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STRUCTURED METHODS IN TRAVEL INFORMATION SYSTEMS

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Abstract

Many travel businesses continue to employ a conventional system that needs customers to come to them directly to purchase tickets. Using this approach, however, takes a long time and is inefficient. With the advancement of information technology, it is now feasible to access data practically, quickly, and efficiently, which may be advantageous to the firm. This study's goal is to create an information system for booking and canceling tickets. The design of this information system may make it simpler for customers and officials, and it can be taken into account in an effort to solve information system difficulties. This study technique employs descriptive data gathering methods such as observation and interviews with MyTours travel agents, whereas the system development method uses structured methodologies. The findings of this study indicate the design of Mytours' information system for ordering and canceling tickets. It is hoped that this research will be taken into account in the improvement of information systems, as well as make it easier for consumers and officers to access information effectively and efficiently.

Keywords: Information systems, Travel, Structured methods.

1. Introduction

Businesses must keep up with technological advancements in order to meet the requirements of today's society. Travel agents, for example, require information technology help as technology advances [1, 2]. Travel agencies are businesses that provide services such as ticket booking and travel document management. MyTours is a travel agency that provides a variety of travel services, including tour packages, airline tickets, hotel bookings, visas, passports, cruises, and others. So far, MyTours product information dissemination has been limited because customers must come directly to find out information on the products and services offered, and search and processing of tour package reservation data continues to take a long time due to irregular data in archive storage, which causes data consistency to be lost. The construction of an information system may help with the administration of tour package reservation data as well as making it easier for clients to find out about the goods and services available [3, 4].

In previous research [5], designed an information system to accommodate the sale of tour and travel tickets. The results showed that the web-based integrated ticket management information system helped to solve the company's problems, improved effectiveness, and provided valid reporting results. There is also research that has demonstrated that establishing an information system may make it simpler for customers to handle data quickly and is also capable of reducing the risk of mistakes in managing data on the admin [6]. Here are some quotes from earlier study on the usefulness of deploying information systems. Because the previous study was limited to information system design, the present study will also apply it to the visual studio.

The goal of this study is to examine the ticket booking system at the MyTours travel agency, and then develop a ticket booking system and payment system based on the findings. The observation and interview methods were employed in this study, whereas the structured approach was used to design the system. It is envisaged that by doing this study, it would be possible to develop a system for handling tour package reservation data and making it easier for clients to buy tickets and learn about the products and services available.

2. Literature Review

2.1. Definition of system

In general, a system can be defined as a set of interconnected parts or components that work together to achieve a specific function or goal. In engineering and technology, a system is a combination of hardware, software, and other components that work together to perform a specific task or function [7]. Examples include computer systems, electrical systems, and mechanical systems.

2.2. Understanding information systems

An information system can be defined as a set of interconnected components that collect, process, store, and disseminate data or information to support decision-making and other business processes within an organization [8]. In computer science, an information system can refer to any system that processes or manipulates data or information, regardless of whether it is used in a business

context. Examples include database management systems, content management systems, and knowledge management systems.

2.3. Definition of travel information system

A travel information system can be defined as a set of technologies and processes that provide travellers with real-time information about transportation schedules, traffic conditions, weather updates, and other relevant travel-related information [9]. Travel information system can refer to a set of technologies that enable transportation providers to collect and disseminate real-time information about transportation schedules, delays, and other relevant information to passengers. Examples of transportation travel information systems include airline reservation systems, train schedule information systems, and bus tracking systems.

2.4. Definition of structured method

A structured method in information systems refers to a formal and systematic approach to developing, designing, and implementing software systems. It is a step-by-step process that involves the use of techniques, tools, and procedures to ensure that the final product meets the requirements and specifications of the end-users. The goal of a structured method is to provide a consistent, repeatable, and reliable approach to software development.

A structured method typically uses a variety of tools and techniques to support each of these phases. For example, data flow diagrams, entity-relationship diagrams, and use case diagrams are often used during the analysis and design phases. Structured programming techniques, such as top-down and bottom-up design, are often used during the implementation phase. Structured method provides a systematic and disciplined approach to software development, helping to ensure that software systems are designed and implemented correctly, efficiently, and effectively [10, 11].

2.5. Definition of flowmap

Flowmap is a type of diagram or visual representation used to depict the flow of materials, goods, people, or information through a system or process [12, 13]. The flowmap is often used in logistics and supply chain management, but can also be used in other fields, such as process engineering and project management.

2.6. Definition of data flow diagram (DFD)

Data Flow Diagram (DFD) is a data or process logic model that is made more detailed than the allowed context diagram, which can be achieved by developing a diagram [14]. It is a graphical representation of the inputs, processes, and outputs of a system, and is often used in software engineering to document and analyse the functionality of a system.

2.7. Definition of data dictionary

Data dictionary is a collection of elements or symbols that are used to assist in the description or identification of each field or file in the system [15]. A data dictionary typically includes a list of all data elements used in the system, along

with their definitions, data types, allowable values, and other relevant information. It may also include information on data structures, such as tables and fields, and data relationships, such as foreign keys and join conditions. The data dictionary serves as a reference for developers, analysts, and other stakeholders involved in the development and maintenance of the system.

2.8. Definition of normalization

Normalization in a system refers to the process of organizing data in a database to reduce redundancy and dependency. It is a technique used in database design to ensure that data is stored efficiently and logically, reducing the risk of data inconsistency and improving data integrity [16]. Normalization involves breaking down a large table into smaller, more manageable tables, each with a specific purpose and set of attributes. The goal is to eliminate data redundancy by creating tables that are in a state of normal form, meaning that each table stores data in a specific, non-redundant way.

2.9. Definition of entity relational diagram (ERD)

ERD is a model to explain the relationship between data in the database based on a perception that the real word consists of these objects [17]. ERDs can be used to identify the relationships between entities, the attributes that describe each entity, and the cardinality or degree of each relationship. Cardinality refers to the number of instances of one entity that can be related to the number of instances of another entity [18].

ERDs are an important tool in database design because they help to ensure that the data model is accurate, efficient, and logical. They provide a visual representation of the database schema, making it easier to communicate the structure of the database to stakeholders such as developers, analysts, and end-users.

3. Methodology

3.1. Data collection method

To analyse the data, it takes data on the running system for booking tour and travel tickets, which consists of travel package booking documents, departure schedules, receipts, and tour package catalogues. The data collection technique used is to collect data obtained from interviews with the My Tours company in Bandung. And make observations about the procedures for the existing system at the company My Tours Bandung.

3.2. Software development method

This research uses a structured system development method with the following stages:

3.2.1. Software requirements analysis

The process of gathering requirements, specifying software requirements so that they are easily understood by the user. At this stage an analysis is carried out on the tour and travel ticket booking system that is currently running at the My Tours Bandung company, by collecting data from travel package booking documents, departure schedules, receipts, and reports related to booking tour and travel tickets.

3.2.2. Design

Software design is a process that focuses on the design of software programs including data structures, software architecture, interface representation, and coding procedures. For the software design stage using tools such as Flowmap, DFD, Data Dictionary, Normalization and ERD.

3.2.3. Code programming (coding)

After doing the design stage, then it must be translated into a Software program. To create program code using Visual Studio 2010 programming and the database using Microsoft Access.

4. Results and Discussion

4.1. Running analysis

The running analysis is carried out to find out more clearly how the system works and can be used as the basis for the proposed system design that is running. The current analysis in this study was carried out with 2 analyses, namely document analysis and process analysis.

4.1.1. Document analysis

Document analysis is a method of determining a system's input, process, and output. Document analysis includes descriptions of the names of the required papers, their purposes, explanations of the documents required in the system, and even samples of these documents. Document analysis is performed to ascertain the distribution route, function, and frequency of arrival of the documents in question. Table 1 below is from the MyTours travel document study.

Table 1. Document details.

No.	Document Name	Description
1.	Booking Tour Packages	**Description**: Booking a tour package contains the booking data. **Source:** Sales Marketing and Administrator Division **Copy:** 1
2.	Departure schedule	**Description:** Departure schedule news information about the departure of the tour. **Source:** Sales Marketing and Administrator Division **Copy :** 2
3.	Receipt	**Description:** The receipt is proof of booking a tour package. **Source:** Sales Marketing and Administrator Division **Copy:** 2
4	Tour Package Catalog	**Description:** The tour package catalog is a description of the tours offered along with prices. **Source:** Sales Marketing and Administrator Division **Copy:** 1

4.1.2. Process analysis

4.1.2.1. Flowmap

The flowchart of ticket bookings to reports for management is shown in Fig. 1. The flowchart below shows the process from consumers filling out the tourist form to operations creating reports and submitting them to management. The order cancellation flowmap is depicted in Fig. 2. The flowchart begins with the submission of a payment receipt as proof of booking a ticket.

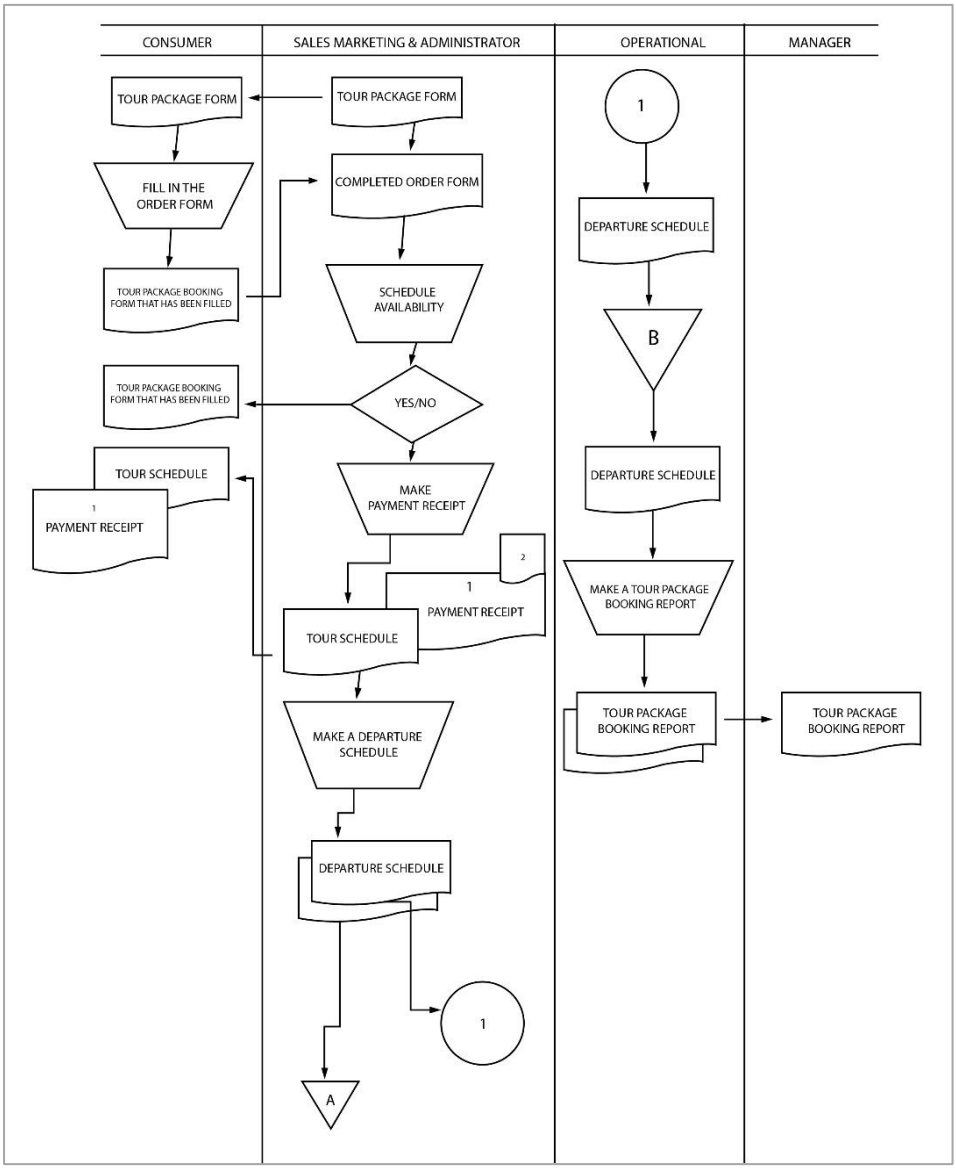

Fig. 1. Registration flowmap.

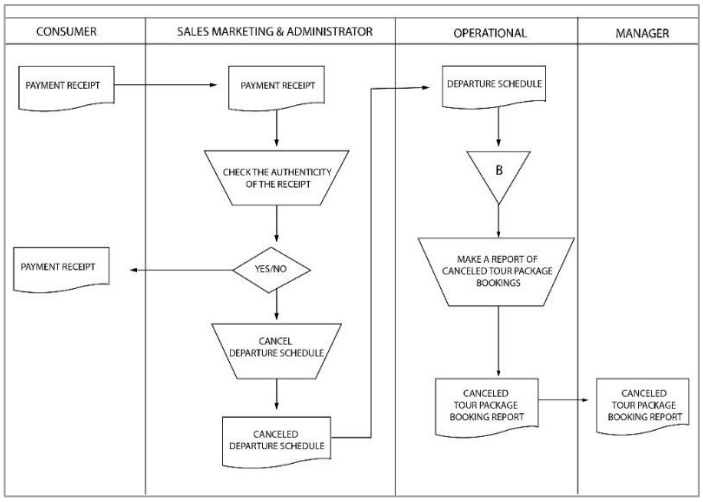

Fig. 2. Order cancellation flowmap.

4.1.2.2. Data flow diagram (DFD)

The DFD diagram shows how the data or information goes according to the system from starting to process input and producing output. Figure 3 shows the DFD that is running on Mytours. Based on this DFD flowmap, it shows the process of registering a tour package to canceling a tour ticket and also showing the process until submitting a report to the manager.

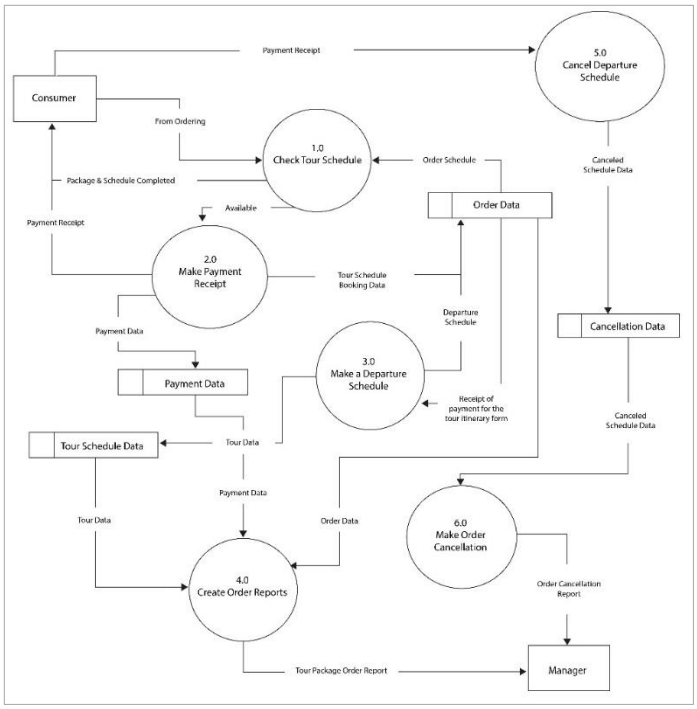

Fig. 3. Data flow diagram.

4.1.2.3. Data dictionary

The data dictionary shows in detail the structure of the data flow and is created based on the data flow in the DFD.

1. Flow Name : Member Data
   Alias : *Data Member*
   Process Flow : *Pengunjung* - Proses 2.0 (input)
   Data Structure : *id_member, username, password_member, email, alamat, no_telp, jenis_kelamin, no_identitas, tgl_lhr*
2. Flow Name : Tour Data
   Alias : *Data Wisata*
   Process Flow : Proses 1.0 - *pengunjung*, Proses 1.0
   Data Structure : *id_wisata, kd_wisata, nama_wisata, lokasi, deskripsi, longitude, latitude, gambar, kategori_wisata*
3. Flow Name : Tour Package Data
   Alias : *Data Paket Wisata*
   Process Flow : Proses 4.0 - *pengunjung* , Proses 4.0
   Data Structure : *id_paket, kd_paket, nama_paket, deskripsi, harga, durasi, konsep_kegiatan, maksimal, minimal, review, detail, gambar*
4. Flow Name : Order Data
   Alias : *Data Pemesanan*
   Process Flow : Member – Proses 5.0, *Pengunjung* – Proses 5.0
   Data Structure : *id_pesan, kd_pesan, id_paket, id_member, jml_pesan, nm_pesan, email_pesan, alamat_pesan, status, spesial_pesan, cekin_pesan, total_pesan, nm_op, id_trans, tgl_pesan*
5. Flow Name : Deposit Confirmation Data
   Alias : *Data Konfirmasi Deposit*
   Process Flow : Member – Proses 6.0, *Pengunjung* – Proses 6.0
   Data Structure :*kd_pemesanan, no_rek, nm_rek, nm_bank, tujuan_bank, jml_transfer*
6. Flow Name : Payment Confirmation Data
   Alias : *Data Konfirmasi Pembayaran*
   Process Flow : *Pengunjung* – Proses 7.0, Member – Proses 7.0, *Pegawai*
   Data Structure :*kd_pemesanan, no_rek, nm_rek, nm_bank, tujuan_bank, jml_transfer*
7. Flow Name : Assignment Letter Data
   Alias : *Data Surat Tugas Process*
   Flow : *Pegawai*
   Data Structure : *nm_pesan, telp_pesan, alamat_pesan, cekin_pesan, No_plat*
8. Flow Name : Receipt Data
   Alias : *Kwitansi* Process
   Flow : *Proses*
   Data Structure : *no_kw, nm_pesan, total_pesan, tgl_kw*

4.1.2.4. Normalization

The act of arranging data items into tables that display entities and their connections is known as normalization. A table can be used to define the database's connection with the data structure. The table's column displays the file's characteristics. This characteristic is used to identify a data item or field.

i. Unnormal form

{id_member, username, password_member, email, alamat, no_telp, jenis_kelamin, no_identitas, tgl_lhr, id_wisata, kd_wisata, nama_wisata, lokasi, deskripsi, longitude, latitude, gambar, kategori_wisata, id_paket, kd_paket, nama_paket, deskripsi, harga, durasi, konsep_kegiatan, maksimal, minimal, review, detail, gambar, id_pesan, kd_pesan, id_paket, id_member, jml_pesan, nm_pesan, email_pesain, alamat_pesan, status, special_pesan, cekin_pesan, total_pesan, nm_op, id_trans, tgl_pesan, kd_pemesanan, no_rek, nm_rek, nm_bank, tujuan_bank, jml_transfer, kd_pemesanan, no_rek, nm_rek, nm_bank, tujuan_bank, jml_transfer, op_id, op_kd, op_nm, op_telp, op_alamat, id_trans, kd_trans, plat_trans, merk_plat, jenis_trans, rental, nm_pesan, telp_pesan, alamat_pesan, cekin_pesan, no_plat, no_kw, nm_pesan, total_pesan, tgl_kw }

ii. 1st Normal form

{id_member, username, password_member, email, alamat, no_telp, jenis_kelamin, no_identitas, tgl_lhr, id_wisata, kd_wisata, nama_wisata, lokasi, deskripsi, longitude, latitude, gambar, kategori_wisata, id_paket, kd_paket, nama_paket, deskripsi, harga, konsep_kegiatan, maksimal, minimal, review, detail, gambar, email_pesan, email_pesan, alamat_pesan, status_pesan, spesial_pesan, cekin_pesan, cekout_pesan, id_konfirmasi, kd_konfirmasi, id_pesan, nm_bank, dp_konfirmasi, pelunasan_konfirmasi, op_id, op_kd, op_nm, op_telp, op_alamat, id_detail, id_pesan, op_id, id_trans, id_trans, kd_trans, plat_trans, merk_plat, jenis_trans, rental}

iii. 2nd Normal form

- Member = { id_member, username_member, password_member, email, alamat, no_telp, jenis_kelamin, no_identitas, tgl_lhr }
- Wisata = { id_wisata, kd_wisata, nama_wisata, lokasi, deskripsi, longitude, latitude, gambar, kategori_wisata }
- Paket wisata = { id_paket, kd_paket, nama_paket, deskripsi, harga, konsep_kegiatan, maksimal, minimal, review, detail, gambar, id_pesan, kd_pesan, nm_pesan, email_pesan, alamat_pesan, status_pesan, jumlah_rombongan, spesial_pesan, cekin_pesan, cekout_pesan, total_pesan, update_pesan }
- Detail pesan = { _id, op_kd, op_nm, op_telp, op_alamat, id_detail, id_pesan, op_id, id_trans, id_trans, kd_trans, plat_trans, merk_plat, jenis_trans, rental}
- Rekening = { id_rek, nama_rek, no_rek, id_bank }

iv. 3st Normal form

- Member = { id_member*, nama_member, username_member, password_member, email, alamat, no_telp, jenis_kelamin, no_identitas, tgl_lhr }
- Wisata = { id_wisata*, kd_wisata, nama_wisata, lokasi, deskripsi, id_kategori, longitude, latitude, gambar }
- Kategori = { id_kategori*, kd_kategori, nm_kategori }
- Tempat Wisata = { id_tempat_wisata*, id_wisata**, id_pw** }
- Paket Wisata = { id_paket*, kd_paket, nama_paket, deskripsi, harga, konsep_kegiatan, maksimal, minimal, review, detail, gambar }
- Pemesanaan = { id_pesan*, id_member**, id_status**, id_pw**, kd_pesan, nm_pesan, email_pesan, alamat_pesan, status_pesan, jumlah_rombongan, special_pesan, cekin_pesan, tgl_pesan, total_pesan, update_pesan }

- Status = { id_status*, nm_status }
- Konfirmasi Deposit = { id_pesan**, id_rek**, kd_rek, kd_dp, rek_dp, nm_dp, tgl_dp, jmlh_dp }
- Konfirmasi Pelunasan = { id_pesan**, id_rek**, kd_lunas, rek_lunas, nm_lunas, tgl_lunas, jmlh_lunas }
- Rekening = { id_rek*, id_bank**, nm_rek } Bank = {id_bank*, nm_bank }
- Kwitansi = { id_pesan**, no_kw, tgl_kw } Surat Jalan = { id_pesan**, no_surat, tgl_surat }

4.1.2.5. ERD

ERD was created using set theory in mathematics. ERD is a relational database modeling tool. As a result, if the database store is OODBMS, the data design does not need to employ ERD [19, 20]. ERD is a model for explaining the relationship between data in a database that is built on fundamental data items with relationships between them. The shape of the conversion of the ERD table is heavily influenced by the variation of a cardinal. To stress the peculiarities of each E-R diagram modeling, the function of cardinality is required [21, 22]. Figure 4 depicts the ERD that is now operating on Mytours. This ERD depicts the link between data from the consumer and payment completion.

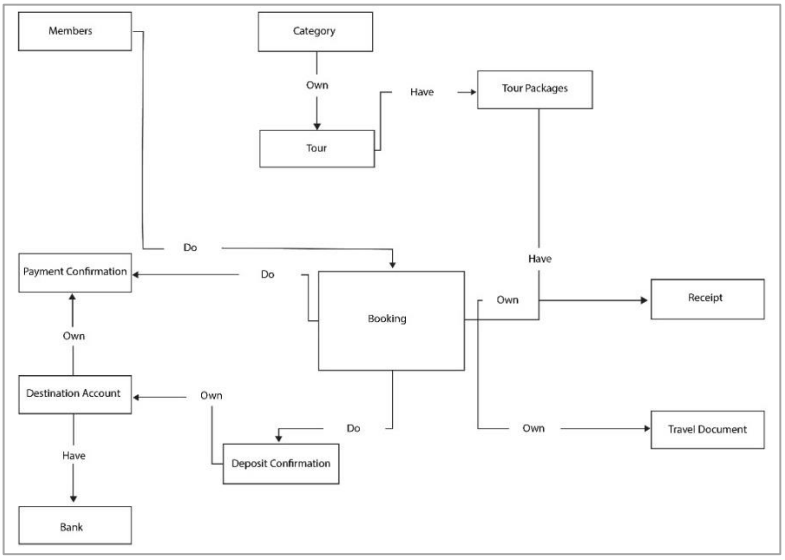

Fig. 4. Entity relational diagram.

4.2. User interface

After the design is made using Flowmap, DFD, Data Dictionary, and others, then the next step is to create a user interface. User Interface is a display that will be seen by the user. The user interface created is a menu display, a log in or register display, a ticket order display, and a cancellation and ticket change display.

4.2.1. Menu form

The menu form is the first thing that customers see when they enter the site. This menu form displays the tour packages that are available (see Fig. 5). Customers

who do not yet have an account can use the sign up or register menu. The various packages may be immediately clicked for details, and once the consumer has viewed the details, the consumer can proceed to the order form by clicking on the message corresponding to the tourist destination.

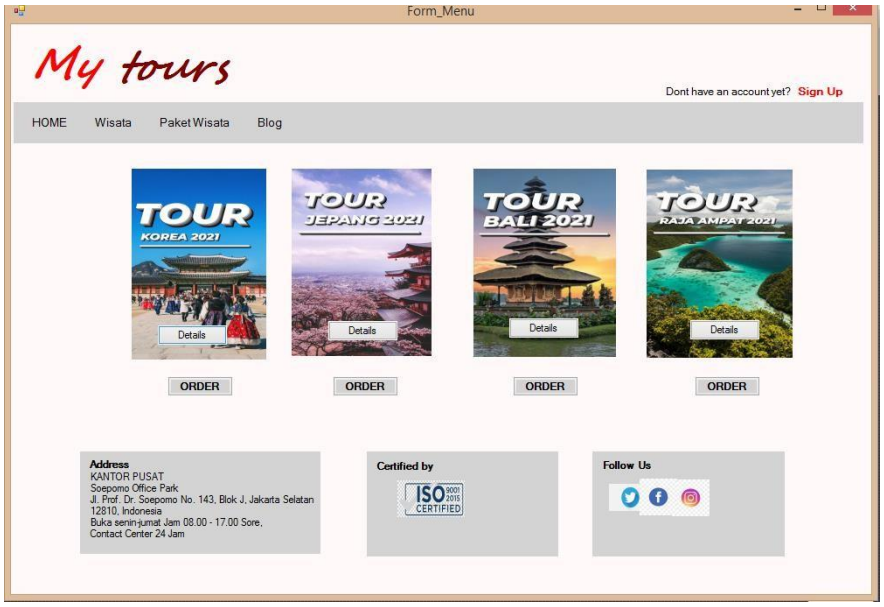

Fig. 5. Menu display.

4.2.2. Login page

The Login page appears when the consumer clicks the Sign Up menu on the form menu. This Login page contains a Sign Up menu for consumers who do not have an account, and a Login menu for consumers who already have an account (see Fig. 6).

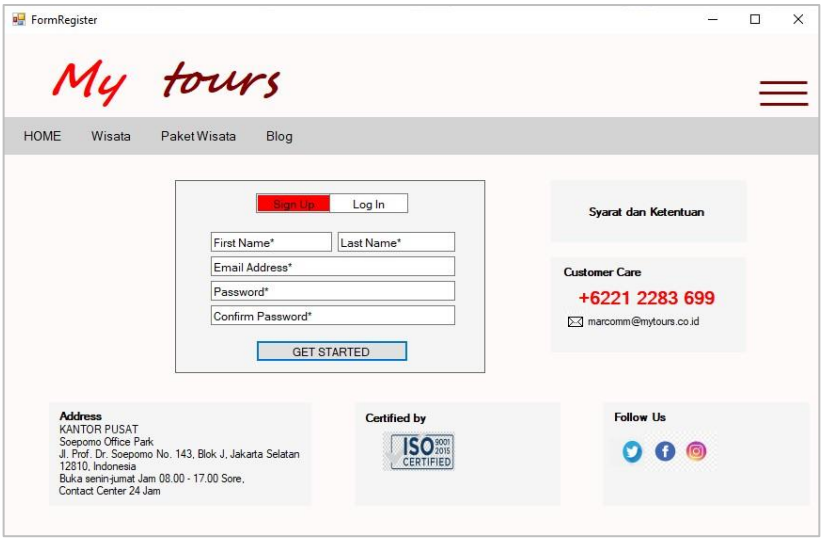

Fig. 6. Login display.

4.2.3. Order form

This order form contains information that customers must provide in order to purchase travel tickets (see Fig. 7). This order form has been organized based on the tourist destination that the client selects from the menu display. After entering the relevant information, click submit, and the data will be saved in the database. Customers will also get an email including the amount to be paid as well as the account number. After completing a purchase, the customer must confirm the payment by returning to the order page and selecting the payment confirmation button, followed by filling in the needed data and uploading a photo of the payment proof (see Fig. 8).

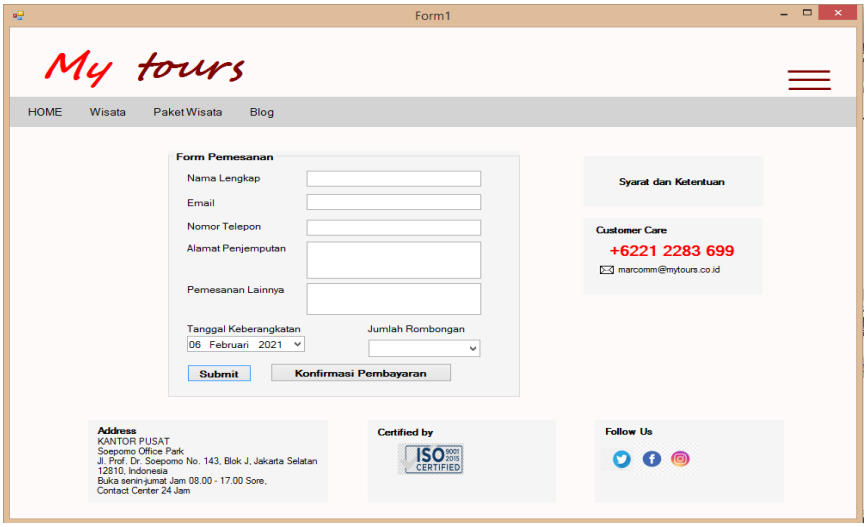

Fig. 7. Order form.

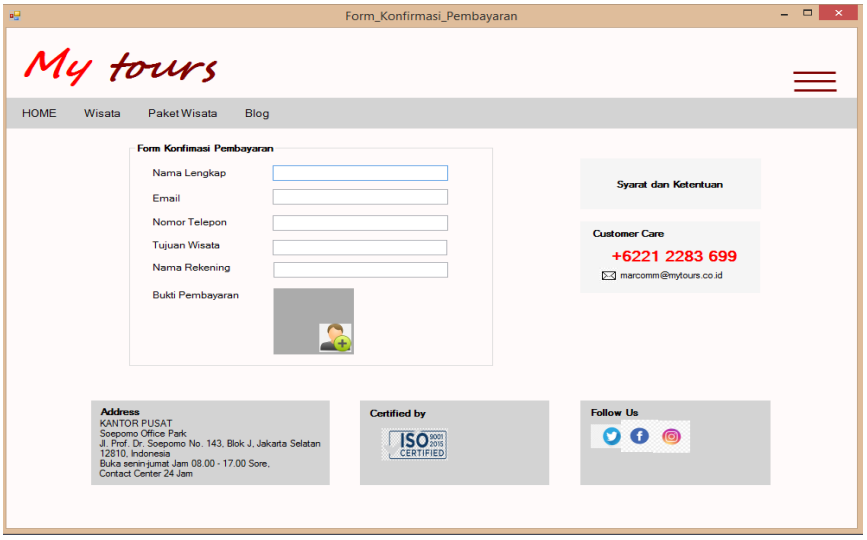

Fig. 8. Payment confirmation form.

4.2.4. Cancellation form

This cancellation form contains data that must be filled in by consumers to cancel travel or tour ticket orders, or to change the early departure schedule (see Fig. 9). After the data is filled in, the consumer needs to click submit and the data is rescheduled or cancelled.

This paper added information regarding the use of websystem to support current use in industry, as it is reported in previous reports [23, 24]. This can support travel information system [25-27].

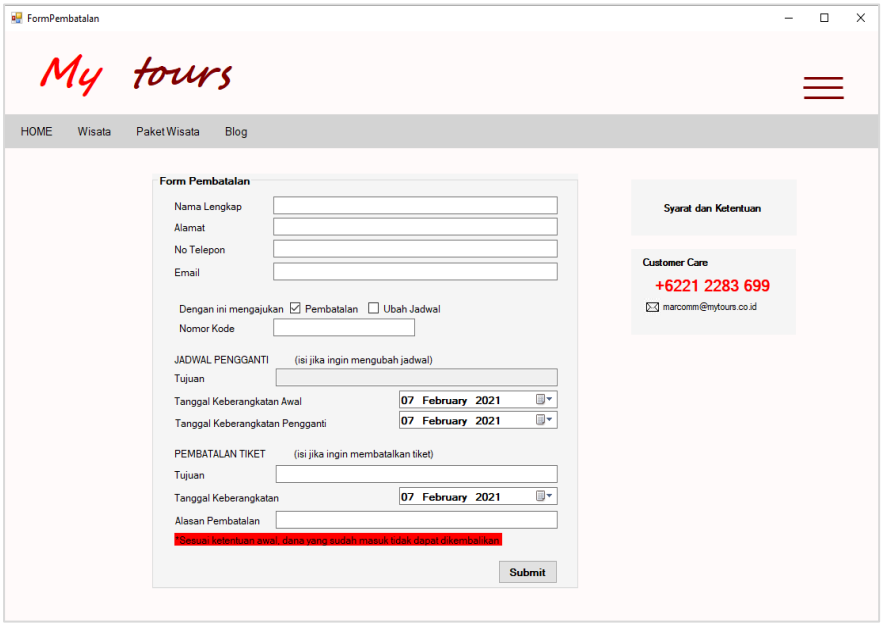

Fig. 9. Cancellation form.

5. Conclusion

MyTours travel agent is one of those whose product information dissemination is still limited, and the system for reservations or ticket reservations still has to come directly. With this ticket ordering information system, consumers can access information about tour packages and make ticket reservations online, making it more convenient. practical, quick, and effective Customers can cancel or alter purchases in addition to buying tickets. Not only can customers order and cancel tickets online, but they may also view information about MyTours travel agents at any time and from any location.

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