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Implementation of Food Ordering Application System Design in a Coffee Shop Using the Multilevel Feedback Queue Algorithm

[1]Irwan, [2]Muhammad Zen
[1,2]Faculty Of Science And Technology, University Of Pembangunan Panca Budi, Medan, Indonesia
Email: irwan04@dosen.pancabudi.ac.id[1], muhammadzen@dosen.pancabudi.ac.id[2]

Keywords

Android, Restaurant, Queue, Web Application

Abstract. The exceptionally quick improvement of business urges each business person to make an alternate type of administration to draw in clients. Quick help is a fascination in itself for clients. In order to speed up food serving time and avoid a buildup of orders in the kitchen or chef, a queuing or scheduling system can be implemented. Staggered Criticism Line is a planning calculation for central processor planning for a PC working framework. The Staggered Criticism Line calculation permits cycles to move lines. A process will be moved to a lower queue if it consumes too much CPU, reducing the amount of CPU interaction time. In this exploration, an Android-based food requesting application was created by carrying out Staggered Criticism Line to make a line for food orders at the culinary specialist.

1. INTRODUCTION

The restaurant industry, for example, requires a sales system that is more efficient, more attractive, prioritizes beauty, cleanliness, and tidiness of service, so that customers are impressed when they enter. The extremely rapid development of business encourages every entrepreneur to create a form that is different from other businesses. the restaurant.[1] Service quality is a changing condition that is connected to products, services, people, processes, and environments that meet or exceed expectations in five main ways: reliability, responsiveness, assurance, empathy, and evidence. tangible (physical things) The nature of administration, particularly in cafés, extraordinarily impacts consumer loyalty, with the goal that clients won't be disheartened or move to another restaurant.[2]

A typical issue frequently experienced by cafés is the build-up of food orders from gourmet specialists, subsequently some client orders are frequently mistaken for different orders and furthermore planning takes a long time.[3] Another issue that emerges is client solace in requesting food, there are many servers holding up at the client's table so clients are less agreeable in requesting food.[4]

One arrangement presented by cafés is to give tablet computers at client tables with the goal that clients can undoubtedly arrange food. One option is to implement a queuing or scheduling system in the kitchen/chef to prevent a buildup of food orders (Simeonov and Simeonovova, 2007). The multilevel feedback queue is a scheduling algorithm that is commonly used in CPU scheduling in the creation of operating systems. The multilevel feedback queue algorithm permits processes to move queues, and in a restaurant, the high priority system is the most orders or the easiest and fastest way to serve.[5] A process will be moved to a lower queue if it consumes too much CPU. This advantages the cooperation interaction since this cycle just purposes a little computer chip time. The Multilevel Feedback Queue Algorithm will be used in this study to create Android-based web apps for restaurant food ordering applications. This is similar to processes that wait too long.[6] The Staggered Criticism Line calculation is utilized to make a line for food orders from culinary specialists, so the time spent serving food is quicker and increments consumer loyalty in restaurants.[8] [9]

2. METHOD

Multilevel Feedback Queue

Computer-Assisted Instruction, or CAI, is a method of education that makes use of computers. The Multi Channel Single Server Queue model serves as the foundation for the multilevel feedback queue algorithm. The ability to move a process from one queue to another, such as with a lower or higher priority, is the primary benefit of a multilevel feedback queue.[10, 11]

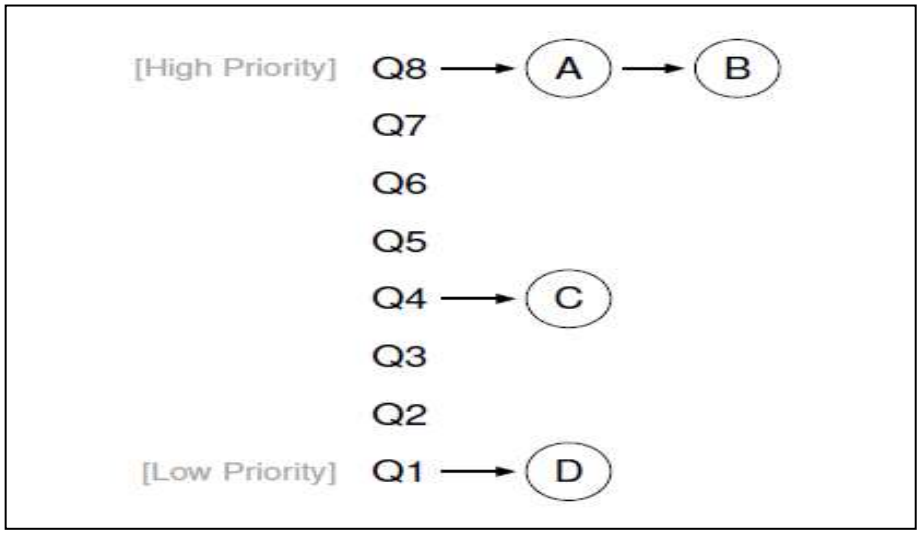
This algorithm is defined through several parameters, including:

a. Number of queues.

b. Scheduling algorithm for each queue.
c. When to elevate a process to a higher queue.
d. When to demote a process to a lower queue.
e. Which queue the requiring process will enter.

This calculation is ordinarily utilized in Working Framework advancement. Particularly in computer processor booking [12]. A process will be moved to a lower queue if it consumes too much CPU. This advantages the cooperation interaction since this cycle just purposes a little computer chip time. In like manner with processes that stand by excessively lengthy. This cycle will be expanded in level. [13], [14]

There are three kinds of classifications utilized in this staggered criticism line, in particular High Need, Typical Need and Low Need. Figure 1 shows an example of this multilevel feedback queue. A queue is considered to be high priority if it requires a lot of processing time and a lot of CPU power. On the other hand, a queue is considered to be normal priority if it uses little time and CPU power.[15] There are two jobs shown in the figure: jobs A and B have the highest priority, while jobs C and D have a low priority. So the work to be finished by the central processor is Occupation A → B → C → D.[16]



Gambar 1. Example of Multilevel feedback queue

Ordering Food at a Restaurant

In a restaurant, taking orders from customers is known as ordering or taking orders. The kitchen, bar, and cashier, among other departments, will receive the food and drink in this scenario.[17, 18]. Taking Order includes several activities, among others:

a. Displays accurate information regarding all food and drinks available on the menu list
b. Record the menu ordered, the quantity ordered, the name of the orderer and others.
c. Confirming orders to customers.
d. Forward orders to related departments.

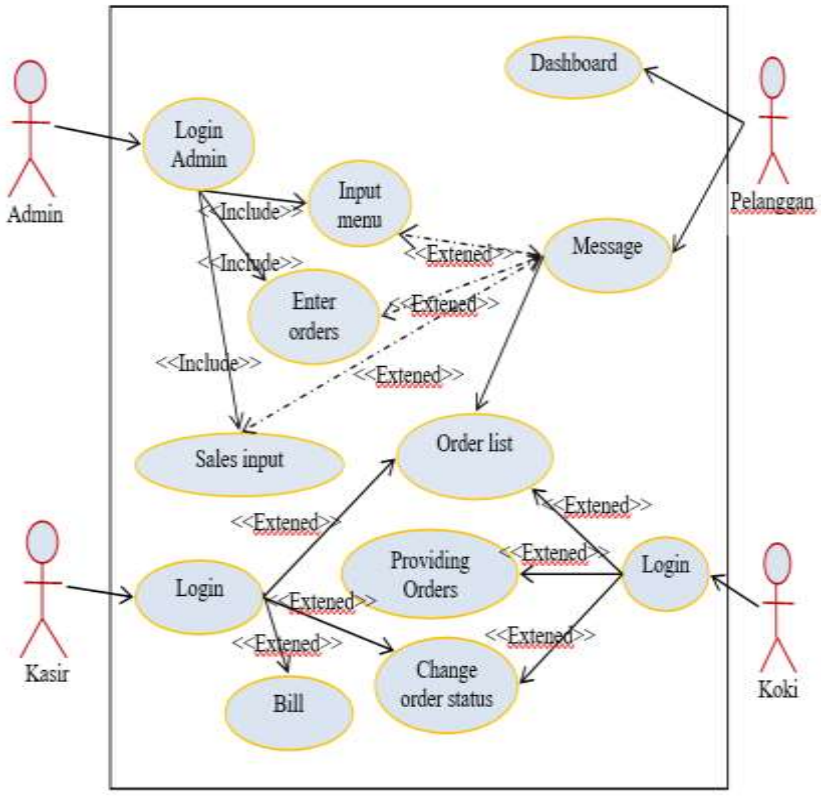
3. RESULTS AND DISCUSSION

The description of the research results below is:.

Global System Design

Global system design will explain the general description of the system and the system model that will be proposed. Because the proposed system will produce object-oriented software, it is necessary to model the system based on the objects used. In this modeling the author uses Unified Modeling Language (UML). At the modeling or global system design stage, the author will design a system based on the requirements of the proposed system, such as creating use case diagrams, sequence diagrams and class diagrams. The detailed design of the global system as explained above cannot fully describe the processes that occur in the system, so a detailed system design is needed that

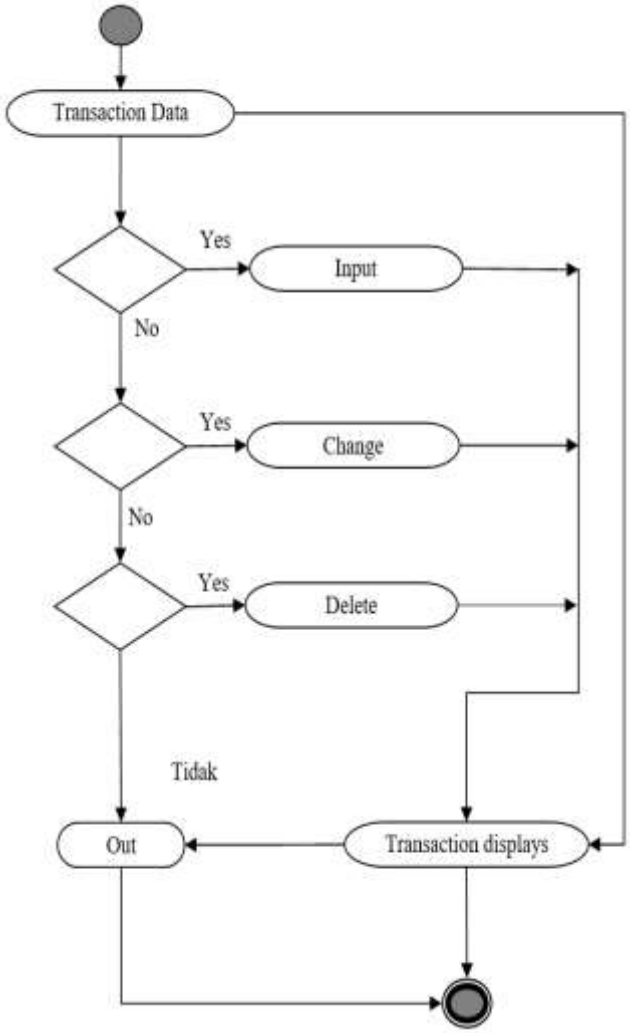
can explain the flow of processes that occur in the system. The detailed system design proposed will be explained one by one below.



Gambar 2. Use Case Diagram

Activity Diagram Transaction Data

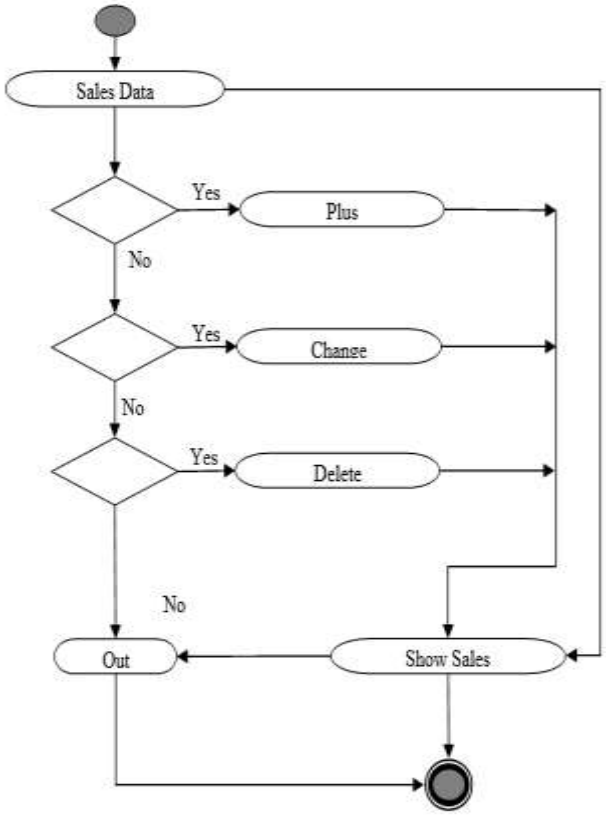
This Transaction data activity diagram will describe admin activities on the Transaction page to process Transaction master data, to add, change, delete menus in the system. The transaction data activity diagram for the proposed system is depicted in the following diagram.



Gambar 3. Activity Diagram Transaction Data

Sales Activity Diagram

This Sales data activity diagram will describe the admin activities on the administrator page to process the Sales menu master data entered by customers, change, delete Sales from the menu in the system. The activity diagram for sales menu data in the proposed system is depicted in the following diagram.



Gambar 4. Activity Diagram Sales Data

Application Views and Testing

The following is a display of the results of food ordering design using the multilevel feedback queue algorithm.

Gambar 5. Main course

Gambar 6. Menu list

Gambar 7. Menu List Page

Gambar 8. Menu Details Data Page

At the implementation and testing stage of the food ordering system design using the multilevel Feedback Queue algorithm method, it is designed simply, so that users can easily run and use the food ordering system application using the designed multilevel Feedback Queue method. After the trial, it will display login to the main menu of the application, and the program is ready for use by the user. Testing is an inseparable part of building a system. Because by testing the system to be implemented, you can find out whether the system is running as desired or not. And it is intended that the quality of the system can be guaranteed before it is implemented. The test plan carried out on the system is in the form of testing using the black-box testing method where testing focuses more on the functional needs of the user.

Table 1. Admin Login System Testing

Test result cases (Normal data)				
No	**Enter data**	**Which are expected**	**Observation**	**Conclusion**
1.	Username: admin Password: admin Click the login button	The form displays login for the admin section, as the information system data center page	Can enter to display Main Admin	[✓]accepted []rejected
Test result case (Incorrect data)				
No	**Enter data**	**Which are expected**	**Observation**	**Conclusion**
1.	Username: admin Password:1234 Click the login button	Cannot log in and an error message appears	displays an error message	[✓]accepted []rejected

Table 2. Order data system testing

Test result cases (Normal data)				
No	**Enter data**	**Which are expected**	**Observation**	**Conclusion**
1.	Add data	Order data will be entered into the database, click Add then the data will be entered on the database server	Order data will be entered into the database, click Add then the data will be entered on the database server	[✓]accepted []rejected

Test result case (Incorrect data)				
No	**Enter data**	**Which are expected**	**Observation**	**Conclusion**
2.	Enter incomplete data	There is a message that charging incomplete data	A message appears that it is charging incomplete data	[✓]accepted []rejected

4. CONCLUSION

The Multilevel Feedback Queue (MLFQ) algorithm can be used to create a queuing system for ordering food. Serving using the MLFQ method is faster than FCFS (First Come First Serve) because in MLFQ there is a distribution of priorities and food serving is done based on existing priorities. Add orders and send them from Android-based applications to web-based applications using web service facilities. Displays a list of orders along with their order status and changes if there are updates. Control the order queue based on the time the order is sent to the kitchen and change the order status, accessed by the kitchen using a web browser..

REFERENCES

[1] F. Wijianti and S. Mohammad Arif, "Sistem Informasi Pengelolaan Obat Pada Puskesmas Kecamatan Pancoran Jakarta Berbasis Java Netbeans," 2023.

[2] E. Khuzainah, "Pembangunan Sistem Informasi Buku Induk Siswa Pada Madrasah Ibtidaiyah Sudirman Pabongan Ngargoyoso Kabupaten Karanganyar," Online.

[3] F. Ramadhan and S. Chendra Wibawa, "Pengembangan Media Pembelajaran Interaktif Matematika Dengan Bot Api Media Sosial Telegram Di Akademi Farmasi Surabaya."

[4] Supriyanto, "Rancang Bangun Aplikasi Resep Masakan Khas Indonesia Berbasis Andoid," *Jurnal Informasi Dan Komputer*, vol. 7, pp. 1–25, 2019.

[5] M. P. Lukman and H. Surasa, "Portable Monitoring Penderita Penyakit Jantung Terhadap Serangan Berulang Berbasis Android," *Seminar Nasional Teknologi Informasi*, pp. 20–26, 2017.

[6] Muhammad Busyro ; Wiwi Verina, "Perancangan Aplikasi Wisata Kuliner Menggunakan Algoritma Collaborative Filtering Dan Algoritma Fp- Growth Berbasis Android," pp. 941–954, 2019.

[7] S. Dewi, N. Putri, and D. Juni, "Perancangan Sistem Informasi Penjualan Obat Berbasis Web Pada Apotek Amelia Sungai Raya," *Jurnal Sistem Informasi Akuntansi* ρ, vol. 88, no. 02, pp. 88–99, 2022, [Online]. Available: http://jurnal.bsi.ac.id/index.php/justian

[8] P. Hasan Putra and M. Syahputra Novelan, "Perancangan Aplikasi Sistem Informasi Bimbingan Konseling Pada Sekolah Menengah Kejuruan," *Jurnal Teknovasi*, vol. 07, pp. 1–7.

[9] C. Ziliwu, R. Sitanggang, R. U. Ginting, and A. F. K. Sibero, "Rancang Bangun Sistem Informasi Penjualan Produk Handmade Berbasis Web," *Jurnal Mahajana Informasi*, vol. 6, no. 1, 2012.

[10] Tedy Ardiansyah, "Model Platform E-Commerce Dalam Mendukung Kesuksesan Umkm Di Indonesia," vol. 1, no. 1, 2020, [Online]. Available: http://www.sanur.com

[11] D. Andrian, R. E. Sari, T. Informatika, T. Ilmukomputer, and U. Utama, "Perancangan Aplikasi Resep Masakan Khas Jawa Berbasis Android Application Design of Traditional Javanese Cuisine Recipes Based on Android," vol. 1, no. 1, pp. 870–882.

[12] N. A. Febriyati and M. Y. Arnol, "Perancangan Sistem Informasi Penjualan Online Berbasis Web Pada Batik Widi Nugraha Ngawi", doi: 10.33387/jiko.

[13] M. Sholeh, P. Studi Informatika, F. Teknologi Industri, P. Studi Rekayasa SIstem Komputer, F. Sains Terapan Institut Sains, and T. AKPRIND Yogyakarta, "Membangun Sistem Informasi Usaha Mikro Kecil Dan Menengah (Umkm) Berbasis Website Sebagai Media Informasi Dan

Promosi Di Desa Negla Kecamatan Losari Kabupaten Brebes," *Jurnal SCRIPT*, vol. 9, no. 2, 2021, [Online]. Available: www.imosumut.com.

[14] R. Gustina and H. Leidiyana, "Sistem Informasi Penggajian Karyawan Berbasis Web Menggunakan Framework Laravel," *JSiI | Jurnal Sistem Informasi |*, vol. 7.

[15] M. Kristiyanti Jurusan KPN STIMART and S. Lisda Rahmasari, "Website sebagai Media Pemasaran Produk-Produk Unggulan UMKM di Kota Semarang," 2015.

[16] F. Rahmat, A. Bukit, G. Geby,) Irvan,) Fahmi, and F. Teknik, "Pembuatan Website Katalog Produk Umkm Untuk Pengembangan Pemasaran Dan Promosi Produk Kuliner Website Creation Product Catalog Msmes For Marketing And Promotion Development Of Culinary Products 1)," 2019, [Online]. Available: www.imosumut.com.

[17] H. Fauzi Siregar and N. Sari, "Rancang Bangun Aplikasi Simpan Pinjam Uang Mahasiswa Fakultas Teknik Universitas Asahan Berbasis Web," *Jurnal Teknologi Informasi*, vol. 2, no. 1, 2018.

[18] R. Bangun Sistem, N. Afni, R. Pakpahan, and A. Rezky Jumarah, "Rancang Bangun Sistem Informasi Penggajian Dengan Implementasi Metode Waterfall," vol. VII, no. DESEMBER, p. p-ISSN, 2019, [Online]. Available: www.bsi.ac.id