The AI Educators:
Requirements Report

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Mission Statement:

Our product is an AI-driven learning platform that will transform the way students acquire knowledge. The problem we identified was that : Traditional education often follows a one-size-fits-all approach, which can leave students struggling to reach their full potential.

Our product seeks to bridge this gap by seamlessly integrating with established educational platforms. Thus from the company perspective, the mission is to: Provide personalized learning to all who seek to learn using Artificial Intelligence

However from the product perspective, the mission is to:

"Create an AI-driven learning platform that will integrate with and upgrade the existing educational platform such that it adapts and personalizes based on each student's unique need and learning preference"

With our mission statements formed we can begin performing our requirements engineering processes. First we will analyze our stakeholders, drivers, and constraints, then we will perform the requirements analysis, elicitation and validation. To conclude we will document our feedback with potential customers.

Stakeholders:

1. Educational Institutions
   Educational Institutes will serve as the primary customer as they are the sponsors for this product. Every modern educational institute has two things : past records of students with utmost detail and an interface through which students can interact. Meaning all modern institutes already have data and software. We will be using this data to train our AI model and will be upgrading the existing software with our product.

2. Students
   Students will serve as one of the direct users and a favored user class. The product is catered to improve the learning experience of students. Students will benefit from AI assistance securely embedded within the platform.

3. Educators/Professors
   Educators/Professors will serve as one of the direct users and a favored user class. They will be able to customize the system to align with their unique teaching methods and objectives, allowing for a more tailored educational experience. Thus, they will have access to fine tune certain aspects of the model.

4. Parents/Guardians
   Parents/Guardians sponsor the education of their respective children and thereby will

serve as the indirect users of the product. Their use of the system will be infrequent at best however the product will enhance their experience as well, of understanding the in-depth growth/ development of their child though reports.

5. AI Developers/Engineers
   AI Developers/Engineers are individuals responsible for training the AI model as well as integrating it with the current platform. All control-flow logic and user interfaces will have to be developed and maintained by them.

6. Administrators
   As there are many users of the product, it becomes critical to provide access based on need-only to prevent misuse of the system. Administrators are individuals who will maintain the authentication and authorization process of the product so as to maintain security and integrity.

7. Regulatory Bodies
   Regulatory Bodies will be a group of individuals responsible for maintaining and ensuring that safeguards exist for the AI-driven platform. While training itself, certain red flags should be identified that are deemed harmful for a productive learning environment and the regulatory body will make sure that all such red flags are correctly identified and documented and the AI-platform does not generate any.

8. Technology Support Teams
   Technology Support Teams will be a group of individuals that will address any grievances with the platform. As the platform needs to be active throughout, they will work akin to any support team for an existing real-time online software.

9. Curriculum Designers
   Curriculum Designers are individuals responsible for ensuring the curriculum is upgraded to reflect AI assistance. They will either create new interactive elements from the existing curriculum or tweak the curriculum in a way that makes it more approachable. Solutions by the AI model can be verified by Curriculum Designers.

Key Drivers:

Drivers highlight the underlying motivation or the key factors that become a driving force in the creation of the project. Some of these drivers are listed below

Personalization: Ability to personalize learning using AI is the primary driver which includes -

- Adaptive learning: We need to tailor content and pace to individual student needs, strengths, and weaknesses.

- Microlearning: Microlearning occurs when the system delivers bite-sized, relevant content that fits busy schedules and attention spans.
- Skill-based recommendations: The platform should suggest resources and pathways based on individual learning goals and progress.

Empowerment of educators: It should be helpful for the educators to teach using the platform

- Automated tasks and workflows: The platform should help in freeing up teachers' time for personalized interaction and support.
- Data-driven insights: The AI-enabled platform should provide teachers with actionable data on student performance and learning gaps.
- Collaboration tools: Facilitate communication and resource sharing among educators.

Seamless integration: The platform needs to integrate and upgrade the existing platform

- Easily connecting with existing learning platforms and educational ecosystems.
- No additional hardware requirement at users end to access the upgraded platform
- The user experience should only improve on using the new interface

Cost-effectiveness: Create pricing structure such that it is affordable to all

- Offering affordable access for schools and families.
- Reduce the global digital divide among the rich and the poor in access to education
- Multiple price tiers to cater to as many people as possible.

Scalability and accessibility: The platform should be scalable on-demand and accessible for all

- Should cater to diverse learning needs and contexts
- Should be accessible with minimum or no additional hardware
- Provide unbiased and ample opportunities to all strata of society

Key Constraints:

1. Budgetary Constraints:
   We don't have a lot of money for the project. This means we need to be careful about what features we can include. We have to prioritize and spend our funds wisely to make sure the important things get done.

2. Regulatory Compliance:
   We have to follow certain rules about keeping data safe. This is really important. We not only need to make sure we're following the rules at the start, but we also have to keep checking and updating things to stay in line with any new rules that come up.

3. Resistance to Change:

Some people might not like the idea of using a new way of teaching with AI. They're used to the old methods. So, we have to help them see the benefits, teach them how to use the new system, and make sure they feel comfortable with the changes.

4. Technological Infrastructure:
    Our new AI system needs to work well with all the different devices and systems that schools are already using. We need to make sure everything fits together smoothly. This might take some testing and planning to get it right.

5. Training and Adoption:
    Not everyone might know how to use our AI system right away. We need to make it easy for them to learn. This includes creating simple interfaces and providing training so that teachers and students can use the system without too much trouble.

User Requirements:

1. Career and Skill Mapping (Key User Requirement):
    Choosing a career is a big deal, and we want to make it easier for you. Our platform not only helps you identify your strengths and weaknesses but also provides guidance on how to improve your skills. We're here to assist you in finding a career path that not only suits your abilities but also aligns with your dreams and goals.

2. Mental Wellbeing and Illness Tracking:
    Your mental health is essential, and we take it seriously. Our platform goes beyond just tracking your emotions – it's a tool to monitor your overall mental wellbeing. If you're not feeling your best, we aim to provide support and resources to help you through challenging times.

3. Parental Engagement Tools:
    Being a parent comes with its own set of challenges. Our platform offers tools specifically designed to enhance your involvement in your child's education and activities. We believe that strong parental engagement is crucial for a child's development, and we want to make it as convenient and effective as possible.

4. Gamified Learning Modules (User Requirement):
    Learning doesn't have to be boring! Our platform incorporates gamified learning modules, turning education into an interactive and enjoyable experience. These games are designed to teach you new things while keeping you entertained, making the learning process more engaging and effective.

5. Global Language Support (User Requirement):
    We understand that language should never be a barrier. Our platform proudly supports a variety of languages from across the globe. Whether you speak English, Spanish,

Mandarin, or any other language, we want to ensure that our platform is accessible to you. Your comfort is important to us, regardless of where you come from.

Business Requirements:

1. Lifelong Learning and Career Pathways Integration (Key Business Requirement):
● Ensure that our platform features seamlessly connect educational content with evolving career pathways and lifelong learning trends.
● Make sure the content stays relevant for users of diverse age groups, including those outside traditional school environments.

2. Accessibility:
● Focus on making our platform easily accessible to all users, regardless of their background, abilities, or location.
● Strive to create an inclusive environment where everyone can benefit from the educational content and features.

3. Global Digital Divide Reduction Initiatives:
● Implement initiatives to bridge the global digital divide, aiming to provide equal access to digital resources and educational opportunities for users worldwide.
● Work towards reducing disparities in digital access and ensuring a more equitable distribution of educational resources.

4. Data Security and Compliance:
● Prioritize the security of user data by implementing robust data security measures and ensuring compliance with relevant regulations and standards.
● Maintain a high level of data protection to build trust among users and adhere to legal requirements regarding data privacy and security.

5. Scalability:
● The system should be able to grow and handle an increasing number of users, courses, and educational institutions without slowing down or encountering technical issues.
● Scalability should extend to different sizes and types of educational institutions, ensuring that the platform is useful for small schools as well as large universities.
● Flexibility in accommodating future expansion plans, such as adding new features or adapting to emerging educational trends, is crucial for long-term success.

6. Partnership Integration:
● The system should seamlessly connect with existing educational tools commonly used in schools, making it easy for educators to incorporate our platform into their teaching methods.

- Integration should not disrupt the workflow of educators, and the platform should complement and enhance the functionalities of other tools, creating a cohesive and efficient educational ecosystem.
- Collaboration with other educational technology providers should be facilitated, fostering a network that benefits the entire education community.

7. Monetization Strategy:
- A sustainable plan for development and maintenance should consider various revenue streams, such as subscription models, licensing fees, or partnerships with educational institutions.
- Pricing models should be transparent and fair, ensuring that the platform remains financially viable for both users and the development team.
- The strategy should allow for adaptability, enabling adjustments based on user feedback, market changes, and evolving needs within the education sector.

8. Compliance Management:
- Beyond initial compliance, the system should have a proactive approach to staying updated on data security regulations and privacy laws.
- Regular audits and assessments should be conducted to identify and address any potential compliance issues promptly.
- Clear communication with users about how their data is handled and protected is essential for building trust and maintaining a strong reputation regarding compliance.

9. Marketing and Outreach:
- A comprehensive strategy for platform promotion should include targeted marketing campaigns that highlight the unique benefits and features of the system.
- Outreach efforts should extend to educational conferences, online forums, and partnerships with educational influencers to increase visibility within the education community.
- Ongoing engagement with users through social media, newsletters, and other communication channels should be part of the strategy to build a strong user community and gather valuable feedback for continuous improvement.

System Requirements:

1. AI Driven Content Adaptation :
AI algorithms for the application should dynamically adapt and curate content based on these points : cultural context, learning preferences, and performance metrics. In cultural context, the AI system should understand different languages, religious beliefs, and historical context. For example, our AI system will present history lessons differently to students in different countries, reflecting their unique cultural perspectives and histories. In learning preferences, every learner has a unique style and pace of learning. Some might prefer visual aids, while others might find auditory explanations more effective. The AI system will be capable of identifying these preferences, either through direct input from the user or by analyzing their interaction patterns,

and then adapting the content accordingly. In performance metrics, our AI system will utilize performance metrics to continually improve the learning experience. This involves tracking the learner's progress, understanding their strengths and weaknesses, and then curating content to challenge and support them appropriately.

2. Interoperability:
In order to offer consumers a smooth experience, the system will guarantee interoperability across a range of devices, operating systems, and browsers. To achieve interoperability, we plan comprehensive testing to be carried out on a variety of platforms, including laptops, smartphones, tablets, and operating systems, including Windows, iOS, and Android, as well as browsers, including Chrome, Firefox, and Safari.

2. AI Algorithm Accuracy:
To ensure that the AI algorithms are more accurate over time and provide better customisation for consumers,we will do regular upgrades. We will be using feedback loops and machine learning approaches to adapt to changing data patterns and user preferences. Along with this we intend on implementing a systematic methodology for continuous improvement that involves regular updates to the AI algorithms, which will help achieve higher accuracy.

3. Real-time Analytics:
The system will be able to track user involvement, track the progress of learning, and evaluate the overall system performance in real time. We will use analytics tools to collect and analyze data on user interactions, learning outcomes, and system responsiveness for this purpose. This will aid in the provision of an easy-to-use dashboard for administrators to monitor and interpret real-time analytics.

5. Offline Capability:
The system will include features that allow users with limited internet access to continue using essential functions even when they are not connected to the internet. Implement offline capabilities by allowing for local storage of critical data and functions. When the system reconnects to the internet, it will ensure that synchronization capabilities are available to update any changes made offline and provide users with clear indications of the offline status and any functional limitations. Perform extensive testing to validate the system's performance in offline mode.

<u>Security Requirements:</u>

1. Real-time Threat Detection and AI-powered Response Systems:
We plan to employ artificial intelligence and machine learning techniques to continuously monitor and identify potential security risks in real time. This technology will act like an advanced, vigilant system, quickly pinpointing any unusual or threatening activities. Upon detecting such threats, it will automatically initiate protective measures or alert the relevant authorities.

2. Data Encryption:
End-to-end encryption will be used by the system to guarantee complete protection of all data transferred across the platform. All sensitive user data, such as contact information and learning progress, must be encrypted using cryptographic techniques that are accepted in the industry. To reduce the possibility of unwanted access, encryption keys and algorithms used for data protection must follow the most recent security guidelines.

3. Identity Verification:
The identity of users gaining access to the platform will be confirmed through the use of a multi-factor, secure authentication system. Robust cryptographic protocols will underpin user authentication, guaranteeing that only authorized personnel can access confidential educational information. The platform will incorporate features like secure tokens or biometric authentication to improve user identity verification.

4. Access Control:
In order to control user access based on roles and permissions, strict access controls will be implemented. Teachers, administrators, and students will all have different levels of access, and the system will make sure that each user can only see the data that is pertinent to their position. To stop illegal access to private information and features, role-based access control (RBAC) systems will be put in place.

5. Ethical AI Monitoring Framework
We will create a framework that will keep a regular check on AI algorithms. This will make sure that the AI stays fair, ethical, and helpful for learning purposes. It will involve checking these algorithms regularly to fix any unfairness or issues that don't match educational goals. The aim is to make sure AI tools used in schools and colleges are trustworthy and useful.

Our AI-driven learning platform prioritizes the confidentiality, integrity, and availability of user data in order to create a safe and reliable learning environment for both educators and students. By adhering to these security requirements, we hope to revolutionize education.

Quality Requirements:

Consistent Learning Outcomes Across Diverse Groups:
Ensure that the platform delivers consistent and equitable learning outcomes across diverse groups of users, irrespective of their background, location, or learning capabilities. The platform will be highly accessible to the supporting users with different abilities, including those with disabilities. The performance of the platform will be consistent across varied environments, ensuring reliable functionality irrespective of geographical location or internet connectivity quality.

Resilience to Technological Changes:
The AI-platform platform needs to be built in a way that it can easily adjust to new and changing technologies. This means it will be flexible and ready to embrace future tech advancements,

keeping it useful and up-to-date for a long time. By staying adaptable, the platform will keep working well for its users and remain competitive as technology keeps evolving.

Performance Optimization:
To give users a smooth learning experience, the AI-driven learning platform will place a high priority on ongoing performance optimization. The system will be built to function well, guaranteeing quick response times and efficient use of available resources.To avoid slowdowns, system resource usage will be continuously checked and optimized.

Scalability Testing:
The learning platform is subjected to regular scalability testing to determine its ability to handle increased user loads. This will ensure that the system remains stable and responsive as the number of users increases.

User Support Services:
The AI-learning platform will offer quick and efficient support services to deal with any problems that users might run into while learning. This will guarantee a satisfying user experience and prompt resolution of any problems that may arise.

Requirement Elicitation Process:

Phase 1 : Deciding Scope and Agenda
During the initial stage of our requirement elicitation process for the AI-driven learning platform, we strategically outlined the scope of our investigation. Our primary objective was to assess market interest in our innovative platform and gain insights into the specific features and functionalities sought after by educators and students.In preparation for this strategic exploration, we crafted a set of interview materials. These materials included tailored questions and prompts aligned with our research objectives. Furthermore, we developed a presentation that introduced the company's mission, the unique purpose of our AI-driven learning platform, and the high-level functionalities that distinguish our product.

Phase 2: Strategic Elicitation Activity - Interviews
For the second phase, we selected key participants, including educators and students, to provide diverse perspectives. Conducting structured interviews allowed us to extract valuable insights into the current challenges faced, and expectations for an innovative learning solution. Throughout these interviews, we assessed interest and adoption, delving into potential concerns or barriers to adoption. Simultaneously, we elicited precise requirements from educators and students, focusing on teaching methodologies, content delivery, assessment strategies, and personalized learning needs

Phase 3: Follow up after Elicitation :
In the last step, we carefully wrote down all the answers and feedback from each interview. We paid attention to common themes, preferences, and special insights shared by everyone. We

then did a smart analysis of all the information to find patterns and trends. We organized the requirements based on their importance and decided which features would make the biggest difference in the learning experience.The final report summarized everything we found, including a list of the most important requirements and important insights.

Requirement Validation and Analysis:

After the completion of the elicitation phase our focus shifted to requirement validation and analysis. In this phase we ensured that the gathered insights align seamlessly with the company's goals and objectives. This Validation ensures that what we learned accurately represents what stakeholders need are and aligns with our plan. We check each requirement against our initial goals and mission. Every requirement is carefully examined to make sure it's doable, relevant, and supports the AI learning platform's goals. We also got feedback from stakeholders(people within our team) to confirm accuracy. Issues raised were discussed and refined, ensuring validated requirements which will act as a strong foundation for the next development stages.

After validation, we thoroughly analyzed the requirements to gain insights for development. This involves categorizing them based on importance, feasibility, and impact. Prioritization is a key aspect of this phase, we identified the critical features that align most closely with the company's vision. The patterns and trends identified during our analysis helped in shaping the strategic direction. This direction serves as the blueprint for subsequent development, ensuring alignment with strategic goals and the company's mission.

User Feedback:

1. Siddharth - Roommate
He emphasized the importance of a user-friendly interface. As a student himself, Siddharth gave many examples of last minute submissions. Hence the AI upgrade should not hamper the user experience by complicating the interface.
2. Anurag's Mother - Family
She highlighted the need for adaptability to various teaching methodologies. As an educator, she provided the valuable insight that there are various teaching styles as well. Personalization is possible in this regard too.
3. Shivam - Classmate
He stressed the significance of robust data security features. Most educational institutes become the target of cyberattacks and as such having an AI-driven platform could lead to sensitive data leak.
4. Shanky - Friend
He advocated for seamless integration with existing systems. Most educational institutes have an existing interface hence integration as opposed to migration seems more feasible.
5. Kartik - Friend
He provided insights into compliance management and ethical considerations.