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Research on the Design of an AI Career Path Recommendation System Based on MBTI from a Cross-Cultural Perspective

Yizhou Zhou[1], Yong Zhang[2], Sijia Yu[3], Naijie Liu[4]

National University of Singapore, Singapore 119077

Abstract: In the process of globalization, personalized career planning within a cross-cultural context has become a challenge, especially when seeking a balance between diverse cultural values and educational systems. This study aims to explore how to provide customized career planning advice in a cross-cultural environment through the design of an AI career path recommendation system based on the Myers-Briggs Type Indicator (MBTI). Utilizing artificial intelligence technology, and leveraging the large language model of OpenAI's ChatGPT combined with big data analysis, the system proposes career paths that align with users' MBTI types, academic backgrounds, grades, and hobbies, in accordance with their personal and cultural backgrounds. By integrating MBTI personality analysis, the research emphasizes the importance of understanding individual tendencies and cultural values in career planning and demonstrates the potential of AI in promoting cross-cultural career planning and educational pathway choices. The development of this system not only provides scientific and systematic support for users to explore suitable career paths but also showcases its effectiveness and innovation in practical application through case analysis. This, in turn, advances individuals' pursuit of personalized and meaningful career development in diverse cultural environments.

Introduction

Amidst the tides of globalization, individuals face the challenge of planning their career paths within diverse cultural backdrops. This demand for cross-cultural career planning necessitates not only a profound understanding of varying cultural values and educational systems but also the provision of personalized career advice that meets unique personality traits and vocational inclinations[1]. Recent years have seen the rapid development of artificial intelligence (AI), with AI-driven career recommendations emerging as a novel trend. Particularly, the Myers-Briggs Type Indicator (MBTI), a widely recognized tool for personality assessment, has been increasingly explored for its application in personalized career planning[2].

This study aims to design an AI career path recommendation system integrating the MBTI personality test and AI technology. By combining MBTI personality analysis and AI algorithms, and incorporating OpenAI's ChatGPT API interface, the system is dedicated to providing users with career path suggestions that align with their personality types, academic backgrounds, grades, and interests. Research by Yanti et al. demonstrates how the application of MBTI assessments, coupled with a rule-based system, can offer customized career path recommendations for individuals of different personality types, affirming the value of MBTI in personalized career planning[3]. Our system further expands on this concept by utilizing advanced AI technology for efficient processing and analysis of extensive career-related data, thus delivering more precise and personalized career recommendations.

The core functions of the system include the input of users' personal information and MBTI results, as well as the generation of a list of career suggestions based on AI algorithms. Additionally, the system pays special attention to cross-cultural adaptability, aiming to understand and reflect the career planning needs of individuals from diverse cultural backgrounds. In this way, our system not only provides career advice but also facilitates a deeper understanding of individuals' personality traits and vocational preferences, offering scientific and systematic support for their career planning.

System Design Framework

The AI career path recommendation system developed in this study is geared towards providing users with personalized career advice based on the MBTI personality test, incorporating the latest trends in international economic development and technological advancements[4]. The system's design and implementation encompass data collection, processing, and recommendation algorithms based on up-to-date career data, with a

special emphasis on cross-cultural perspectives and real-time updates to ensure the accuracy and timeliness of the recommendations.

The technical architecture of the system comprises the following key components:

1. Data Collection: The system gathers basic user information through online questionnaires, including MBTI type, educational background, and career interests.

2. Real-time Data Update: The system regularly calls upon a CSV data package that lists recommended careers for 32 MBTI types. This package is updated in real-time according to international economic developments and technological advancements, introducing emerging industries and popular professions to ensure that the system's recommendations remain current.

3. Recommendation Algorithm: Based on the results of data analysis, the system utilizes the API provided by OpenAI, combined with a customized recommendation algorithm, to generate career suggestions for users. The algorithm takes into account users' personalized needs and cross-cultural backgrounds, leveraging the advanced text-generation capabilities of the GPT model to output career paths that match users' characteristics. With the global knowledge base of ChatGPT, the system's recommendations consider cultural differences and career development trends from around the world, avoiding regional constraints and subjective biases, thus ensuring the broad applicability and multicultural inclusivity of the recommendations.

In [4]:
```
class CustomerProfile:
    def __init__(self, name, mbti, major, grades, hobbies):
        self.name = name
        self.mbti = mbti
        self.major = major
        self.grades = grades
        self.hobbies = hobbies
        self.profile_info = []

    def add_profile_info(self):
        self.profile_info.append({
            'Name': self.name,
            'MBTI': self.mbti,
            'Major': self.major,
            'Grades': self.grades,
            'Hobbies': self.hobbies
        })

    def display_profile(self):
        for info in self.profile_info:
            print(f"Name: {info['Name']}, MBTI: {info['MBTI']}, Major: {info['Major']}, "
                  f"Grades: {info['Grades']}, Hobbies: {info['Hobbies']}")
```

In [5]:
```
import csv

class MBTICareerMatch:
    def __init__(self, csv_file):
        self.mbti_careers = self.load_mbti_careers(csv_file)

    def load_mbti_careers(self, csv_file):
        mbti_careers = {}
        with open(csv_file, newline='', encoding='utf-8') as csvfile:
            reader = csv.reader(csvfile)
            mbti_types = next(reader)
            for row in reader:
                for i, mbti in enumerate(mbti_types):
                    if mbti not in mbti_careers:
                        mbti_careers[mbti] = []
                    if i < len(row):
                        mbti_careers[mbti].append(row[i])
        return mbti_careers
```

Figure 1 Code for This System By Jupyter

Key Technologies and Features

The AI career path recommendation system developed in this study employs a comprehensive technical implementation strategy to offer users personalized career advice based on their MBTI personality indicators. The following is a description of the key components of the system's technical implementation:

Overview of the Technical Framework

The system is primarily built using the Python programming language, leveraging its robust data processing and analysis libraries, such as Pandas, to handle user input and career data.

User Information Processing

User personal information, including name, MBTI type, major, grades, and hobbies, is collected through the `InteractiveCustomerProfile` class. Once this information is inputted by the user, the system stores it within an internal data structure for further analysis.

Real-time Update and Application of Career Data Packages

The system periodically updates a CSV data package that includes careers corresponding to MBTI types, ensuring the recommendation system reflects the latest career trends and emerging industries. The `MBTICareerMatch` class reads and parses this data to match recommended careers to different MBTI types.

Generation of Personalized Career Advice

After users complete their personal information input, the system uses an OpenAI API call to generate a personalized career development report based on the user's MBTI type and personal preferences. During this process, the system constructs a detailed prompt that incorporates

user information and career suggestions as input to the GPT model provided by OpenAI. The career development analysis report returned by the model is then displayed to the user.

This innovative system not only simplifies the process of matching individuals to suitable career paths but also brings a level of precision and customization previously unavailable. By integrating real-time data with the user's unique profile, the system ensures that the career advice is both current and highly relevant to each user. Moreover, the use of the OpenAI GPT model allows for a dynamic and intelligent interpretation of career data, providing insights and recommendations that align with global trends and individual aspirations.

Output and Case Study

In our AI career path recommendation system, the output is presented in the form of a comprehensive career development report, providing users with an in-depth analysis in a visual format. As illustrated by the attached figure, the report is designed in a clear and understandable layout, showcasing key content such as basic information, understanding of the INFJ-A personality in the workplace, career path recommendations, and suggestions for enhancing career prospects. The goal of the report is to provide individuals with career planning guidance tailored to their MBTI personality type, while also considering cross-cultural impacts and a global perspective.

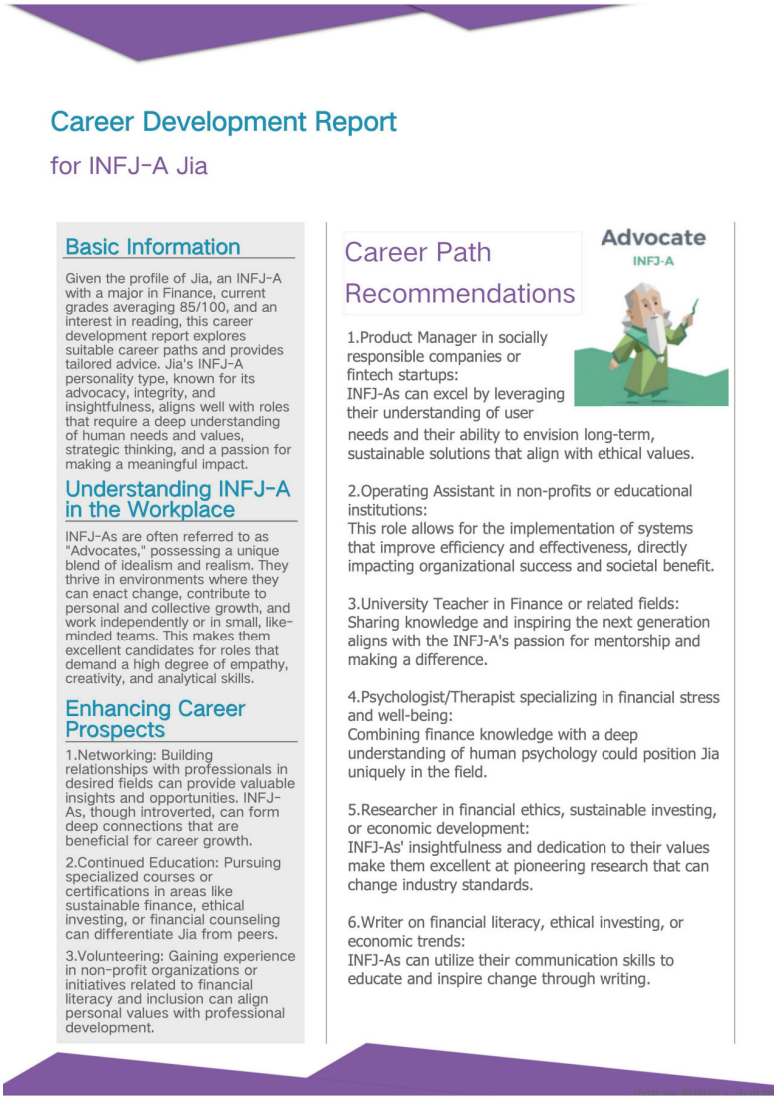

Figure 2 Career Development Report for Case Jia INFJ-A

Case Study: Practical Application of Cross-Cultural Career Planning

Taking the case of Jia, a financial major student with an INFJ-A personality type, scoring an average of 85/100, and with interests including reading, the report demonstrates the system's practical effectiveness through the following aspects:

1. Personalized Career Matching: The system first identified Jia's MBTI type—INFJ-A—known for their advocacy, integrity, and insight. The report recommended six career paths aligned with this personality type, such as a Product Manager at a fintech startup or an Operations

Assistant at a nonprofit organization.

2. Enhancing Career Prospects: The report further provided strategies to enhance career prospects, such as networking, continued education, and volunteering. These suggestions are particularly considerate of Jia's expertise in finance and her interest in reading.

3. Cross-Cultural Perspective: The system's global knowledge base offered Jia a range of global and multicultural career options, unrestricted by geography, thus enhancing her competitive edge in a globalized job market.

Through the analysis of Jia's case, our system has proven its efficacy in the realm of cross-cultural career planning. Utilizing the career development report provided by the system, Jia gained a clearer direction for her future career and a deeper understanding of how to align personal values with career goals. Moreover, the system also helped Jia identify key skills and knowledge areas for further development, particularly in industries that combine financial expertise with humanitarian care.

The AI career path recommendation system developed in this study represents the integration of technology and theoretical research in the field of cross-cultural career planning. Designed with the global context in mind, the system aids users in exploring career paths aligned with their MBTI personality types, promoting harmony between educational pathways and career development goals. The system offers an innovative tool that supports more informed career choices within a multicultural environment, thanks to a constantly updated career database and the integration of MBTI personality analysis.

System Impact

The cross-cultural adaptability and personalized recommendation features of the system demonstrate its potential in providing users with customized career development guidance. Particularly for individuals seeking employment across different countries and cultural contexts, the system's recommendations can reduce cultural barriers and deepen their understanding of the global job market. Additionally, the educational pathway suggestions from the system help guide users towards learning opportunities that are most likely to enhance their career success.

Challenges Encountered

During the design and implementation of the system, we faced several challenges, including how to accurately interpret the correlation between MBTI test results and career inclinations, as well as ensuring that the recommended careers stay in sync with global market trends. These challenges were effectively addressed by establishing a multi-source data synchronization mechanism and developing a flexible user feedback system.

Future Work

Moving forward, we plan to further refine and expand the system in the following directions:

- Technological Upgrades: Investigate more advanced data analysis and machine learning technologies to enhance the system’s predictive accuracy and recommendation relevance.

- User Experience Optimization: Continue to optimize the interface design based on user research and feedback, providing a more intuitive and interactive user experience.

- Expansion of Application Scenarios: Consider applying the system to a wider range of career planning scenarios, such as career transitions, continuing education, and retirement planning.

- Multilingual Support: To better serve users from different countries, we plan to launch multilingual versions to increase the international applicability of the system.

In summary, the AI career path recommendation system has a significant impact and broad application prospects in the field of cross-cultural career planning. With ongoing technological innovation and enhancements to user experience, the system is poised to become an essential tool in supporting individual career development and educational choices.

Conclusion

This study has successfully designed and implemented an AI career path recommendation system, which integrates MBTI personality analysis to offer an innovative solution for personalized career planning in a cross-cultural context. The main contribution of the system lies in its real-time updated career database, which ensures that the career advice received by users is not only personalized but also consistent with current global job market trends. Moreover, the system's design eliminates geographical limitations, enhancing users' understanding of career opportunities in different cultural backgrounds, and supports more informed decision-making in a multicultural environment.

The innovation of the system is also reflected in its straightforward and intuitive user interface, which allows users to easily input information and quickly receive career advice based on in-depth data analysis. In the future, with further technological developments and continuous improvements to the user experience, this system is expected to become a key tool in the field of cross-cultural career planning, helping users explore and achieve their career goals on a global scale.

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About the author:

First author: Yizhou Zhou (2000.01-) Male, Han nationality, born in Zibo, Shandong Province, Master degree, Master of Science, research direction: Intelligent education

Second author: Yong Zhang (1993.07-) Male, Han nationality, born in Binzhou, Shandong Province, Bachelor's degree, research direction: Primary and secondary education management

Third author: Sijia Yu (2001.03-), female, Han nationality, born in Jinan, Shandong Province, Bachelor's degree, research direction: psychology

Fourth author: Naijie Liu (2005.02-), female, Han nationality, Jinan, Shandong Province, Bachelor's Degree, research direction: Information System Management