 24 hours. This is done so that the team stays focused on the goals set and improves each member's performance. The Daily Scrum itself is presented to determine the status of work on the project, as shown in the following table:

Table 2. Daily Scrum

Description of Backlog	Processing	Estimated time (Hour) Day						Status
		1	2	3	4	5	6	
Admin can access the database by logging in	Creating Database	2	1	2	2			Done
	Interface Layout Design	3	1					
	Coding	2	2	1				
	Testing			1	2			
The system can display the main e-commerce page	Creating Database	3						Done
	Interface Layout Design	2	2					
	Coding		3					
	Testing		1					
The system can sort products by certain categories	Creating Database		2	4	2	3		Done
	Interface Layout Design	1	2					
	Coding			2	4			
	Testing				1	2		
Product information successfully displayed according to the seller's data	Creating Database			2	2			Done
	Interface Layout Design	3	1					
	Coding		2	2				
	Testing				1			
Users can make product submissions to the admin	Creating Database		1	2				Done
	Interface Layout Design	2	2					
	Coding		2	3				
	Testing			2				
The system can display the Terms and conditions page for submitting a product	Creating Database		2					Done
	Interface Layout Design	1						
	Coding	2						
	Testing	1	1					
Admin can view, delete, add, change product data	Creating Database			2	2	3	2	Done
	Interface Layout Design		3			2		
	Coding			2	2	1	2	
	Testing		1			2	2	
The system can display a column about brief developer information at the end of each page	Creating Database							Done
	Interface Layout Design	2						
	Coding	1	2					
	Testing		2					

e-ISSN 2527-1682
p-ISSN 2527-9165

3.3. Sprint Review

Sprint execution ends with a Sprint Review conducted to inspect the achieved increments. At this stage, the product is tested based on the agreed test method, checking the Increment and adapting the Product Backlog if necessary. The Development Team and stakeholders collaborate to review what was completed in the Sprint. Increment presentations are made to get feedback and develop the ability to collaborate.

3.4. Sprint Retrospective

In the Sprint Retrospective, the developer conducts a review meeting session to monitor the team's results and performance during the Sprint, including:

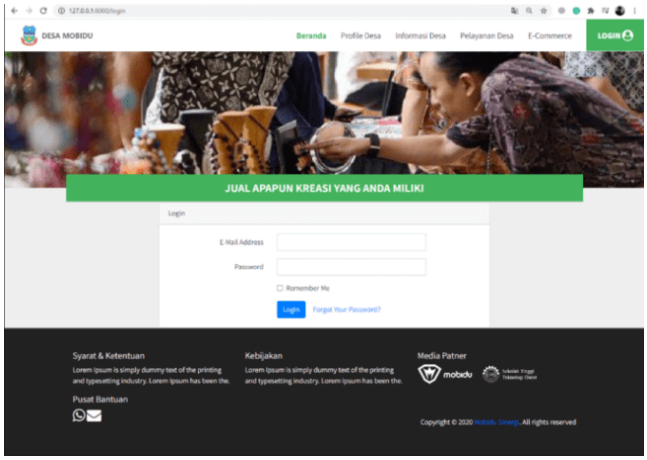

Figure 6. Login Page View

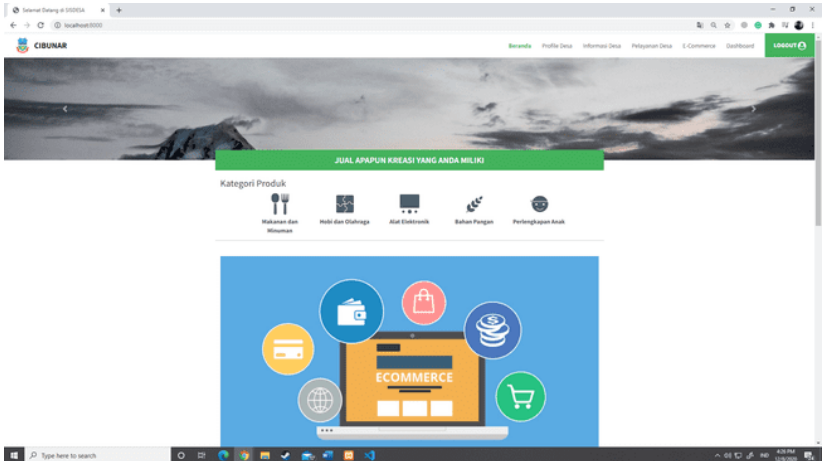

Figure 7. Sisdesa e-commerce Main Page Display

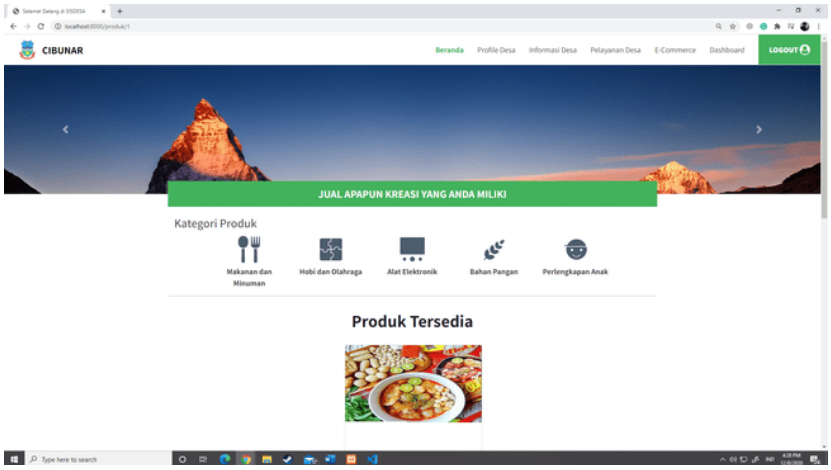

Figure 8. Product Category Page View

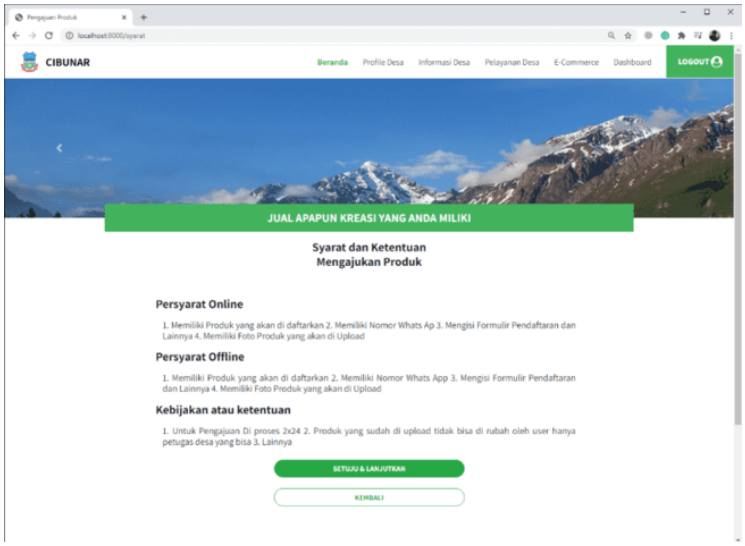

Figure 9. Terms and Conditions Page View

Figure 6 displays the admin login page to access the Dashboard admin page. Figure 7 is the main page view of the e-commerce Sisdesa. Users can access this page to search for local products from the village community of SMEs. Figure 8 displays the product pages that are sold by category. Users can access this page to search for products by category. Figure 9. is a page display of the terms and conditions applied by each village as a limitation in submitting products.

3.5. Discussion

This study aims to successfully design a Village Information System E-Commerce System Using Agile Methodology. The discussion of research results includes how research results can fill the problem space in gap analysis. In previous studies, no village information system had an e-commerce application on its website, especially in the Garut area. It's also the novelty of this research. The benefits of this study can be felt by different stakeholders, both in the village community and in the local government.

4. CONCLUSION

Based on the results of this study, it is to produce e-commerce that acts as a new feature for villagers aimed at rural communities to market products online. Direct Message is one method that can be applied to conduct transactions between sellers and buyers through the personal contacts of each seller and buyer. This research can be used to create a new e-commerce platform using Android in the future.

ACKNOWLEDGEMENTS

Thank you to various parties who have supported this research, especially to the Institut Teknologi Garut, which has encouraged the author to continue completing this article.

5. REFERENCES

[1] S. Z. Ahmad, A. R. Abu Bakar, T. M. Faziharudean, and K. A. Mohamad Zaki, "An Empirical Study of Factors Affecting e-Commerce Adoption among Small- and Medium-Sized Enterprises in a Developing Country: Evidence from Malaysia," *Inf. Technol. Dev.*, vol. 21, no. 4, pp. 555–572, Oct. 2015, doi: 10.1080/02681102.2014.899961.

[2] P. Ueasangkomsate, "Adoption e-commerce for export market of small and medium enterprises in Thailand," *Procedia-Social Behav. Sci.*, vol. 207, 2015.

[3] K. Laudon and C. Traver, *E-commerce: business, technology, society*. 2016.

[4] I. G. T. . Isa and I. Ariyanti, "Kansei Engineering in Designing Web-Based e-Commerce UMKM Product," *J. Online Inform.*, vol. 6, no. 2, pp. 198–208, 2021, doi: 10.15575/join.v6i2.786.

[5] S. Adhy, S. E.- JURNAL, and undefined 2016, "PENERAPAN E-COMMERCE UNTUK MENINGKATKAN DAN MEMPERLUAS PEMASARAN DI UMKM (Studi Kasus di UMKM Pengrajin Tahu Putih dan Telur Asin di," *ejurnal.stiedharmaputra-smg.ac.id*.

[6] Rahayu, Rita, and J. Day., "Determinant factors of e-commerce adoption by SMEs in developing country: evidence from Indonesia," *Procedia-Social Behav. Sci.*, vol. 195, pp. 142–150, 2015.

[7] Z. H. A. Almtiri and S. J. Miah, "Impact of Business technologies on the success of E-commerce Strategies: SMEs Perspective," in *arXiv preprint arXiv*, Dec. 2020, p. 06214, doi: 10.1109/CSDE50874.2020.9411376.

[8] A. Srivastava, S. Bhardwaj, and S. Saraswat, "SCRUM model for agile methodology," *Int. Conf. Comput. Commun. Autom.*, pp. 864–869, 2017.

[9] F. ur Rehman, B. Maqbool, M. Q. Riaz, U. Qamar, and M. Abbas, "Scrum software maintenance model: Efficient software maintenance in agile methodology," *2018 21st Saudi Comput. Soc. Natl. Comput. Conf.*, pp. 1–5, 2018.

[10] A. R. Ramadhani and L. Fitriani, "PERANCANGAN APLIKASI PERSEDIAAN BARANG DAN TRANSAKSI PENJUALAN BARANG DI ALYA STORE," *J. Algoritm.*, vol. 13, 2016.

[11] N. Kuruwitaarachchi, M. S. A. Yajid, A. Khatibi, and S. F. Azam, "Information technology factors influence the adoption to ecommerce in small and medium scale organizations in Sri Lanka: a research agenda," *Int. J. e-Education E-bus. e-Management e-Learning*, vol. 10, no. 1, pp. 95–103, 2020.

[12] Z. Kremez, L. Frazer, S. Weaven, and S. Quach, "E-commerce structures for retail and service franchises: E-commerce implementation in mature franchise systems," *Asia Pacific J. Mark. Logist.*, 2019, doi: 10.1108/APJML-11-2018-0461.

[13] D. Beerbaum, "Applying Agile Methodology to regulatory compliance projects in the financial industry: A case study research," Kamath, 2019.

[14] F. Hayat, K. S. Arif, K. Wahab, M. Abbas, and A. U. Rehman, "The Influence of Agile Methodology (Scrum) on Software Project Management Software Project Management View project software testing View project The ,nfluence of Agile Methodology (Scrum) on Software Project Management," *2019 20th IEEE/ACIS Int. Conf. Softw. Eng. Artif. Intell. Netw. Parallel/Distributed Comput.*, pp. 145–149, 2019, doi: 10.1109/SNPD.2019.8935813.

[15] A. Ribeiro and L. Domingues, "Acceptance of an agile methodology in the public sector," *Procedia Comput. Sci.*, vol. 138, pp. 621–629, 2018.

[16] B. Pasaribu, Y. Latief, and S. Riantini, L, "Development of Risk-Based Standardized Work Breakdown Structure (WBS) to Improve Quality Planning of Drainage Construction Work Development of Risk-Based Standardized Work Breakdown Structure (WBS) to," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 258, no. 1, p. 012054, 2019, doi: 10.1088/1755-1315/258/1/012054.

[17] L. Fitriani, M. A. Nugraha, E. Satria, and D. Tresnawati, "Geographical Information System distribution of health insurance and employment administrator office," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 1098, no. 3, p. 032050, 2021, doi: 10.1088/1757-899X/1098/3/032050.