Career Nextgen: Uplifting the Career by Improving People's Professional Capabilities and Competencies

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ABSTRACT

Acquiring a successful career is the biggest hope of any individual and all the other expectations or everything that they wish for depends on how they are going to perform in their professional life. If one doesn't have a triumphant profession, it becomes complicated to achieve supplementary targets. Accordingly, since career has become a major aspect of our lives, an appropriate guidance methodology should be available. But in the current context, the problem of not having a mechanism to bridge the industry and the students who look for employment opportunities and also the circumstances where students who are not equipped with proper professional skills struggle a lot with the career are major complications.

The aim of this research is to address these issues by assisting students through stepwise career guidance and development solutions with the help of emerging technology and in a way that suits the modern digital era. The proposed solution is focusing on implementing a web-based system for facilitating the interaction of students with industry experts, university-industry collaboration, mentorship and guidance, and many more provisions through a single platform. The solution is developed by analyzing the requirements and the expectations of the users through conducting various surveys and questionnaires where the validity and the need of developing such a system were ensured by the verified results obtained from those methodologies. Thereby, this research elaborates how the solution is suggested to resolve the above-mentioned complexities and to uplift the students' career life effectively, guiding them towards success.

Keywords: *Career development, Career guidance, University-industry Collaboration, Web application, Programming*

1. INTRODUCTION

A common problem that exists in Sri Lankan context is that there are not many proper online platform that provides career development guidance for school leavers, undergraduates or fresh graduates who are new to their professional career. Most of people cannot think about how they should proceed with their careers because they won't get proper guidance after passing out from schools or universities about how to get ahead in the job successfully and due to lack of that assistance, they face a lot of complexities. The main reason is that unlike in the past, at present, skills matter a lot more than the paper qualifications to be engaged in proper jobs and now the job competition is so high. (Vincent Vickey Victor, Jyoti, Dheya careers, Rahul Sharma, Sndra Jones,A Sudarshan, 2016-2022) So, there should be a way for them to develop their professional skills with proper assistance. Even school leavers and university students struggle a lot when choosing their career path finding suitable opportunities which suit their passion. Also, people face problems when facing interviews because they lack essential skills even though they have educational qualifications. So, there should be a way for them to get continuous guidance from mentors and solve out their doubts related to their career journey, at the same time develop skills and go up in the career ladder. (Maree, 2018)Therefore, by considering these issues, a career development application that addresses and caters the above-discussed

problem by facilitating users with properly articulated career development plans.

As the skills matter a lot more than qualifications in present, it is highly recommended to be equipped with the required skills sets to face the job competition successfully and confidently. (Peters, 2021) Therefore, as a solution, the "Career NextGen" which is a web-based application is implemented in order to improve people's capabilities and competencies related to occupational aspects. Further, this provides career guidance and the assistance to acquire the knowledge, abilities, and experience which are important to distinguish right profession for them to succeed in the work environment.

The significant stimulation behind the application is to offer online assistance to its main user group(students) notwithstanding geographical limitations or some other related issues, for example, time constraints, voyaging issues and so on. (Mustafa Serbes, Mustafa Albay, 2017). The students will be benefited a lot and they will not have to search here and there to obtain career guidance and to get guaranteed career development.

2. LITERETURE REVIEW

Currently, the career development processes happening in the country have many loopholes. One of the main is that continuous guidance is not provided to the students to go up in their career ladder. Though some authorities and institutions launch career development programs, most of the time, they are limited to 1month/3months/6months or 1 year and nothing beyond. Some of the other significant gaps in prevailing procedures can be identified as follows: (Policy, 2012)

- Failed to reach a large, targeted user group.
- Insufficient information systems regarding the job demands.
- Deficiency in giving professional training and necessary skills through an online platform.
- Less attention is paid on career improvement of school leavers.
- Lack of joint effort of universities and companies and interaction among those parties and students is very low.
- The involvement of industries in the career guidance sector is considerably less.
- No proper methodology for career mentoring and counseling, job placements, competency growth etc.

According to the recent research statistics, the unemployment rate in Sri Lanka is notably high. (ColomboPage News Desk, 2020)One of the foremost reasons for this is that efficient career development plans and guidance methodologies are not implemented and hence students are left with complications.

Table 1: Unemployment rates by age groups and gender – 2019

Age group(years)	Number	Unemployment Rate (%)		
			Gender	
	Sri Lanka	Sri Lanka	Male	Female
Total	411,318	4.8	3.3	7.4
15-24	201,698	21.5	17.6	28.7
25-29	93,793	11.0	6.6	18.5
20-39	59,009	3.2	1.3	6.3
Over 40	56,818	1.2	0.9	1.7

Table 2: Unemployment rates by level of education and gender -2019

Level of Education	Number	Unemployment Rate (%)		
			Gender	
	Sri Lanka	Sri Lanka	Male	Female
Total	411,318	4.8	3.3	7.4
Grade 10 & below	140,781	2.8	2.4	3.8

G.C.E(O/ L)	98,346	6.5	4.9	9.6
G.C.E(A/ L) & above	172,191	8.5	5.0	11.9

In Sri Lanka, a few amounts of standard career guidance/career development applications exist in the current context. A thorough study is done regarding those applications to get an idea about the procedure and even the method of how manual career guidance processes are happening in various institutions are examined. One of the main applications which exist is "Career Me" (CareerMe, n.d.) which is a system that gives a detailed report of what careers match the users based on a questionnaire given to them at the beginning and then that application allows to find certain job vacancies and meet advisors.

Another app called "CareerGuide" (CareerGuide.com, 2018) which is based in India also operates and it's all about student career counselling only.

Those are the major applications that can be identified but there are some institutions and companies in both public and private sector which provides career advice. Some of them are government centers like NYSC-National Youth Service Council (Council, 1978-2022), NAITA-National Apprentice and Industrial Training Authority (Authority., 1981- Present), VTA - Vocational Training Authority (VTA, n.d.), National Career Guidance and Counselling center and private centers like Pathfinder Career Consultancy Service (PVT) Ltd (Pathfinder, n.d.). Also, some universities have their career guidance and skills development unit which are solely for the particular university's students which other students are not benefited.

Furthermore, as per the study carried out before the project initiation, a few research done on the topic of career guidance could be identified.

- A research paper on “Digital System and Application for Career Guidance for students” (Aditya Biala, Sharmistha Banerjee, 2021)
- A research based on online career counselling through video conferencing (Team, 2014)
- Article which describes ensuring career readiness through career development and guidance. (Vanessa Dodd,Jill Hanson &Tristram Hooley, 2021)
- Article on career guidance provisions in Sri Lanka (Career Connect(Sheila Clark, Kath Waykne)
- Article on importance of career guidance (Verma, 2020)

According to the study done, a clear realization could be made on the fact that the existing application on the selected project is completely different from the developed system. The main reason is that, almost all the applications that are investigated focuses only on one main aspect of the project domain. For example, certain applications such as “Career Guide” mentioned above is focused only on career counselling. But the developed project contains various other aspects other than career coaching though career advisors. Therefore, it will be benefited a lot in almost all the aspects related to the domain.

3. THE PROPOSED SYSTEM

The initial point of the study carried out about the existing procedures of career guidance and development in Sri Lanka and get understanding of how some similar applications related to that work in the current context. Through that comprehensive study, the researcher identified certain areas and gaps which should be addressed throughout and then developed the scope accordingly to cater all the required functionalities. The scope is suggested in a way that there are clear and unique differences between the prevailing career development apps and the new system.

"Career NextGen" can be considered as an application that works with professional skill advancement, communication and interaction of students with industry specialists, university-industry coordination, mentorship plus guidance and a lot more arrangements through a one single platform. The students (undergraduates, school

leavers, graduates) will be benefited lot through this application since different essential components are incorporated there.

As the name "Career development and guidance application" proposes, the undertaking depends on two methodologies as indicated by how the researcher interprets it. The first approach is career guidance, and the other is career development. However, those two add to a typical last objective despite there being a few slight contrasts distinguished between them. In the career guidance module, the researcher is intending to bring universities and certain organizations to one stage where they would set a cooperative effort to lay down an appropriate career guidance for the designated client gatherings. Consequently, the career development module mentioned above will be actually acting a self-learning/self-development mechanism where no professional parties given above are not involved. The students will be helped a great deal and they won't need to look to a great extent to get career guidance and to get ensured regarding the professional improvement. They will get the opportunity to obtain all the services related to career guidance from this single platform without searching much in various sources.

3.1. Objectives and Deliverables

The main objective is to supply an effective and usable product to the user which is focused on career guidance aspect with the intention of eliminating the hassles that students come cross in building the professional career. Other than that, the following objectives are satisfied,

- Providing a better and more reliable way to interact with industry experts and staff to pave the way to a victorious career.
- Providing a Comprehensive solution which is simple and user friendly to bring all the related parties together (university, industry, student)
- To serve the users a platform to discuss the issues related to the career and to enable users to get hired for jobs by directly interacting with the companies
- Pushing students and even universities towards digitalized platforms rather than manual system

The users will not require high educational levels, technical skills or advanced computer expertise to deal with this system functions. This platform is designed in a way that we can expand rapidly and add more functionalities and extensions efficiently. The specification of the proposed system can be summarized as an accurate system without any data redundancy, efficient data handling , better graphical user interfaces , saving time and money via the computerization and providing solutions for existing problem.

A proper study has also been carried out:

- To analyze how universities and companies can work collaboratively to provide career guidance for the students.
- To implement new methods to reduce the existing problems by giving better solutions which suits the modern era
- To analyze existing career development processes and provide recommendations and suggestions for improvement

The deliverables include a fully featured web application which can be accessed through web browsers such as Google Chrome, Microsoft Edge which could be used as the student-professionals communication platform whereas the professional parties are interconnected with real-time functionalities.

3.2. **Potential failures**

The system potentially focuses on major functionalities including the Career Guidance course management, Job Portal, University-industry collaboration, Career guidance tips/files uploading and downloading, Student forum, Interaction with career advisors, Payment gateway integration, FAQ section, profile management and chat platform. All the

mentioned functional requirements are enabled based on the user group who are accessing the system.

4. SYSTEM DEVELOPMENT APPROACH

4.1. Requirement Elicitation

The requirement gathering was done in order to identify the current processes and require improvements in the career guidance and development area. Gathering information from various related parties helped immensely to develop the project to give the maximum benefit to its users. Certain requirement gathering techniques were allowed at the initial stage of the project.

4.1.1. Questionnaire

Before conducting the project, a short questionnaire was designed for friends to informally participate within. conducting a questionnaire not only allowed me to understand the issues with existing career guidance, but also what functionality should be prioritized and included. From analyzing the questionnaire results, it made me understand that more than 8%of people who attempted the questionnaire has no clear idea about their career path which they should proceed. Moreover, according to the results, most of the students are afraid of job interviews due to lack of prior experience and skills which was solved from the developed web and android applications. Furthermore, professional skill development is the most needed criteria suggested by the students and that need is also fulfilled from the Career NextGen application. Most of them prefer to get career guidance through an online platform. Overall, the short survey proved very useful, specifically during the creation of system functions and user requirements. importantly, by analyzing the results of the questionnaire, I could realize that I have given the solutions to the real problems faced by students and the real requirements needed by them through my project.

4.1.2. Interview

Had discussions with the responsible people through career guidance of some government and private universities such as University of Colombo, Open University of Sri Lanka, University of Sri Jayewardenepura and SLIIT Contacted some career guidance institutes such as VTA and NAITA The expectation was to get an understanding about how universities are providing career guidance and development and to identify how career guidance institutes work and what they offer. This technique helped a lot to obtain so many details regarding how career guidance units of universities interact with students in career guidance the programs offered by them to develop the skills of students.

4.2. System Design and Development

4.2.1. Agile framework

For this project, an Agile approach was taken during the development process. Agile is a set of methods and practices followed during software development that is based on values and principles expressed in the Agile Manifesto. The manifesto advocates that when developing software, the focus should be on interaction, working software, customer collaboration and responding to change. Processes, extensive documentation, contract negotiation and sticking to a plan hold less value The reason this approach was more suited to this project than, for example, the traditional Waterfall model was because it promotes iterative and incremental development. With Waterfall, processes, such as requirements and design, are treated as oneoff activities. In Agile, they are seen as continuous which allows for adaptation and changes at any time in the development process. This was important for this project because potential users were going to be massively involved throughout development to ensure the product created was liked and usable. If users were unhappy with the current product, Agile' s flexibility allowed for changes to requirements and design. Having processes as

continuous activities also meant that a fully working piece of software should be present at the end of each iteration. This was necessary for this project as there were tight time constraints. It was better to have a working piece of software that did not have all the functionality rather than an incomplete, non-working piece of software that tried to incorporate all functionality

4.2.2. Test Driven Development

Test Driven Development (TDD) is an agile technique, where project requirements are expressed through tests before implementation is commenced was used throughout the project to identify breaking changes made to the code base and test the requirements of the project. Test-driven development is a style of programming that works well with Agile as it relies on a very short development cycle. It is made up of three main phases. The testing phase where a test is developed and executed, the coding phase where the code is developed to pass the test and the refactoring phase where improvements are made to the code while preserving the functionality. The main benefits a test-driven development approach is that it helps the developer establish an understanding of what the code needs to do. While also testing each piece of functionality before starting a new task.

4.3. Implementation

After the requirements gathering stage, high-level system designs were created including initial UI designs, UML diagrammatic explanations which were used to design the underlying data model of the system and to identify the activities within the construction process. In the system implementation, the following tasks are identified:

Identification of software components and the architecture of the software - The components are identified, and the system is designed in a way that all the software components are interrelated. This is mainly called as the software architecture. This software architecture is converted into a system which is compatible and operatable with the computer.

Interface designing - The user connects with the system through the system interface and do the necessary tasks through that. So, proper interface designing enhances the convenience of using the system. The interface is always deigned in an attractive way.

Database designing - In database designing, the necessary data required for the entire system were identified and saved in the system database.

4.4. Control plan

The PRINCE2 two project management methodology (Bentley, 2009)was followed throughout the project timeline from the point of starting the project and to the final demonstration. Thereby, the major milestones were achieved by adhering to the processbased project management framework by controlling each phase of the project properly. Various techniques were utilized such as supervisor reviews, highlight reports, minor documentation at the end of each stage, proper risk management and quality plans evidence through videos and recordings, end-stage reviews with the intention of reaching the desired objectives according to the project timeframe. As well as adopting Agile for the development process, PRINCE2 was adopted for the overall management of the project.

4.4.1. Practices followed

Throughout the development process it was important to use coding practices so that the code was consistent and followed the same structure. Code following the same structure also meant for future developers, the code could be understood quicker. Proper formatting of the code documents Commenting the functions of important codes Each function is tested for the

performance and accuracy after each functionality implementation.

4.4.2. Verification and validation

The verification is used to check whether the application is aligned with the specifications and to certify that the application is bug free. Verification techniques include

Inspection- visual assessment of project outcomes and deliverables to distinguish errors, mistakes, development standards' violations, and supplementary issues

Reviews - Obtaining the feedbacks/comments from project stakeholders such as supervisors, users, clients, or other interested parties to find defects and to assure quality. This included design reviews, document reviews, requirement reviews

Analysis - Utilization of perceived analytic techniques to clarify or ensure the performance of the project components

Test- Verifying the system some predefined inputs to guarantee that the system will deliver expected outputs as determined by the necessities.

The validation is done to check whether the requirements are met, and the validity of the right product is confirmed. The validation techniques include White box testing for Detailed investigation on internal logic and the structure of codes, Black box testing-for Examining the functionalities without caring about its internal workings, Consistency checks and validity checks, Completeness checks.

4.4.3. Tools and technologies

"CareerNextGen" is completely developed using the latest trending technologies in the industry such as PHP, HTML, AJAX, JavaScript, jQuery, Bootstrap and MySQL. Used tools such as Visual Studio Code, phpMyAdmin, WAMPP Server, Stripe payment gateway have led into a flexible developing approach where it provides many services which could be used while the development is going on. The reasons to choose the above technologies are, it provides the latest security and performance increments without much of a hassle. Many of the technologies are becoming widely used technologies over the industry. These come in handy where the developer gets what they need, with the best solution implementations.

4.4.4. Usability evaluation

Usability refers to the nature of a client's experience while cooperating with items or frameworks, including application Usability is a blend of variables including:

Understandable design: an almost easy comprehension of the architecture and navigation of the system. Simplicity of realizing: how quick a client who has never seen the UI can achieve fundamental assignments

Productivity of utilization: How quick an accomplished client can achieve undertakings

Mistake recurrence and seriousness: how regularly clients make mistakes while utilizing the framework, how genuine the mistakes are, and how clients recuperate from the mistakes.

5. FINDINGS AND RESULTS

Questions asked to selected samples Circulated questionnaire was based on close-ended questions. For further evaluation and assistance to research, certain interviews and one to one discussion are carried out with open-ended questions. In the questionnaire, 15 questions were given to answer regrading to the career guidance and development. Thereby, the responses were taken successfully from various student categories such as undergraduates, graduates, school leavers and from various age groups who are with different employment

statuses. The key findings following the interview and questionnaire stage are as follows:

- Most of the respondents highly believe that the existing career guidance methodologies in Sri Lanka should be further improved.
- The students are in need of proper mechanisms to guide them towards their career goals and thereby assisting for the professional skill development.
- There are very limited number of approaches to obtain career guidance after leaving the schools or after graduating.
- Online platforms can be used effectively to improve people's professional capabilities.
- University-industry collaboration plays a vital role in providing career guidance and thereby it has to be improved further with the technology.

The developed system caters almost all the career guidance plus development requirements as discussed above in this paper.

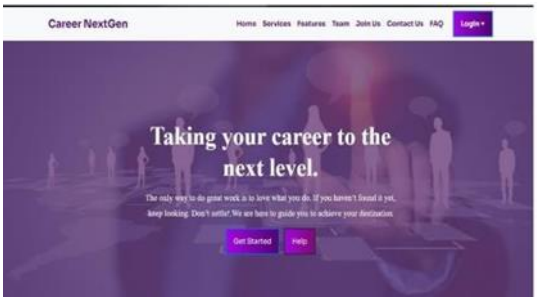


Figure 1: The main page of the developed system.

The Figure 1, given below shows the main page of the web application which gives the users the chance to access their related user accounts and navigate to the allocated functionalities.

The university industry collaboration is established in order to implement career guidance methodologies for the university student(undergraduates). The university of each registered undergraduate will interact with them to provide numerous facilities. The universities and registered companies interact with each other through this platform and through the inbuilt chatting functionality. The Figure 2 given below shows the university dashboard where university users can perform activities like managing partnership companies and undergraduates, publishing notices and trainings, collaborate with companies through the chat.

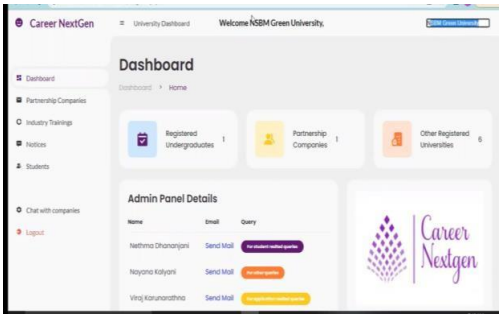


Figure 2: University dashboard

The Figure 3 shows what the users can do as students. The given figure is the dashboard of undergraduates but the other two student categories; school leavers and graduates will be redirected to a different dashboard with different set of functionalities upon login. From here, functional requirements such as job portal, advisor section, career development courses,

forum etc. can be accessed according to the necessity.

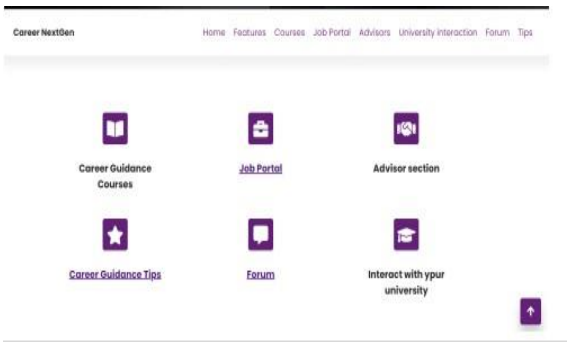


Figure 3: Functionalities available for the undergraduates

One of the main functionalities in the developed system is the advisor section which provides mentorship to students. The students have the ability to send connection requests to the registered career advisors in various job fields in order to receive continuous career guidance. Thereby, if the particular advisor accepts the connection request, the student has to pay a certain fixed amount through the integrated payment gateway before receiving the mentorship. Online after the proper payment, the connected students get the chance of selecting meeting time slots published by the specific advisor and then connect with a meeting. The Figure 4 given below depicts the payment operation which is done through Stripe payment gateway.

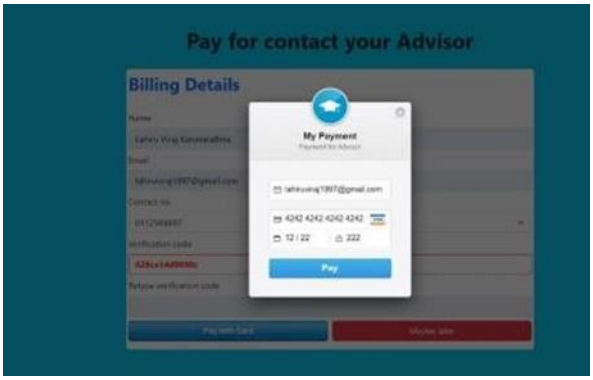


Figure 4: Payment gateway interface of the system

Another major functionality of the application is the job portal where companies can publish job vacancies, the applications received from candidates and download resumes, reject or shortlist received applications, send messages to the candidates through the inbuilt mailbox where the students get the chance of viewing the available job vacancies posted by the companies, filter job search as required, apply for the jobs ,viewing the status of applied jobs whether the application is rejected or shortlisted , sending direct messages to the companies and receive replies through mailbox etc. The given Figure 5 displays the dashboard of the job portal which is related to a company.

The above provided are only some of the major functionalities of the implemented application. But there are many more functional requirements such as FAQ section where frequently asked questions can be viewed, career guidance tips section, where uploading/downloading of files related to career guidance are involved, Student Forum in which students get chance to post questions or reply to the posted questions and career guidance courses section where students can enroll into various professional courses and learn on their own etc. All integrated features are also aligned with nonfunctional requirements such as performance, security, usability,

reliability, scalability etc. in order to ensure the effectiveness and the quality of the system.

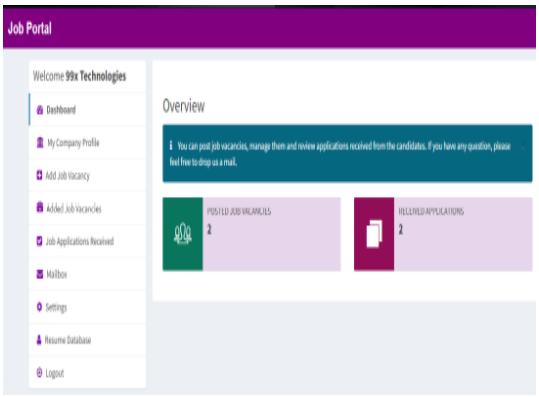


Figure 5: Job portal

6. CONCLUSION

According to the analyses results, it is realized that there must be a technique that facilitates professional skills development, the interaction of students with industry experts, university-industry collaboration, mentorship and guidance and many more provisions through a single platform. With the developed system, the assistance to the students is given through stepwise career guidance and development solutions with the help of emerging technology and in a way that it suits the modern digital era. The problem of not having a mechanism to bridge the industry and the students who look for employment opportunities and also the circumstances where students who are not equipped with proper professional skills struggling a lot with the career were the major motivations behind choosing this project domain. The critical focus of the project is aimed to offer online-based help to its primary client group(students) despite geological restrictions or a few other related issues, for instance, time imperatives etc. The students are helped to a great extent since the excellent career guidance and professional improvement are guaranteed exclusively via this solution. Users and other parties who are involved in the purpose will find very easy to use this system because there are internationally accepted standards. The business model is pretty straightforward as the Sri Lanka is indeed in need of a better and simplified career development procedure.

This could be improved furthermore in the future by addressing the consumer needs.

7. FURTHER WORK

The project can be extended to facilitate inbuilt video conferring mechanism to connect with the advisors from the web application itself without using Zoom Meetings.

Moreover, as for future work, the researcher is planning to analyze more on the user requirements and provide opportunities for the universities or companies to hold online career guidance and development programs through the platform and also implement several diverse components to expand the better quality of the solution.

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