

sMARKET

Market Place for Smart People

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Abstract—This is a software solution that helps recruiters of the University of Windsor streamline their engagement with freelancers at a scale. It offers a lot of features that handle complex operational needs of the university with a large freelancer workforce, such as onboarding, compliance screening and task management. For a developing city like Windsor, it gets tough for freelancers or students to find jobs within the city. The website that we have been building, helps students or any user to showcase their skills and make money out of it.

I. KEYWORDS

- 1)Freelance - to do pieces of work for different organizations, rather than working all the time for a single organization.
- 2)Freelancer - someone who works on different projects with different companies instead of being a company employee.
- 3)Recruiter - Recruiter in our project is the person who posts problem statements and provides jobs to freelancers.
- 4)Hire - To recruit a user and provide work for the selected freelancer.
- 5)Remote work - Working online and integrating the project online.

II. ACKNOWLEDGMENT

We wish to express our sincere gratitude to Dr. Ziad Kobti, Professor and Director of school of computer science at University of Windsor, for providing suggestions and giving an opportunity to work on our project “sMARKET” while guiding us through the semester. We are also thankful to teaching assistants who helped us scale up our project and support us throughout the semester.

Contributions of each member of team in the project:
UI and Forms - Jayaditya Kakarala, Dikshitha Devana.
Database tables and connections - Hardika Dave, Phaneendra Gudikandula.
Javascript and PHP - Phaneendra Gudikandula, Jayaditya Kakarala.

Testing functionalities and documentations - Dikshitha Devana, Hardika Dave.

III. INTRODUCTION

A. Problem Statement

The idea of the project is to develop a freelancing website for the University of Windsor. The system ensures the maintenance of information of all the existing freelancers and potential clients that would make use of the website. With this website, it would be easier for the students or staff to reach out to the available freelancers on the website in order to develop a project based on their requirements and timely delivery of the requirements. Our website provides a platform to find freelancers with specific subject expertise required to solve a problem statement. Platform helps in providing jobs to freelancers who are looking for challenging projects. Providing an opportunity to work remotely on different projects.

B. Motivation

Building a project might need incorporation of different technologies. A technical engineer with great knowledge in required technology is required to build effective projects. If there is a project that requires different technology which is not an expertise of members of the team, there should be a platform to find resources who can help in completing the project. This platform should be helpful for users of both technical and non-technical background. If a non-technical background person has an idea then that person can hire a technical freelancer to complete the project. This also helps freelancers to gain experience and generate revenue.

C. Background

This project, sMARKET has a base concept of freelancing which is a system used by every individual in the university

of Windsor. It helps in a variety of fields like freelancer management, tracking and reporting. The term didn't really start to make the rounds until early 2014. Although it's a relatively new concept, however, it's a powerful system for managing all the doubtful concepts that you'll want to look into sooner rather than later. Today, among all the unemployed, every third is a young specialist with a higher or secondary vocational education. Graduates' ideas about future work are only half the time justified to one degree or another. Young people, finishing school, do not fully understand the proper professional activity. In the educational process, it is necessary to pay more attention to the formation of ideas about their future profession in accordance with the situation on the labor market[1]. Freelancing became a way to gain such experience and understand the market needs.

D. Objectives/Hypothesis

The objective of this website is to provide a platform to those who are willing to showcase their skill or talents and gain monetary benefits by delivering use cases on time and balancing the requirements of the clients. By introducing this website at the University of Windsor, any person can act as recruiter and freelancer. Recruiters will hire freelancers to complete their jobs and pay accordingly. It not just gives the people an opportunity to showcase their skill but promotes talent within the campus itself. Using this website, individuals can offer their services directly to clients, without third-party resources that often take a cut of the pay. Freelancing helps in gaining experience about work nature and helps in learning about the market and its needs. Helps in self assessing and learning required skills. This solution offers people to work on those projects they are interested in.

E. Report breakdown description

This report explains about our project "sMARKET" in detail and also provides documentation for our project. Report provides an idea of the project and introduces the project and motive behind the project. Objectives of the project are clearly mentioned. This project was done through learning through many online articles and research papers which are mentioned in the related work section. Approach section provides the architecture and design of the system. It specifies functional and nonfunctional requirements. Documentation for using the website is provided in the experimental setup section. We have mentioned the discussions and future development plan of the project.

IV. RELATED WORK

We are developing this website for the University of Windsor. Currently, There is no such service available in the University. In the market there are many such websites like upwork and fiverr but they are more concentrated on working professionals than students. Our website concentrates on students and provides them the experience of the working environment. We have taken inputs from various research papers. We have learned about the working of these kinds of websites and designed it for students [2][3].

V. APPROACH

This part of the report describes the methodology used, starting with the assumptions, environment, setup, and leading to the algorithms for the prototype that we have proposed and developed.

A. Definitions

The following terminologies have been used to developed the project -

- **HTML:** Hypertext Markup Language (HTML) is the standard markup language for documents designed to be displayed in a web browser.
- **CSS:** Cascading Style Sheets (CSS) is a simple mechanism for adding style (e.g., fonts, colors, spacing) to Web documents.
- **JavaScript:** JavaScript is a programming language commonly used in web development. It is used to create interactive effects within web browsers.
- **SQL:** SQL stands for Structured Query Language. SQL is used to communicate with a database. SQL statements are used to perform tasks such as update data on a database, or retrieve data from a database.

B. Specification

1) Functional Requirements:

- The system allows users to search for suitable freelancers and hire them by registering and logging into it.
- The system also allows users to register themselves as freelancers and collaborate with people.
- The users can specify their requirements to the freelancer and get an estimate of the total cost and time that would be needed to complete the project.
- The system provides the users to post a job and keep a track of their information and update it accordingly.

2) Non-Functional Requirements:

- **Ease of use:** The website must have a user friendly as well as a well-designed interface that makes it easy for a user to utilize the service.
- **Error handling:** The mechanism of error handling of the website should be able to handle exceptions and report it to the user.

C. Architecture

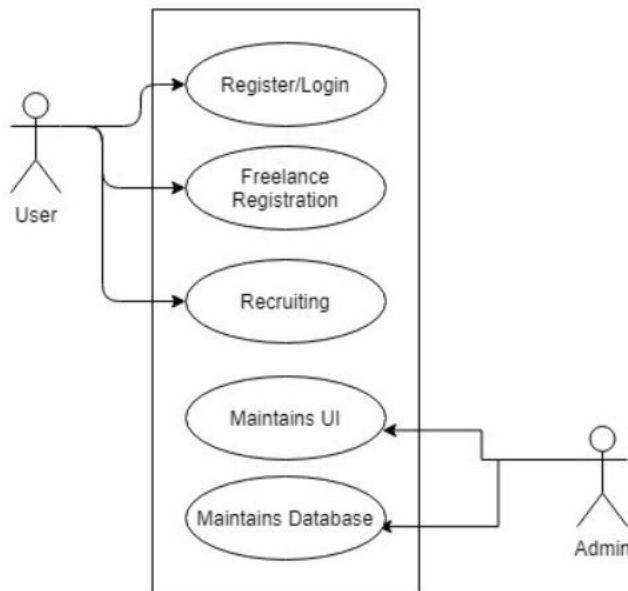
We have used 3-Tier architecture for the web application. A 3-Tier architecture is a client-server architecture in which all the layers of the application are developed as independent modules. It allows any of the modules to be upgraded or replaced independently.

The three Tiers are:

- 1) Presentation Tier:* It is the topmost layer of the system. It is the UI of the system and it displays the services offered by the system.
- 2) Application Tier:* This is the middle tier of the system. It consists of the business logic of the application.

3) *Data Tier*: It consists of a database of the system. Data in this tier is kept independent of the application or business logic.

D. Design



The actors in this website are mainly the users of the website and the admin. The users are required to register into the application and make use of all the services provided. The user can also register as a freelancer and recruit other users. An admin is the one who maintains the UI and the database.

E. Methodology

The website was developed using the Agile methodology. The system is first divided into modules. Scrum meetings are organized every week to discuss the progress of the product. After each scrum meeting, the modules are developed and tested. Each of the modules can be implemented and tested separately. The subsequent release of the new module will add more functionalities to the previous release of the system. The developed modules are then integrated. As each of the modules is loosely coupled and autonomous, we can deliver the system with limited functionalities first and later add the remaining functionalities.

VI. EXPERIMENTAL SETUP

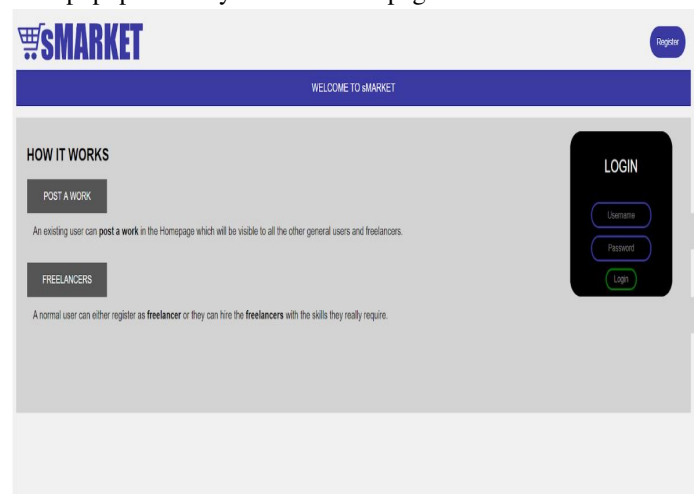
In this section, we proceed to describe how to execute the prototype and what experiments (or runs, or tests) look like (Setup and interpretation of data that you collect).

A. Implementation details

sMarket is a web based application system in which the UI is developed using HTML5, CSS, PHP and JavaScript as the scripting language. The back-end is developed using SQL.

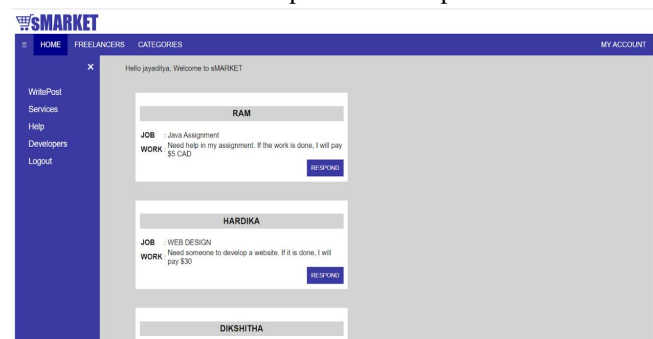
1) Login Register Page:

- It is used for creating an account in the sMarket website or if you are already a registered user then it is used to login into the website with your account details. It also consists of the basic information on how to use the website.
- We have used the POST method to check the login details entered by the user with the details saved in the database by using the same method while registering.
- If the input entered by the user matches with the data present in the database “kakaral_wp1” in “userdetails” table which was created in the phpMyAdmin using myweb.cs.uwindsor.ca then only it grants the user to visit the homepage else it shows the alert message as popup and stays in the same page.



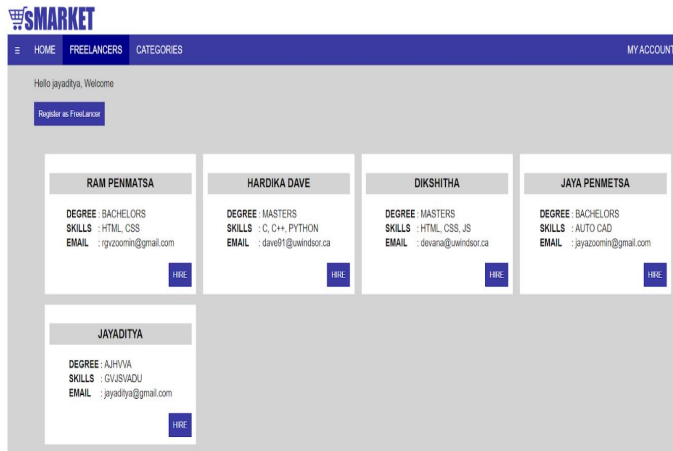
2) Home Page:

- It is the main page of the website sMARKET which allows the user to either publish a post (as recruiter) or respond to an already published posts (as freelancer) but it only allows the user to respond to the posts if he was registered as freelancer or else it alerts the user to first register as freelancer.
- Here we used the POST method to store the post information in the “post” table which stores the unique postid, type and the information.
- For free users, it only allows them to publish 2 posts. It does not allow the user to publish more posts and alerts the user to upgrade the account with some money so that the users could publish more posts.



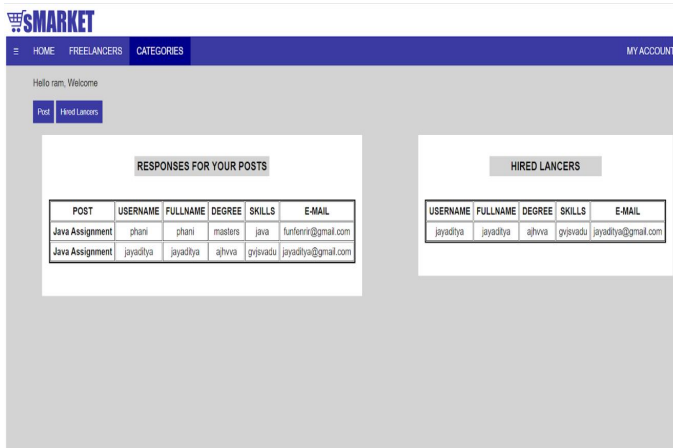
3) Freelancer Page:

- This page is useful for the freelancers, recruiters who can hire the freelancers directly by viewing their account details here and to the users who want to register as freelancers. Here they can register as freelancers and can hire the freelancers.
- Here also we used the POST method for the freelancer registration process which stores the freelancer's account details in the table "freelancer" table and to store the name of the recruiter and freelancer's name and full name in the "hired" table if someone is hired.



4) Categories Page:

- In this page users who published the posts can check the responses of freelancers who had responded to their posts and the users i.e recruiters who hired the freelancers can view the list of freelancers with their details that they had hired.
- We are displaying the results in a table using PHP code from the tables "hired" and "responses" in the "kakara_wp1" database.

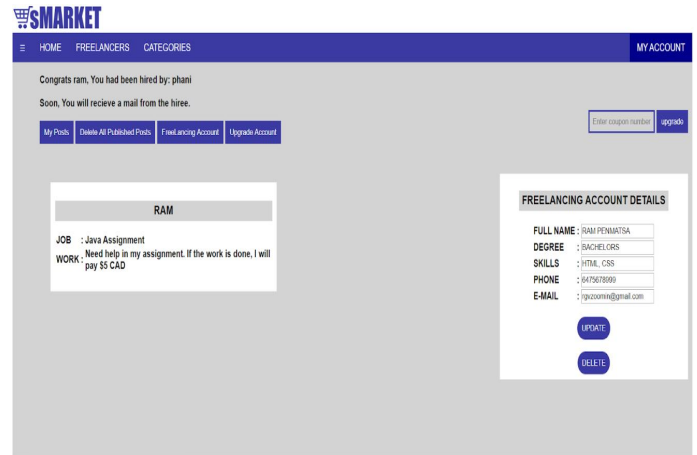


5) My Account Page:

- This page is mainly designed for the users to manage their accounts like editing their freelancing account details and delete published posts and etc.
- To apply a coupon number the user has to choose an upgrade account option to get extra features like

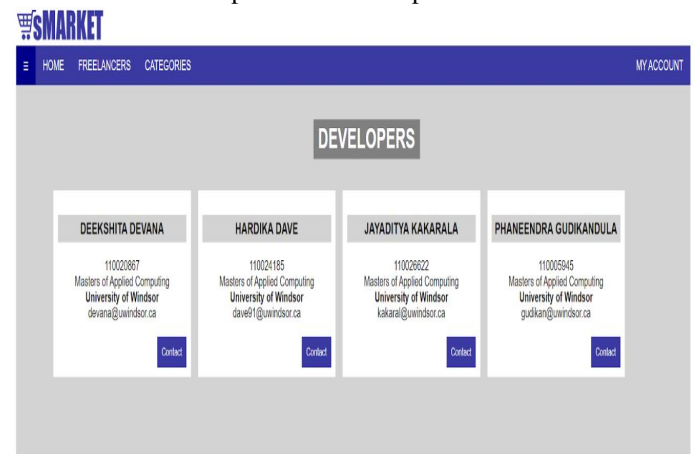
publishing more posts and to delete all the published posts and to update or delete the freelancer account details and the user can view all their published posts and the user can know the details of the recruiter if they are hired by someone.

- We are using PHP to extract all the data from the database in the my account page.



6) Developers Page:

- This page shows the details of the developers of this website and provides an option to contact them for the users.
- The contact button in this page redirects to the linked in account of the particular developer.



There are a few more pages like help and services pages which will be developed in future where we want to implement the chatbot and few more features.

B. Testing

We have used the following testing types in our project -

1) **Functionality Testing:** Functionality Testing is used to check if an application runs as per intended specifications. Testing is done to check if all functions are implemented and working [4].

Testing includes:

- Testing all Links in web pages are working correctly and make sure there are no broken links.
- Test forms are working as expected.

- Test HTML and CSS for any syntax errors and relations.
- Testing workflow of website.
- Testing Database for consistency and integrity.
- Testing all the specific features of web applications.

2) *Usability Testing*: Usability testing is the process by which the human computer interaction characteristics of a system are measured, and weaknesses are identified for correction.

Usability testing includes the following:

- The website should be easy to use.
- The instructions provided should be very clear.
- Check if the instructions provided are perfect to satisfy its purpose.
- The main menu should be provided on each page.
- It should be consistent enough.

3) *Regression testing*: In this testing, the module is tested to check if addition of a new feature is affecting the already implemented features. The system is tested against all previous features upon addition of features and their correlation.

4) *Cross browser testing*: This type of testing is done to check the compatibility of the website with different browsers.

C. Challenges and Findings

Common challenges for such a website would be Miscommunication[5] between freelancer and recruiter, Accuracy of project, Project integrity, Timely delivery [6].

- In this project, in My Account the user can update their freelancing account details but if the same user has responded to a post before where the user freelancing account details are stored in the database, then the previous details will be stored in the database which are changed by the user now. So, to avoid this conflict if the user has updated his details then the details in the responses table also should be updated.
- There is a chance that the user who publishes can also respond to his post which will be useless. So, to avoid that conflict we restricted the user who published the post from responding to his own post.
- There is a chance that the freelancer after registering as a freelancer can also hire himself which does not make any sense. So, to avoid this conflict, we have restricted the user from hiring himself.
- A user of the website is allowed to post their job requirements only twice. If the user needs to post more jobs, then the users have to upgrade their account by paying a certain amount. Although as of now, creating a payment page without any investment will be a challenge.

VII. DISCUSSION

The goal of this project is to develop a website for the University of Windsor which deals with the concept of freelancing. The main intuitive here is to provide some path

of learning to the students of Windsor apart from the traditional classes. We have dealt with the concepts of existing freelancing websites and came up with this project to have a dedicated site for our university.

Agile methodology[7] is followed in the development of this project[8], where the tasks are divided into sprints and followed the iterative model. Each phase feedback has given us some input to the next development process.

Validation to each and every step is done rigorously so that our previous development steps are not affected. The website has undergone all kinds of software testing and eliminated all the bugs accordingly.

We have decided on the roles of each member. We had a team meeting to decide on the flow of websites and technologies to be used. We decided to use HTML and CSS for UI and JAVASCRIPT and PHP for client side and server side scripting, and decided to use an open source MySQL database. In each scrum meeting we presented developed features, checked for updates that need to be done and decided on next features that need to be implemented.

VIII. CONCLUSION

The project has been developed mainly to provide some employment opportunities for students of the city. We conclude our project by stating that we have clearly understood all the modules of the system. We have implemented all the functionalities of the project along with the successful utilization of different phases of software engineering to develop the system. Users have the opportunity to participate and take advantage of the website by posting jobs and hiring freelancers suitable for their development. The project is open for further development.

IX. FUTURE WORK

The future work includes the development of various modules of the website which are mentioned as below -

- 1) A chatbot can be added that interacts with the users to make a note of the basic requirements of the users
- 2) In order to make transactions between the user and the freelancer, we need to add a payment gateway. A secure transactions platform makes the system more user friendly
- 3) For time to time updates and interaction with the freelancer and to track the progress of the project, we could set up a chat forum or chat sessions

X. REFERENCES

- [1] Akhmetshin, E.M., Kovalenko, K.E., Mueller, J.E., Khakimov, A.K., Yumashev, A.V., Khairullina, A.D. (2018). "Freelancing as a type of entrepreneurship: advantages, disadvantages and development prospects". Journal of Entrepreneurship Education.[Online]. Available : <https://www.abacademies.org/articles/freelancing-as-a-type-of-entrepreneurship-advantages-disadvantages-and-development-prospects-7745.html> . [Accessed Apr., 14 2020].

[2]shortlist.co, 'What is a Freelancer Management System (FMS)', 2017. [Online]. Available: <https://shortlist.co/what-is-a-freelancer-management-system-fms/>. [Accessed: Feb., 26 2020].

[3]Debra Osnowitz: Freelancing Expertise: Contract Professionals in the New Economy." Administrative Science Quarterly. Los Angeles, CA: SAGE Publications, June 1, 2011. [Accessed: Mar., 03 2020].

[4]softwaretestinghelp.com , 'A complete web application testing guide: How to test a Website',2019.[Online]. Available : <https://www.softwaretestinghelp.com/web-application-testing/amp/> .[Accessed Feb.,28 2020].

[5]Anders Ulvøy, 5 Risks of Freelancing, 2020 .[Online]. Available: <https://mworker.com/5-risks-of-freelancing/>. [Accessed: Apr., 10 2020].

[6]thebalancecareers.com,'The Disadvantages of Freelancing',2019.[Online]. Available : <https://www.thebalancecareers.com/disadvantages-of-freelancing-2164223> .[Accessed: Feb., 28 2020]

[7]Cody Arsenault,'Agile Web Development-Comprehensive Overview',2017.[Online]. Keycdn, Available: <https://www.keycdn.com/blog/agile-web-development> . [Accessed Feb., 26 2020].

[8]S. R. Kumar, R. Sharma and K. Gupta, "Strategies for web application development methodologies," 2016 International Conference on Computing, Communication and Automation (ICCCA), Noida, 2016, pp. 160-165.doi: 10.1109/CCAA.2016.7813710