

# Engineering Design & Management

## AI 益友

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## 1) The Problem and The Solution

Getting accepted to a university after your high school education has become a basic necessity in the world especially among the students and their parents. Students study hard to get accepted to a good university with tons of hopes and also to have a good, fun, memorable college life. But one thing that they all forget or ignore because they don't even like to think about it is none other than the very competitive exam system in colleges. Studies show that 8 out of 10 college students experience frequent stress. This stress occurs mainly due to final and mid term examinations, high competition among colleagues, GPA, pressure from your family members and relatives and your self doubt. Students can reduce this stress a lot if they actually perform well in the class by securing a good GPA.

But how can they do this? Not all the students are equally smart and talented and not all the students can graduate with a first class degree. Some students are just gifted with good brains, while some students can't do anything without extra support. Generally when it comes to the university sector, almost all the students need that extra support, guidance and assistance to perform well in the class. But now the next problem is who is there to offer that extra support whenever they are in need?

This is why you need someone like AI 益友.

## 2) The Product and the Process

AI 益友 is an intelligent task-specific chatbot designed to assist university students in China with understanding their subjects, studying effectively, and preparing for their careers after college. This chatbot utilizes Reinforcement Learning from Human Feedback (RLHF), Knowledge Space Theory (KST) Instruction turned LLM, and a vast database of Chinese university materials to provide personalized study materials, exam sample questions, Yanki card creation and mind maps.

By analyzing students' uploaded materials, requirements, and knowledge states, AI 益友 identifies knowledge gaps and generates tailored content to help students enhance their learning experience.

### Process





# Set up your profile

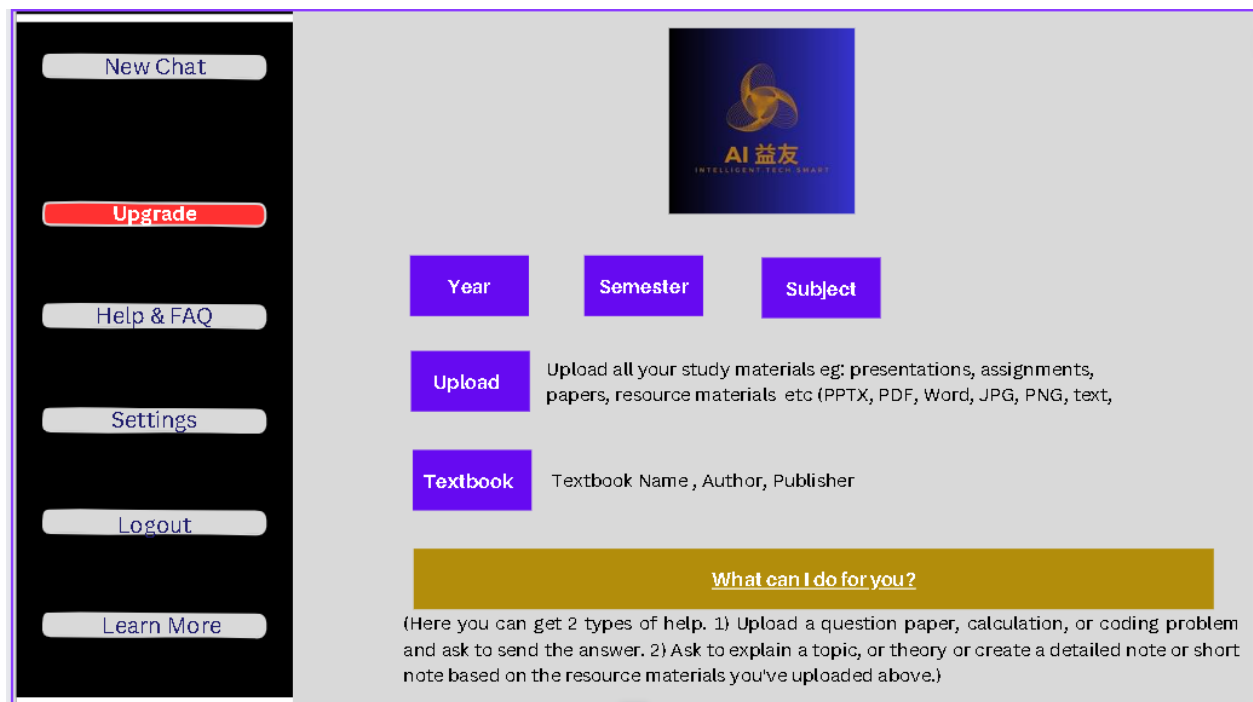
Submit

- Full Name: \_\_\_\_\_
- Date of Birth: \_\_\_\_\_
- Country of Residence: \_\_\_\_\_
- Nationality: \_\_\_\_\_
- Level of Education: \_\_\_\_\_
- University: \_\_\_\_\_
- Major: \_\_\_\_\_
- Year Joined: \_\_\_\_\_
- CGPA: \_\_\_\_\_
- Graduation Year: \_\_\_\_\_

It is very important to fill your profile details properly with real information. This user data helps the chatbot to get a clear picture of you and it directly helps when generating personalized study materials that fits well with the user’s knowledge level.

When talking a little bit about the resources uploaded by the users, this AI益友 chatbot can learn and remember everything in these resource materials. After the task is done, and if the user is not using those soft copy resource materials anymore for a month, those will be deleted automatically after 30 days.

In fact, AI益友 has 2 phases. Data gathering phase and the responsiveness phase. The data gathering phase is known as pre pre-training phase and the user responsiveness phase is known as interference. The secret to generative AI’s success and the reason it has suddenly taken off is the abrupt discovery of pre-training’s exponential scalability. Recent advancements in cloud computing and inexpensive hardware technology have made this scaling possible.



**AI益友 chatbot interface**

AI益友 model has used unsupervised learning during the process of pretraining. Since the developers don't need to know or compare the output with the predicted values, all they have to do is dump more and more information into the AI益友 pre-training mechanism, which is called transformer-base language modeling.



### 3) Technology, Research and Development

Research on technology research and development would involve staying updated on the latest advancements in artificial intelligence, natural language processing, machine learning, and related fields. This would help in identifying opportunities for enhancing the capabilities of AI 益友, improving its performance, and incorporating new features or functionalities. Research should also focus on any potential legal or ethical considerations related to the use of AI in education and ensure compliance with relevant regulations.

The development of AI 益友 involved extensive research to understand the specific needs of university students in China and their challenges in comprehending complex subjects. The chatbot's design plan focuses on leveraging cutting-edge technologies, such as RLHF and KST, to provide personalized and adaptive learning experiences. The integration of a comprehensive database of university materials ensures that AI 益友 can cater to various departments and majors.



#### 4) Impact of Chinese university students

China is a country that keeps on experimenting with the latest tech and makes sure that every citizen uses those facilities.

According to Statistica, the digital literacy rate in China is 94.11%.

Chinese college students are already using the latest technology in their studies. So this is just another irreplaceable addition which will actually provide value and help students to understand their subject matter.

AI 益友 has the potential to revolutionize the learning process for Chinese university students. By providing personalized study materials and exam sample questions, the chatbot empowers students to grasp complex subjects more effectively. Additionally, the mind map generation feature helps students organize their knowledge and improve information retention. Universities partnering with AI 益友 can enhance their students' learning outcomes, attract more prospective students, and strengthen their position in the education sector.



## 5) Innovation and Entrepreneurial Potential

AI 益友 exhibits significant potential for innovation and entrepreneurship in China. Its ability to analyze students' knowledge states and identify knowledge gaps sets it apart from traditional study materials and tutoring services. The chatbot's personalized content generation, exam preparation assistance, and sample questions, MCQs, model questions, mind maps and Yanki cards creation offer a unique and valuable learning experience.

By partnering with universities in China, AI 益友 can establish itself as a pioneering educational technology solution, enhancing the reputation and competitiveness of both the chatbot and the partnering institutions.



## 6) Industrial Application and Development Values

AI 益友 holds significant industrial application potential in the education technology sector. By incorporating state-of-the-art AI techniques and leveraging a vast database of university materials, the chatbot can adapt to different subjects, majors, and learning styles.

Its development values lie in promoting accessibility, efficiency, and personalization in education. The chatbot fosters lifelong learning habits, equips students with essential skills, and prepares them for their careers, aligning with the demands of the modern knowledge economy.

### The annual birth rate in china Vs the students who go to universities every year in china

In general, the birth rate and the number of students attending universities can have an inverse relationship. A higher birth rate can result in a larger pool of potential university students, while a lower birth rate may lead to a smaller cohort entering higher education.

If the birth rate in China is declining, it is possible that the number of students going to universities might also decrease in the future. However, other factors, such as government policies, investments in education, and the demand for skilled workers, can influence the number of students attending universities and may counterbalance the effects of declining birth rates.

## 7) Advantage Analysis


AI 益友 offers several advantages for university students, university lecturers, and the universities themselves:

### Advantages for University Students:

- 1. Personalized Assistance:** AI 益友 provides personalized study materials, exam sample questions, and content tailored to each student's individual needs and knowledge gaps. This personalized approach helps students enhance their learning experience and improve their understanding of the subjects they are studying.
- 2. Effective Studying:** By analyzing students' uploaded materials, requirements, and knowledge states, AI 益友 can identify knowledge gaps and provide targeted content to fill those gaps. This helps students study more effectively and efficiently, focusing on areas where they need the most help.
- 3. Enhanced Exam Preparation:** With access to a vast database of Chinese university materials, AI 益友 can generate exam sample questions and provide practice materials that align with the specific curriculum and requirements of the students' courses. This enables students to prepare effectively for exams and improve their performance.
- 4. Study Organization Tools:** AI 益友 offers features like Yanki card creation and mind maps, which can help students organize and consolidate their learning materials. These tools assist in structuring information, making connections between concepts, and promoting effective information retention.

### Advantages for University Lecturers:

- 1. Automated Feedback and Assessment:** AI 益友 can provide automated feedback on student assignments, quizzes, or exams. This saves time for lecturers by reducing the need for manual grading and allows them to focus on providing more targeted and in-depth feedback to students.



**2. Knowledge Gap Identification:** By analyzing students' uploaded materials and knowledge states, AI 益友 can help lecturers identify common knowledge gaps or misconceptions among students. This information can guide lecturers in addressing these gaps during lectures or providing additional resources to support student learning.

**3. Improved Teaching Materials:** AI 益友's vast database of Chinese university materials can serve as a valuable resource for lecturers when developing course materials. They can access a wide range of content, including study materials, sample questions, and relevant references, to enrich their teaching materials and improve the overall quality of instruction.

#### **Advantages for Universities:**

**1. Enhanced Learning Outcomes:** By providing personalized assistance and targeted content, AI 益友 can contribute to improved learning outcomes for students. This can positively impact the reputation of the university and attract prospective students seeking effective and personalized learning experiences.

**2. Data-Driven Insights:** AI 益友 collects and analyzes data on students' learning progress, knowledge gaps, and performance. Universities can utilize these insights to gain a deeper understanding of student needs, identify areas for curriculum improvement, and make data-driven decisions to enhance the quality of education.

**3. Efficient Resource Allocation:** AI 益友's automated feedback and assessment capabilities can help optimize the allocation of teaching resources. Lecturers can focus on providing more personalized and targeted support to students, while the chatbot handles routine tasks such as grading and basic feedback.

Overall, AI 益友 offers advantages to university students, lecturers, and universities by providing personalized assistance, improving study effectiveness, enhancing exam preparation, automating feedback and assessment, identifying knowledge gaps, and offering data-driven insights for continuous improvement in teaching and learning.

## 8) Profitability and Market Potential

The Chinese market offers significant profitability and market potential due to several factors:

- 1. Large Consumer Base:** China has the world's largest population, with over 1.4 billion people. This vast consumer base provides a tremendous market potential for businesses across various industries.
- 2. Rising Middle Class:** China's middle class has been rapidly expanding, leading to increased purchasing power and disposable income. This creates opportunities for businesses to cater to the growing consumer demands and preferences of this affluent segment.
- 3. E-commerce Boom:** China has experienced a massive growth in e-commerce, with platforms like Alibaba's Taobao and JD.com dominating the market. This trend provides businesses with access to a vast online consumer market and enables efficient distribution and marketing channels.
- 4. Technology and Innovation:** China has become a global leader in technology and innovation, particularly in areas such as e-commerce, fintech, artificial intelligence, and electric vehicles. Businesses that leverage and align with China's technological advancements can tap into a dynamic and competitive market.
- 5. Urbanization and Infrastructure Development:** China's ongoing urbanization and infrastructure development initiatives continue to drive economic growth and consumer demand. Emerging cities and regions present untapped market opportunities for businesses looking to expand their presence.
- 6. Government Support and Policies:** The Chinese government has implemented various policies to promote domestic consumption, encourage foreign investment, and support innovation and entrepreneurship. These initiatives can provide favorable conditions and incentives for businesses operating in the Chinese market.

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## 9) Advertising and Marketing


When promoting AI 益友 among university students, lecturers, and universities in China, we have developed a comprehensive advertising and marketing strategy.

**1. Targeted Digital Marketing:** Utilize digital channels and platforms that are popular among the target audience, such as social media (WeChat, Weibo, Douyin), education-focused forums, and university websites. Create engaging content, including informative articles, videos, and testimonials, highlighting the benefits and features of AI 益友. Consider leveraging influencers or key opinion leaders in the education field to endorse the chatbot.

**2. Collaborations with Universities and Lecturers:** Establish partnerships with universities and lecturers to gain credibility and reach a wider audience. Offer free trials or demos of AI 益友 to lecturers, allowing them to experience the chatbot's benefits firsthand. Conduct workshops or presentations at universities to showcase how AI 益友 can enhance student learning and teaching effectiveness.

**3. Campus Ambassadors and Student Referral Programs:** Recruit campus ambassadors who can promote AI 益友 within their universities. Provide them with exclusive benefits, incentives, or discounts to encourage them to spread the word among their peers. Implement a referral program that rewards students for referring their friends or classmates to use AI 益友.

**4. Content Marketing and Thought Leadership:** Develop a content marketing strategy that focuses on providing valuable educational content to students and lecturers. Create blog articles, podcasts, or video series that address common challenges faced by university students and offer practical tips for academic success. Establish AI 益友 as a thought leader in the field of



educational support and provide valuable insights on studying techniques, exam preparation, and career development.

5. **Participate in Education Events and Conferences:** Attend education-focused events, seminars, and conferences in China to showcase AI 益友's capabilities. Consider sponsoring or organizing workshops, panel discussions, or presentations related to educational technology and student success. Engage with attendees and collect feedback to continuously improve and refine the chatbot's features.

6. **Online Advertisements and Search Engine Optimization (SEO):** Invest in targeted online advertising campaigns using platforms like Baidu, China's leading search engine, and other popular online channels. Optimize your website and content to rank higher in search engine results for relevant keywords related to educational support and student success.

7. **Testimonials and Reviews:** Gather testimonials and positive reviews from students, lecturers, and universities that have benefited from using AI 益友. Feature these testimonials prominently on your website, social media platforms, and marketing materials to build trust and credibility among the target audience.




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## 10) Management System

- 1. User Management:** The management system should include user authentication and access control mechanisms to handle user registration, login, and account management. This ensures that only authorized users, such as university students and lecturers, can access and utilize AI 益友's features.
- 2. Content Management:** The management system needs to handle the organization, storage, and retrieval of the vast database of Chinese university materials. It should support efficient indexing, tagging, and search functionalities to enable quick and accurate content retrieval based on user needs.
- 3. Data Analysis and Processing:** AI 益友 relies on data analysis and processing to understand users' knowledge states, identify knowledge gaps, and generate tailored content. The management system should handle the processing and analysis of user data, ensuring data privacy and security while also employing appropriate data anonymization techniques.
- 4. Learning Algorithms and Models:** The management system should incorporate the learning algorithms and models used by AI 益友, such as Reinforcement Learning from Human Feedback (RLHF) and Knowledge Space Theory (KST) Instruction turned LLM, transformer based language modeling, NLP, and transfer learning. This facilitates the training, updating, and deployment of these algorithms and models to enhance the chatbot's performance and accuracy.
- 5. Feedback and Improvement Loop:** The management system should support the collection and analysis of user feedback, including ratings, reviews, and suggestions. This feedback loop is crucial for identifying areas of improvement, refining the chatbot's functionality, and enhancing the user experience over time.
- 6. System Monitoring and Maintenance:** The management system includes monitoring capabilities to ensure the smooth operation of AI 益友. It tracks system performance, uptime, and user engagement metrics to identify any





issues or bottlenecks and take proactive measures for maintenance and optimization.

7. **Integration and Scalability:** The management system allows for integration with other university systems, such as learning management systems (LMS) or student information systems (SIS). It is also designed to scale effectively to handle increasing user demand, data volume, and feature expansion as the user base grows.

8. **Administration and Support:** The management system provides administrative tools for system administrators to manage user accounts, handles user support requests, and performs system configurations. It should also include mechanisms for handling user inquiries, providing timely support, and addressing technical issues.



## 11) Finance

The financial aspect of AI 益友's operations are carefully managed to ensure sustainability and profitability. Here are some key considerations:

**Revenue Generation:** AI 益友 can generate revenue through various channels, such as subscription fees, licensing agreements with universities, or partnerships with educational institutions and by issuing shares.

**Cost Management:** The cost management system has tools and processes for tracking and managing the costs associated with AI 益友's development, maintenance, and infrastructure. This includes expenses related to technology infrastructure, research and development, personnel, marketing, and ongoing updates.

**Business Partnerships:** Collaborating with universities and educational institutions can provide financial support through partnerships, funding, or grants. Establishing strategic alliances with relevant organizations in the education sector can help expand AI 益友's reach and generate additional revenue streams.

**Investment and Funding:** Depending on the scale of AI 益友's operations and growth plans, seeking investment or funding from venture capitalists, angel investors, or government programs can provide the necessary capital to fuel expansion and innovation.

**Financial Planning and Forecasting:** Planning to develop a comprehensive financial plan that includes revenue projections, cost estimates, and cash flow analysis. Regularly reviewing and updating the financial forecast to monitor



the financial health of AI 益友 and making informed decisions regarding pricing, resource allocation, and investment strategies.

**Compliance and Legal Considerations:** Ensuring compliance with relevant financial regulations and tax requirements. Seeking legal advice to understand any legal obligations, intellectual property protection, and data privacy and security regulations that may impact AI 益友's operations.



## 12) Conclusion

AI 益友 is a promising educational technology solution designed to support Chinese university students in their learning journey. By providing personalized study materials, exam preparation assistance, and knowledge organization tools, AI 益友 aims to reduce stress, improve academic performance, and enhance learning outcomes.

Through continuous research and development, AI 益友 leverages cutting-edge technologies like RLHF and KST to deliver a unique and adaptive learning experience. Its potential impact on Chinese university students is significant, offering valuable support, promoting digital literacy, and revolutionizing the learning process.

AI 益友's innovation and entrepreneurial potential are evident, with opportunities for partnerships with universities and expansion in the education technology sector. The industrial application and development values lie in promoting accessibility, efficiency, and personalization in education, aligning with the demands of the modern knowledge economy.

The Chinese market provides a lucrative opportunity for AI 益友.