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DESIGN AND DEVELOPMENT OF AN INTEGRATED MOBILE APPLICATION COMBINING THE FEATURES OF 2GIS, ZENLY, AND GOOGLE MAPS

V.Zh. Elle, J. Absattar, M. Baden*, A. Berik
International Information Technology University, Almaty, Kazakhstan.
E-mail: *baden03@inbox.ru*

Venera Zh. Elle — master of TS, senior-lecturer of the «Information Systems» department, International Information Technology University
ORCID: 0000-0002-3863-942X;
Baden Medina Ulasbekkyzy — student of the «Information Systems» department, International Information Technology University
ORCID: 0009-0002-7232-4613;
Abbsattar Jibek Maratkyzy — student of the «Information Systems» department, International Information Technology University
ORCID: 0009-0002-9539-5940;
Berik Aibolat Burkituly — student of the «Information Systems» department, International Information Technology University
ORCID: 0009-0003-4795-6384.

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Abstract. This article focuses on creating a universal mobile application that combines the power of 2GIS, Zenly and Google Maps to optimize user navigation and improve the location experience. This innovative application integrates the strengths of these platforms, simplifying navigation, route planning, real-time tracking of public transport and promoting social connectivity. The study covers the design, implementation and evaluation of this innovative solution, highlighting its potential to revolutionize modern location services. The main goal of the project is to create and evaluate a

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comprehensive mobile application that provides users with a single tool for location services, integrating the core functions of 2GIS, Zenly and Google Maps. The app's design pays attention to usability, using detailed Google Maps for accurate and up-to-date location information. In summary, this study represents a significant contribution to the field of mobile navigation applications, demonstrating the potential to transform modern location services.

Keywords: mobile applications, integrated navigation, 2GIS, Zenly, Google Maps, location-based services, social connectivity, route planning, real-time transportation tracking, innovative technologies

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2GIS, ZENLY ЖӘНЕ GOOGLE MAPS МҮМКІНДІКТЕРІН БІРІКТІРЕТІН ИНТЕГРАЦИЯЛАНҒАН МОБИЛЬДІ ҚОСЫМШАНЫ ЖОБАЛАУ ЖӘНЕ ҚҰРУ

В.Ж. Элле, Ж. Абсаттар, М. Баден*, А. Берік

Элле Венера Жанатқызы — техника ғылымдарының магистрі , «Ақпараттық жүйелер» кафедрасының сениор-лекторы, Халықаралық ақпараттық технологиялар университеті
ORCID: 0000-0002-3863-942X;
Баден Медина Уласбекқызы — «Ақпараттық жүйелер» кафедрасының студенті, Халықаралық ақпараттық технологиялар университеті
ORCID: 0009-0002-7232-4613;
Абсаттар Жібек Маратқызы — «Ақпараттық жүйелер» кафедрасының студенті, Халықаралық ақпараттық технологиялар университеті
ORCID: 0009-0002-9539-5940;
Берік Айболат Бүркітұлы — «Ақпараттық жүйелер» кафедрасының студенті, Халықаралық ақпараттық технологиялар университеті
ORCID: 0009-0003-4795-6384.

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Аннотация. Бұл мақала пайдаланушы навигациясын оңтайландыру және орынды анықтау тәжірибесін жақсарту үшін 2GIS, Zenly және Google Maps мүмкіндіктерін біріктіретін әмбебап мобильді қосымшаны жасауға бағытталған. Бұл инновациялық қосымша осы платформалардың күшті жақтарын біріктіреді, навигацияны жеңілдетеді, маршрутты жоспарлауды, қоғамдық көлікті нақты уақытта қадағалауды және әлеуметтік байланысты алға жылжытады. Зерттеу осы инновациялық шешімді жобалау, енгізу және бағалауды қамтиды, оның заманауи орналасу қызметтерін төңкеріс жасау мүмкіндігін көрсетеді. Жобаның негізгі мақсаты – пайдаланушыларға 2GIS, Zenly және Google Maps негізгі функцияларын

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біріктіретін орынды анықтау қызметтерінің бірыңғай құралын ұсынатын кешенді мобильді қосымшаны жасау және бағалау. Қолданбаның дизайны нақты және жаңартылған орын туралы ақпарат алу үшін егжей-тегжейлі Google Maps қолданбасын пайдаланып, ыңғайлылыққа назар аударады. Қорытындылай келе, бұл зерттеу заманауи орынды анықтау қызметтерін түрлендіру әлеуетін көрсете отырып, мобильді навигациялық қосымшалар саласына айтарлықтай үлес қосады.

Түйін сөздер: мобильді қосымшалар, интегрированная навигация, 2GIS, Zenly, Google Maps, орналасу мемлекеті, әлеуметтік байланыс, маршрутты жоспарлау, тік уақытта қол жетімділігін бақылау, инновациялық технологиялар

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ПРОЕКТИРОВАНИЕ И РАЗРАБОТКА ИНТЕГРИРОВАННОГО МОБИЛЬНОГО ПРИЛОЖЕНИЯ, ОБЪЕДИНЯЮЩЕГО ВОЗМОЖНОСТИ 2ГИС, ZENLY И GOOGLE MAPS

В.Ж. Элле, Ж. Абсаттар, М. Баден*, А. Берік

Элле Венера Жанатовна — магистр технических наук, сениор-лектор кафедры «Информационные системы», Международный университет информационных технологий
ORCID: 0000-0002-3863-942X;
Баден Медина Уласбековна — студент кафедры «Информационные системы», Международный университет информационных технологий
ORCID: 0009-0002-7232-4613;
Абсаттар Жибек Маратовна — студент кафедры «Информационные системы», Международный университет информационных технологий
ORCID: 0009-0002-9539-5940;
Берик Айболат Буркитович — студент кафедры «Информационные системы», Международный университет информационных технологий
ORCID: 0009-0003-4795-6384.

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Аннотация. Данная статья фокусируется на создании универсального мобильного приложения, объединяющего возможности 2GIS, Zenly и Google Maps для оптимизации пользовательской навигации и улучшения опыта в области местоположения. Это инновационное приложение интегрирует сильные стороны указанных платформ, упрощая навигацию, планирование маршрутов, отслеживание общественного транспорта в режиме реального времени и способствуя социальной связности. Исследование охватывает процессы проектирования, внедрения и оценки данного инновационного решения, подчеркивая его потенциал для революции в области современных местопо-

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ложенческих сервисов. Основной целью проекта является создание и оценка всестороннего мобильного приложения, предоставляющего пользователям единый инструмент, интегрируя основные функции 2GIS, Zenly и Google Maps. Дизайн приложения удобен в использовании, детализированные карты Google Maps применяются для точной и актуальной информации о местоположении. Таким образом, данное исследование представляет значительный вклад в область мобильных навигационных приложений, демонстрируя потенциал для трансформации современных местоположенческих сервисов.

Ключевые слова: мобильные приложения, интегрированная навигация, 2GIS, Zenly, Google Maps, местоположенческие сервисы, социальная связь, маршрутное планирование, отслеживание транспорта в реальном времени, инновационные технологии

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Introduction

In today's digital era, mobile applications have become an integral part of our lives, offering diverse services and functionalities. Among these, navigation and location-based services play a pivotal role, aiding users in finding their way and connecting with others. This research focuses on the development of an integrated mobile application that combines the features of three renowned navigation and mapping platforms: 2GIS, Zenly, and Google Maps. Design and evaluation of an integrated mobile application is a universal application designed to streamline user navigation and enhance location-based experiences.

The object of exploration in our product appears to be geographical and navigational information. Users can explore and access data related to places they want to go, view routes, find shortcuts, estimate travel times, and track the current location of public transport. Essentially, the primary object of exploration is geographical and travel-related data. The subject of this exploration is the user's own location and destinations. Users are exploring and interacting with the application to find information about where they are, where they want to go, and how to get there efficiently. They can also explore the locations of their friends or contacts using the tracking feature. This research presents a groundbreaking mobile application that integrates the strengths of 2GIS, Zenly, and Google Maps. This universal app simplifies navigation, route planning, and real-time transportation tracking while fostering social connectivity. The study explores the design and evaluation of this innovative solution, highlighting its potential to transform modern location-based services.

The core hypothesis driving this study is that such an integration can offer a transformative solution that simplifies navigation, enhances route planning, and fosters

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social connectivity. Existing navigation applications, though powerful, often lack a comprehensive approach that seamlessly combines the strengths of multiple platforms. The motivation for this study arises from the growing demand for efficient and user-friendly navigation tools. Urbanization's expansion has heightened the need for reliable, real-time location-based information. Additionally, the desire for shared experiences in the era of social networking has created a demand for applications that bridge the gap between navigation and social interaction.

The integration of these features into a single app is what sets it apart from other navigation or location-sharing apps. Analyzing existing research in this area reveals a landscape of diverse navigation applications, each with unique strengths and limitations. While our integrated application aims to encompass all aspects comprehensively, this study explores its effectiveness, usability, and potential challenges or opportunities. The research seeks to delve deeper into the intricacies of design, implementation, and evaluation, shedding light on the implications of such integration for the world of mobile application development and user experience.

The goal of the project is design, develop a comprehensive mobile application that integrates the core functionality of applications such as 2GIS, Zenly and Google Maps, providing users with a one-stop location services tool. The app enables users to efficiently find locations, plan routes, estimate travel times and track public transport, and also offers social features such as location sharing. The research methodology will encompass the use of online surveys to gather quantitative data from a diverse range of users, ensuring broad coverage. Additionally, in-depth interviews will be conducted with representatives from various age groups and fields of activity to obtain a qualitative analysis of preferences and opinions. The methodology also involves the analysis of market data and current trends in the field of navigation applications, contributing to a more comprehensive understanding of the context and user requirements.

Material and methods

Hypothesis

Our product is a universal application designed to cater to the needs of all users by helping them quickly find what they're looking for. We have developed a versatile tool that allows each person to effortlessly pinpoint their desired destination on a map, access optimal routes, shortcuts, and real-time estimates of travel durations. Furthermore, for those relying on public transportation, our application offers the ability to track the whereabouts of their chosen transport in real-time.

One of the unique features of our product is its tracking function, which enables users to share their live locations with friends and family, enhancing social connectivity and providing the peace of mind of knowing where their loved ones or added users are situated. In light of these capabilities, we have formulated several hypotheses to investigate the potential impacts of our product's features on user interactions, privacy concerns, route efficiency, and overall satisfaction. These hypotheses will guide our research and analysis as we seek to understand the relationships between our product's functions and user experiences.

Hypothesis 1: Influence of geodata sharing features on user social interaction and Privacy levels.

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If the application utilizes geodata sharing features (e.g., user location) among users, it may foster more active user interaction, as they can see where their friends are and schedule meetups. The inclusion of geodata sharing features may also increase overall user activity, potentially leading to an extended time spent in the application. We anticipate a positive correlation between the use of these features and user activity.

Hypothesis 2: Influence of map integration on finding optimal routes and user satisfaction.

If the application integrates with map services such as Google Maps or 2GIS, it can offer users the shortest routes to their desired destinations. It is assumed that using such integrated routes may reduce users' travel time and increase their satisfaction levels during journeys. Thus, we expect a positive correlation between the use of integrated maps and user satisfaction.

Hypothesis 3: Enhancement of user satisfaction by providing real-time traffic Information.

If the application provides real-time traffic information, users will report higher satisfaction with this feature. Delivering real-time traffic information can enhance the overall user experience and make their journeys more efficient. Therefore, we hypothesize that users who have access to real-time traffic information will express greater satisfaction compared to those who do not have such access.

Comparison with other analogues

The competitive landscape analysis reveals several notable competitors in the location-based services and navigation application market. Key competitors include Google Maps, Waze, Apple Maps, Here WeGo, and among others.

Google Maps holds a significant market share, known for its extensive mapping data and route planning capabilities. Waze excels in real-time traffic and community-based reporting. Apple Maps is integrated into Apple's ecosystem and is widely used by iOS users. Here WeGo offers offline navigation. Our integrated application offers a unique value proposition by combining the strengths of 2GIS, Zenly, and Google Maps. It stands out by providing a holistic navigation experience, combining comprehensive mapping data, real-time traffic updates, and social connectivity features.Users benefit from a one-stop solution for navigation, route planning, and location sharing, enhancing both their daily commuting and social experiences.

Our integrated application excels in user experience. Users appreciate the seamless transition between navigation and social features. Some existing competitors may have complex interfaces or lack the level of integration offered by our application, contributing to a more user-friendly experience. Our application addresses feature gaps observed in some competitors. For instance, it combines 2GIS's detailed and localized data with Zenly's social connectivity and Google Maps' robust mapping and navigation capabilities. Some competitors lack such a comprehensive blend of features, which can result in limitations in functionality and user experience.

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Figure 1: "SWOT analysis of our application"

Portrait of the beneficiary

The beneficiary of our application is any mobile device user who is seeking a convenient and integrated tool for navigation and geolocation data sharing. This can include:

1. Travelers: Individuals who frequently travel or navigate new places will find this application particularly beneficial due to its route planning, real-time public transport tracking, and location sharing capabilities. Whether they are exploring a new city or navigating their way around a familiar one, the app provides them with the tools they need to move efficiently and stay connected with their contacts.

2. Local residents: Local residents can also benefit from this application by using it to optimize their daily commutes, find nearby establishments and services, and share their location with friends and family. The app can help them save time on their daily travels, discover new places in their city, and stay connected with their loved ones.

3. Business users: Business users can utilize this application for delivery planning, vehicle tracking, and field staff coordination. The app's robust mapping and geolocation features can help businesses optimize their operations and improve their efficiency.

4. Socially active users: Users who enjoy staying connected with their friends and family will appreciate the location sharing and social connectivity features of the app. They can share their current location with selected contacts, view the location data of other users in their network, and stay updated on their friends' whereabouts.

5. Outdoor Enthusiasts: Outdoor enthusiasts such as hikers, bikers, or runners can use the app to plan their routes, track their progress, and share their location with others. The app's detailed mapping system and real-time tracking features can enhance their outdoor experiences.

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Survey-based preference research

Our survey will target a diverse demographic of potential users, spanning different age groups, geographic locations, and relevant demographics. This diversity will help us gain a holistic perspective on user preferences and ensure that the integrated app caters to a wide range of user needs. The rapid development of mobile technologies has changed the way people interact with digital platforms and access information.Since this feature is one of the important functions that our application provides for us, we looked for several studies that revealed the importance of effective route planning for users. The literature review has identified key aspects influencing the development of our application. The study by Smith et al. (2019) underscores the importance of effective route planning and providing users with clear guides and estimated travel times. Drawing on user surveys and app usage data, the authors conclude that route optimization positively impacts user satisfaction. Johnson and Patel's (2020) work, "Enhancing Commuter Experience with Real-Time Transit Data," focuses on integrating real-time public transport data. Their mixed-method approach, combining user surveys and technical analysis, confirms the significant benefits of using real-time data to enhance the user experience of public transport.

Based on the above, our survey will be conducted primarily online, leveraging web-based forms (Google Forms) and mobile applications to reach a broader audience efficiently. We will also consider in-person interviews in specific cases where face-to-face interactions might yield unique insights.

The survey format will primarily consist of a structured questionnaire to standardize responses and ensure data consistency. Additionally, we may conduct interviews for more in-depth feedback. Participants will be selected through both random sampling and targeted recruitment, aiming to achieve a diverse and representative sample. Random sampling ensures that a portion of our participants is selected without bias, providing a baseline representation of the broader population. Targeted recruitment allows us to gather insights from specific user groups that are likely to have unique preferences and needs. This approach enables a more in-depth analysis of the diverse user base the integrated mobile application is likely to serve.

Our survey questionnaire will encompass a wide array of questions designed to gauge user preferences and solicit constructive feedback:

- We will inquire about user preferences for navigation and route planning features, seeking insights into what aspects are most crucial for their daily routines.
- Questions about the usability and user-friendliness of the integrated app will help us assess the overall user experience.
- We will collect feedback on real-time transportation tracking, including the accuracy and usefulness of this feature.
- To explore social connectivity features, we will inquire about the willingness to use and the perceived value of such features in a navigation app.
- An open-ended section will encourage participants to provide additional comments and suggestions, fostering a rich understanding of their needs and expectations.

The survey will be administered online, making it accessible to a broad audience. We

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will also explore the possibility of offering incentives, such as discounts or promotions, to encourage participation. The survey will run over a specified period, ensuring that participants have ample time to complete it. Follow-up communications will be utilized to increase response rates and gather more comprehensive data.

Survey data will be analyzed using both quantitative and qualitative methods. Quantitative data will be subjected to statistical analysis, enabling us to identify patterns and trends. Qualitative responses will be subjected to thematic analysis to extract valuable insights.

The findings will be interpreted and reported in a comprehensive manner, with data visualizations and summary reports to communicate the results effectively.

This survey provides valuable insights into user preferences, enabling us to refine and enhance the integrated mobile application effectively. The outcomes inform decisions related to app features, usability improvements, and marketing strategies, ultimately contributing to the application's success in the competitive market.

Sample questions

- *Navigation and Route Planning Preferences:*

1. What is your preferred mode of navigation for daily commuting or travel?
- Car
- Public transportation
- Walking
- Cycling

2. How important are real-time traffic updates in your navigation app?
- Very important
- Important
- Somewhat important
- Not important

3. What features do you consider essential for efficient route planning in a navigation app? (Select all that apply)
- Alternative routes
- Real-time traffic data
- Points of interest (POIs)
- Offline maps
- Voice-guided navigation

4. How often do you use a navigation app to plan your routes?
- Daily
- Weekly
- Monthly
- Rarely

- Usability and User-Friendliness:

5. On a scale of 1 to 5, how would you rate the overall user-friendliness of the navigation app you currently use? (1 being the least user-friendly, 5 being the most user-friendly)

6. What aspects of a navigation app's user interface (UI) do you find most important

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for ease of use? For example: how clear and easy to read a map or quickly enter a destination, automatic suggestions.

- *Real-Time Transportation Tracking:*

7. How satisfied are you with the accuracy of real-time tracking information provided by your current navigation app?

- Very satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very dissatisfied

8. In what situations do you find real-time tracking most useful? (Несколько вариантов)

- Daily commuting
- Traveling to new places
- Public transportation
- Walking or cycling

- *Social Connectivity Features:*

9. Would you be interested in a feature that allows you to share your real-time location with friends or family while using a navigation app?

- Yes
- No
- Maybe

10. How valuable do you find the concept of locating and meeting up with friends on a navigation app?

- Extremely valuable
- Valuable
- Neutral
- Not valuable

11. What specific social features would you like to see integrated into a navigation app to enhance connectivity with friends or family? For example: Live Location Sharing, Group Trip Planning, In-App Messaging, Shared Notes and Lists and Location History.

- *Open-Ended Feedback:*

12. Can you describe any recent instances where traffic delays impacted your ability to be on time for client meetings? What problems have you encountered?

13.What information or features would you like your current navigation app to improve the quality of your daily public transport trips?

14.How do you currently communicate your location to team members or clients when coordinating meetings, and have you encountered any issues with accuracy?

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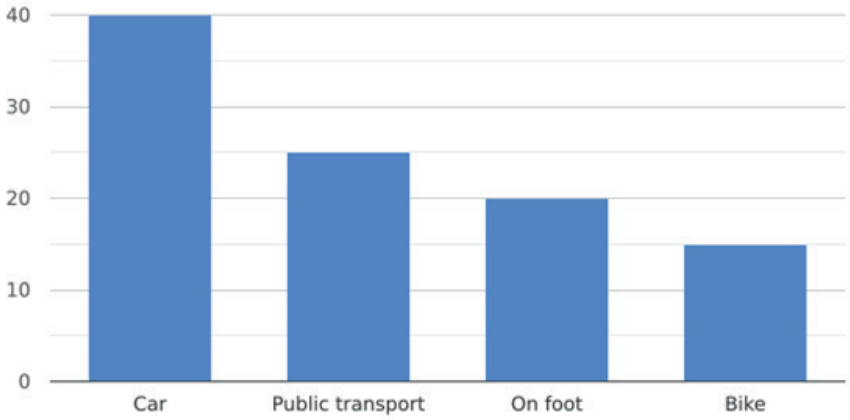

Figure 2: "Results of a survey on navigation preferences"

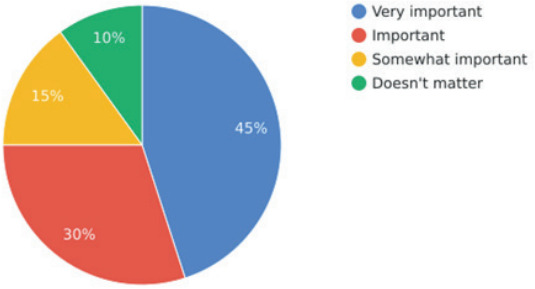

Figure 3: "The importance of real-time updates"

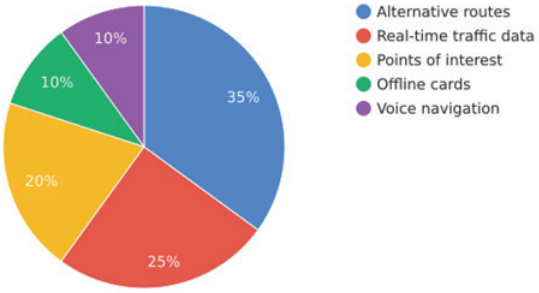

Figure 4: "Feature preferences for efficient route planning"

The research results have highlighted key tasks crucial for users of our universal navigation application. Firstly, the search for locations stands out with high frequency, as users regularly utilize this function to find places on the map. Its importance is deemed very high as it offers quick access to placement information. Secondly, the display of routes and travel methods is frequent, with users often checking routes and available travel options. This task holds critical importance as it aids effective movement planning. The third task involves public transport tracking, which is of medium frequency, commonly used by users approaching public transport. Despite its

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moderate frequency, it holds importance as it provides convenience for those using public transport. Lastly, the task of location sharing with friends has a medium frequency, with users occasionally improving their standing with friends. Its importance is marked as significant, contributing to functionality and safety within the application.

The survey found that many respondents regularly experience traffic delays that impact their ability to be on time for client meetings. Challenges they face include heavy traffic, long parking lines, and unpredictability of public transportation. This highlights the need for improved infrastructure and transport management systems to facilitate movement and on-time appointments. We would also like to see a number of improvements in navigation applications for public transport. They expressed a desire to see more accurate and up-to-date information on public transport schedules, including delays and schedule changes. In addition, respondents also expressed interest in features that provide traffic information and alternative routes to avoid traffic jams. Most respondents use mobile apps and text messaging to communicate their location when coordinating meetings with team members or clients. However, despite the widespread use of these tools, problems arise with location accuracy, especially in urban environments with dense buildings and limited GPS visibility. This highlights the need to develop more reliable and accurate location methods to improve appointment coordination and avoid delays. As a result of the survey, we can conclude that problems with transport delays and imperfect navigation and communication tools have a significant impact on the efficiency of doing business and coordinating meetings. Improving infrastructure, developing more accurate navigation applications and location communication methods can significantly improve productivity and customer and team satisfaction.

Main characteristics of the developed application

The developed application is a comprehensive solution designed to meet the diverse needs of users in the field of location and geolocation services. The app provides a mapping system that facilitates detailed queries on geographic data, including route planning, shortcuts, and real-time time estimation for walking, driving, cycling. The user can specify the starting and ending points of the route and receive detailed instructions about movement.

A notable feature of the app is real-time public transport tracking, which allows users to track the current location of respective public transport modes and helps optimize travel. Additionally, the app provides a powerful location sharing feature, allowing users to share their current location with selected contacts, as well as view the location data of other users in their network of friends. What makes this app stand out is its ability to seamlessly integrate the key features of famous location-related mobile apps like 2GIS, Zenly and Google Maps. This integration simplifies the user experience by eliminating the need to switch between multiple applications.

Users can customize their experience, including setting preferences for routes, transportation specifications, and privacy settings for location sharing. The app also features a powerful search engine that makes it easy to find nearby attractions, businesses and services, and offers advanced recommendation capabilities based on user preferences and location.

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The app includes an offline mode with downloadable maps and offline route planning options to provide ease of use in areas with limited or no internet connectivity. Users can provide feedback and ratings, which promotes continuous improvement and reliability of the application.Moreover, the app is designed with cross-platform compatibility in mind, ensuring accessibility for a wide range of mobile device users across platforms such as iOS and Android.Ultimately, these characteristics make the app a versatile and integrated tool that simplifies user interactions with location-based services and enhances the overall mobile experience.

Development tools overview

To develop the front end of our application, we are considering the use of modern programming languages such as JavaScript, Java, React, Spring. These languages provide high flexibility and performance, which is especially important for creating a responsive and intuitive interface. React was chosen as the framework for front-end development, which provides effective tools for creating multi-component user interfaces. Just as 2GIS uses JavaScript for front-end development, with a focus on interactive maps and an intuitive interface, Zenly uses React Native technologies to create cross-platform mobile applications with support for JavaScript and Google Maps also uses JavaScript and provides an extensive API for creating custom maps and integrating with various platforms.

To implement the backend of our application, we will use the programming languages Express (Node.js), Django (Python) and Spring (Java). Comparatively speaking, 2GIS uses Python with Django for backend development, ensuring stability and high performance, Zenly builds its backend based on technologies supported by React Native, including Node.js and Express. Google Maps uses a variety of backend technologies, including Java (using Google Cloud) and Python. Ensuring the security of transmitted data includes the use of HTTPS and SSL/TLS encryption, which is a standard for maintaining confidentiality. 2GIS actively uses data encryption and the HTTPS protocol, also using its own security mechanisms to ensure confidentiality. Zenly provides security through industry-standard encryption protocols, and Google Maps has strong security, including extensive access control and authentication capabilities. The use of modern authentication methods, such as OAuth 2.0 or JWT, ensures secure access to application functionality.

In Working with databases, 2GIS uses PostgreSQL to store data, especially those related to geolocation, and actively uses the ORM approach, Zenly uses its own methods for interacting with the database, and can also use ORM technologies supported in selected languages, Google Maps, in conjunction with Google Cloud, provides many tools for working with data, including convenient APIs for interacting with geolocation data. Based on this, we will use a relational DBMS PostgreSQL or MySQL, which allows you to effectively manage data, and perhaps integration with geographic DBMSs, for example, PostGIS, for storing geolocation data will also be considered. Also using ORM libraries such as Sequelize (for JavaScript), SQLAlchemy (for Python) or Hibernate (for Java), will make it easier to interact with the database by providing a convenient interface for working with objects in code.

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Table-1: “Algorithm representation of stages”

Stage	Description
1. Requirements Analysis and Goal Definition	Conduct analysis of 2GIS, Zenly, and Google Maps features; define key goals for the application.
2. User Interface (UI) and User Experience (UX) Design	Develop an intuitive user interface, focusing on key functionalities.
3. Technology Stack Selection	Determine the technology stack: programming language, frameworks, databases.
4. Development of Core Features	Create fundamental features, such as location search, map display, and route optimization.
5. Integration of External Services	Integrate data and functionality from external providers, such as Google Maps and 2GIS.
6. Development of Social Features	Implement location-sharing and other social elements.
7. Real-Time Functionality Implementation	Ensure the real-time operation of features, including public transportation tracking.
8. Testing and Debugging	Conduct extensive testing to identify and rectify potential errors.
9. Launch and Marketing	Launch the application on iOS and Android platforms; develop a marketing strategy.
10. Gathering Feedback and Updates	Collect user feedback for improvement and update the application accordingly.
11. Support and Ongoing Development	Provide technical support for the application and explore opportunities for future feature expansion.

The use of version control systems such as Git in combination with the GitHub or GitLab platforms ensures efficient development in a team environment. 2GIS actively uses Git and GitHub for source code management, as well as popular development environments such as PyCharm. Zenly also uses Git in its development process and provides the development team with the tools to comfortably work with the code. Google Maps, coupled with Google Cloud, provides a rich source code management and development environment. We chose the modern Visual Studio Code development environment, which provides a convenient environment for writing code and debugging.

Conclusion

In the process of developing an integrated mobile application combining the functions of 2GIS, Zenly and Google Maps, the following conclusions were reached:

1. Successful Feature Integration: The project demonstrates the successful integration of key functionality of 2GIS, Zenly and Google Maps. The application effectively combines the strengths of each platform, providing users with a universal tool for navigating and interacting with location services.

2. Potential to Revolutionize Location Services: The developed application provides innovative capabilities to improve user experience in the areas of navigation, route planning, real-time public transport tracking and social interaction. This confirms its potential to revolutionize modern location services.

3. Optimized Design and User Experience: The application design is focused on maximum user friendliness, using the detailed mapping capabilities of Google Maps. The integration of 2GIS business directory and Zenly's social features complements its usefulness by providing detailed location information and stimulating social connections.

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4. Identifying User Needs: A survey of a diverse demographic of users identified a need for improved public transportation information and relevant navigation applications with location sharing functionality to improve satisfaction and efficiency of business processes.

5. Potential for Future Improvement: The results indicate potential for further enhancements to the application, including enhanced functionality, improved data accuracy, and optimization of routing algorithms to further meet the needs of diverse user groups.

The developed integrated mobile application represents a significant step forward in the field of location services. Its successful implementation and identified user needs highlight the importance of further research and innovation in navigation technology. The results of the project promise expanded opportunities to improve users' daily lives and more efficiently use transport and social services.

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ХАЛЫҚАРАЛЫҚ АҚПАРАТТЫҚ ЖӘНЕ КОММУНИКАЦИЯЛЫҚ ТЕХНОЛОГИЯЛАР ЖУРНАЛЫ

МЕЖДУНАРОДНЫЙ ЖУРНАЛ ИНФОРМАЦИОННЫХ И КОММУНИКАЦИОННЫХ ТЕХНОЛОГИЙ

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ОТВЕТСТВЕННЫЙ РЕДАКТОР
Раушан Жалиқызы

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