

REPORT

SOFTWARE ENGINEERING

CMP020N204S

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Declaration

I hereby certify that this report constitutes my own work, that where the language of others is used, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of others. I declare that this report describes the original work that has not been previously presented for the award of any other degree of any other institution.

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INTRODUCTION

In this report we take a close look at our team's journey through four sprint and the development of sprints to create a functional website. The report describes our team's progress, difficulties, and successes as we worked through the agile development process for the website.



Problems and research questions to be solved

Research Question: In order to guarantee timely delivery, user pleasure, and scalability, how can we effectively implement agile approaches in the development of the population's website?

Detailed Explanation: Specifically, our research question explores the application of agile methods in the process of creating a website for the general public. It attempts to investigate the complexity and challenges involved in developing a website that handles demographics, population data, and related information.

Professional, ethical, social and legal consideration

We place a high value on social inclusion, legal compliance, ethical data processing, and professional behavior as we build our population website. Maintaining professionalism, we follow guidelines for clear documentation and industry expectations. We uphold informed consent, data transparency, and user privacy ethically. In terms of society, we design for community benefit, diversity, and accessibility. Legally speaking, we uphold the data protection regulations. We produce a website that upholds the ethics, responsibility, and inclusion through including these factors into our development process. This builds trust and has a good impact on our website.

Project Objectives and goals

Delivering timely demographic data, emphasizing user happiness, encouraging inclusivity, and ensuring data security are the goals of our website and to create a user-friendly interface, improve data presentation, boost website speed, and build credibility. As well as providing accurate data, encouraging participation, and reducing hazards are some of our goals.

Background

Accessible demographic data is in greater demand, which is addressed on our population website. A solid collection for accurate data is necessary since demographic changes are influencing many fields, including public policy and urban planning. A literature analysis identifies shortcomings in the user experience and data accuracy of the population websites now in existence, while the technological evaluation emphasizes the importance of effective data visualization tools and safe data management.

With the use of agile approaches, user happiness, and ethical standards, our project seeks to close these gaps. Our website wants to be a useful tool for researchers, leaders, and the general public by providing timely, accurate, and easy-to-use demographic data. The background study supports the importance of our project by illustrating how our website is essential to addressing the changing requirements of users of demographic data.

Report overview

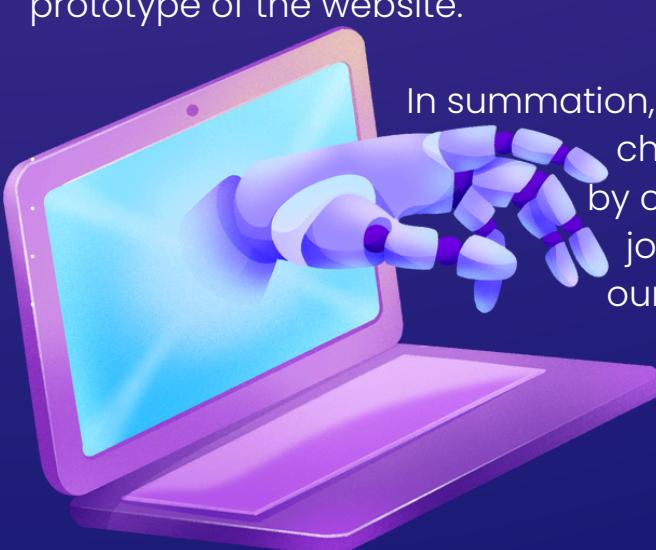
In our extensive report, which details the agile development process we used to create our population website. We went through various stages as a group.

We start our project by going into great detail about the background of our website. We talk about the demand for easily accessible demographic data as well as the knowledge that technology and literature reviews have to offer.

The project's aims and goals are then outlined, emphasizing our commitment to meeting deadlines, putting user happiness first, encouraging inclusion and protecting data.

We next go into the legal, social, ethical, and professional factors that influence our process of development, highlighting our commitment to maintaining transparency and honesty in every area of our website.

Going forward, we will offer a thorough analysis of each of our four sprints, discussing the experiences, difficulties, and lessons we encountered along the way—from establishing the structure and improving our plan to developing the application and executing the final prototype of the website.



In summation, we show the importance of our project in satisfying the changing demands of consumers of demographic data . by concluding our report with thoughts on our flexible . journey, suggestions for future work, and a summary of our findings.

REVIEW OF TECHNOLOGY

We carefully evaluated a range of possibilities in our technology evaluation to identify the best solutions for our population website project. Scalability, performance, security, ease of development, and conformity with our project objectives were some of the criteria we took into account. Following a thorough assessment, we decided on the following technologies:

HTML was the main technology used to create our population website. HTML is the basis of web development. Because of its ease of use, adaptability, and extensive support, it's the best option for building static web pages and efficiently organizing material.

CSS, was chosen to go well with HTML and improve the way our website looks. We may alter the look of HTML elements with CSS styles, guaranteeing consistency in design and enhancing user experience.

Frontend Framework: We used pug for our frontend

Backend Framework: We used node.js for the backend

Deployment and Containerization: Docker was selected for containerization since it offers a portable and lightweight way to distribute our program in various settings. Furthermore, Docker-compose improves our deployment process by making multi-container application management easier.

Through the use of these technologies, we hope to create a population website that is scalable, reliable, and easy to use while preserving standard procedures for web development and catering to the varied demands of our users.

DESIGN

Our design for our build-oriented project centers on developing an extensive and simple population website that allows users to locate demographic information for cities, nations, regions, and continents. Users will now be get personalized features by creating profiles. Both frontend and backend components are included in the design, which also specifies the technology and architectural choices that will be used during the development phase.

Frontend Design: To create dynamic HTML content, our frontend design will use Pug, formerly known as Jade, as the templating engine. We'll put in place an easy-to-use interface with search capabilities and navigation options that make it simple for people to look up and examine demographic statistics. Interactive forms for looking up population figures by city, nation, region, or continent will be available on the front end. Users will also be able to save favorite locations for later use, modify their search preferences, and create profiles.

Backend Design: To create an efficient and successful server-side design, we will use Node.js on the backend. Node.js will process incoming requests and function as the runtime environment. We intend to incorporate authentication and authorization protocols to provide a secure user experience and safeguard confidential data.

Other Strategies: Other strategies could involve switching to a new backend stack, like Django or Ruby on Rails, or using alternative frontend frameworks, such React.js or Vue.js, and express.js for creating interactive user interfaces. However, due to its ease of use, flexibility and consistency with our project specifications, we ultimately selected Pug and Node.js . These technologies provide a more efficient development experience, allowing us to quickly and effectively build a population website that is both reliable and user-friendly.

IMPLEMENTATION

We carefully changed our design specifications into functional components during the implementation phase of our population website project, paying close attention to both frontend and backend development. Here, we've selected the main conclusions and accomplishments from this phase:

Frontend Development: Pug Templating Engine: Pug was used to create HTML pages in a dynamic manner, which improved code maintainability and streamlined the development process.

User Interface Design: Created interactive forms with user-friendly, responsive user interfaces that allow users to search for population data by region, city, nation, or continent.

The creation of profiles, the ability to alter search criteria for a more personal experience have all been implemented.

Backend Development: Node.js was used to create an efficient reliable server-side design for routing and processing incoming requests.

Combining and Examining:

Unit Testing: To verify the reliability and accuracy of the code, unit tests are carried out to verify the functionality of individual components.

Integration Testing: To confirm how frontend and backend components interact and find any compatibility problems, integration testing was carried out.

Findings:

Functional Website: All intended features and functionalities were successfully implemented, leading to a population website that is fully operational and enables users to search for data about the people and generate customized profiles.

Smooth User Experience: Designed with an easy-to-use design that is both responsive and intuitive, users may browse with ease and enjoyment.

Safe Data Management: Strict security protocols, such as authorization and authentication, were put in place to protect user data according to privacy laws.

All things considered, our project's implementation phase was effective in producing the intended results and setting the groundwork for a dependable and user-friendly population website.



CONCLUSION

In conclusion, the process of creating the population website has been enjoyable and challenging. We have effectively completed the project and produced a working, user-friendly website through careful planning, careful execution, and ongoing development. Here, we provide an overview of our main findings and outputs, offer an analysis of our project's processes, and suggest possible directions for further research.

Thought: During the endeavor, we came across a number of obstacles and educational chances. We learned a lot about database administration, user interface design, and front-end and back-end development. We persevered and changed our strategy to get beyond challenges even though we encountered certain setbacks, such as scope modifications and technological issues. We discovered how crucial it is to have strong problem-solving, teamwork, and communication abilities. Looking back, we identify areas that need work, such better time management and organization, to increase our productivity and efficiency in next projects.

Future Work: Although we have made great progress in creating the population website, there are still a number of areas that need to be explored and improved. Future research could focus on the following areas:

Improved Data Visualization: By using interactive graphs and charts to show population patterns and statistics, users can gain a deeper understanding of demographic information.

Exploring population distributions and spatial trends is made possible by integrating geospatial tools and APIs to enable geographic data display and analysis.

Social integration is the process of incorporating social media sharing tools so that individuals can inform and engage their networks with demographic insights and discoveries.

Performance Optimization: Enhancing a website's responsiveness and loading speed through performance testing and optimization will guarantee a smooth user experience on various devices and network configurations.

Feedback process: Putting in place a feedback process to prioritize feature upgrades and user-driven changes while also collecting suggestions for more improvements.

In conclusion, working on the population website project has been a worthwhile educational experience that has helped us apply theory to real-world software development and problem-solving. We are better prepared to face challenges in the future and carry on with our innovative by taking account of our journey and identifying areas that need development.



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APPENDICES

[Appendix A: Code of Conduct:<https://github.com/VinuDVR/SE-Coursework/blob/main/Documents/CODE%20OF%20CONDUCTGROUP%20%20%2011.docx>]

[Appendix B: GitHub Repository Link:<https://github.com/VinuDVR/SE-Coursework>]

[Appendix C: Dockerfile:<https://github.com/VinuDVR/SE-Coursework/blob/main/docker-compose.yml>]