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«ІНФОРМАЦІЙНІ ТЕХНОЛОГІЇ І АВТОМАТИЗАЦІЯ – 2025»

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such a way that, if necessary, it allows its expansion in the direction of accounting for both the main and all secondary factors that in one way or another affect the wear diagram [7].

Thus, the following conclusions can be drawn:

- Changing engine operating modes significantly affects the nature and amount of wear on diesel engine cylinder liners.
- For each diesel engine, there is an optimal crankshaft speed at which bushing wear is minimal.
- An increase in the compression ratio and maximum combustion pressure leads to further differentiation of the bushing wear intensities in the upper zone and in the rest of its part.
- Increasing the degree of inflation has a positive effect on the nature of the bushing wear pattern, leveling it.
- Increasing the temperature of the bushing surface reduces the intensity of wear and has a positive effect on the service life of the parts of the cylinder -piston group.

The most desirable way to increase engine power is to increase the boost ratio when the engine is operating at optimal speeds and to ensure the maximum possible and permissible temperature level of the cylinder - piston group parts internal combustion engine cylinders was investigated. The factors that have the greatest impact on the wear of friction surfaces in the cylinder - piston group of an internal combustion engine were analyzed. Based on the conditions that affect the intensity of cylinder wear, it was found that a number of factors can be neglected and their values can be taken as fixed, increasing or decreasing wear depending on the type of fuel and lubricants used.

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UDC 004

CONCEPTUAL DESIGN OF A BUS TICKET SALES SERVICE MODULE

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The development of the digital economy requires process automation. The research focuses on the development of a bus ticket sales module, which includes database modelling, user interface and order/payment processing logic to improve the efficiency of transport companies.

The activities of modern Ukrainian society in a market economy are closely linked to the use of information systems and technologies. The development of the digital economy, particularly in the field of e-commerce, requires specialists to have knowledge of algorithmisation, programming, modelling and

designing information systems, organising databases, as well as skills in the effective management of large amounts of information.

One promising area in the transport industry is the incorporation of information technologies, particularly in automating passenger ticket sales processes. Modern information systems can enhance customer service quality, provide convenience and speed in ticket issuance, and optimize the management of flights, seats, payments, and routes.

The development of a bus ticket sales module is an urgent task that requires modern design approaches. This includes building effective database structures, creating a user-friendly interface, and implementing the logic for order processing and payment. Integrating this module into a unified information system for a transport enterprise can significantly enhance its efficiency.

Table 1.The data dictionary

Element name	Identifier	Type and length	Element purpose
Ticket	Tickets_ID	INTEGER	Stores a unique ticket identifier.
Users	Users_ID	INTEGER	Stores a unique user identifier.
Trips	Trips_ID	INTEGER	Stores the flight ID for which the ticket was purchased.
Routes	Routes_ID	INTEGER	Stores the route ID on which the ticket was purchased.
Seat	SeatNumber	INTEGER	Retains seat number on flight.
Ticket Price	TicketPrice	REAL	Retains the original ticket price.
Discount	Discount	TEXT	Retains the discount applied to the ticket.
Date of ticket purchase	PurchaseDate	TEXT	Stores the date of ticket purchase.
Flight date	FlightDate	TEXT	Saves the flight date.
Passenger	PassengerName	TEXT	Stores the name of the passenger who purchased the ticket.
Payment	Payments_ID	INTEGER	Stores a unique payment identifier.
Payment amount	PaymentAmount	REAL	Stores the amount paid for the ticket.
Payment date	PaymentDate	TEXT	Stores the date of payment.
Payment type	PaymentType	TEXT	Stores the payment type.
Payment status	PaymentStatus	TEXT	Stores the ticket payment status.
Route	Routes_ID	INTEGER	Stores the route ID that is part of the journey.
Departure time	DepartureTime	TEXT	Stores the departure time from the current route stop.
Arrival time	ArrivalTime	TEXT	Stores the arrival time at the current route stop.
Distance from the start of the route	DistanceFromStart	REAL	Stores the distance from the initial stop of the route to the current one.
Cost from the initial stop	PriceFromStart	REAL	Stores the fare from the initial stop to the current one.
Date of operation in the schedule	OperatingDay	TEXT	Stores the day of the week when the flight takes place.
Departure time	DepartureTime	TEXT	Stores the departure time of the flight in the schedule.
Arrival time	ArrivalTime	TEXT	Stores the flight arrival time in the schedule.
Employee ID (Manager)	Manager_ID	INTEGER	Stores the manager's unique identifier.
Employee position	Position	TEXT	Stores the manager's position in the organisation.

The provision of bus ticket sales services is closely connected to the collection, processing, and storage of large amounts of diverse information. In today's environment, this process is increasingly facilitated by e-commerce, which enables efficient organization for transport companies, particularly bus operators. This is achieved through the automation of sales, reservations, payment processing, and data analysis.

The sale of bus tickets in electronic format is a process in which the customer can view available flights, book a seat, make a payment, and receive an electronic ticket without having to visit the bus station in person. To implement this process, it is necessary to develop a comprehensive information system that includes a flight database, a user registration and accounting system, an interface for route selection, a payment subsystem, and a module for storing electronic tickets.

The data dictionary is detailed in Table 1, and the physical model of the project is illustrated in Figure 1.

A company that provides bus ticket sales services performs the following main functions:

registration of managers with the storage of personal data such as name, surname, contact information;

systematisation and storage of flight information, including route, departure and arrival times, number of available seats, fare;

processing orders – customer route selection, seat reservation, booking confirmation;

payment processing through integration with electronic payment systems (bank cards, e-wallets);

providing an electronic ticket after successful payment – in the form of a PDF document.

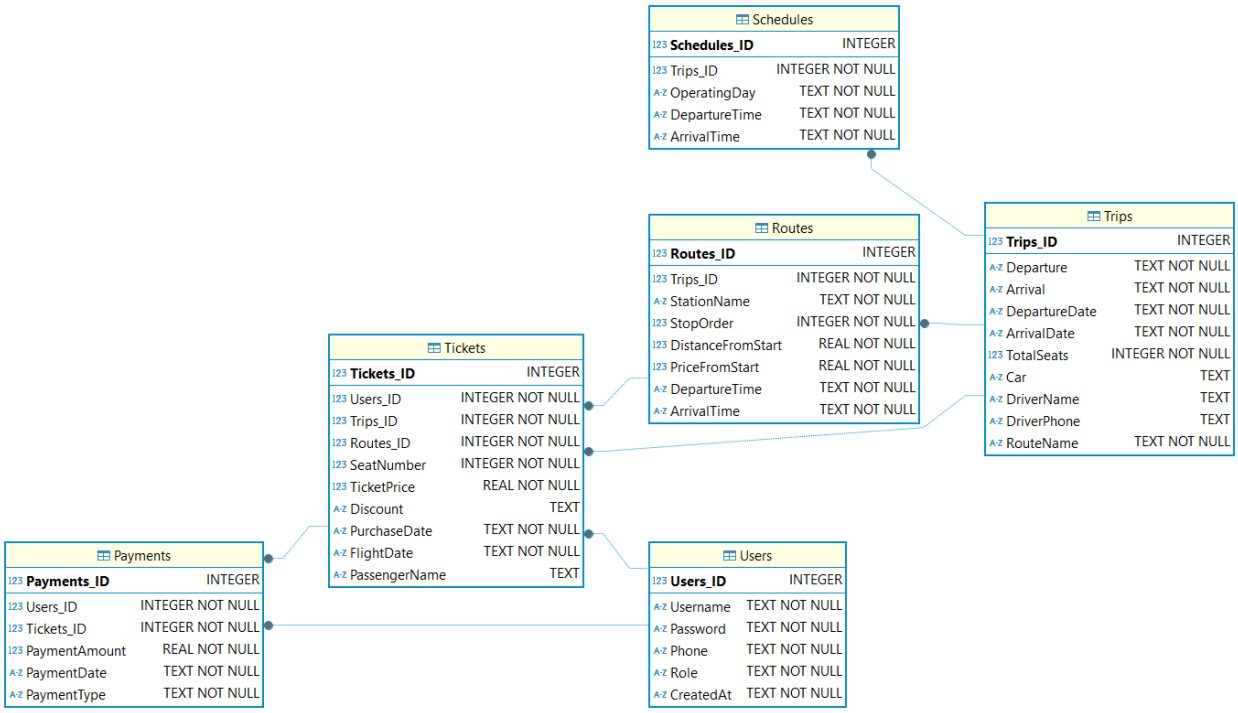

Figure 1. Physical model «Bus ticket sales service»

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