Advanced Career Builder

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Abstract **- The dilemma of choosing a career is a serious issue that most high school students and graduates face in today's corporate world. The uncertainty and confusion lead them either choosing a wrong career or wasting the time without proper guidance. The aim of this model is to predict the most suitable career for the user using technologies like Machine Learning, Artificial Intelligence, Data Mining, etc. to help them choose the right path and save their time. The model learns the user's goal and tries to understand their habit and guides them towards their goal through a series of tasks and helps them accomplish their goal. Users connect with like-minded people through community features and learn other perspectives in the society. They are benefited with knowledge and news of their domain through the model's features and help them participate in competitions. This journey not only helps the users to stay determined by making a habit of working towards their goal but also polish their existing skills and help them reach their destination.**

Keywords - Data Mining, Artificial Intelligence, Career Guidance, Machine Learning.

I. INTRODUCTION

Most of the students across the world are most likely to get stuck with the question of what is their right career path. Students with less awareness about the available opportunities are more likely to end up in the wrong career path. In order to help such students overcome the difficulty and to bring down the risk factors by predicting their suitable career path. Assigning them regular tasks to make them meet up with required skills and thereby to achieve their goals.

In an ever-evolving global landscape, the significance of effective career development cannot be overstated. As the dynamics of the job market continually shift, individuals find themselves faced with new challenges and opportunities that demand a proactive and adaptive approach to career planning and advancement. The contemporary workforce, marked by rapid technological advancements and changing economic paradigms, requires individuals to not only identify their passions and talents but also to cultivate a skillset that aligns with the demands of the modern professional world. This conference paper presents a comprehensive exploration of a groundbreaking career development-based project that seeks to empower individuals of all backgrounds to chart their unique course towards personal and professional fulfilment. By bridging the gap between academic aspirations and real-world career achievements, this project strives to equip individuals with the knowledge, skills, and resources necessary to navigate the complex and ever-changing terrain of the job market successfully.

In the pages that follow, we will delve into the project's key components, methodologies, and outcomes, shedding light on its potential to revolutionize the way we approach career development. This project's findings and insights promise to offer valuable guidance to educators, career counsellors, and individuals seeking to optimize their career trajectories in a rapidly evolving world. By embracing a holistic and forward-thinking approach to career development, we aim to empower individuals to not only survive but thrive in the competitive and dynamic realm of the modern workforce.

Our main aim is to observe the user's goal, and passion and make a road map of habits and tasks that not only helps the user to accomplish their goals through small steps but also helps the user to stay dedicated and work for their goal consistently for the ultimate triumph. We identify the user's most relevant domain using Machine Learning and build an utility mobile app to develop habits consistently. In order to keep the user on track and monitor their performance level we use Artificial Intelligence.

II. MOTIVATION

Existing career guidance or career counselling enterprises are mostly physical or the sessions are held through virtual meetings. Obviously, the career counsellors meet their clients once in their early career life. The counsellors can't guide the client throughout the process of achieving their dream career. National Career Services (NCS) which was introduced by the Ministry of Labor and Employment of India, acts as a virtual bridge between Job Seeker and Employer. NCS also provides counsellors to have their own account.

Job Application, interview processing and other related services are performed in NCS. But all these existing career guidance and career assistance systems don't have personalized interfaces based on the user's target career. Our business model enables the user to experience a user-friendly interface for each user and allows them to do the tasks assigned to them to develop their skills. And also providing a report on the analysis based on their weekly work action.

This business model aims to achieve the following objectives:

- To develop a business model that will be helpful and useful for all group of people who are struggling to find a career or a job.
- To provide some tests and quizzes to the users those will help them regarding in their career path.
- To facilitate both job seekers how are looking for job and company to hire people in effective and fast manner.
- To make career-building services affordable and accessible to a wide range of individuals, including those from underprivileged backgrounds.
- To offer networking platforms and events that enable individuals to connect with professionals, mentors, and peers in their chosen fields.
- To provide personalized career counselling and guidance, considering each individual's unique background, experiences, and aspirations.
- Assist individuals in creating long-term career plans, setting realistic goals, and providing guidance on the steps needed to achieve those objectives.
- Provide a gamified learning platform, to keep the learners engaged and motivated.
- To infuse AR & VR based learning procedure.

This business model targets the following community:

1. Students: Students can register in the system and be able to use its features such as taking career test that will help them in make decision for their future university courses. Also, for the students in university level can find part time job during their vacation. Also, for final year students who need to do their training to find a suitable job for them.
2. Job hunters: People who are looking for jobs can use this system to find and search for jobs that by viewing the company profile before applying for the job.
3. Companies / Organization: Companies can use this system to search for candidates, create various job postings, and track the applied candidates. Furthermore, they can request or apply for a career talk, seminar or workshop regarding careers.
4. Advisors / Consultants: Advisor can give the advice for both company and normal users such as students or job seekers. In addition, advisor can post and create an event to help other system user.

III. METHODOLOGY

A. Proposed Solution

1) Data Mining

Data mining is the process of sorting through large data sets to identify patterns, trends and relationships that can create insights into how the data can be used through data analysis.

Data mining is used in the preliminary development of the model. The problem to be tackled is abundancy of data. There is a lot of information available on every career option but the solution lies on how we are handling the data. Thus, Data Mining plays a pivotal role in handling large raw data sets and brings out valuable insights and information from it, which will help to figure out the best possible route to achieve the dream career. A descriptive model differentiates the patterns and relationships in data. Descriptive Data Mining provides descriptive information about the past behaviour of the data by analysing it. Insights are created by analysing the behaviour and progress of the user from the performances, and are further used for preparing the report.

2) Data Visualization

With visualization is the graphical representation of information and data. By using visual elements like charts, graphs, and maps, data visualization tools provide an accessible way to see and understand trends, outliers, and patterns in data. In this model, we use Looker, a data visualization tool, to represent the progress of the user's performance graphically to get a clear picture of the user's performance in each and every task given in the model. It helps users see and understand their progress better.

3) Data Preprocessing

Data preprocessing is a process of preparing the raw data and making it suitable for a machine learning model. It is the first and crucial step while creating a machine learning model. The scikit-learn

preprocessing package provides several common utility functions and transformer classes to change raw feature vectors into a representation that is more suitable for the downstream estimators. We collect the data through questionnaires and check for any missing data and outliers. Also, the raw data sets of job roles are processed and are classified accordingly. Once the data is processed, it is fed to the algorithm for the analysis.

4) Data Analytics

Data analytics (DA) is the process of examining data sets in order to find trends and draw conclusions about the information they contain. In this project we use the analytics to show the progress report of the user on a regular basis. Power BI is used to visualize the progress by converting the data of different sources and performances to build interactive dashboards and reports.

5) Task Assignment

With AI assisted automation assignment of the tasks are done from the analytics process. The user gets tasks in a variety of amounts based on the user's performance and progress made in the model.

6) Augmented Reality Content

Augmented Reality enables students to stay focused and attentive and indulge in effective learning experiences. This helps them understand the concepts in a better manner and implement their learnings efficiently. Furthermore, this technology helps them get their doubts clarified and relearn concepts in real-time, thereby reducing the chances of any glitches or disruptions in their learning experience.

Images: Augmented Reality can be used to overlay images on real-world objects. For example, a user can point their smartphone camera at a museum exhibit and see additional information overlaid on the exhibit through the Augmented Reality app.

Videos: Augmented Reality can also be used to overlay videos on real-world objects. For example, an Augmented Reality app could be used to project a virtual video onto a movie poster, allowing users to watch a trailer for the film.

3D models: Augmented Reality can be used to project 3D models onto real world objects. For example, an Augmented Reality app could be used to project a virtual model of a car onto a physical car, allowing users to view the car from all angles.

Audio: Augmented Reality can be used to overlay audio on real-world objects. For example, an Augmented Reality app could be used to provide audio instructions for assembling a piece of furniture when the user points their smartphone camera at the instruction manual.

Fig.1

Figure 1 Augumented Reality wherein a car model is showcased.

7) Virtual Reality Interships

VR can adapt to the individual learning styles and preferences of each intern, allowing them to learn at their own pace and receive personalized feedback. Internships via VR can be accessed from anywhere in the world, allowing companies to broaden their pool of potential interns and provide opportunities for individuals who may not have been able to participate in traditional in-person internships.

Potentially save companies money on travel, accommodation, and other associated costs, making it a more cost-effective option for both the company and the intern.

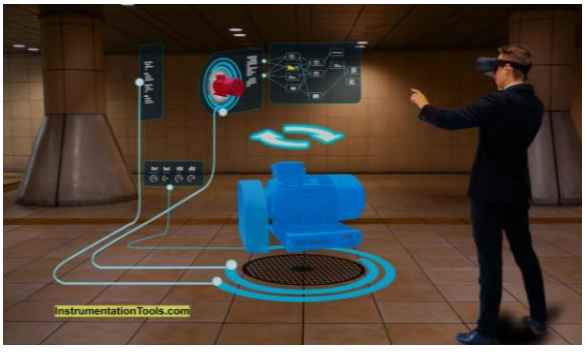

Fig.2

Figure 2 Virtual Reality technology used in Industrial Automation.

Fig.3

Fig.4

Fig.5

Fig.6

Fig.7

Fig.8

This app was built using - Frontend – React-Native; Backend – Express JS; Database – Mongo DB; Augmented Reality – Unity.

IV. LITERATURE SURVEY

[1] Cruz, A. F., etc have discussed about the development of a web platform tailored for vocational guidance. It acknowledges challenges in career guidance, such as a lack of trained professionals and the need for an organized system. To address these issues, the paper introduces a web-based solution that considers students' career expectations. The research evaluates this platform using usability metrics and assesses its effectiveness in helping students understand their career preferences based on Holland's RIASEC theory. Overall, the paper aims to enhance career decision-making for students in a specific regional context by providing a user-friendly and context-appropriate guidance tool.

[2] Vignesh, S., etc have found out that after students completing their higher secondary education, many of them worldwide grapple with the daunting task of choosing a suitable career path, often lacking the maturity to make informed decisions at the age of 18. This uncertainty persists as they contemplate their post-12th options and whether they possess the requisite skills for their chosen field. Our computerized career counselling system offers a solution by predicting the ideal department or career based on individuals' skills, assessed through an objective test. Completing this assessment within our system enables individuals to make more informed choices, reducing the chances of selecting an unsuitable career path and minimizing the risk of failure.

[3] Anand, A., etc have worked in the dynamic and uncertain corporate world, individuals often face the challenge of choosing the right career path. Our product aims to help users navigate this uncertainty by introducing them to various career domains. This approach takes into account crucial aspects of human behaviour, both conscious and subconscious, that shape one's attitudes and aptitudes. Our analysis employs Aptitude Tests, Psychometric Tests (including the Myers-Briggs Type Indicator - MBTI), and handwriting analysis. The combination of these three modules provides users with tailored career options, blending conscious answers from questionnaires with subconscious insights from handwriting analysis to ensure informed career decisions.

[4] Kiselev, P., etc their recent research has demonstrated the ability to forecast personality traits

by analysing social network data. This paper explores the underpinnings of social constructivism in the context of using machine learning for career guidance and extends our understanding of the significance of social networks in psychological research. To validate these theoretical foundations, the study calculates the AUC-ROC measure in the modelling of career [5] Herr, E. L. etc in this paper explores the evolving field of counselling, specifically within the realms of education, careers, and employment. It delves into counselling challenges in various settings, including schools, universities, businesses, industries, and communities, addressing issues such as unemployment, underemployment, career changes, and disabilities. It also highlights the growing understanding of how career counselling intersects with mental health, stress management, anger management, and overall behavioral well-being.

[6] Seng, K., etc developed a web-based Career Guidance and Employment Management System. CGEMS serves as a one-stop platform for students, job seekers, career advisors, consultants, and organizations to connect and collaborate. It offers users career-related tests and quizzes to help them discover suitable career paths based on their personalities. Additionally, companies and organizations can use CGEMS to post job descriptions when they are seeking employees.

[7] El Haji, E etc , has proposed a multi-expert system for educational and vocational guidance, employing a multi-agent approach that draws on diverse areas, including artificial intelligence. In this approach, a problem is distributed among agents that collaborate and communicate to solve it. The primary focus is on educational and career guidance, with expertise stemming from pedagogical, psychological, sociological, and economic sources. Additionally, two more experts, a coaching expert and a system supervisor, are introduced. The system functions as a decision support tool, aiding students and job seekers in constructing their career paths by considering various relevant factors.

[8] Shi, Y. R etc, has stated about the problem of availability of career guidance services in schools and government agencies, many college graduates still grapple with career choices. This study seeks to develop a digital game for career planning, leveraging the motivational and engaging aspects of gaming to guide individuals toward suitable career paths. The paper's goal is to assess the feasibility of such a career game and propose strategies for creating an effective game-based career guidance system.

[9] Shovon, M. H. I., etc has described about improving the academic performance of engineering and science students in their first year of university is a significant challenge, as it strongly influences their GPA. This study investigates factors like quizzes, exams, assignments, and lab work. It suggests sharing this information with instructors before final exams to reduce dropout rates and enhance student performance. The paper introduces a hybrid method using Decision Tree data mining and Data Clustering to predict students' GPAs, enabling instructors to take proactive steps in improving academic outcomes.

[10] Chuang, T. Y., etc, investigated the impact of computer-based video games on children's cognitive learning, comparing them to traditional computer-assisted instruction (CAI). The study involved 108 third-graders from Taiwan. The research aimed to determine if there were statistically significant differences in student achievement between two instructional approaches: traditional CAI and computer-based video games. The results revealed that playing computer-based video games not only improved fact/recall processes but also enhanced problem-solving skills by recognizing multiple solutions for problems.

[11] Gati, I., etc, studied about the predictive validity of the Making Better Career Decisions (MBCD) computer-assisted career decision-making system was examined. Telephone interviews were conducted with 70 clients who had used MBCD six years earlier to assess their current career satisfaction. Participants were divided into two groups: those whose chosen careers were recommended by MBCD and those whose choices were not recommended. Results showed that 84% of the recommended group were highly satisfied with their careers, while only 38% of the non-recommended group were highly satisfied. This suggests that MBCD's recommendations positively impacted career satisfaction, highlighting its predictive validity and potential benefits for career guidance.

[12] Schaub, M., etc, aimed to expand upon Social Cognitive Career Theory (SCCT). It investigated two main aspects: firstly, it explored how personality indirectly affects individual interests through the mediation of learning experiences and socio cognitive mechanisms. Secondly, it tested the hypothesis that

self-efficacy perceptions and outcome expectations are influenced by career-related learning experiences. The study involved 327 college students who completed assessments related to personality, learning experiences, self-efficacy, outcome expectations, and interests aligned with Holland's six RIASEC themes. The results showed that personality's influence on interests was mediated through learning experiences and socio cognitive mechanisms, with varying degrees of mediation. The study also found strong support for the relationships between learning experiences and self-efficacy across different themes, and in most cases, the connection between learning experiences and outcome expectations was partially mediated by self-efficacy perceptions.

[13] Na, S., Xumin, suggested a critical method in data mining, with a specific focus on the standard k-means clustering algorithm. It highlights the limitations of this algorithm, notably its inefficiency due to the repeated calculation of distances between data objects and cluster centers in each iteration. To address this issue, the paper introduces an improved k-means algorithm that utilizes a simplified data structure to store information for subsequent iterations, thus eliminating the need for redundant distance calculations. The enhanced method is shown through experiments to significantly boost clustering speed and accuracy while reducing the computational complexity of k-means.

[14] Lent, R. W etc, observed a Social Cognitive Career Theory about how personal cognitive factors influence career development while acknowledging external contextual factors. Despite its continuous research and practical applications, SCCT's contextual variables have been less explored. This article suggests exploring the concept of "career barriers" within SCCT, advocating for the study of both contextual barriers and supports, and proposing further research and practical directions focused on SCCT's contextual aspects.

[15] Vargas, J. C. G., etc, proposed that Vocational guidance's purpose is to help students choose their educational path, but many find existing tests inadequate. This document presents a system called KunaySoft, which considers various student characteristics like school environment, career expectations, learning styles, and personality types. It aims to offer personalized recommendations for different higher education programs, going beyond traditional tests and skills assessments. The document details the terms and development process of the KunaySoft system.

[16] Dunwell, I., etc, studied about the competitive global job market, understanding how short-term decisions impact long-term career prospects is crucial. This paper introduces an innovative approach to career guidance, using a serious game called 'MeTycoon.' It incorporates game elements like character development and decision-making, providing an engaging and visual way to explore career choices and their consequences. 'MeTycoon' was deployed online and evaluated with questionnaires among a UK audience, demonstrating promising user engagement with 38,097 website visits and 408,247 video views embedded in the game. An online survey of players (n=91) revealed that this approach, integrating educational elements seamlessly into gameplay, is seen as an intuitive way to facilitate learning, making it valuable for both learners and career professionals.

[17] Shi, Y. R., etc, suggested that, despite the availability of career guidance services in Taiwan's educational institutions and government agencies, a significant number of college graduates in the country still grapple with career decisions. This study seeks to address this issue by designing a digital game for career planning. Digital games are seen as a way to boost individuals' motivation and interest in exploring career options that align with their interests and abilities. The paper's goal is to assess the feasibility of such a career game and propose strategies for creating an effective game-based career guidance system.

[18] Sampson Jr, J. P., etc, did a study in the literature on career counselling and development was examined through an analysis of refereed journal articles published in 2013. The study sought answers to four key questions: the range of content topics covered, the degree of integration of theory, research, and practice, variations in article characteristics, and variations in content between theory, research, and practice articles. The analysis identified 360 unique topics in 357 articles from 24 journals. The findings revealed slow evolution in content topics and limited integration of theory, research, and practice. Implications were suggested for future research, improved integration, education, journal policies, and subsequent content analyses.

V. SOFTWARE REQIUREMENT SPECIFICATIONS

1) Introduction:

Advanced Caree Builder is a career development-based project that manages to help individuals pursue their dream and achieve their professional and personal goals. It maintains track records of their result and completed tasks to make the user have consistent practice. It gives updates on trends and changes happening in the field of profession of the user and a community platform that keeps them up to date.

2) Purpose:

The purpose of this project to is to create a utility platform with efficient features that can help an individual to fulfil their personal and professional requirements. It reduces the uncertainty and provides the optimizing skill development. It keeps the users informed and encourages goal-oriented habits that enhance their existing skills and helps to learn new ones. The project aims in helping the user to create a long-term career plan and break down their goals into manageable steps and milestones to keep them stay on track.

3) Scope:

The proposed model is designed to help students and graduates choose the most suitable career path through the use of technologies like Machine Learning, Artificial Intelligence, and Data Mining. By providing personalized guidance and support, the model can save users valuable time and effort in selecting the right career path. The AR content, community features and access to domain specific knowledge and news can enhance user’s learning experiences and provide them with opportunities to network with like-minded individuals. The model also encourages the deserving learners to experience VR internship. Overall, the proposed model has the potential to benefit users in making informed career choices and pursuing their professional goals.

4) Definitions:

- Career Guidance Platform: Refers to the software application being developed in this project, designed to assist high school students and graduates in making informed career choices and developing the skills necessary for their chosen paths.
- User Profile: A digital representation of a user within the Career Guidance Platform, containing information about the user's interests, skills, strengths, and long-term career goals.
- Machine Learning: A subset of Artificial Intelligence that involves the development of algorithms and statistical models that enable computers to improve their performance on a specific task through learning from data.
- Artificial Intelligence: The simulation of human intelligence processes by computer systems, including tasks such as reasoning, problem-solving, and learning.
- Data Mining: The process of discovering patterns, trends, and insights within large datasets through various techniques, often used for making data-driven decisions.
- Community Features: Functionalities within the platform that facilitate interactions and connections between users who share similar career interests.
- Progress Tracking: The system's capability to monitor and record user achievements and advancements in their career goals and skill development.

5) Acronyms:

- AI: Artificial Intelligence
- ML: Machine Learning
- UI: User Interface
- UX: User Experience

6) Abbreviations:

- hrs: Hours
- GB: Gigabytes

7) Technologies to be used:

- Mobile app development tools
- Artificial Intelligence and Machine Learning
- Data Storage and Processing
- Cloud Services
- Security tools
- Analytics and Monitoring
- Testing and Quality assurance

8) Tools to be used:

- Integrated development environments
- Database Management
- Design and prototyping tools
- Communication and collaborations

9) Overview:

The Advanced Career Builder is a platform to assist high school students and recent graduates in making informed career choices and effectively developing the skills required for their chosen career paths. Leveraging advanced technologies such as Machine Learning, Artificial Intelligence, Augmented Reality, Data Mining, this platform aims to provide users with the guidance, resources, and support they need to embark on successful career journeys.

10) System Functions:

The system functions of the project encompass a wide range of features and capabilities designed to meet the needs of its users. These functions are essential for providing personalized career guidance, skill development, community engagement, and access to learning resources. Here are the key system functions of the project:

- User Registration and profile creation
- User authentication
- Job assessment and analysis
- Community features
- Progress tracking
- Notifications and alerts
- Content management

11) User Characteristics:

- High school students
- Recent graduates
- Career explorers
- Varied skill levels
- Community seekers
- Goal-oriented

12) Constraints:

- Third party dependency
- Language diversity
- Changing technology landscape

VI. SYSTEM IMPLEMENTATION

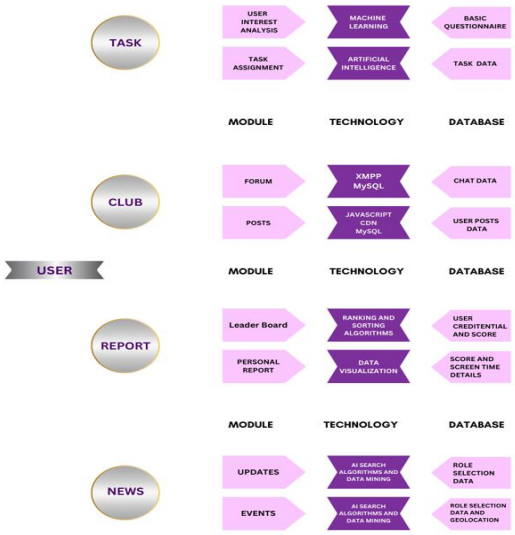

Fig.4
Figure 4 Architecture Diagram

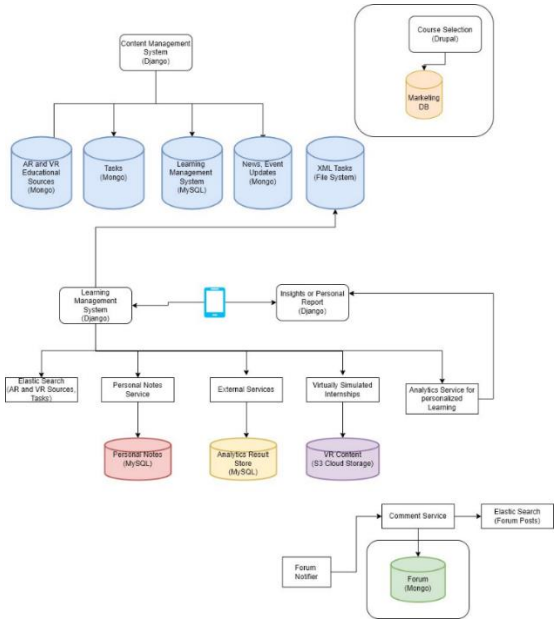

Fig .5
Figure 5 System flow of the application

Fig. 5

Figure 5 Business perspective of Advanced Career builder and it's requirements.

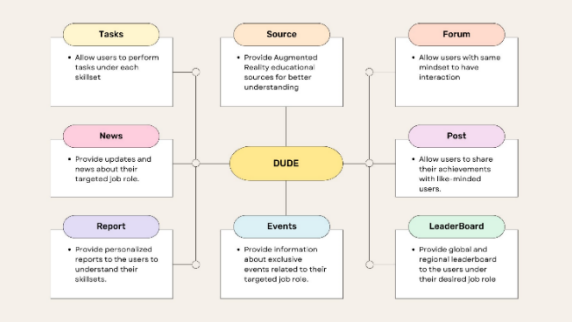

Fig.6
Figure 6 Mind map of the application

VII. CONCLUSION AND DISCUSSION

In conclusion, the model outlined in the abstract represents a promising solution to the perennial challenge of career selection and development. By integrating advanced technologies, personalization, community-building, and skill enhancement, it offers a comprehensive approach that has the potential to significantly improve the career outcomes and overall well-being of individuals in the corporate world. However, it's important to acknowledge potential challenges such as data privacy concerns and the need for continuous model improvement to ensure accurate career predictions. Nevertheless, as technology continues to advance, models like this one have the potential to play a transformative role in shaping the future of career development.

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