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WEB DEVELOPMENT OF A SERVICE CENTER PLATFORM FOR WORKING WITH CLIENTS

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The article discusses the main stages and methods for implementing the service centre's web platform for working with clients, which are described in detail. In addition, the MySQL database used in product development is considered. The program uses a client-server model, which improves the creation and modernization of a web resource several times.

As for the functionality of the web platform, it has a simple structure that allows one to register and access these courses. The implementation of the client-server model in the product is described, and many advantages of this architecture and a local web server running on the web platform are studied.

A reliable CRM system brings order to financial documentation, helps to quickly process orders, and creates the best conditions for the work of service centre employees.

Keywords: information system, sensors, alerts, server, web platform, client-server model.

Introduction. Currently, there is no room for uncertainty about the importance and impact of the Internet on business, and websites are an extremely powerful marketing tool for any organization. Everyone from small companies to large corporation can benefit. An accurate sense of branding, knowledge of products, services, and the company as a whole, opportunities for online transactions, and most importantly, the ability for a company to have an online presence.

An online presence is vital for a business to thrive. Moreover, this is not just a website, but a professional website that is well organized, easy to navigate, informative, reliable, and brings results to the customers who use it. Nowadays, consumers are increasingly searching for information on the internet, and therefore, the probability that a website is the first impression that a business makes on potential customers is very high. Web development is the entire process of creating, designing, testing, and maintaining websites and web applications. This applies to all the work that aims to make a web application look great. Web design, web content development, client/server scripting, network security settings, and sometimes SEO optimization.

Web development covers a wide range of services that include website or web application creation, cybersecurity solutions, UX/UI design, e-commerce solutions, website architecture, quality testing, maintenance, consulting, and even your own CMS.

Information systems enable professionals to expand their professional capabilities and carry out their activities more efficiently, economically, and purposefully. Modern markets create the need to constantly improve production efficiency, respond quickly to all changes, improve the quality of customer service, reduce losses, and make effective forecasts for the future. This requires reliable information for a complete analysis of corporate activities. Whether it is the state of the production cycle, inventory accounting, relationships with suppliers or branches, personnel tasks, or documentation of information, Therefore, automation tasks will appear sooner or later. Only the methods of achieving the final result can be different.

Automate routine work to reduce labour and time costs, create a single knowledge base to store work experience and ready-made solutions to typical problems, and optimize departmental work through more efficient task distribution among employees, taking into account the employee's experience and knowledge set and its relevance to the topic of work [1].

Formulation of the problem.

Service centre platform development process. To automate the processes of this business, various software products can be used, such as managing a small firm or managing a trading enterprise with improvements in industry-specific functions. Automation with the help of software products helps to solve all the main issues related to accounting and management of not only service centres but also repair shops online since everything is implemented in the web interface.

The program for the service centre combines various components of business activities into one system, namely:
– object of protection: a natural person and/or property;
– sales and marketing;
– procurement and provision of resources; cooperation with product manufacturers;
– control of the production process and composition;
– Exchange Fund;
– mutual settlements, product delivery;
– design, preparation, and accounting of repair-related works;
– accounting for retail sales;
– cash and non-cash payments;
– personnel and earnings;
– property management;
– financial resources [2].
    Classic web application model
    Consider the classic web application model:
– The user goes to a web page and clicks on any of its elements.
– The browser sends a request to the server.

- In response, the server generates a completely new web page and sends it to the browser, etc.
- On the server side, it is possible to generate not the entire page again but only some parts of it and then transfer it to the user.
  AJAX model:
- The user goes to a web page and clicks on any of its elements.
- The browser sends a corresponding request to the server.
- The server returns only the part of the document that has changed.

Some applications use certain variations in the server response format. These variations have acquired semi-official names [3].

AHAH (asynchronous HTML and HTTP) is a related AJAX approach.

For dynamically updating web pages using JavaScript. Its main difference from AJAX is that the server's responses must be plain HTML. The advantage of this approach is greater compatibility and functionality (support for browser navigation buttons, file uploads, etc.). It is implemented as regular frames that automatically change their size according to the size of the content or as hidden frames that perform only data loading functions.

Asynchronous XHTML and HTTP, or the abbreviation AXAH, are almost the same as AHAH. The only difference is that in AHAH, the server returns HTML to the client, while in AXAH, it is already XHTML.

Let's compare the standard approach and AJAX.

In the classic web application model [4]:
- The user goes to a web page and clicks on any of its elements.
- The browser generates and sends a request to the server.
- In response, the server generates a completely new web page and sends it to the browser, etc. After that, the browser completely overloads the entire page.
  When using AJAX:
- The user goes to a web page and clicks on any of its elements.
- The script (in JavaScript) determines what information is needed to refresh the page.
- The browser sends a corresponding request to the server.
- The server returns only the requested part of the document.

The script makes changes based on the received information (without completely reloading the page).

Analysis of the relevance of the work.

Stages and methods of developing a web platform. Developing a website can be a complex and time-intensive undertaking. To increase the efficiency of work, the creator must use modern stages and development methods that speed up the development of the web platform.

When creating a web platform for studying online courses, the following stages and methods were used, which are given in the following subsections:

A. Collecting all necessary information

As with most non-standard projects, the work initially began with collecting information. While this step may be on the verge of pettiness, it is the most important of the whole process.

If we collect all the necessary information from the very beginning, we save a huge amount of time on the road, especially in the initial stages of the design phase.

On average, at least a dozen websites were researched to extract the best ideas for the industry in which the site would be built. Then these ideas were improved and included in the work plan [5].

B. Content overview

This phase occurs concurrently with the entire website development process. The reason is that more and more information is inevitably collected as the process progresses at every step.

When one starts filling his site with valuable content, it all starts with the home page (also called the home page) and the main internal pages.

It's important to clarify that when referring to content, we are not exclusively addressing text. The content also includes visual effects such as photos, videos, tables, and charts. Even audio clips are considered content. In fact, this is everything that visitors come across [6].

C. Design

After creating a sitemap, developing a framework, and planning a roadmap, it's time to get your hands on website design. Wireframes are converted into typography, colour graphics, animations, buttons, menus, etc.

When designing, one of the most crucial factors taken into consideration is the target user. Design determines how unique a website can be, and this is a factor in a pleasant user experience. To create a good impression for the user, web design must be exciting.

There must be a form of branding that matches the purpose of the site. The combination of colours chosen for the website certainly drives user interaction. Colour can evoke different emotions, so a creative way to combine them can be very effective in design [7].

D. Implementation

After the design is approved, the next step is to develop the website itself, which is the main task.

Frontend development is the development of the client part of a website for interaction with users. What is designed in the initial stages turns into special animations and effects. Later, features are integrated based on a selection of techniques and tools.

Backend development is the reverse side of interface development. A backend is a user-side and server-side interaction that links the entire website. It's more like the engine room. The code on the server is responsible for the server side, database, business logic integration, and so on, depending on the purpose of the website [8].

Development methods. When creating a web platform for studying online courses, the following methods were used:

IntelliJ IDEA is a special programming environment or Integrated Development Environment (IDE) designed primarily for Java. This environment is used specifically for application development. There is a Community Edition licensed under Apache 2.0 and a Commercial Edition called the Ultimate Edition. What sets IntelliJ IDEA apart is its ease of use, flexibility, and robust design. It was first released in 2001 and included

the following features improved code navigation and code refactoring features, it was very popular, and in 2010 it won the award for the best Java-based programming tool, putting tools such as NetBeans, Eclipse, and IntelliJ in the spotlight. Tools like Net-Beans, Eclipse, and JDeveloper were highlighted, as was Google's 2014 release of an open source development environment for Android based on IntelliJ IDEA. This IDE supports many other programming languages, including Python, Lua, and Scala. The main reason why this IDE is considered one of the best Java-based programming tools is its supporting features, It is therefore easy to use and the applications it creates are very well designed. It also has advanced error checking features that make checking for errors faster and easier. [9].

Atom is an open-source text editor. This is an alternative for developers to use simpler text editors, such as Notepad or Notepad Plus. Unlike Notepad Plus and Notepad, Adam provides additional benefits for developers, such as syntax highlighting for specific code blocks. One can see the entire structure of the project and switch between files much faster than editing in Notepad Plus.

MAMP is one of several popular platforms. It turns your computer into a server environment that can host websites while running on it. MAMP uses Apache, MySQL, and PHP, which makes it very compatible with WordPress. A free version is available, or one can pay for your own version, which includes installers and other features to help one quickly set up your first website and improve your workflow. Like all locally hosted sites, your MAMP development and testing site will not be publicly available. This allows one to freely create or test features without worrying about them affecting your front-end user experience (UX). It also prevents visitors from coming across your semi-finished site. In addition, local development does not require an internet connection, so one can work from anywhere. Local sites also load faster, which can slightly improve your productivity. After you have completed creating or making changes to your site, one can transfer it to an existing server [10].

Client-server model. The client-server model, also known as client-server architecture, is a distributed application framework where tasks are divided between a server and a client. These components can either reside on the same system or communicate over a computer network or the Internet. The client is a service provided by the server. The client depends on a separate application to send requests for accessing the services offered by the server. The server runs one or more applications that share resources and distribute tasks among clients. The client-server relationship requires adherence to a standardized communication protocol, which explicitly defines the rules, language, and dialogue patterns. This interaction follows established request and response messaging patterns.

Client-server communication commonly adheres to a set of TCP and IP protocols. Specifically, the TCP protocol ensures a persistent connection between the client and server, maintaining it until the messaging between them is completed.

The TCP protocol defines an optimal method for distribute application data into packets so that the network can deliver, send, and receive packets, and manages flow control and retransmissions when packets are dropped or distorted. IP is a protocol that

allows each packet sent over the Internet is a no-connection protocol in which each packet is an independent data unit that is not inherently linked to any other data unit.

Client requests are organized and prioritized by the scheduling system. The client-server approach enables a general-purpose computer to enhance its capabilities by leveraging shared resources from other hosts. Common client-server applications include e-mail, World Wide Web, and network printing.

The client-server architecture model has many advantages:

All necessary data can be centralized on a single server, making data protection and user authentication easier to manage.

Network segments, servers, and computers can be seamlessly incorporated into the client-server network, typically without significant disruptions.

Data access can be efficient even when clients and servers are not in close proximity. All nodes in a client-server system are independent and request data only from the server, making it easy to update, replace, or move nodes. Data transmitted over the client-server protocol is platform independent [11].

Web server. The local server of the MAMP program was selected to create a web-based platform for studying online courses.

At its core, a web server is either software, hardware, or a combination of both that stores and delivers content to a web browser.

The server communicates with the browser using the Hypertext Transfer Protocol (HTTP).

The web server also supports SMTP (Simple Mail Transfer Protocol) and FTP (File Transfer Protocol).

What makes understanding the workings of web servers significant? The success of a website depends not only on its content and functionality but also on the efficiency of the web server used for its operation. This requires understanding the capabilities and limitations of the web server. When discussing how a web server works, it is not sufficient to simply outline how low-level network packets enter and exit the web server.

When web servers were first prototyped many years ago, they served simple HTML documents and images. The job is to receive a request for the content of a web page and display this URL in a local file on the host server. The server then downloads this file from Google Disk and transmits it over the network to the user's web browser. The interaction between the browser and the server is facilitated through communication via HTTP.

Because this simple scheme allows one to transfer static content, such as the Hypertext Markup Language (HTML) and image files, to a web browser, it became the original concept of what we now call the World Wide Web. The simplicity of this approach has given rise to a significantly more intricate exchange of information between browsers and web servers.

Arguably, one of the most significant extensions of this inquiry is the introduction of dynamic content, where web pages are generated in response to user input, either directly or indirectly. The oldest and most widely used standard for this is the Common Gateway Interface (CGI). This is a rather meaningless name, but it essentially defines

how the web server should run applications locally and transmit their results through the web server to the web browser of the user who needs dynamic content.

By all rules, the user's web browser should never know that the content is dynamic, since CGI is essentially a web server extension protocol. In Fig. 1, the following shows what happens when the browser requests a page that is dynamically generated from a CGI application.

The second important progress, and what makes e-commerce possible, is the introduction of the hypertext secure transfer protocol (HTTPS). This protocol allows one to provide secure communication between the browser and the web server.

In a nutshell, this means that the user and the server can safely transfer sensitive data to each other through what can be considered an insecure network. Another thing is what happens when data is received both ways and should not be ignored [12].
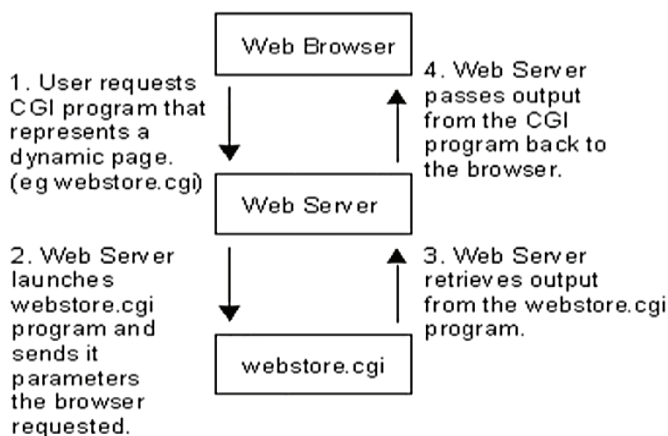

Fig. 1. Request a page by browser

Mysql database. The MySQL database was used to develop the web platform.

MySQL is an open-source relational database management system. Similar to other relational databases, MySQL organizes data in tables, which consist of rows and columns. Users can define, process, control, and query data using the Structured Query Language, better known as SQL. The MySQL name is a combination of" My", the name of the daughter of MySQL creator Michael Videnius, and "SQL".

MySQL, renowned for its flexibility and robust capabilities, stands as the most widely used open-source database system globally.

As an integral component of the widely adopted Ramp Technology stack, which includes a Linux-based operating system, Apache web server, MySQL database, and PHP for processing, MySQL is employed to store and retrieve data across a diverse range of popular applications, websites, and services [13].

Let's look at the main registration table in the database where users will be stored in Fig. 2.

Fig. 2. User registration table

From this table, we can see that there are 4 fields:
– "id" number of the registered user;
– "email" mail of the registered user;
– "name" user name;
– "pass" password that the user enters during registration and later authorization.

Ui development level. The parts that designers use to create applications or websites are called user interface (UI) elements. They add interactivity to the user interface by specifying touch points for the user during navigation. Buttons, scroll bars, menu items, and check boxes

The user interface uses user interface elements to create a visual language and ensure the consistency of the product, making it convenient and easy to navigate without much user effort.

User interface elements generally fall into one of four categories:
– input controls: allow users to enter information into the system;
– information components: share information with the user;
– navigation components help users navigate a product or website. Common navigation components include the tab bar and the main application menu;
– containers contain related content together.

Features of Dal development. The layer of computer programs that provides simplified access to data stored in some type of persistent storage, such as a relational database, is the data access layer (DAL) in software. This abbreviation is mainly used in the Microsoft.NET environment.

A DAL can return a reference to an object with properties instead of a field string in a database table. Such a model can potentially receive or write records to or from the file system. Another implementation can be achieved by creating a class with data access methods that refer directly to the appropriate set of database procedures. The data access layer hides the complexity of the underlying data store.

In order not to use such commands as "create", "update" or "delete" in a certain table in the database, there is a class and several procedures that are stored and can be

created in the database. These operations can be invoked by a method within the class, which will return an object containing the requested values. Or the create, update, and delete commands can be executed inside simple functions stored in the data access layer.

The business logic methods within the application can be associated or mapped to the data access layer.

Definition and concept of THE CRM system. The CRM system is a set of certain software and technologies designed for the accounting, processing, and storage of information about customer relationships. With the help of CRM, one can automate and improve business processes in such areas: as sales, marketing, customer service, and support.

With the help of the CRM system, it is possible to coordinate the interaction of various departments of the company that conduct work with the client, as well as various channels of interaction with the client himself. In addition, CRM can give different company departments access to complete information about the client necessary for the best satisfaction of his needs. Usually, customer relationship management systems are adopted as programs for automating sales and interactions with customers.

However, today, system developers have functionally expanded their programs and turned them into a comprehensive business automation tool. Thus, CRM as a technology for increasing efficiency and organizing business work can be adapted to any business. The main thing in a modern CRM system is the ability to solve the internal relations of the company and management. In other words, to be able to build and automate business processes.

In fact, a business process is a certain algorithm that works from time to time to achieve a result. In this algorithm, a number of factors should be taken into account, such as time planning, setting the task, tracking key points of the process, informing employees, and building reports.

Business processes can be characterized by three mandatory elements: stable connections, actions during the process, and logical completion.

Simultaneously, it is crucial to recognize that not all users involved in the business process may be aware of subsequent steps. Everyone must be responsible for their own stage and complete tasks on time. For the owner of the process, the achieved result is important, as is the timely analysis of problems arising during the work. Logging (protocol) of the process helps to record all the subtleties, correct it yourself, or make adjustments to the operation of a separate part of the process.

The construction and, even more so, the automation of business processes can be useful for both small and large companies, since any action can be imagined for the process: coordination of documents, order from the product supplier, shipment to the branch, customer service, fulfilment of the customer's order. These actions are mandatory and take place within the company at a certain frequency.

Thus, all companies that want to:
– create a unified IT infrastructure;
– to put order into permanent tasks;
– Remember all the details of actions, from the most important to the smallest;
– minimize the impact of human factors on the processes;

– include customers in their business processes;
– share responsibility honestly and reasonably;
– save time and money on company management.

The implementation of all the tasks listed above can be ensured by implementing a CRM system in the company.

Functionality and automation of crm systems. A. The main functions and capabilities of CRM are now highlighted as follows:

Customer accounting: the CRM system maintains a single database of your customers and counterparties, where all details, communication channels, and histories of interactions and purchases are registered. Contacts in the database can be organized, filtered, and segmented based on various criteria.

Sales management: keeping data on potential and real deals, up to step-by-step control of each operation, partial automation of the company's business processes, along with the automation of the sales funnel.

The analytical functions of the CRM system are based on the array of collected information.

The CRM system generates diverse statistical reports that can be utilized to assess the effectiveness of marketing channels, events, and employee performance, make sales forecasts, and facilitate strategic planning. The main functions of the CRM system are shown in Fig. 3.
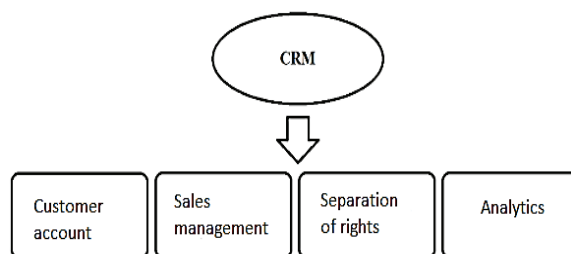
Fig. 3. Functions of the CRM system

Automated document designer and document flow automation.

In each company that uses CRM, the tasks and functions of such a system may differ. Therefore, when choosing a CRM, one must first determine the business requirements for the CRM system and for which purposes one plan to use it, because the choice of CRM for the sales department, service centre, or building work within the company will be different.

According to the functional purpose and use of CRM systems, three main categories are distinguished.

The first category is operational CRM, which is responsible for registration and operational access to primary information about events, companies, projects, and contacts. The main functional capabilities of CRM systems of this type include the formalization of all business processes of interaction with the client, control of the processing of long

and complex requests, analysis of the stages of the work performed, planning and control of communications with clients, as well as the collection and classification of maximum information about the client. This type of software is most effective when used in an enterprise that has long-term projects with many stages, in which several employees or even departments participate. Systems of this type can work completely autonomously. Integration with other software is not critical. Since the number of applications is not large, information on them can be entered manually.

The analytical capabilities of such systems are usually quite limited. There is simply no great need for them in the case of rare customer requests. Basically, there are analytics on the stages of work, samples by customers, and evaluations of the work of employees.

Another category is analytical CRM, which is responsible for reporting and analysing information in various sections. The functionality of such a CRM includes the synchronization of disparate data sets and the search for patterns to develop the most effective strategy for marketing, sales, and customer service. Analytical CRM requires good integration of systems, a large amount of developed statistical data, and high-quality analytical tools.

Users of such systems are companies in which the number of requests per unit of time is quite large, but at the same time, each interaction is quite short. Most often, at the same time, there is a fairly large assortment and a significant number of customers.

The main module in systems of this type is a powerful analytical tool that allows one to work with a large volume of disparate data.

Finally, the last category is collaborative CRM. Such a system involves such close contact with end consumers and clients that they can have an impact on the company's internal processes. Such processes can be, for example, surveys to change product qualities or service orders, web pages for customers to track the status of the order, SMS notifications about events related to the order or personal account, the ability for the customer to independently choose and order products and services in real time, and many other interactive possibilities.

There are practically no systems that support collaborative CRM on the market, as the collaborative process in most cases is purely individual and should be automated due to an extremely flexible CRM system (Fig. 4).

Summarizing the overview of CRM systems and the consideration of their various categories, it is possible to highlight the main tools that, in general, the technology of customer relations includes:
– collection of all accumulated information about customers into a single customer database;
– collection of the history of relations with customers, partners, and suppliers;
– exchange of information between different departments and employees;
– automation of the sequence of tasks and their integration into the working environment;
– receiving analytical reports;
– customer satisfaction control, registration, and handling of complaints;
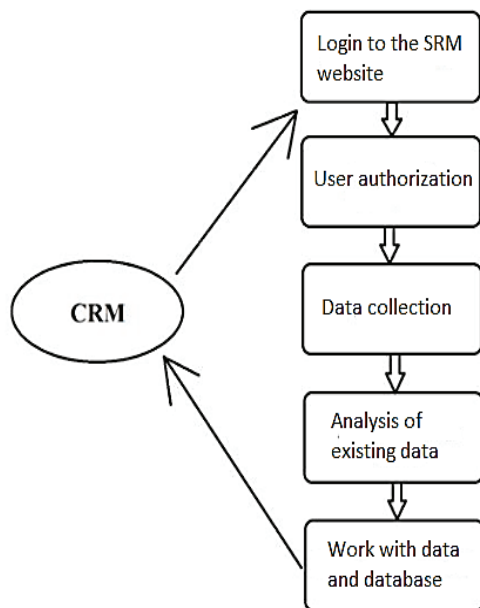– accumulation of the company's knowledge and its management.

Fig. 4. Functional block diagram of the CRM system

The successful implementation of the CRM system in the structure of the enterprise will allow it to achieve the following goals:

– reduction of costs: automation of complex calculations and other operations, re-duction of unnecessary communication between employees, and formalization of business processes;
– acceleration of business processes: messages, exception of unnecessary ones;
– routine business process tasks and simplification of processing operations data;
– increasing business transparency: when data on the work of all employees is entered into the system, it is possible to make reports on the basis of this data to the management to understand the situation on the ground;
– KPI-based management: for every process, one have the option to choose performance indicators (metrics) and commence tracking them through the CRM system;
– standardization of business processes, all employees work according to a certain scheme, which is embedded in the CRM system.

Designing the database for the system. To represent the logical structure of the CRM system, the "entity-connection" data representation model is chosen. The entity-relationship model is grounded in significant semantic information about the real world and is crafted to logically represent data. It establishes the value of data within the context of their relationships with other data (Fig. 5).
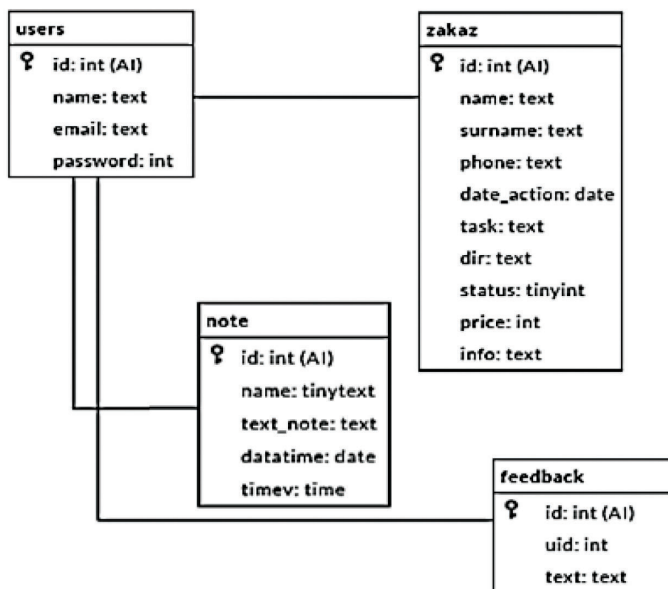
Fig. 5. Model connection of the database of the CRM system

We will select the following entities for the system database: user, order, notes, and forum. Each entity must contain an attribute or group of attributes that will uniquely identify each instance of the entity. This attribute is called a primary key. Therefore, it is necessary to select attributes for inclusion in the composition of the primary key. The primary key must be selected in such a way that, based on the values of the attributes included in it, it is possible to accurately identify the instance of the entity. In addition, none of the attributes of the primary key must have a null value. The values of the primary key attributes must not change. If the value has changed, then this is already a different instance of the entity. When choosing a primary key, one can add an additional attribute to the entity and make it a key. The use of unique numbers facilitates the process of indexing and searching in the database. The primary key chosen when creating the logical model may be unsuccessful for efficient database access and must be changed when designing the physical model.

Conclusions. Therefore, such a web platform is the best CRM for a service centre because it automates the execution of various tasks and allows one to manage them within the same system. The use of automation software contributes to:

Fast order processing. Managers will cooperate more quickly with consumers, as one can confirm your request at any time.

Send notifications about the completion of repairs or reminders about the recording time to The Wizard. Integration with IP telephony allows one to set up automatic sending of messages.

Simplify the work of repair shop managers. CRM for the service centre has calculation functions that will help one determine the cost of services and repairs under warranty.

Drawing up the work schedule of craftsmen, issuing sick leave and vacation documents, calculating wages, etc.

Automation of service centres helps not only to improve internal work processes but also increases the loyalty of your customers. To choose a suitable CRM system, one needs to know what functions it should perform.

Order tracking, which allows one to speed up processing, use an individual approach to working with the client, and preserve the history of cooperation,

Calculation of wages and maintenance of relevant documentation, in which all payments made are recorded.

Financial accounting, which helps organize transactions for suppliers, conduct cash and accounting operations, keep records of consumables, etc.

Collecting statistics to track the effectiveness of all business processes and the work of repair shop employees.

Send reminders to customers and notify employees about their tasks thanks to easy integration with IP telephony.

Designer for creating a work schedule for craftsmen with the ability to view the status of orders and control their delivery dates.

A reliable CRM system brings order to financial documentation, helps to quickly process orders, and creates the best conditions for the work of service centre employees.

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WEB-РОЗРОБКА ПЛАТФОРМИ СЕРВІСНОГО ЦЕНТРУ ДЛЯ РОБОТИ З КЛІЄНТАМИ

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У статті розглянуто основні етапи та методи впровадження веб-платформи сервісного центру для роботи з клієнтами. Крім того, розглядається база даних MySQL, яка використовується при розробці продукту. Запропонований інформаційний продукт використовує клієнт-серверну модель, що в кілька разів покращує створення та модернізацію веб-ресурсу. Веб-розробка охоплює широкий спектр послуг, включаючи створення веб-сайтів або веб-додатків, рішення з кібербезпеки, дизайн UX/UI, рішення для електронної комерції, архітектуру веб-сайтів, тестування якості, технічне обслуговування, консультації та навіть власну CMS.

Інформаційні системи розширюють професійні можливості фахівців і дозволяють їм більш ефективно, економно і цілеспрямовано здійснювати свою діяльність. Сучасні умови ринку створюють потребу у постійному підвищенні ефективності виробництва та швидкій реакції на будь-які зміни, підвищувати якість обслуговування клієнтів, знижувати збитки, робити ефективні прогнози на майбутнє. Для цього необхідно мати достовірну інформацію для повного аналізу діяльності компанії. Будь то стан виробничого циклу, облік запасів, відносини з постачальниками або філіями, кадрові завдання або документування інформації, тому завдання автоматизації рано чи пізно з'являться. Різними можуть бути тільки способи досягнення кінцевого результату.

Актуальність теми обумовлена необхідністю автоматизації рутинних завдань з метою скорочення трудових і часових витрат, створення єдиної бази знань для зберігання робочого досвіду та готових рішень для типових проблем, оптимізації робочого процесу шляхом більш ефективного розподілу завдань між працівниками, враховуючи їхній досвід та знання.

Спираючись на проведений аналіз низки сучасних платформ, пропонована, на нашу думку, веб-платформа є найкращою CRM для сервісного центру, оскільки вона автоматизує виконання різноманітних завдань і дозволяє керувати ними в одній системі. Використання програмного забезпечення дозволяє: швидко опрацьовувати замовлення; надсилати повідомлення про завершення роботи або нагадувати про час запису; спростити роботу керівників оскільки CRM має функції розрахунків, формувати графіки роботи.

Автоматизація сервісних центрів допомагає не тільки покращити внутрішні робочі процеси, але й підвищує лояльність клієнтів. Надійна CRM система наводить порядок у фінансовій документації, допомагає швидко обробляти замовлення та створює найкращі умови для роботи співробітників сервісного центру.

Що стосується функціональних можливостей веб-платформи, то вона має просту структуру, яка дозволяє зареєструватися та отримати доступ до цих курсів. Описано реалізацію моделі клієнт-сервер у продукті та досліджено багато переваг цієї архітектури та локального веб-сервера, що працює на веб-платформі.

Ключові слова: *інформаційна система, датчики, сповіщення, сервер, веб-платформа, клієнт-серверна модель.*