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Scrum Framework Implementation of Fish Mobile Auction Module in Pasar Iwak Marketplace

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Abstract: Lelang Ikan mobile application is an online auction in the marketplace platform of Pasar Iwak based on Android platform. Scrum fbacklogs andpplied and consists of determining the product backlog, creating sprint planning and sprint backlogs, and conducting sprint reviews and sprint retrospectives. The product backlog resulted 14 backlog items based on the results of system and user requirements for user auctioneers. Sprint planning and sprint backlog are divided into four sprints, namely front-end and back-end development, system integration process and system implementation. Sprint reviews are carried out by implementing two types of testing, namely blackbox testing and user acceptance testing (UAT). Blackbox testing emphasizes testing application functions or features, while UAT is applied to measure the level of user acceptance. The results of blackbox testing showed that the features provided by the application are in accordance with the predetermined requirements. Whereas UAT showed the result of 66.8%, which means that the application is in the appropriate category and can be accepted by users. The application development process ends at the sprint retrospective stage which is a suggestion or feedback after the application testing. The suggestions obtained are in the form of adding tracking features, payment features with payment gateways, and application development with the iOS platform.

Keywords: Fish Auction, Online Aucion, Mobile Application, Agile Development, Scrum Framework

INTRODUCTION

The use of mobile devices is now common for people and part of lifestyle. There are many benefits obtained from using mobile devices, one of which is for business management and development. Several mobile applications have been developed to support business management and development such as marketplace applications, e-commerce applications, auction applications, marketing applications, customer management applications, and point of sales applications. The use of this mobile device provides added value and benefits that can indirectly have an impact on profits or profits obtained. In addition, using a mobile application can also increase the reach of a product's market share due to its flexibility and ease of access.(Aulami & Ariani, 2022)(Hendriawan et al., 2021)(Ardian & Fernando, 2020)(Kurniawati, 2022)(Arie Kusumawardhani, Bruri Trya Sartana, M.M, 2018)(Wiguna et al., 2019)

Auction is a type of buying and selling transaction of goods that is open to the public and is carried out by bidding on a price that increases or decreases from the initial price offered in writing or orally until a price agreement occurs. Based on the bidding media used, currently auction transactions are divided into two types, namely conventional auctions and electronic auctions. Conventional

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auction transactions are auction processes that are usually held in one place where auctioneers and bidders meet and bid directly. Meanwhile, electronic auctions are conducted without a meeting in one place directly between the auctioneer and the bidder. The presence of auctioneers and bidders in electronic auctions is carried out through online media using the auction application platform, either in the form of a website or a mobile application. Examples are the Indonesian Auction (https://lelang.go.id/) developed by the Directorate General of State Assets, ibid (https://www.ibid.astra.co.id/) an auction of automotive and electronic goods developed by the Astra group, and koelak (https://koelak.com/) developed by the Bumi Jaya Auction House.

This research focuses on developing a fish auction application with an Android-based mobile platform. The fish auction mobile application developed is part of the Pasar Iwak (http://pasariwak.com/market/) application product. The Iwak market application is a marketplace application for the sale and auction of fish managed by the Marine and Fisheries Service (DKP) of Kendal Regency as a forum for fish farmers in Kendal Regency to sell their fish harvests. In addition, the Iwak Market application can also be used as a means to stabilize the price of farmed fish products and cut the distribution chain of selling farmed fish, most of which is usually done through collectors or intermediaries. There are several fish auction mobile applications that have been developed, for example ornamental fish auctions, fishing fish auctions, and bid-fish applications. However, most of the mobile applications that have been developed are intended for fishermen with caught fish or marine fish products. Thus, the Iwak Market application, especially for fish auction modules, is very important to be developed in order to bring benefits to bring freshwater fish farmers, especially in Kendal Regency.(Nuraminudin, 2020)(Nuraminudin, 2020)(Balqis et al., 2019)

LITERATURE REVIEW

Online auction application development methods that are currently often applied include *adaptive software* development, (Andri & Suyanto, 2020)*research* and development, (Andarsyah & Fadilla, 2020) and *rapid application development*(Sons et al., 2019). These methods are known as the agile development methods group (Abrahamsson et al., 2002) . The *agile* development method is one of the application development methods that has advantages in adaptability to changes and processing time. Agile development is an iterative and *incremental* approach where each phase or stage is done in one skilus on a small scale or commonly known as a sprint (Jain et al., 2018) . One approach in *agile development* is *scrum*(Srivastava et al., 2017). Some applications that have successfully implemented the *scrum* approach include mobile order taking systems, smart cleaning applications, e-commerce applications, development monitoring and evaluation applications, and project-based learning. This research focuses on developing online auction modules with Android-based mobile platforms and applying agile development methods with a scrum approach in the development process. (Riana, 2021)(Hutrianto & Son, 2020)(Ambayu & Hartomo, 2022)(Prastio & Ani, 2018)(Jurado-Navas & Munoz-Luna, 2017)

The scrum approach has several stages including product backlog, sprint planning and (Schwaber & Sutherland, 2020) *sprint backlog*, sprint review and *retrospective sprint*. The product backlog is determined based on the analysis of system needs and user needs. Spint planning is a plan for the work on each item in the product backlog which is done in order of priority. Sprint review is a process to review applications that have been done by applying *blackbox* testing and *user acceptance testing* (UAT). The application development process ends at the retrospective sprint stage which is a suggestion or feedback after application testing. If there is a suggestion, it will be added to the product backlog which will then be done.

METHOD

This Research method in mobile application development for the online fish auction module includes four stages as shown in Figure 1, covering the stages of literature review, problem identification and needs analysis, application development, analysis of results and conclusions. The details of the research in Figure 1 are as follows:

Literature Review

The literature review stage is a stage of review of research and publications from other research that has been carried out related to the topic of mobile application development and auction of

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goods. The results of the literature review stage are in the form of *research gaps* that can describe the position and contribution of research currently carried out.

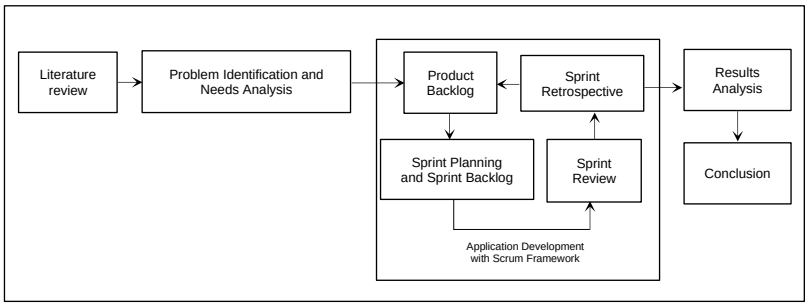

Figure 1 Stages of Research

Problem Identification and Needs Analysis

Identification of problems is carried out by conducting visits and interviews of parties related to the development of fish auction mobile applications, such as the Marine and Fisheries Service (DKP) of Kendal Regency and fish farmers. The issue raised relates to the absence of a *platform* or place for fish farmers to sell their fish harvests. After determining the problem, an analysis of system needs, and user needs can be carried out through surveys and interviews. The needs analysis is carried out with the aim of determining the features in the developed mobile application.

Application Development

The application development process is carried out by applying a scrum framework which is part of the *agile development* method. The scrum framework consists of several stages which include determining the product backlog, creating a *sprint planning* and sprint *backlog*, conducting a *sprint review* and *a retrospective sprint*.

Product backlog is a determination of the functionality or features that must be provided by the application. The determination of features is based on the results of the analysis of system needs and user needs. Sprint planning is a work plan for each product backlog that has been divided into several parts (*sprint backlog*). Sprint review is a stage to review application products to users which is carried out with two types of testing, namely *blackbox testing* to test the readiness of application features and UAT to test user readiness. The final stage in the scrum framework is a retrospective sprint which is a suggestion or feedback after application testing. If there is a suggestion, it will be added to the product backlog which will then be done.

Analysis of Results and Conclusions

Analysis of the results is carried out on each phase carried out in the development of the fish auction mobile application. Then, conclusions will be drawn based on the results of the analysis that has been carried out.

RESULT

In this case, it explains the results of each stage of research that has been carried out. Starting from the application description, scrum framework implementation and application test results.

App description

The fish auction mobile application is one of the modules in the Pasar Iwak (http://pasariwak.com) marketplace application which was developed with the aim of selling fish through online auction transactions. The fish auction mobile application is expected to help fish farmers to provide a transparent auction venue, get the best-selling price of fish, and transactions and payments that are fast and can be directly accepted by fish farmers as auctioneers.

The management strategy in the fish auction mobile application is illustrated by creating a business model using the *business model canvas* (BMC). Business model analysis of fish auction mobile applications is carried out by identifying key *partners*, key activities, *key resources*, *cost*

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structure, *value propositions*, customer segments, *customer relationships*, application *channels* and *revenue* streams. The business model of the fish auction mobile application can be seen in Figure 2.

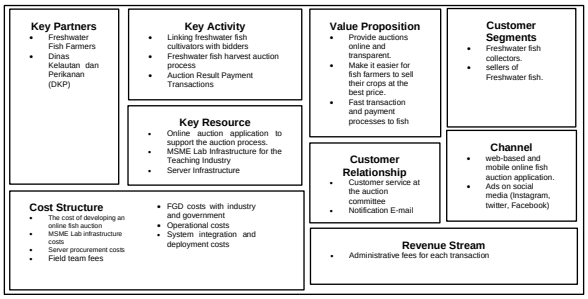

Figure 2 Business model in the Fish auction Mobile App

Figure 2 shows the results of the business model analysis running in the fish auction mobile application. K*ey partners* of the fish auction mobile application are fish farmers and the Marine and Fisheries Service (DKP) of Kendal Regency. *The key activity* provided by this application is to connect fish farmers directly with buyers (auction participants), online crossing processes, and payment transactions. The resources needed (*key resources*) in this application are MSME labs for industrial training and server infrastructure. Cost structure includes application development costs, usually infrastructure, server procurement costs, field team costs, FGD costs and operational costs as well as system deployment integration. The benefits obtained (*value proposition*) with the development of this auction application are that it provides an online auction and transaction process, making it easier for fish farmers to sell their crops, and fish farmers can receive payments quickly.

The fish auction mobile application is developed using the CodeIgniter framework, the Java programming language, and the MySQL database. Figure 3 shows the architecture of the auction mobile application.

Figure 3 Fish Auction Mobile Application Architecture.

Implementation

This section describes the results of implementing a scrum framework which is divided into several stages, including product backlog, sprint planning and sprint backlog, sprint review and retrospective sprint.

Product Backlog

Product backlog is the development priority of functionality or features that must be provided by the application based on system needs and user needs. There are four types of users in the fish auction mobile application, namely auction participants, auctioneers who are fish farmers, auction committees, and admins who are managers of the Iwak Market Application and representatives from the Kendal Regency Fisheries Service. The product backlog is determined based on the flow in the fish auction process for the auctioneer's users. The product backlog results can be seen in Table 1. There are 14 backlog items that must be realized in the development of this application. Furthermore,

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the product backlog will be divided and worked on on a smaller scale in the sprint planning and sprint backlog stages.

Table 1 Product Backlog Results

ID	Backlog Name
1	app start page
2	auction information page
3	login page
4	Registration Page
5	profile page
6	Create an auction
7	View offers
8	Auction winner information
9	View payment information
10	View order list of eagle lwinners
11	packaging and shipping inputs
12	view product testimonials
13	Sales history page
14	Balance page

Sprint Planning and Sprint Backlog

Sprint planning is the creation of development plans that are carried out on a smaller and repeatable scale. Sprint planning for the fish auction mobile application consists of four sprints. Each sprint is depicted with a backlog sprint which is a list of items in the product backlog that have been sorted by work priority. The development of this fish auction mobile application consists of four sprints, namely the front-end development process, *back-end* development, system integration process, and system implementation.

a. Sprint 1

Sprint 1 is the stage of work for the front-end development process by creating a user interface for the product backlog in Table 1. Figure 4 is an example of the initial display of the fish auction mobile application page.

Figure 4 Fish Auction Start Page

b. Sprint 2

Sprint 2 is a stage of working on the application back-end by designing application flows and databases. In general, the flow of the fish auction process is carried out in four stages depicted in Figure 5, namely registration, product selection, *bidding* and transactions.

Figure 5 shows the flow in the fish auction process on the fish auction module in the Iwak Market Application for auctioneer users. The process begins with *a user login* or account registration to get user access rights and carry out auction activities. The auctioneer's access rights can add fish products to be auctioned and determine the initial bid price. The auction process is followed by users with access rights for auction participants to be able to see the fish products being auctioned and bid

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on the selected fish products. The selection of the winner of the auction is determined by the highest price bid made by the auction committee. After getting the auction winner information and payment confirmation, the auctioneer will package and ship his fish products. When the fish product has been confirmed to be received by the auction winner, the auctioneer will get payment from the auction organizer.

Database design is done with a *Database Management System* (DBMS) using MySQL. There are several table designs created, including the auctioneer table, the bidder table, the committee table, the admin table, the deposit table, the auction table, the bidding table, the winner table, and the payout table. Table 2 is an example of an auction table design and Table 3 is an example of a bidding table.

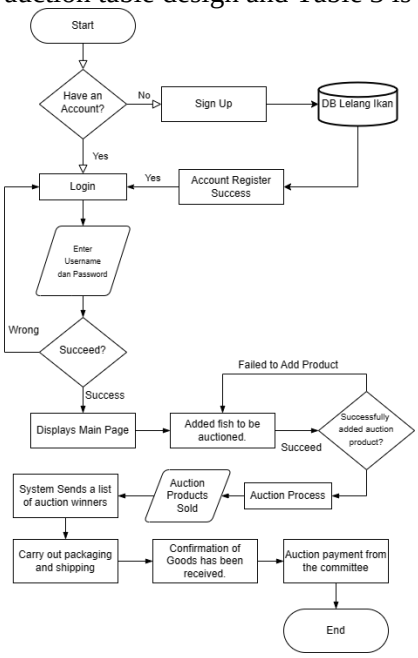

Figure 5 Fish Auction Process Flow with Auctioneer user

Table 2 Auction table design

Key	Field	Type	Size
PK	**Lelang_id**	Char	20
	Pelelang_id	Char	20
	Product	Varchar	40
	Desc_produk	text	
	Image	varchar	255
	harga_awal	Double	
	harga_minimal_diterima	Double	
	incremental_value	Double	
	tgl_mulai	datetime	
	tgl_selesai	datetime	
	harga_beli_sekarang	Double	
	metode_bayar	Int	
	Status	Int	
	panitia_id	Char	20
	Information	varchar	255

Table 3 Offer table design

Key	Field	Type	Size
PK	**bid_id**	Int	

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	lelang_id	Char	20
	peserta_id	Char	20
	tgl_bid	datetime	
	harga_tawar	Double	

c. Sprint 3

Sprint 3 is a stage of system integration. System integration is carried out by combining the Iwak Market platform for websites and mobiles using APIs and optimizing the management of database administrators.

d. Sprint 4

Sprint 4 is the stage of implementing and setting the access rights of application users which includes auctioneers, bidders, and admins consisting of application admins and admins from the DKP.

e. Sprint review

Sprint review is carried out by applying two types of testing, namely blackbox testing and user acceptance testing (UAT).

Blackbox Testing

Blackbox testing at this stage will be focused on application functions for users with auctioneer access rights. Table 4 is the result of testing with blackbox testing with several predetermined scenarios.

Table 4 *Blackbox Testing* Results

Test scenarios	Expected results	Result
Login	The system displays a login page and can log in to the auctioneer's account	Appropriate
Profile	The system displays the *user profile* page as well as displays the auctioneer's account information	Appropriate
Auctioneer Dashboard	The system displays the auctioneer's main page such as the conditions menu, create auctions, packaging and shipping inputs, and withdraw balances	Appropriate
Create an Auction	The system displays a create auction page to start offering products	Appropriate
Auction Catalog	The system displays an auction catalog page containing auction products	Appropriate
Sales History	The system displays a sales history information page	Appropriate
Payment	The system displays a payment information page	Appropriate
Withdraw Balance	The system displays a balance withdrawal page, and the auctioneer can enter the balance withdrawal amount	Appropriate

User Acceptance Testing (UAT)

UAT is a measurement of the level of application acceptance by users. UAT on the fish auction mobile application was carried out using a questionnaire that was distributed to 26 respondents. There are six questions in table 5 that must be answered by respondents with weighting values and percentages in table 6.

Table 5 UAT Questions

no	question
1	Can the fish auction mobile application be recognized by the initial interface of the application?
2	Are you able to find the account list menu easily?
3	Are the features in this fish auction mobile application easy to understand?
4	Is the auction order delivery feature easy to fill?

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5	Is fit you to open an auction is easy to operate?
6	Is the color display on the application comfortable to look at?

Table 6 UAT Assessment Weight

Scale	Information	weight	Percentage
SS	Very Suitable	5	80 – 100%
S	Appropriate	4	60 – 79 %
.CS	Quite Appropriate	3	40 – 59%
TS	Non-Compliant	2	20 – 39%
STS	Highly Incompatible	1	0 - 19%

The results of filling out the questionnaire and calculating the weight of respondents can be seen in Table 7. Question 1 gets answer 1 quite appropriate, 20 appropriate, and 5 very suitable. Question 2 gets answer 6 according and 20 very appropriate. Question 3 gets 6 appropriate answers and 20 is very appropriate. Question 4 gets answers 18 are not appropriate, 6 are appropriate and 2 are very appropriate. Question 5 gets answer 2 is not appropriate, 18 is appropriate and 3 is very appropriate. Question 6 got the answer 2 not appropriate, 6 appropriate and 18 very suitable. The calculation of the weight value of each answer in table 7 is obtained by calculating the multiplication between the number of answers and the weight value of each answer.

Table 7 Questionnaire results and UAT weighting

Question	Assessment Weights					Sum	Percentage
	STS	TS	.CS	S	SS		
Question 1	-	-	3	80	25	108	69.16%
Question 2	-	-	-	24	100	124	79.3%
Question 3	-	-	54	24	10	88	56.3%
Question 4	-	4	54	24	-	82	52.5%
Question 5	-	-	12	76	15	103	66%
Question 6	-	-	6	24	90	120	76.83%
Average							66.68%

The UAT results show a value of 66.8% meaning that the fish auction mobile application is in line with user expectations and can be well received.

Retrospective sprint

Retrospective sprints in the form of suggestions and *feedback* obtained after the testing process is complete. There are several suggestions and inputs obtained for the further development of the fish auction mobile application, such as the addition of a tracking system for the auction products sent so that the auction winner knows the position or location of the product he won. To improve the ease and security of transactions, user respondents suggested adding a payment gateway feature. Also, developing applications with the iOS platform in order to reach even more application users. Suggestions and inputs in this retrospective sprint will be included in the list of items in the product backlog for the next stage of research.

DISCUSSIONS

Based on the evaluation and testing of the fish auction application from the Pasar Iwak marketplace, it can be concluded that the fish auction mobile application can support and improve the functionality of the Pasar Iwak marketplace platform, especially for fish farmers in selling their fish harvest. this can be seen from the blackbox testing results show that the system functionality or features have been developed properly according to system requirements and user needs. While the UAT results show that the fish auction mobile application can be used and accepted by users properly.
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CONCLUSION

There are several conclusions that have been drawn during the development process of this fish auction mobile application, including: the fish auction mobile application can support and improve the functionality of the Pasar Iwak marketplace platform, especially for fish farmers in selling their fish harvests. The developed fish auction mobile application includes four processes, namely registration, product selection, bidding, and transaction. The application development process is carried out by referring to the scrum framework which is carried out in stages or through several *sprints*, this makes the development process more planned and can detect early if there are deficiencies during the development process.

REFERENCES

Abrahamsson, P., Salo, O., Ronkainen, J., & Warsta, J. (2002). Agile software development methods: Review and analysis. *VTT Publications*, *478*, 3–107.

Ambayu, G. L., & Hartomo, K. D. (2022). Analisis dan Pengujian Sistem Informasi Penjualan Produk UMKM Menggunakan Metode Scrum. *JATISI (Jurnal Teknik Informatika Dan Sistem Informasi)*, *9*(3), 2016–2028. https://doi.org/10.35957/jatisi.v9i3.2229

Andarsyah, R., & Fadilla, R. (2020). Aplikasi Lelang Online Geographic Information System (WEBGIS) Intelligence PT. Pegadaian (Persero) Menggunakan Metode Research and Development. *Jurnal Teknik Informatika*, *12*(2), 1–7.

Andri, & Suyanto. (2020). Pengembangan Aplikasi Lelang Karet Berbasis Mobile Sebagai Pendukung Akses Informasi Lelang. *Edumatic: Jurnal Pendidikan Informatika*, *4*(2), 85–94. https://doi.org/10.29408/edumatic.v4i2.2631

Ardian, A., & Fernando, Y. (2020). Sistem Informasi Manajemen Lelang Kendaraan Berbasis Mobile (Studi Kasus Mandiri Tunas Finance). *Jurnal Teknologi Dan Sistem Informasi (JTSI)*, *1*(2), 10–16.

Arie Kusumawardhani, Bruri Trya Sartana, M.M, M. K. (2018). Analisa Dan Perancangan Mobile Customer Relationship Management (M-CRM) Berbasis Android Studi Kasus Aplikasi Peduli Sekitar. *Jurnal Idealis*, *1*(5), 169–176.

Aulami, R., & Ariani, F. (2022). Aplikasi E-Marketplace Pada Usaha Mikro Kecil Menengah (UMKM) Berbasis Mobile. *Jurnal Informatika Dan Rekayasa Perangkat Lunak*, *3*(1), 66–72.

Balqis, A. N., Ramadhana, L., Wirawan, R., & Isnainiyah, I. N. (2019). Bid-Fish: An android application for online fish auction based on case study from Muara Angke, Indonesia. *IOP Conference Series: Materials Science and Engineering*, *508*(1). https://doi.org/10.1088/1757-899X/508/1/012128

Hendriawan, M., Budiman, T., Yasin, V., & Rini, A. S. (2021). Pengembangan Aplikasi E-Commerce Di PT. Putra Sumber Abadi Menggunakan Flutter. *Journal of Information System, Informatics and Computing*, *5*(1), 69. https://doi.org/10.52362/jisicom.v5i1.371

Hutrianto, H., & Putra, A. (2020). Implementasi Scrum Model Dalam Pengembangan Aplikasi Pelaporan Sampah Sebagai Wujud Smart Cleaning. *JIPI (Jurnal Ilmiah Penelitian Dan Pembelajaran Informatika)*, *5*(1), 9. https://doi.org/10.29100/jipi.v5i1.1552

Jain, P., Sharma, A., & Ahuja, L. (2018). The Impact of Agile Software Development Process on the Quality of Software Product. *2018 7th International Conference on Reliability, Infocom Technologies and Optimization: Trends and Future Directions, ICRITO 2018*, 812–815. https://doi.org/10.1109/ICRITO.2018.8748529

Jurado-Navas, A., & Munoz-Luna, R. (2017). Scrum Methodology in Higher Education: Innovation in Teaching, Learning and Assessment. *International Journal of Higher Education*, *6*(6), 1. https://doi.org/10.5430/ijhe.v6n6p1

Kurniawati, R. (2022). Implementasi Scrum Pada Perancangan System Mobile Taking Order Coffee Aplikasi Berbasis Mobile. *JATISI (Jurnal Teknik Informatika Dan Sistem Informasi)*, *9*(2), 1275–1294. https://doi.org/10.35957/jatisi.v9i2.2037

Nuraminudin, M. (2020). Analisis dan Implementasi Onesignal dalam Pembuatan Aplikasi Mobile Hybrid Lelang Ikan Hias. *JURTEKSI (Jurnal Teknologi Dan Sistem Informasi)*, *VI*(3), 209–214.

*name of corresponding author

Prastio, C. E., & Ani, N. (2018). Aplikasi Self Service Menu Menggunakan Metode Scrum Berbasis Android (Case Study: Warkobar Café Cikarang). *Jurnal PETIR*, *11*(2), 203–220.

Putra, K. I. E., Santoso, N., & Santoso, E. (2019). Pengembangan Aplikasi Pelelangan Ternak Burung Lovebird berbasis Android. *Pengembangan Teknologi Informasi Dan Ilmu Komputer*, *3*(7), 6887–6895.

Riana, E. (2021). Konsep Penerapan Metode Scrum dan RDC System Dalam Pengembangan System Mobile Taking Order Web. *Jurnal Media Informatika Budidarma*, *5*(1), 297. https://doi.org/10.30865/mib.v5i1.2688

Schwaber, K., & Sutherland, J. (2020). The Scrum Guide. *Agile Metrics: Agile Health Metrics for Predictability*, *November*, 133–152.

Srivastava, A., Bhardwaj, S., & Saraswat, S. (2017). SCRUM Model for Agile Methodology. *Proceeding - IEEE International Conference on Computing, Communication and Automation, ICCCA 2016*, 864–869.

Wiguna, P. D. A., Swastika, I. P. A., & Satwika, I. P. (2019). Rancang Bangun Aplikasi Point of Sales Distro Management System dengan Menggunakan Framework React Native. *Jurnal Nasional Teknologi Dan Sistem Informasi*, *4*(3), 149–159. https://doi.org/10.25077/teknosi.v4i3.2018.149-159

*name of corresponding author