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Luminary X: A Smart Career Development Platform Integrating Learning Analytics and Mentorship

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ABSTRACT

The world where we are currently living in is growing very fast, as everything has started to shift online. But this has its own cons, as the career preparation environments have its own extremely discontinuous methods where skills do not match with interests, project building, proper mentorship for chosen career path, and job listings are used by isolated and uncoordinated systems. This environment presentation is difficult to the learners' because it is hard to keep track of their progress, time to time career guidance by mentors who are already in that position and can guide from their own mistakes so the new comers do not get stuck in a loop. The rat race that we are currently in, where everyone is going in the same direction and almost none are following their own interests as they do not even know what career would they pursue with their set of skills, they do not know if there is any career path with their match of interest. The important part is interest creates efficiency. The solution to this dilemma presents this paper Luminary X, which is a single web-based system that has it all. This platform has a section to choose the skills that match with the learners' interests. After that they will get AI powered assistance to start a career that uses those skills. They will get guidance from alumni who's has done great in their chosen career. Users can upload their projects and get help in building it to an advanced level. This platform enables an AI powered guide, who will help them to reach their desired goals. This makes the model from traditional linear learning environment to a structured in order platform. To plan project work that can turn into portfolio ready projects. Luminary

X is built on a scalable web architecture using Next.js, React.js, Tailwind CSS, Node.js, and Express.js. The platform integrated user profile, skill tracking, project management, alumni interaction, and AI-powered career guidance within a single responsive interface. It enables learners to monitor their progress, receive personalized mentorship, and achieve structured career development through a unified ecosystem.

Keywords— Interest matching skills, alumni advice, goals tracking, project into professional work, web-based systems.

I. INTRODUCTION

The extreme growth that we are seeing in the education sector, which directly links to employment system has altered how students and freshers approach their jobs. Nowadays, students can study their desired skills online, people are sharing their project repositories, there are platforms from where students can connect with professionals from their dream companies, there are services that we can use to build our resume. All of these resources have become very popular and useful for us as a student as well as a fresher entering in this corporate world. These platforms are helping students, freshers as well as companies a lot by providing great skill enhancement services and hiring enthusiastic employees for company's growth[14], [20]. But still, regardless of all these services, these multiple apps have their own control. The platforms are great but only to an extent, after that they demand users to switch between these platforms. We need to alternate between various platforms that have control to our career development process. These platforms are independently essential, in order to address various areas of our professional growth. But such a division tends to complicate the consistency of the user to go through multiple platforms every other day for various factors in their career growth.[6], [18] This issue makes learner unable to trace the advancement of their skills, organize their project work into structured professional work, receive mentorship in time, and present themselves in a professional manner.

Contemporary career preparation is much broader than academic performance. It needs constant improvement of skills and learning new technologies for the desired career, making projects using those skills, accurate mentorship, and transparent communication of progress. What we have observed is that the vast majority of platforms are focusing on the individual aspects of their course delivery, connecting with professionals, or job listings without providing a pathway that connects with the learner's interest which will efficiently increase the learning outcomes into career growth. Such a fragmented ecosystem leads to un-organized development of an individual, which eventually increases lack of self-

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confidence among learners in their shift to academic settings and right career path.[4], [11]

During our academic and career selection phase, we saw a lot of people struggling with the same issue. They have no interest in doing what majority the is doing, but individually they can do great with their own skill set, but they do not even know that those skills have any job opportunities or not, they do not have a guide to help them realize their worth. To address this issue, we thought of making a platform that will combine skills that match interests, then a career guidance that is achievable, project development to a professional level, alumni interaction and progress tracking in a single ecosystem. This platform totally enables users to map their growth using structured skill maps and will achieve milestones while doing the work, which will eventually motivate them.[6]. [12] We tried to make new informal learning in a systematic way to help learners validate themselves in the realworld competencies and practice in their desired career. Luminary X is based on the new technologies and scalable web architecture to increase its responsiveness, usability and extensibility. We tried our best to focus on the design principles, system architecture, and functional workflow of Luminary X, which eventually helps in improving clarity, communication, continuity, and effectiveness of the career development platform.

Fig. 1. Functional Workflow of the Luminary X career development platform

As shown in Fig. 1, the Luminary X platform follows a structured career development workflow.

II. LITERATURE SURVEY

Before designing an integrated platform that should address these limitations that have been stated before, it is essential to look out for and take review on what is already present in the current market. Therefore, it is important to examine how existing online learning systems, skill development platforms help in career growth. The studies on online growth systems can be broadly classified into four categories: online learning systems, skill development on projects, career guidance platforms and combined career progression frameworks. While we examined these areas, it gave an insight about current development as well as the limitations of the development of these platforms.

A. *Web Based Training and Learning Platform*

The available literature that we studied shows the importance of online learning solutions that are expanding the access to education on a large scale. The study shows that the designed online courses, certifications and self-directed learning have a positive impact on learners. It is increasing the understanding and learning independence. It is also found that the majority of these platforms are beneficial. But the important part is that the focus is on short-term goal rather than long-term career growth.

These online courses serve discrete course completion or certificates having fewer ways to observe that the cumulative skill development actually matches the desired career output or not. After having this realization, it is observed that there is a loss of connection because of lack of interest. [14], [15]

B. *Portfolio Making and Project Based Growth*

Project based is the most effective way of expressing your theoretical knowledge into practical real-world applications. It has also gained great recognition because it is a very powerful technique of showing one's abilities, knowledge and level of thinking capacity in making the project. The study also indicates that hands-on technical problem-solving skills are being enhanced on projects. However, many project repositories are of static nature, as they do not match with the standard level of display. Projects are commonly presented but there is no evident connection or desire with the specified skill set or professional growth, which makes it hard to determine the competency level of development.[7], [4] Thus, although project based learning contribute its key role in learning practical experience increment organized career guidance is minimal.

C. *Mentorship and Career Guidance System*

Mentorship has its own significance in career development and has been seen in the literature and many studies, that when someone experienced in our dream role guides us in our career development process. It directly affects decision making by clearly explaining pros and cons effectively understood. The construction and work development in the desired goal need to be done to grow in the career, which eventually increases our confidence. Online mentorship has been widely surfaced in geographic boundaries to promote communication between students, freshers and professionals. Despite these platforms offering high value they need to be individual advisory, which effects in real results of learners, skill advancements, and projects. This lack of integration results in restricting the capacity of mentors to provide data driven advice. [1], [17]

D. *Coherent Career Development Models*

The research we have been doing has shown to be in favor of comprehensive models that integrate learning analytics, skill matching with interest and career recommendations according to the desired skills. Although some of the studies show that applied conceptual, theoretical implementation on a scale are very few. Existing solutions that we have reviewed do not have a single interface linking the project development to a professional level, learning the interested skills, mentorship engagement, and develop a visualization of progress. This lack of integration leads to disinterest in the

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user experience, and limits the effectiveness of online career platforms.[6], [8], [12]

In addition to the limitation identified in existing systems, it highlights that the difficulty of main system sustaining learners' motivation and daily involvement. Online platforms provide an opportunity to learners to engage in real world competitions. While these platforms do not directly compete with each other, they offer a chance to look out for the real world competition. However, the flexibility of such platforms lacks in identifying progress of an individual, which leads to inconsistency and lost goals. Many times, students acquire multiple certificates and accomplishments without having a clear understanding of how these skills are contributing in real life applications.

The other limitations that we have seen are that many systems do not blend well together to share data smoothly with each other. The data generated while learning, such as skills, assignments, scores, projects are rarely sent back or automatically updated across all platforms. As a result, what happens is that user's information is scattered throughout multiple platforms, instead of storing in one single platform. We have seen it many times that students have to enter their information again and again by themselves. This increase in workload, sometimes results in entering incorrect information.

Although we have seen that job-matching and re-matching portals when role changes are very precious. However, these portals do not offer freshers to learn and adapt to new skills to help them make a change in career. These portals are good for short-term goals that is job findings. As they do not care about learning and advancing one another by following up with new technologies. Our research has shown that modern organized plans rely on data visualization and analytics tools. There should be visualization for learners to let them know where they stand, how they are improving. There should be graphs and accomplishments to show progress, skill gaps and achievements.

Nonetheless, the majority of existing systems give very few statistics to see our graph that whether we are growing or not. Many systems fail to update candidate data dynamically after user's work. Lack of daily updates about user's work makes these platforms less effective in support for career development process.

All the literature study has shown us, the importance of showcasing daily improvement, interest based skill matching, project work ready, mentorship and development visualization all in one platform is important. To fill these loopholes, it is very important to have a platform that does not simply summarize the user data but also gives it in a structured and meaningful form. These facts are very important. That is why the structure and goal of Luminary X design must overcome the limitations by providing a career development process with user friendly ecosystem.

III. RESEARCH GAP

A critical review of the available research and current day digital career development indicates the deficiencies in the system of supporting career development among students and freshers who are building their careers. Most of the learning platforms that we have seen have high focus on courses completions and certificates while failing to track the ongoing skill development through time. Sometimes, while celebrating learning accomplishments, we tend to forget the long term goals through it. It makes it even more difficult to analyze and judge the growth it gave.

On the same note, the project based learning is mainly upon presenting the project by the user. To showcase user's work but they do not have standard methods to show the user that making project is not enough. It should also match with certain skills, competencies, and standard procedures. After this there is a sense of disconnection arises between the standard professional manner and practical activity. This can be resolved by strategic planning and growth driven measures. This disintegration eventually leads to impact the performance on portfolio, which is very important in displaying professional work and knowledge.

This separation also limits the capabilities of mentors to provide personalized and evidence based feedback according to the user's work and capabilities showcased. Moreover, job portals and recruitment process in most cases does not give much support to career preparedness, they just focus on job discovery. They do not give focus on progress tracking or self-assessment development.

The other important growth which is found in the literature is the lack of integrated and interactive architecture which should have learning tasks, interest matching skills, project enhancement, and mentorship interactions in one flow. The accomplishments should be reviewed by the user, it is very important to monitor progress, career responsibility, excellence, and clarity among learners.

All these gaps can be filled by a comprehensive single platform that links matching skills, with career growth, guidance, learning and practice in one way. The short-comings that are observed with the current development of the online learning systems underlines the necessity of having a pattern approach that interrelates both learning activities and practical approaches in one

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location. This will set goals which involves dealing with these challenges with a quantifiable and implementable approach.

IV. RESEARCH OBJECTIVES

This research is focused on developing and designing a single framework making it possible to have organized career growth. The main objectives of this research are as follows:

1) To create a combined career development system with interest based skill matching, professional project work, and access to mentorship in a single system.

2) To adopt a strategy where users can review their own work with statistics and graphs in an organized learning platform.

3) To create an interactive web based system which should be scalable enough to make the platform responsive, extensible and usable.

4) To offer organized dashboards that ensure transparency in career development in desired skills, making decision on both the side that is mentors and learners. In order to provide a bag full of subsequent advancement, such as smart career navigation, safe data handling and community features are essential.

In addition to the important functional goals the objectives stated, also points out the importance of more specific matching of technical design and real life career development requirements. Online career platforms should have the flexibility, scalability, and usability to be in various groups of users and demand in the industry. By focusing on each individual data on how they are progressing over time. It should also include different aspects of a career such as interest-chosen skills, projects, learning activities and achievements. By doing our work this way, makes the objective of the proposed platform more clear and well defined. This platform can be used by students who are not able to figure out what path they should choose to go on, plus freshers who are early stage. It would be very beneficial for the early age professional who want to grow professionally for a long period of time.

Another important aspect reflected in the research objectives is the focus on transparency and accountability in career progression. Many existing systems provide limited information on how learning efforts translate into measur-able outcomes. The objectives address these limitations by prioritizing clear visualization of progress and milestone based tracking, enabling users to access their development objectively. This transparency also supports mentors in providing more targeted guidance based on observable data rather than subjective assumptions.

Most currently available systems are quite limited and restricted. The main thing that they do not focus on is skill gain process, The progress of the learner, as they do not clearly translate learning efforts such as courses, practice, projects into measurable outcomes. It is very important for a guide to understand a learner's situation in a better way. To do that it is important to have a clear visibility of learner's progress. A guide can provide more accurate and personalized guidance based on what they observe from the learner's data. So, that the decisions made are not based on assumptions and guesswork. We all know that career growth never stops and therefore the system must evolve itself continuously to help in career development.

In our opinion, career support platform must be adaptable and flexible over time. The process of building a system in a way that allows expansion, modifications by using modular techniques.

V. SYSTEM ARCHITECTURE

Luminary X platform defines the general architecture of the system and the design proposal used in the methodological approach. We tried to make the architecture modular, scalable, and maintainable whereas we kept the methodology in structured form for growth purposes.

We tried to make Luminary X based on a multi-tier web architecture that is designed in a modular way. We designed the system in a way that it separates the presentation layer that is the user interface, the application layer that is the core processing, services, data storage and handling. The rules, workflows and decision making of the system are handled separately from the user interface and data storage.[5], [19]

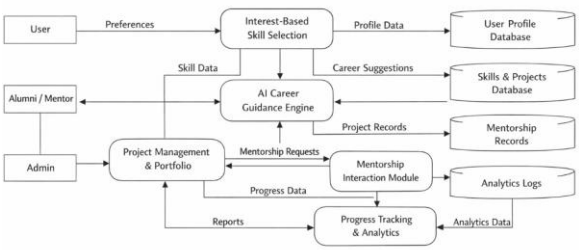

Fig. 2. Functional Workflow of the Luminary X career development platform

Fig. 2 illustrates the flow of data between user, system modules, and storage components within the luminary X platform.

1) Front End Layer: The front-end layer is the center of attraction for any platform. It directly interacts with the user and presents something to them. We have used Next.js and react.js for front-end because it allows the interface to be modular and in components-based sections, the way we wanted. We also used animations to catch user's attention and to make our website more engaging and impressive. The front-end layer has a structured dash-board with interested skill section, project work section, alumni talk section, AI-powered career

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guidance section, daily improvement tracker in a single interface.

2) Back End Layer: The backend layer is designed in such a way that it handles user data securely. It is designed to handle data processing, application logic, and APIs. We developed these components to be fully implemented during the final deployment phase of the system. It is developed using http://node.js/Node.js and http://express.js/Express.js to process the user authentication, authorization, requests, and also keep the data encrypted to the authorized user only. This layer is the most important layer, as it has access to system resources and designed to support for future enhancement.

3) Data Layer: The database layer is developed using NoSQL and MongoDB to support all kinds of data. The important entities of the data coming to the system mainly consist of user profile data, skill development interaction logs between the user and the system, especially in project-related data, the alumni talk process data between the user and the mentor, and activity logs. The flexible schema design is chosen because it is capable of updating rapidly as the user goes through the multiple processes in their career development journey, these database solutions were needed because it is flexible for all kinds of data. There are authentication and authorization process are involved to have its access control and data integrity.

4) Tools and Workflow Development: The design of the user interface and system prototype were implemented using Figma, so that the designs look clear in terms of layout, user benefits, and to maintain the flow of the system. We used GitHub as a version control system that allowed structured well-defined code, collaborative environment, to keep track of version and management. This method made sure that the system is scalable, flexible to work for real-life situations.

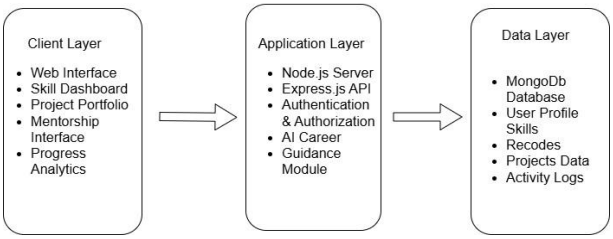

Fig. 3. High-level system architecture of the Luminary X platform

Figure 3 illustrates the overall system architecture of the Luminary X platform.

VI. DEVELOPMENT CHALLENGES

Making Luminary X was never an easy challenge. Our wish was to bring together the important life aspects such as skills choosing by your own-self that match with your interests, making the projects portfolio ready, alumni interaction to guide the user and reassure them that they are not alone and whatever they enjoy doing can be done and the progress charts to motivate them to keep moving further. All of these sections are working fine alone and independently but to bind them all together required some serious considerations to ensure that the data is flowing in the right direction and also enables user navigate easily.

The system flexibility we designed was another large challenge that has to be done carefully to keep the system easy to use. The design can have new updates; we can add more features in future but to do all that we need to

make sure that the site is flexible. We tried to keep the flow as simple as possible in case the students and early age freshers have less expertise with technology.

There were also various challenges we faced during the development of front end. We were required to build the interface that can accommodate various sizes of the screen and remain responsive. The integration needed to be seamless to navigate easily between the dashboard, skill page, project page, progress page within the existing state. The addition we did by adding animations to make sure that users were kept engaged but it should not include anything that can affect them negatively such as performance, adding more noise to the interface.

The other problem we faced was data modeling. We needed to keep the database flexible so that it can hold all kinds of data coming through, and maintain the in-formation the same and also enable us to retrieve the information in a speedy manner. This required multiple design changes to make it accurate.

Lastly, it did not take us long to keep the platform align with actual career requirements. A transformation of concepts that are independently working great but combining it together had to be developed through repetitive adjustments. These issues taught us how to approach a project that is to design with a user first mentality and then make informed decisions.

VII. RESULTS AND DISCUSSION

The process completion of Luminary X resulted in a working prototype which demonstrates that the major components of career development can rely on a single platform. We integrated choose your interest skills, career guidance, project management, mentorship and progress tracking in a single online platform. We checked the functionality of the system, system navigation by the user and server side, and the quality of the integrated design.

The prototype we designed provides our users to use one screen that can connect all the useful career tools. Learners are able to alternate between the different sections that we have designed like monitoring their progress, managing projects to an upgraded level, communicating with alumni to know their mistakes and growth reasons, and most importantly viewing progress without switching between multiple applications. This

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one workflow fixes the inconsistency user does by going through multiple platforms that are happening by existing online career support systems. It allows individuals to get a better view of their career growth.

We have applied modern front-end technologies to make the system fast and interesting. We added effective layout, smooth navigation and engaging animations which enhance the user experience, engagement, and efficiency within the system. It has a unique design which means that the individual parts can operate on their own, as well as when combined. This ensures that the system is simple to expand and it is easy to add features later on. The platform will continue to improve in the future through more useful and advanced features.

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