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Integrating Machine Learning with Four Pillars of Destiny and Five Elements: A Study on Career Selection Strategies

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ABSTRACT

Effective career guidance is essential for helping individuals make informed career choices, yet traditional methods often fall short, leading to dissatisfaction and misalignment with career aspirations. The Four Pillars of Destiny, a traditional chinese metaphysical framework, offers unique insights into personality traits and potential career paths but is not widely integrated into modern career coaching. Meanwhile, machine learning provides personalized, data-driven career recommendations but faces challenges such as potential biases. This study aims to explore how the four pillars of destiny can be combined with contemporary career counselling methods and evaluate the effectiveness of machine learning in career selection, addressing the gap in integrating traditional and modern approaches to enhance career decision-making processes. We collected data on billionaires from Wikidata, including their birthdate, which allowed us to calculate the pillars of day, month, and year, essential components of the Four Pillars of Destiny. Each pillar was related to the five elements (wood, fire, earth, metal, water), providing a comprehensive view of the individual's elemental composition. The dataset was meticulously cleaned and pre-processed to ensure accuracy and reliability. We employed principal component analysis and random forest algorithms to analyse the data, achieving an overall accuracy of 66%. The study revealed that while the model performed reasonably well, there is room for improvement, particularly in handling class imbalances. The development of a career advisor web solution based on the four pillars of destiny and the five elements theory represents a significant advancement in personalized career guidance. This tool offers tailored career recommendations by aligning individuals' intrinsic strengths with suitable career paths, providing a unique and culturally enriched perspective on career planning. The web solution, currently in its alpha testing phase, aims to enhance career decision-making by integrating traditional elements with modern technology. This study underlines the potential benefits of combining the four pillars of destiny and machine learning in career coaching, offering a holistic approach to career guidance.

Keywords:
Machine learning; Four Pillars of Destiny; five elements; career selection; random forest; Principal Component Analysis

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1. Introduction

This study critically examines the integration of the Four Pillars of Destiny (FPD), a traditional Chinese metaphysical framework, with modern machine learning (ML) techniques to enhance career guidance. Traditional career counselling often fails to align with individual aspirations, leading to dissatisfaction, while ML offers personalized recommendations but struggles with biases. The research aims to bridge these gaps by combining FPD's cultural insights with ML's data-driven capabilities, proposing a career advisory system that is both culturally adaptive and technologically advanced. Although FPD is widely used in East Asia, its application in contemporary, data-driven career guidance is limited, particularly outside Asian contexts. The study highlights the potential of this integration to provide a more precise and culturally relevant approach to career counselling, addressing both the need for personalized guidance and the challenges of bias in ML algorithms. By exploring this intersection, the research offers a novel framework that respects traditional insights while leveraging modern technological advancements, aiming to improve the effectiveness and satisfaction of career guidance practices.

1.1 Problem Statement

Effective career guidance is essential for enabling individuals to make informed vocational decisions. However, traditional career counselling methodologies frequently demonstrate significant shortcomings. For instance, a study conducted among university students in Brazil revealed that many experienced dissatisfaction with their professional choices, attributable to insufficient career guidance and a lack of self-awareness [1]. This dissatisfaction often culminated in heightened anxiety and uncertainty regarding career selection as students neared graduation [1]. Similarly, a survey in Nigeria indicated that a substantial proportion of students pursued academic programs misaligned with their career aspirations, largely due to inadequate career guidance services [2]. These findings underscore the inherent limitations of conventional career counselling approaches and emphasize the pressing need for more robust and effective strategies [1,2].

The FPD, a traditional Chinese metaphysical framework, offers a distinctive approach to career selection by analysing personality traits, potential vocational paths, and life experiences derived from an individual's birth data. Widely adopted in countries such as South Korea [3], Japan, and Vietnam [4,5], FPD has been seamlessly integrated into career coaching practices within these regions. Despite its cultural relevance and demonstrated utility, FPD remains underutilized in modern career counselling methodologies. This disparity highlights a significant opportunity to investigate the integration of FPD with contemporary career guidance techniques, aiming to enrich and refine the career decision-making process.

ML has emerged as a transformative tool in career selection, providing personalized and data-driven recommendations [6,7]. By analysing diverse attributes such as skills, interests, and academic performance, ML models can predict suitable vocational pathways with notable precision. Nevertheless, the incorporation of ML into career counselling is not without challenges, including issues related to algorithmic biases and the imperative for fairness in predictive outcomes. The integration of the FPD with ML presents an opportunity to develop a more comprehensive and balanced approach to career guidance. This study seeks to address the existing gap between traditional metaphysical frameworks, such as FPD, and contemporary career coaching practices while evaluating the efficacy of ML in enhancing career decision-making processes.

1.2 Research Questions

This study aims to address two primary research questions. First, it seeks to explore how the FPD and Five Elements can be integrated into modern career coaching to enhance career decision-making processes. By examining the potential of FPD, the study will investigate how this traditional Chinese metaphysical framework can provide personalized insights into an individual's career path, aligning their choices with their intrinsic strengths and life goals. Second, the study will evaluate the comparative advantages and limitations of using ML algorithms versus traditional methods in career selection. This involves assessing the accuracy, fairness, and user satisfaction of ML-driven career recommendations compared to conventional career counselling approaches, ultimately aiming to determine the most effective strategies for guiding individuals in their career journeys.

RQ1: How can the Four Pillars of Destiny (FPD) and Five Elements be integrated into career counselling to enhance career selection processes?

RQ2: What are the comparative advantages and limitations of using Machine Learning (ML) algorithms versus traditional methods in career selection?

1.3 Research Objectives

This study is designed to accomplish two primary objectives. First, it aims to investigate the potential of integrating the FPD and the Five Elements into modern career coaching practices, assessing their influence on career selection processes. By analysing how FPD can offer personalized insights into an individual's vocational trajectory, the study will evaluate its capacity to align career choices with intrinsic strengths and life aspirations. Second, the study seeks to assess the efficacy of ML algorithms in predicting suitable career paths, comparing their performance to traditional career counselling methods. This assessment will focus on the accuracy, fairness, and overall effectiveness of ML-driven recommendations, with the goal of identifying optimal strategies for supporting individuals in their professional development journeys.

RO1: To explore the potential of integrating the Four Pillars of Destiny (FPD) and Five Elements into contemporary career counselling practices and assess its impact on career selection.

RO2: To evaluate the effectiveness of Machine Learning (ML) algorithms in predicting suitable career paths compared to traditional career counselling methods, focusing on accuracy and fairness.

2. Literature Review

2.1 Four Pillars of Destiny and Career Selection

The Four Pillars of Destiny (FPD), also known as BaZi, represents a traditional Chinese metaphysical framework that evaluates an individual's fate based on their birth data. This system has been explored for its potential application in career coaching, offering a unique perspective that synthesizes cultural, philosophical, and psychological dimensions. In career advising, FPD is valued for its ability to provide insights into personality traits, potential vocational trajectories, and significant life experiences, all of which are instrumental in guiding individuals toward fulfilling and well-aligned career decisions [8].

In South Korea, Saju is deeply embedded in traditional beliefs and is frequently utilized for fortune-telling, matchmaking, and selecting auspicious dates for significant events [9]. Similarly, in Japan, Shichū Suimei serves to understand personality traits and forecast future occurrences. Both practices have evolved to fit their respective cultural contexts, blending with local customs and beliefs [10].

The FPD is deeply embedded in the philosophical traditions of Neo-Confucianism. For instance, the intellectual achievements and success of Toegye Yi Hwang have been attributed to his FPD, which provided insights into his character and life experiences. This exemplifies how FPD can serve as a philosophical framework for understanding career potential and facilitating personal development [8]. In Korea, FPD is often considered alongside other unconventional disciplines, such as acupuncture, reflecting its cultural integration. The acceptance of FPD is influenced by socio-cultural factors, including familial traditions and societal norms, which, in turn, can significantly impact career decision-making processes [3,9].

Understanding the applicability of FPD across different cultural settings is essential. In collectivist cultures like South Korea and Japan, where traditional beliefs and family expectations are prevalent, FPD is widely accepted and integrated into daily life [9]. In contrast, more individualistic cultures may place greater emphasis on personal agency, potentially diminishing reliance on such metaphysical systems in Korea [10]. Recognizing these cultural nuances is vital for effectively applying FPD in various contexts.

FPD can be utilized to evaluate personality traits and psychological attributes, which are critical components in career counselling. Understanding an individual's inherent characteristics may enable the alignment of vocational choices with their intrinsic strengths and limitations [11]. The integration of FPD into career coaching represents a synthesis of traditional and modern methodologies. This approach involves leveraging FPD to augment psychological frameworks in vocational guidance, thereby providing a holistic and multifaceted strategy for career planning [11].

FPD possesses the capacity to identify significant life events and pivotal moments that can inform career planning and development. This aligns with the overarching objective of career coaching, which seeks to prepare individuals for unforeseen opportunities and challenges along their career selection [12]. Incorporating FPD into educational settings has the potential to enhance career advising programs by providing students with a deeper understanding of their prospective vocational pathways and personal development. This approach may prove particularly effective in systems that emphasize lifelong learning and the cultivation of career competencies [13].

While the FPD offers a distinctive approach to career advising, it is crucial to situate it within the broader context of established career development theories. Traditional career counselling often emphasizes logical and rational decision-making processes, which may conflict with the metaphysical underpinnings of FPD. Furthermore, reliance on cultural and philosophical tenets may not align seamlessly with the global shift toward standardized, evidence-based career counselling methodologies. As such, integrating FPD into career coaching requires striking a careful balance between respecting cultural traditions and adhering to contemporary scientific standards [3,13].

FPD analysis offers customised insights aligned with an individual's distinct personality, skills, and prospective career trajectories. It assesses strengths and weaknesses by examining the energy patterns in an FPD chart, directing individuals towards career choices that correspond with their authentic selves [14,15]. It can also emphasise areas where individuals may flourish at different stages of their lives [14-16]. FPD uncovers intrinsic talents and capabilities, allowing individuals to engage in professions that optimise their strengths, resulting in enhanced job happiness and success [17,18]. Additionally, the study on seven Small and Medium Enterprises (SMEs) using the FPD for talent selection revealed motivations such as employee satisfaction and performance and issues like resume authenticity [19]. Chung-chia [19] highlighted the benefits of selected highly-adapted employees through FPD analysis.

A FPD chart can identify industries or professions that are most favourable for success, providing essential guidance for those navigating their professional paths [17,18]. FPD readings can identify advantageous times for major professional transitions, like work shifts, promotions, or educational endeavours, so assisting individuals in capitalising on these possibilities [17,18]. FPD reading equips individuals to navigate work challenges and prospects with strategic foresight by anticipating probable barriers and opportunities [17,18]. Additionally, in Vietnam, a growing number of young individuals are selecting their professional career path based on insights from fortune telling and numerology [4,5]. The FPD is extensively employed in South Korea [9], Japan [10], and Vietnam [3-5].

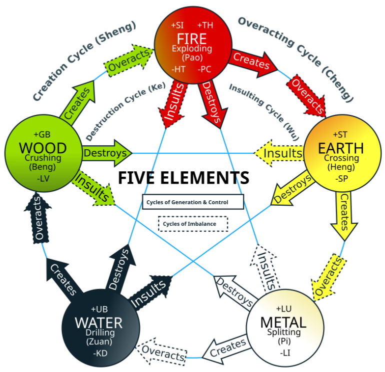
Table 1
Structure of a BaZi Chart illustrating the Four Pillars of Destiny

Hour	Day	Month	Year	
Children	Destiny	Career	Mentors	**Heavenly Stems**
Assets	Relationship	Wealth	Friends	**Earthly Branches**

The BaZi chart in Table 1 also known as the FPD is a traditional metaphysical tool used to analyse an individual’s destiny based on their birth data. The chart is divided into four pillars: Hour, Day, Month and Year. Each representing different aspects of a person’s life. Each pillar consists of two components: Heavenly Stems and Earthly Branches. The Hour Pillar can reveal an individual's job accomplishments and the potential support from their supervisor in career advancement [20]. The Day Pillar represents assets, relationships and wealth, reflecting the individual’s personal attributes and their interactions with close friends and family [15,18]. The Month Pillar is crucial for understanding career changes and business dynamics, offering information about the individual’s relationship with their immediate environment and societal norms [21]. The Year Pillar is linked to parents or mentor, friends, wealth, and broader social connections, providing a perspective on the individual's overall life path and long-term goals [15,18].

(a)

(b)



(c)

Fig. 1. Two components under FPD: (a) Heavenly Stems and (b) Earthly Branches
(c) Five Elements Theory adopted from [22]

2.1.1 Heavenly Stems

The Heavenly Stems in Fig. 1(a), consisting of ten elements (Jia, Yi, Bing, Ding, Wu, Ji, Geng, Xin, Ren, and Gui), are integral to the FPD. Each stem is paired with the Five Elements (Wood, Fire, Earth, Metal, Water) and the Yin-Yang theory, where each stem embodies a specific element and either a Yin or Yang attribute [23,24]. This pairing creates a 60-year cycle when combined with the Earthly Branches, which is used to denote years, months, days, and even hours in the Chinese calendar. This cyclical system is fundamental to FPD, providing a framework for understanding the temporal influences on an individual's life [23].

In the context of FPD, each pillar (year, month, day, and hour of birth) represents different aspects of a person's life. The Heavenly Stem of each pillar interacts with the corresponding Earthly Branch to offer insights into personality traits, potential life events, and compatibility with others [8, 25]. The Day Master, which is the Heavenly Stem of the day pillar, is particularly significant as it represents the core personality and intrinsic qualities of an individual. For instance, Toegye Yi Hwang's Day Master was Ji-earth, which influenced his intellectual pursuits and philosophical achievements [8]. The Heavenly Stems are deeply embedded in Chinese philosophy and cultural practices, reflecting the ancient Chinese understanding of the universe's cyclical nature and the interconnectedness of all things through the principles of Yin-Yang and the Five Elements [24].

2.1.2 Earthly Branches

The Twelve Earthly Branches in Fig. 1(b) are fundamental symbols in Chinese metaphysics, representing time and space. Paired with the Ten Celestial Stems, they form a 60-year cycle essential to the FPD. Each Earthly Branch is linked to an animal sign and a specific element, contributing to an individual's overall energy profile. For instance, the branch "Zi" is associated with the Rat and the element water [24]. The interaction between Earthly Branches and Celestial Stems through patterns of Mutual Aid and Mutual Contention can either enhance or weaken the energies represented by the Stems, influencing a person's destiny [24].

With the framework of FPD, the Earthly Branches serve as a critical component in providing insights into various dimensions of an individual's life. These branches interact with the Five Elements theory, a foundational concept in Chinese philosophy and medicine that encapsulates the cyclical interactions and transformations observed in nature. Each element is associated with specific seasons, colours, tastes, and emotions [26]. The equilibrium of these elements, shaped by the influence of the Earthly Branches, is vital for sustaining harmony and well-being. By analysing the dynamic interplay between the Earthly Branches and the Five Elements, practitioners can offer guidance on achieving balance and fostering success in life, while addressing potential challenges and identifying opportunities for personal growth [8,24].

2.1.3 Five Elements Theory

The Five Elements Theory, a cornerstone of Chinese metaphysics, comprises Wood, Fire, Earth, Metal, and Water, which are interconnected through cycles of generation and restriction. These dynamic relationships significantly influence diverse facets of life, nature, and health. For example, Wood fuels Fire, while Water suppresses it [27,28]. Beyond its philosophical underpinnings, this theory finds practical applications in disciplines such as Traditional Chinese Medicine (TCM) and governance. In TCM, each element is associated with specific organs and physiological conditions, thereby informing diagnostic and therapeutic methodologies [26,27]. Th The holistic framework of TCM emphasizes the critical importance of maintaining elemental balance to promote overall well-being [27].

Moreover, the Five Elements Theory exerts its influence on governance and societal structures. Dong Zhongshu, for instance, championed a governance model that reflects the interdependence of these elements, advocating for a systematic alignment of official roles and responsibilities [28]. Culturally, the elements are intertwined with practices tied to seasonal transitions and moral virtues, illustrating their profound and pervasive impact on Chinese society [26]. While some critiques argue that the theory may risk oversimplifying intricate phenomena—particularly within medical contexts—its sustained relevance across both philosophical and practical domains highlights its enduring significance as a cornerstone of Chinese metaphysics.

2.2 Machine Learning in Career Selection

Machine learning (ML) has transformed career selection by providing personalized, data-driven recommendations to individuals navigating their vocational trajectories. Through the analysis of diverse attributes—such as skills, interests, academic performance, and personality traits—ML models can predict optimal career pathways, thereby refining decision-making processes for students and job seekers. This method not only enables individuals to align their career choices with their inherent strengths and personal interests but also mitigates the limitations of traditional career counselling approaches, which often lack precision and adaptability [29].

ML models, including Random Forest and Support Vector Machine, are utilized to assess an individual's skills and interests, delivering tailored career recommendations. These models analyse dynamic and personalized assessments to identify suitable vocational pathways, ensuring alignment with the individual's inherent strengths and preference [29]. Similarly, systems such as the one proposed by Bhaskaran, et al. [30] employ algorithms like Naive Bayes and K-Nearest Neighbours to predict career trajectories based on academic performance and extracurricular engagement. This methodology facilitates the alignment of academic accomplishments with career aspirations, providing valuable insights into potential job opportunities [30].

ML algorithms, such as CatBoost, AdaBoost, and XGBoost, are employed to classify jobs into distinct sectors, including IT, teaching, and business. These models evaluate a range of parameters—such as academic performance and technical competencies—to recommend roles that align with an individual's profile [31]. Additionally, techniques like Decision Trees and Random Forests are utilized to match graduates with appropriate job opportunities based on their educational qualifications and professional experience. Notably, the Random Forest model has demonstrated high accuracy in generating personalized job recommendations, underscoring its effectiveness in enhancing career alignment [32].

A significant challenge in utilizing ML for career selection lies in the potential for bias, particularly against diversity subgroups. Ensuring algorithmic fairness and explainability is paramount to mitigating adverse impacts on candidates from diverse backgrounds [33]. Furthermore, integrating user feedback into ML models is critical for fostering continuous improvement and enhancing adaptability to evolving job market dynamics. This iterative process ensures that career recommendations remain both relevant and effective over time [29].

While ML presents substantial advantages in career selection, it is imperative to address the ethical and practical challenges associated with its implementation. Key concerns, including algorithmic bias, the necessity for transparency, and the legal ramifications of employing AI in career counselling, must be carefully examined to ensure equitable and just outcomes. Furthermore, the incorporation of ML into career selection processes should serve to augment, rather than supplant, human judgment and traditional counselling methodologies, thereby fostering a balanced and holistic approach to career guidance [33].

ML holds the potential to revolutionize career selection by delivering personalized and data-driven recommendations. Nevertheless, addressing the ethical and practical challenges associated with its application is crucial to ensuring fair and effective outcomes. By integrating the analytical capabilities of ML with the nuanced insights of human judgment and traditional counselling methodologies, a more holistic and balanced approach to career guidance can be realized [29].

2.3 Career Selection

Recent advancements in traditional career counselling have emphasized the importance of integrating subjective factors and narrative approaches into career guidance. The life-design paradigm, for instance, adheres to social constructionism and emphasizes the significance of the stories that individuals construct about themselves and their careers. This paradigm has been particularly effective in helping individuals navigate the complexities of modern career paths by focusing on personal narratives and life stories [34, 35]. Additionally, mixed approaches that combine traditional psychometric methods with narrative techniques have shown great potential in enhancing career counselling effectiveness, particularly among university students [35]. These approaches provide a more holistic view of career development, addressing both the objective and subjective dimensions of career choices.

In the realm of ML, recent studies have focused on improving the fairness and accuracy of recommendation systems. Techniques such as Neural Collaborative Filtering and autoencoders have been employed to capture complex user-item interactions and improve scalability [36]. Moreover, advancements in deep learning and reinforcement learning have significantly enhanced the capabilities of these systems, allowing for dynamic adaptation to real-time user feedback and optimizing long-term engagement [36]. A systematic review by Pagano, *et al.*, [37], highlighted various bias and unfairness identification and mitigation techniques, emphasizing the use of fairness metrics such as Equalized Odds, Opportunity Equality, and Demographic Parity to ensure equitable outcomes in ML models. These advancements underscore the necessity of integrating both traditional and modern approaches to develop a comprehensive and effective career guidance system.

3. Research Methodology

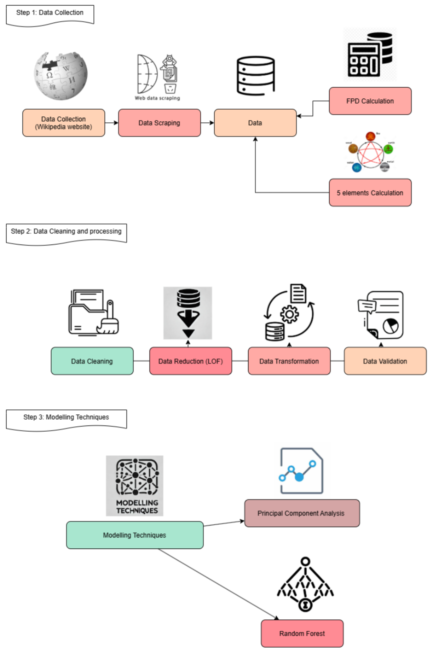


Fig. 2. Research flow of this paper

The research flow comprises three major steps. Step 1 is data collection. Steps 2 is data cleaning and preprocessing. Step 3 is the modelling techniques. The detail of each step is discussed in the following subsections.

3.1 Data Collection

In this study, we collected data on billionaires by scraping information from Wiki data. The dataset includes the billionaire's name, birthday, gender, net worth, citizenship, and source of wealth. Using the birthdate, we calculated the pillars of day, month, and year, which are essential components of the FPD. Due to the unavailability of the hour of birth, the hour pillar was not included in our analysis. Each pillar was then related to the Five Elements (Wood, Fire, Earth, Metal, Water), providing a comprehensive view of the individual's elemental composition.

To ensure the precision and reliability of the industry-related elements, we cross-referenced our findings with data from Douglas Chan's website [38] and validated them through consultation with a bronze medallist from the BaZi World Championship [39]. This rigorous and systematic approach enabled the creation of a dependable dataset that seamlessly integrates traditional metaphysical concepts with contemporary data analytics. The resulting dataset provides a solid foundation for examining the relationship between the Five Elements and career success, offering meaningful insights into potential vocational pathways and achievements based on individuals' FPD charts.

3.2 Data Cleaning and Preprocessing

During the data cleaning and preprocessing phase, we meticulously eliminated duplicate entries to preserve the integrity of the dataset. To address potential inconsistencies, each billionaire was assigned a single citizenship. Given that many billionaires own multiple companies, we collected business descriptions for each enterprise and aligned them with the corresponding Five Elements (Wood, Fire, Earth, Metal, Water). This process reduced our initial dataset from 682 entries to 339 unique records.

To address the challenges of data availability and class imbalance, several robust methodologies were implemented to ensure the reliability and validity of the findings. Initially, the dataset was meticulously cleaned and pre-processed to eliminate duplicates and inconsistencies, thereby enhancing data integrity [40]. The Local Outlier Factor (LOF) method was employed to detect and remove outliers, refining the dataset to 305 robust entries. Additionally, Principal Component Analysis (PCA) was utilized to reduce dimensionality and highlight the most significant features, ensuring that the model focused on the most relevant data points [37]. The selection of Random Forest (RF) as the primary algorithm was based on its proven effectiveness in handling complex and imbalanced datasets, as it prioritizes the most informative features and mitigates overfitting [41]. These steps collectively aimed to enhance the robustness of the analysis and ensure that the findings are both accurate and reliable.

In addressing potential biases inherent in the ML algorithms, several strategies were incorporated to ensure fairness and equity in the recommendations. Recognizing the risk of algorithmic bias, particularly against underrepresented groups, a thorough bias assessment was conducted during the model evaluation phase [37]. This involved analysing the model's performance across different demographic groups to identify any disparities [41]. To mitigate these biases, techniques such as re-sampling and synthetic data generation were implemented to balance the class distribution [37]. Furthermore, fairness constraints were incorporated into the model training process to ensure that the predictions were equitable across all groups. By integrating these bias mitigation strategies, the aim was to develop a more inclusive and fair career recommendation system, thereby enhancing the overall effectiveness and ethical integrity of the approach.

3.2.1 Validation and reliability

The validation and reliability of our clustering model were evaluated using several key metrics. The Silhouette Score of 0.1517 indicates moderate cohesion within clusters and separation between them, suggesting scope for improvement in clustering quality. The Davies-Bouldin Index, with a value of 2.0884—where lower scores are preferable—reveals some overlap between clusters, implying that the clusters lack clear separation. Similarly, the Calinski-Harabasz Index, which measures the ratio of between-cluster dispersion to within-cluster dispersion, yielded a value of 45.72, indicating limited distinctiveness among the clusters. Furthermore, bootstrap analysis produced a mean Silhouette Score of 0.1844 with a standard deviation of 0.0188, reflecting a degree of stability and consistency in the clustering results. Collectively, these metrics underscore areas for potential refinement in our clustering methodology to improve its overall effectiveness.

3.3 Modelling Techniques

In this study, we utilized PCA and RF as our primary ML algorithms. These methods were chosen for their effectiveness and strong recommendations in career selection strategies.

3.3.1 Principal Component Analysis (PCA)

Principal Component Analysis (PCA) is a robust statistical technique employed to reduce the dimensionality of large datasets while retaining maximal variance. In the context of career selection, PCA streamlines complex data encompassing multiple variables, such as skills, interests, and academic performance. By converting the original variables into a set of uncorrelated variables, referred to as principal components, PCA facilitates the identification of the most influential features impacting career decisions. This transformation not only enhances the manageability of the data but also underscores the critical factors that should be prioritized in career guidance [6, 29, 30].

3.3.2 Random Forest (RF)

Random Forest (RF) is an ensemble learning method that constructs multiple decision trees during the training phase and outputs the mode of their predictions. Renowned for its robustness and high accuracy, RF is particularly well-suited for career selection tasks. It has been successfully applied in educational contexts to predict academic performance and career outcomes, showcasing its potential in facilitating informed career decisions [7,13,29,30]. Furthermore, RF excels in handling complex and imbalanced datasets by prioritizing the most informative features, thereby delivering balanced and unbiased career recommendations. Its capacity to manage numerous input variables without overfitting renders it a highly valuable tool in career guidance systems, where diverse and multifaceted factors must be considered [7].

4. Results and Discussion

4.1 Model Evaluation and Validation

Table 2
Performance Metrics of the RF classifier After PCA

Class	Precision	Recall	F1-Score	Support
0 : Earth	0.67	0.57	0.62	7
1 : Fire	0.57	0.47	0.52	17
2 : Metal	0.69	0.82	0.75	33
3 : Water	0.00	0.00	0.00	2
4 : Wood	0.67	0.67	0.67	3
Accuracy	0.66			62
Macro Average	0.52	0.51	0.51	62
Weighted Average	0.63	0.66	0.64	62

The RF classifier, after applying PCA demonstrated an overall accuracy of 66%, indicating that it correctly classified career classes for 66% of the test instances. This performance is particularly noteworthy for Class 2 (Metal), where the model achieved a precision of 0.69, recall of 0.82, and an F1-score of 0.75. These metrics suggest that the model is quite effective in predicting this class, reflecting its robustness when sufficient data is available. However, the model faced significant challenges with Class 3 (Water), which had only two instances. The precision, recall, and F1-scores for this class were all 0.00, highlighting the difficulty in accurately predicting classes with limited data. This discrepancy underscores the importance of addressing class imbalances to improve the model's overall predictive accuracy. These results indicate that while the RF classifier performs well for classes with ample data, it struggles with underrepresented classes. Enhancing the dataset and refining the model could potentially mitigate these issues, leading to more reliable and equitable career recommendations.

The macro-average precision, recall, and F1-score are 0.52, 0.51, and 0.51, respectively, reflecting the model's performance across all classes (the Five Elements) without accounting for class imbalance. In contrast, the weighted-average precision, recall, and F1-score are slightly higher at

0.63, 0.66, and 0.64, respectively, indicating improved performance when the model considers the distribution of instances across classes. These metrics suggest that while the model demonstrates reasonable effectiveness, there remains significant room for improvement, particularly in its ability to handle classes with limited instances. This evaluation highlights the critical need to address class imbalance and explore additional techniques to enhance the model's predictive accuracy and robustness.

4.2 Factor Loading Analysis

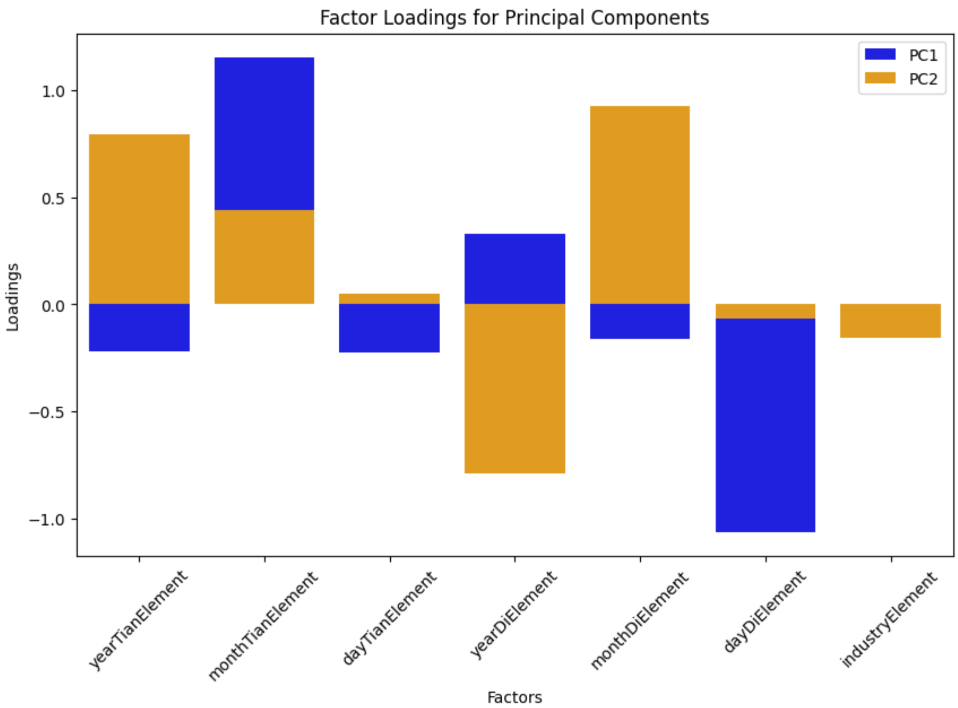


Fig. 3. Factor Loadings for Principal Components (PC1 and PC2)

The factor loadings for the principal components (PC1 and PC2) provide valuable insights into the significance of each feature in the dataset. For PC1, the monthTianElement (career) has the highest positive loading (1.153), indicating that it is the most influential factor in this principal component. Conversely, the dayDiElement (relationship) has the highest negative loading (-1.061), suggesting that it also plays a significant role but in the opposite direction. Other features such as yearDiElement (Friends) (0.331) and dayTianElement (destiny)(-0.226) contribute to PC1, but to a lesser extent. These loadings help us understand which features are most important in explaining the variance captured by PC1.

For PC2, the yearTianElement (Mentors) has the highest positive loading (0.791), followed closely by the monthDiElement (wealth) (0.926). This indicates that these elements are the most significant contributors to PC2. The yearDiElement has a high negative loading (-0.790), highlighting its importance in the opposite direction. The other features, such as industryElement (-0.155) and dayTianElement (destiny) (0.048), have smaller loadings, indicating a lesser impact on PC2. By analysing these loadings, we can identify the key factors that influence the principal components, which in turn helps in understanding the underlying structure of the data and improving the accuracy of career selection models.

4.3 Model Analysis

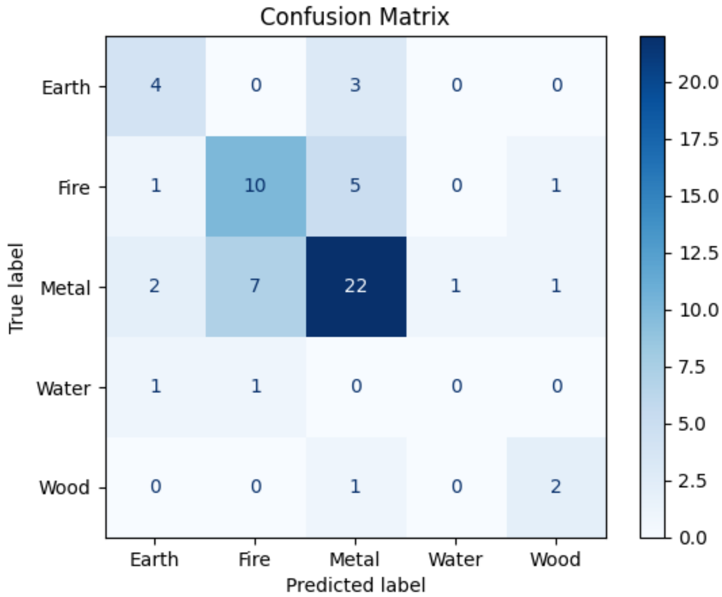


Fig. 4. Confusion matrix of the model

The confusion matrix for this study reveals several key insights into the model's performance. For the Earth element, the model correctly identified 4 instances but misclassified 3 instances as Metal, indicating a moderate level of accuracy. With a total of 7 actual Earth instances, the model's performance suggests some confusion between Earth and Metal, which could be due to similarities in their feature representations.

The Fire element demonstrates a more mixed performance in the model's predictions. While the model correctly identified 10 instances of Fire, it misclassified 5 instances as Metal and 1 instance each as Earth and Wood. Given that there were 17 actual Fire instances, the model's tendency to confuse Fire with Metal is particularly noteworthy. This confusion may arise from overlapping characteristics between these two elements, indicating that further refinement of the model or more discriminative feature selection could enhance predictive accuracy.

The Metal element exhibits the strongest predictive performance, with 22 correct classifications out of 33 actual instances. Nevertheless, some misclassifications persist: 2 instances were classified as Earth, 7 as Fire, and 1 each as Water and Wood. This suggests that while the model demonstrates a relatively high proficiency in identifying Metal, there remains room for improvement, particularly in distinguishing Metal from Fire. In contrast, the Water element shows no correct classifications, with all instances misclassified as either Earth or Fire, underscoring a significant challenge in accurately predicting this class. Similarly, the Wood element demonstrates limited success, with only 2 correct classifications out of 3 instances. The small sample sizes for both Water and Wood likely contribute to these suboptimal performances, indicating that augmenting the dataset with additional samples for these elements could enhance the model’s ability to discern their unique characteristics.

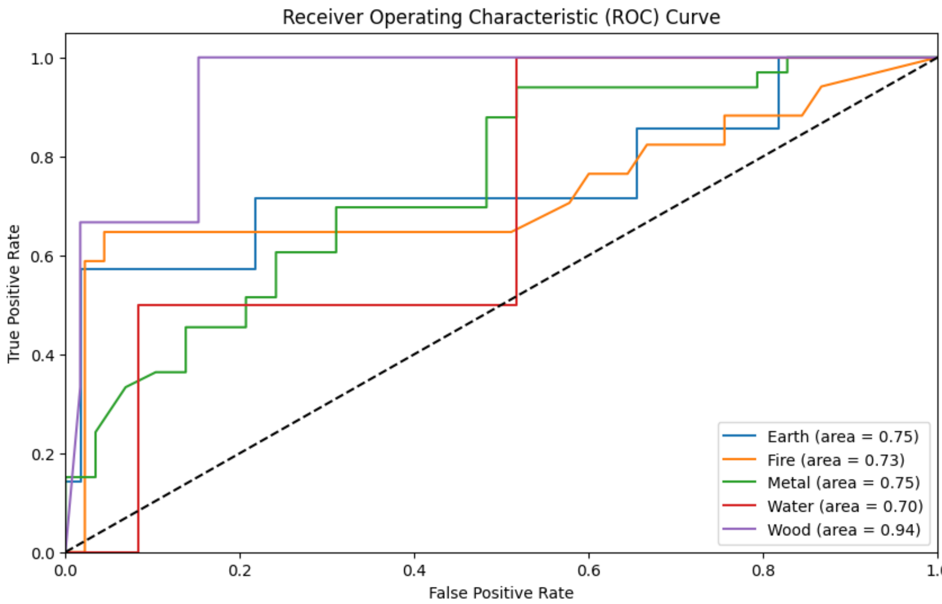


Fig. 5. ROC of the model

The ROC curve analysis for ML model provides a comprehensive view of the model's ability to distinguish between each element. The Wood element, represented by the purple line, stands out as the best performer with an area under the curve (AUC) of 0.94. This high AUC indicates that the model is highly effective at identifying Wood instances with minimal false positives. The curve quickly reaches a high true positive rate, demonstrating the model's strong confidence and accuracy when predicting the Wood element, despite the limited number of samples.

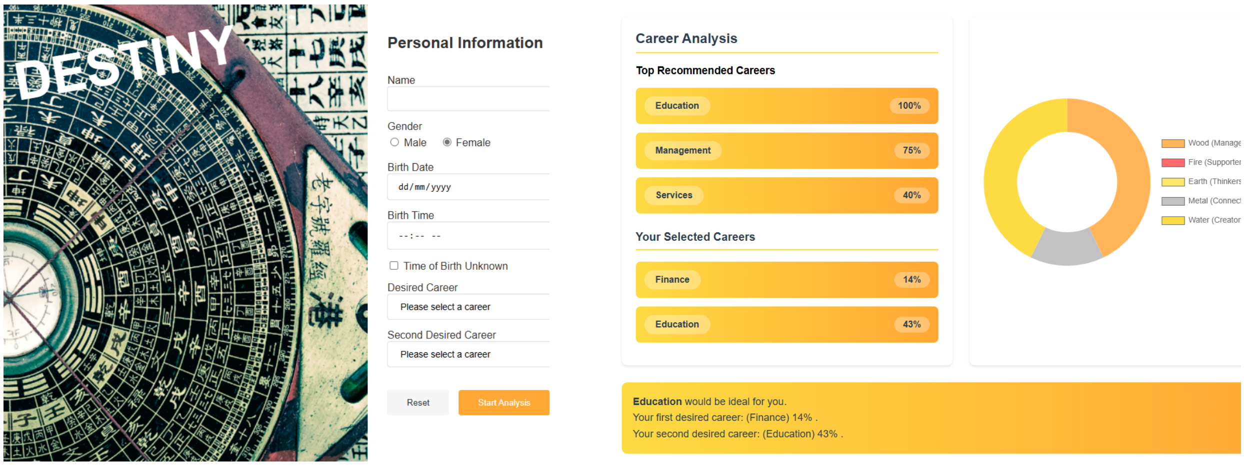
For the Earth and Metal elements, represented by the blue and green lines respectively, both have an AUC of 0.75. This moderate performance suggests that the model is reasonably good at distinguishing these elements from others, performing better than random guessing (which would have an AUC of 0.50). However, there is still room for improvement. The curves for Earth and Metal show that while the model can correctly identify these elements often, it occasionally struggles with false positives, indicating some overlap in the feature space with other elements.

The Fire element, represented by the orange line, has an AUC of 0.73, which is slightly lower than Earth and Metal but still indicates a good level of discrimination ability. The model shows some proficiency in identifying Fire instances, but there are instances where it confuses Fire with other elements. This performance aligns with the confusion matrix, where Fire had notable misclassifications, particularly with Metal. The ROC curve for Fire suggests that while the model can often correctly identify Fire, it does so with less confidence compared to Wood.

The Water element, represented by the red line, has the lowest AUC of 0.70. Although this is still better than random guessing, it indicates that the model has the most difficulty distinguishing Water from other elements. The poor performance of the Water element in the confusion matrix, with no correct classifications, is reflected in the ROC curve. The model's struggle with Water could be due to the small number of samples or overlapping features with other elements, suggesting a need for more data or feature engineering to improve performance.

Overall, the ROC curves provide valuable insights into the model's strengths and weaknesses. The high performance for Wood is surprising given the few samples, indicating that the model is highly confident when it does predict Wood. The moderate performance for Earth, Metal, and Fire suggests that while the model is generally good at identifying these elements, there is still some confusion that needs to be addressed. The low performance for Water highlights a significant challenge, emphasizing the need for further refinement to improve the model's ability to distinguish this element accurately.

4.4 Implication for Career Selection



(a) (b)

Fig. 6. Prospect career advisor alpha version: https://fpd.lertraveldiary.com/damin/ (a) Form (b) Result

The development of a career advisor web solution, refer to Table 1 is based on the FPD and the Five Elements theory. The web solution in Fig.6 represents a significant advancement in personalized career guidance. By calculating a confusion matrix where the Day Master (the most significant key pillar in FPD) [3,8,20] is mapped against industry elements, we have created a tool that offers tailored career recommendations. This approach leverages traditional metaphysical insights to align individuals' intrinsic strengths with suitable career paths, providing a unique and culturally enriched perspective on career planning. The web solution, currently in its alpha testing phase, aims to enhance career decision-making by integrating these traditional elements with modern technology.

To maximize its impact, the career advisor web solution can be implemented in various real-world contexts, such as universities, career counselling centres, and corporate HR departments, where it has the potential to significantly enhance career guidance practices. Conducting pilot tests and collecting user feedback will be crucial for refining the tool and validating its effectiveness across different cultural settings. Expanding its practical applications involves detailing specific use cases and testing in diverse environments to gather insights and demonstrate its efficacy. Enhancing cultural relevance by assessing the applicability of the FPD and Five Elements theory in non-Asian cultures can further extend its reach. Additionally, integrating advanced ML algorithms and developing user-friendly interfaces will improve the tool's accuracy and accessibility. Strengthening the impact assessment through quantitative metrics and longitudinal studies will provide a thorough evaluation of the tool's effectiveness. Addressing ethical considerations, such as bias mitigation and transparency, is essential to ensure fair and equitable recommendations for all users. By implementing these enhancements, the career advisor web solution can become a vital resource for career coaches and individuals, effectively bridging the gap between traditional metaphysical frameworks and modern career guidance practices.

4.5 Linking Results to Research Objectives and Questions

This study showed that combining FPD and the Five Elements theory into career counselling brings a distinctive and culturally rich viewpoint to career planning. The creation of a career advisor web solution, which uses these traditional metaphysical ideas, displayed encouraging outcomes in matching individuals' natural strengths with appropriate career paths. The tool's capability to provide tailored career suggestions based on users' birth information and elemental makeup points to its potential to improve career decision-making processes. This answers RQ 1 by presenting a working application of FPD in contemporary career counselling.

The research discovered that the RF classifier, following the use of PCA, reached a total accuracy of 66%. This suggests that ML algorithms can give precise career suggestions. However, the model encountered difficulties with class imbalances, especially in forecasting underrepresented classes like Water. These results emphasize the advantages of ML in managing large datasets and offering data-driven suggestions, while also noting the requirement for further improvement to handle biases and improve fairness. This directly answers RQ 2 by contrasting the effectiveness of ML algorithms with traditional methods and spotting areas for improvement.

5. Conclusion

This study explored the integration of the FPD and the Five Elements into contemporary career coaching, highlighting their potential to improve career decision-making processes. By utilizing traditional metaphysical insights, the research provided personalized career recommendations that align individuals' inherent strengths with appropriate vocational paths. Additionally, the study assessed the effectiveness of ML algorithms in predicting career trajectories, identifying both their strengths and limitations compared to traditional career counselling methods. This dual approach underscores the potential of combining ancient wisdom with modern technology to enhance career guidance.

The practical implications of this research are noteworthy. The creation of a career advisor web solution that merges FPD with data analytics offers a comprehensive approach to career guidance. This tool delivers customized career advice based on users' unique birth information and elemental composition, facilitating more informed and satisfying career decisions. As the solution undergoes further testing, it promises to become a valuable resource for career coaches and individuals seeking personalized guidance. This innovative approach not only enriches the career counselling landscape but also provides a culturally sensitive framework that respects traditional insights while leveraging technological advancements.

Despite these promising developments, the study faced several challenges and limitations. Issues such as data availability, class imbalance, and model misclassification presented significant hurdles [36,37,40]. The need for further refinement in clustering and prediction models is apparent to enhance their accuracy and reliability [36,37,40]. Addressing these challenges is crucial to optimizing the effectiveness of the career advisor web solution. Future research should focus on exploring additional metaphysical frameworks and advancing ML algorithms to deliver more precise and equitable career recommendations. Ensuring algorithmic fairness and mitigating potential biases in career selection models are essential for achieving inclusive and just outcomes. Continued exploration in these areas will contribute to the development of more robust and reliable career guidance tools.

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