Article

Career Path Decisions and Sustainable Options

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Abstract: Career planning has become more important than standalone job decisions in the current environment, where individuals have a wider range of choices of occupations and jobs than ever before. This paper reviews the theoretical developments in career guidance theory and recommends a holistic approach towards 'Career Path Guidance', incorporating psychological, sociological and developmental perspectives. An approach that considers several future steps in a career cannot be without challenges. The contextual and environmental situations along with individual characteristics are subject to change along a career path. Additionally, different stages in a career path are another variable that needs consideration to achieve a sustainable future. It has, therefore, been proposed that the career course be mapped by considering external factors, internal improvements and path-related dynamism. A multidimensional understanding of career guidance and the amount, complexity and sensitivity of the data involved mean that this approach may be better executed using computer-assisted systems that can source and logically analyze a large amount of information from several sources to produce coherent, sustainable and practical career path decisions.

Keywords: career guidance; career path planning; developmental potential; computer-assisted career guidance; sociological perspective

1. Introduction

This paper is part of an ongoing research project aimed at providing an online guidance mechanism of 'Career Path Planning' for individuals, taking into account the personal characteristics of the individual, contextual conditions and developmental potential. The main objective of this paper is to provide a model of career planning for individuals by utilizing a comprehensive approach that can help to plan a career path for them. We differentiate this research from traditional information technology (IT)-based job portals, as the scope of this research is broader, and the focus is different from the available job portals that advise on job choices at any single point in a career. On the other hand, this research aims to supplement the decision-making process by considering several subsequent steps in a career, i.e., career path planning. The proposed mechanism can identify and assist in reaching a plausible career goal through a series of steps in the career path. Both the objective conditions around an individual and personal characteristics are subject to change along a career path [1,2]. The present study extends the boundary discussion on the career-planning process and the choices of occupations and jobs along a career path. Past research in the field of economics, psychology, sociology and management have implications for individual career path planning [3,4]. However, most of these implications are standalone and present a comprehensive model. This study addresses the generic idea of explaining multiple aspects in the career-planning process by proposing

a comprehensive model. Hence, this involves an extensive review of the literature and tracing the connections from a variety of past studies. Five different approaches are utilized to present the proposed model, i.e., the trait–factor approach, the theory of work adjustment approach, the psychological and socio-psychological approach, the sociological approach and the developmental approach. The past literature has indicated the link of these approaches with occupations and job-choice decisions. However, these links are unconnected in a comprehensive model [5,6]. It is further proposed that the availability of such a model can assist individuals in choosing appropriate career paths by utilizing a large amount of decision data through the use of IT-based systems.

Although an individual can have multiple options of career paths at any given stage in a career, contextual and personal changes may yield different shapes along various career paths, leading to dissimilar ultimate outcomes in a career [4]. Thus, the choice of a path is a source as well as the result of the career path guidance process [7]. Additionally, the selection of a suitable path must be calibrated according to the developmental potential and available resources at each step of the chosen course of career. Both the path and the final goal, resulting from such a process, should be able to satiate the social and financial needs of an individual while helping him or her reach an ultimate career objective through the optimal utilization of the individual's capabilities, potentials and available resources. Nevertheless, the amount and complexity of the required data, along with the sensitivity of the analytical process for such a guidance system, make career path planning an opportunity not without obstacles and challenges [8].

Such an approach to career planning would be impossible without the use of Information and Computer Technology (ICT). There are two important reasons for this. Firstly, the use of IT makes it possible to handle a large amount of data gathered from multiple sources and subsequently proposes a logical outcome from those data. This is not possible in human career counseling due to the limitations of human memory along with the time and effort needed to gather and interpret data manually for each individual [9]. In contrast, computer programs are capable of using logic and rules derived from theory, expert knowledge, real-time information and the personal profiles of individuals to derive appropriate career options for individuals at different stages of their career. Without a doubt, the designing of such online and intelligent systems is a challenging task, and so is the handling and updating of the required information, if the results are to be practically feasible and add value. Secondly, the use of an online system can help extract real-time information from multiple sources and multidimensional perspectives, relevant to the career-decision process [10]. An online system not only helps make career guidance available to a large number of individuals at different locations but also helps gather information from these individuals.

However, as mentioned earlier, designing such a system requires the comprehensive study of theoretical underpinnings in order to develop the rationale and logic for career path decisions and guidance. The complexity of such an analytical process makes the outcome sensitive to both the quality of information used and logic used to derive inferences from that information. Moreover, a holistic approach is needed that must include all the important perspectives of career choice decisions. Consequently, a major part of this paper tries to analyze different schools of thought on vocational choice and the career-decision process and identifies margins of improvement within as well as outside these approaches. The theoretical groundwork behind these approaches can help define the logic and rationality for the analytical process and provide a basis to draw inference out of large amounts of data from multiple sources. Although the focus of this paper is on career path planning, the theoretical foundations are derived from general theories of career guidance and vocational choice.

Career guidance is a multidimensional subject, and the prior literature on this issue, sourced from various perspectives, has brought forth a host of factors which can have an important bearing on the quality of such guidance. For instance, early work performed on career guidance [6,7] emphasized the importance of an individual's interest, aptitude and personality in choosing the appropriate vocation. Later on, this approach was extended

by including the role of the individual's acquired skills, abilities and qualifications in the career-guidance process [7,8]. The use of psychosomatic analysis in proposing a suitable vocation was brought in through the application of theories developed on the psychological front [9–11]. A comparatively modern contribution, from the management science perspective, is the person–job fit theory which proposes an increased job satisfaction for the job incumbent and better productivity for the employer when personal characteristics of an individual match with the job requirements [12–16]. This paper uses a comprehensive literature review to identify important aspects of career guidance theory.

It should be noted that defining guidance for any career decision is quite a complex task. This research study aims to develop a guidance system not only for a single career decision but for defining a career path that spans several career decisions. A holistic approach is needed in order to identify different aspects of an individual's profile and the environment in order to propose an optimal career path. The two major dimensions of career guidance, identified in the literature, are that of individual profiles and social context [17]. Individual profiles include abilities, qualifications, attitude, interest, personality and psychological analyses. It also includes the analysis of demands and desires of the individual in the relevant social context [18]. Situational analysis includes the economic and social analysis based on macro and microeconomic indicators, job market data, trends, social values, expert opinions and career progression tracks of successful individuals. A new dimension that this paper proposes is the developmental potential of an individual. The inclusion of the developmental perspective, apart from adding a different dimension to career decisions, plays a critical role in the series of decisions along the career path by connecting the outcomes of adjacent steps.

Besides including the developmental perspective, the proposed approach of career path planning has two-fold benefits over isolated career decisions. At the micro level, it provides individuals comprehensive career guidance to help them plan their careers strategically rather than making career decisions without consideration of the past and the future context [19]. This is because isolated decisions are often based on apparent and easily available information, trial and error, seasonal fads or stereotypical information about occupations. Therefore, the individual may run the risk of heading to career dead ends. Additionally, the approach may benefit employers due to increased job satisfaction and motivation.

At the macro level, it may help in developing a database of available potential in terms of human resources and thus help the economy in adjusting this resource according to estimated future trends. The human resources of a country are considered an important economic asset. The efficient utilization of this asset aids the economy by guiding this resource in the right direction. Accordingly, the training, education and deployment of a country's human resources should match the requirements of the economy on the one hand and the talent and aspiration of individuals on the other. Therefore, it is not only important but also necessary to develop a relevant and pertinent guidance system that can help optimize the potential of individuals for the economy and employers as well as for themselves [7]. The proposed approach is a logical and rational step towards this goal.

Careers should be planned in a logical manner, keeping in mind factors both internal and external to an individual. Decisions based on a myopic and short-term orientation may not be ideal. More often than not, the education and training an individual receives do not support their aspirations. The individuals' potential is under-utilized along with employee dissatisfaction, which is detrimental to the workplace.

It is therefore proposed to use an approach that builds upon the literature on academic and career guidance as well as counseling and planning aspects of human resources. Although the approach is broad in scope, an important aspect of such an endeavor should be to capture broad-based theoretical support from different fields dealing with human decision-making processes. Combining such an approach with the expert knowledge and real-time industry data is expected to establish well-defined rules for computer-aided career guidance systems that are able to provide relevant guidance to individuals based on

personal profiles on the one hand and on economic and job data on the other hand, while calibrating both in light of the individual's developmental potential. Such a customized and holistic approach is possible with today's information and computer technology [9].

Five different perspectives relevant to career guidance are explored below.

1.1. Trait–Factor and Related Approaches

Frank Parsons may be credited as being the first to have explored career planning in a structured and methodical manner [20]. This model considers three factors as being important when making career plans, i.e., knowing oneself, information about the available occupations and the development of reasoning in choosing an appropriate career. According to his model, each individual has a unique set of traits in terms of values, interests, abilities and personality. Different occupations demand performance in specific areas, and this performance is based on a certain set of factors [21]. These factors can be presented in an objective form and may be termed as occupational profiles. A logical link between personal traits and occupational factors can provide direction in choosing a career. This model, also referred to as trait–factor theory, laid the foundation for much of the work performed on career counseling and planning in the 20th century. Following a similar direction, it is described in the literature that attitudes developed during the early years of life have the greatest impact on occupational choices [22]. He explained that career choice decisions are derivative of the individuals' needs, formed due to their backgrounds and occupational characteristics. A researcher classified six different personality types and proposed the occupational choice as being an extension of an individual's personality [23]. The advocators of trait–factor theory have continued to emphasize the importance of the relationship between traits and occupational characteristics for better career planning [24–27]. Critics of trait–factor theory have raised questions about the validity of Parson's model for the specific needs of individuals, particularly in the context of multiple options available in a particular situation [28,29].

1.2. Theory of Work Adjustment

The merging of the fields of vocational psychology and counseling psychology has improved understanding of career counseling [6,19,20]. A landmark work in career planning was presented in the form of Theory of Work Adjustment (TWA) as a result of Minnesota Studies in Vocational Rehabilitation [30,31]. This effort in vocational psychology explained the individual's choice of career, continuance, progress and performance by describing the adjustment and facilitation of individuals with their work environment. Work adjustment is defined from two aspects. First, individuals interact with their environment in order to obtain personal gratification, pleasure and contentment. Second, individuals, due to varying potential and abilities, have different fits with the requirements of jobs. Both the aspects define the adjustment of an individual for a given job. A good match or fit yields a higher level of personal satisfaction as well as performance and progress. These factors are defined as "Satisfaction from the job" and "Satisfactoriness of the Job". The former is defined as an employee's personal preference towards a job as compared to other alternatives, whereas the latter is described as how good an employee can perform a job as compared to other jobs. Individuals are likely to leave a job when satisfaction is low, and they may not achieve considerable success on the job if satisfactoriness is low. Consequently, it is advisable, in both scenarios, to choose an alternative job with comparatively better satisfaction as well as satisfactoriness. Further work on this theory has presented a number of instruments to measure satisfaction, satisfactoriness and other dimensions used in the MSS model [21,22]. These include the Minnesota Importance Questionnaire—MIQ [30], Minnesota Satisfaction Questionnaire—MSQ [32], Minnesota Satisfactoriness Scale—MSS [33], and Minnesota Job Description Questionnaire—MJDQ [34].

1.3. Psychological/Socio-Psychological Approach

Research in psychology and social psychology has brought in two additional dimensions in the area of career planning and decision making during the middle of the 20th century. Research in psychology has shed light on the effects of unconscious motives, sentiments and negative energies of the ego and superego on the decision-making process of individuals. This work, attributed to Freud and his associates, gave birth to the idea of psychotherapy for the purpose of tracing and fixing the impact of these forces on human decision-making process [35]. Moreover, research on job motivation and the job satisfaction of individuals, originating from intrinsic and extrinsic factors, started to appear in the literature such as that by Maslow and Herzberg et al. [15,16,36,37]. These findings have helped determine how individuals evaluate various aspects when choosing different jobs in their career. Empirical studies have strongly supported the negative effect of low levels of job motivation and job satisfaction on job continuity [12–14,38–40]. Consequently, these factors have been recognized as having significant bearing on career-planning decisions. In the field of social psychology, researchers have put forth the idea that social factors, in addition to psychological factors, have an impact on the decisions and choices of individuals [41,42]. In this context, a new dimension has evolved in the realm of career planning and counseling that focuses on individual behaviors related to the social pressures, demands and relationships [43]. Desired as well as actual self-image and social pressures both come together to create an individual's world, within which they work, choose occupations and strive for achievement. An important work recognizing sociological factors that may have an impact on occupational choice was presented by Blau [44]. He studied the psychological, sociological and economic determinants in defining occupational choices.

1.4. Sociological Approach

Considerable work has been conducted on the generic decision-making process from sociological perspectives. According to this paradigm, the success of any decision is inspired and measured by the social factors related to the give and take options [45]. Choosing an alternative may involve the consideration of intangible and economic gains [43,44]. Furthermore, human beings deal with 'objectives' and 'means' differently when deciding between alternatives. Variability in human behavior implies that different means may be chosen in various situations to reach the same objective. Therefore, the assumption of always choosing one alternative over the other, in a given situation, can be challenged, in particular if they fall under 'means' and not 'objectives' [46,47]. Thus, human choices may not be representative of the underlying motives of these decisions, which may be multidimensional and interactive rather than only relevant to choices [48]. Interestingly, theories on human behavior started incorporating multidimensional views on decision making and the choice of alternatives quite a long time ago [49,50]. However, these concepts remain under-utilized when defining career decisions and occupational choices.
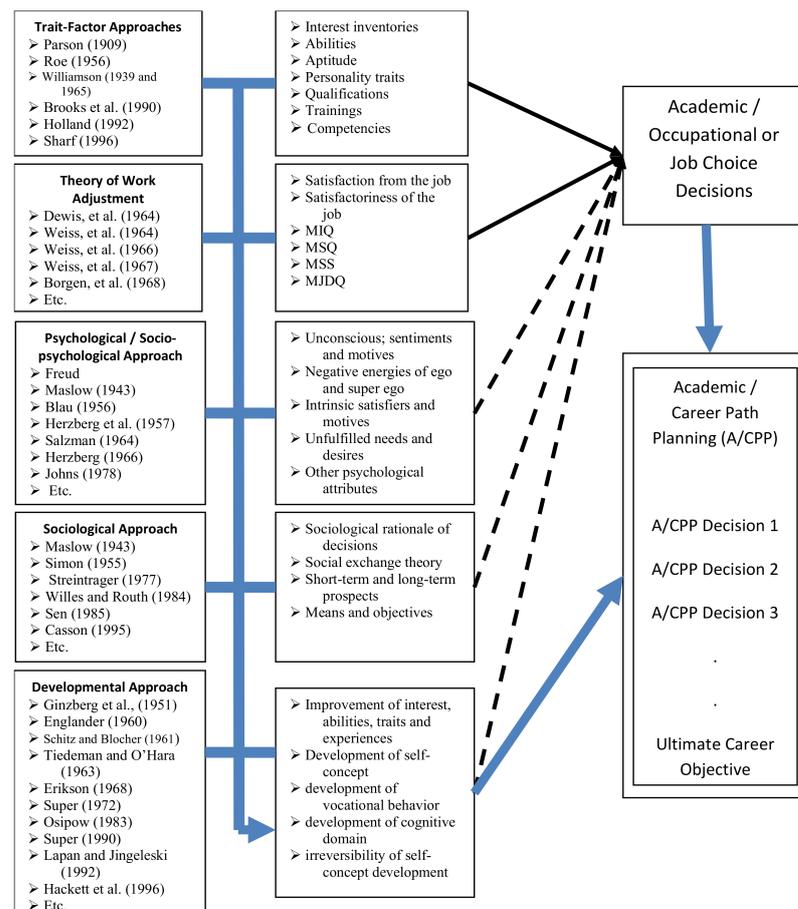
1.5. Developmental Approach

A deficiency in the trait–factor approach and theory of work adjustment is their assumption of dealing with the occupational choice as an unvarying decision at any point of an individual career. In this regard, researchers have presented the idea of change in vocational choices because of personal developments in life and qualifications [51]. Hence, it is plausible to propose that individuals develop their interests, capabilities and potential to fit with different jobs as they progress in life. Changes in abilities, interests and even job-specific traits are especially dynamic in the early span of an individual's life and career [48,49,52]. On the other hand, the self-concept and self-perception of individuals also mature with advancement in life and career. Individuals use their self-concept to assess their match with different occupations [53], while using the concept of social space to find their compatibility with different options within an occupation [53]. The maturity of the self-concept improves the individual's understanding of their vocational behavior [53–57]. The super defines how different experiences in life change the self-concept of individuals [54].

Another development in individuals is in the cognitive domain. Although the development of the self-concept helps individuals to know themselves, improvement in the cognitive domain improves the decision-making capability and, consequently, career decisions [58]. Therefore, developments in three different dimensions during the individual's career span gradually improve one's understanding about the self, one's fit with the environment and one's decision-making ability.

For these reasons, it is important to address career paths as dynamic and shifting, requiring a developmental rather than a static approach. The role of career counseling is not to find a match between personal factors and job requirements and environment only, but also to suggest how a developmental approach may be used to improve some of the weak areas while capitalizing on areas of strength. Such an approach can help individuals beyond finding a job that matches their abilities. An important consideration, in this regard, is the irreversibility of this developmental process [50]. This means that, once individuals develop a dimension, it is impossible for them to redo (undo) it. This irreversibility of the developmental process makes it more critical to select a right and timely choice from the developmental perspective [59].

The last two perspectives, which are comparatively under-utilized in career guidance research and practice, should be given a fair weightage to improve the quality of career guidance. The proposed model is presented in Figure 1. The bold lines show those associations that have been utilized in the field of career guidance. Dotted lines indicate the under-utilized perspectives in career guidance. The proposed model of career path planning is presented with dark bold lines.

Figure 1. Theoretical review of the developments in career guidance and the margins of the proposed approach.

2. Materials and Methods

In the present paper, we performed a detailed and comprehensive search of articles published in multiple journals since 1909, which investigated predictors of career path. Essentially, the articles address career guidance from five different perspectives, namely trait–factor and related approaches, the theory of work adjustment, the psychological/socio-psychological approach, the sociological approach and the developmental approach, and they present a comprehensive model that may assist individuals in selecting a career path that serves to define and accomplish their long-term individual goals.

In order to develop rationale and logic for career path decisions and guidance, a comprehensive study of the theoretical underpinnings was conducted. The complexity of such an analytical process has made the outcome sensitive to both the quality of information used and the logic used to derive inferences from that information. This paper details a holistic approach that includes all the important perspectives of career choice decisions. A major part of this paper tries to analyze different schools of thought on vocational choice and career-decision process and tries to identify margins of improvement within as well as outside these approaches. The theoretical groundwork behind these approaches can help define logic and rationality for the analytical process and can provide a basis to draw inference out of a large amount of data from multiple sources. Although the focus of this paper is on career path planning, the theoretical foundations are derived from general theories of career guidance and vocational choice.

2.1. Methodology

Frank Parsons may be credited as being the first to have explored career planning in a structured and methodical manner [20]. Research articles since 1909 that contained theories and empirical results relevant to career planning were obtained by using a systematic approach. As per the hypothesized model, studies relevant to five different approaches, namely the trait–factor approach, the TWA approach, the psychological/socio-psychological approach, the sociological approach and the developmental approach, were selected. After excluding the duplications, the search yielded 70 titles.
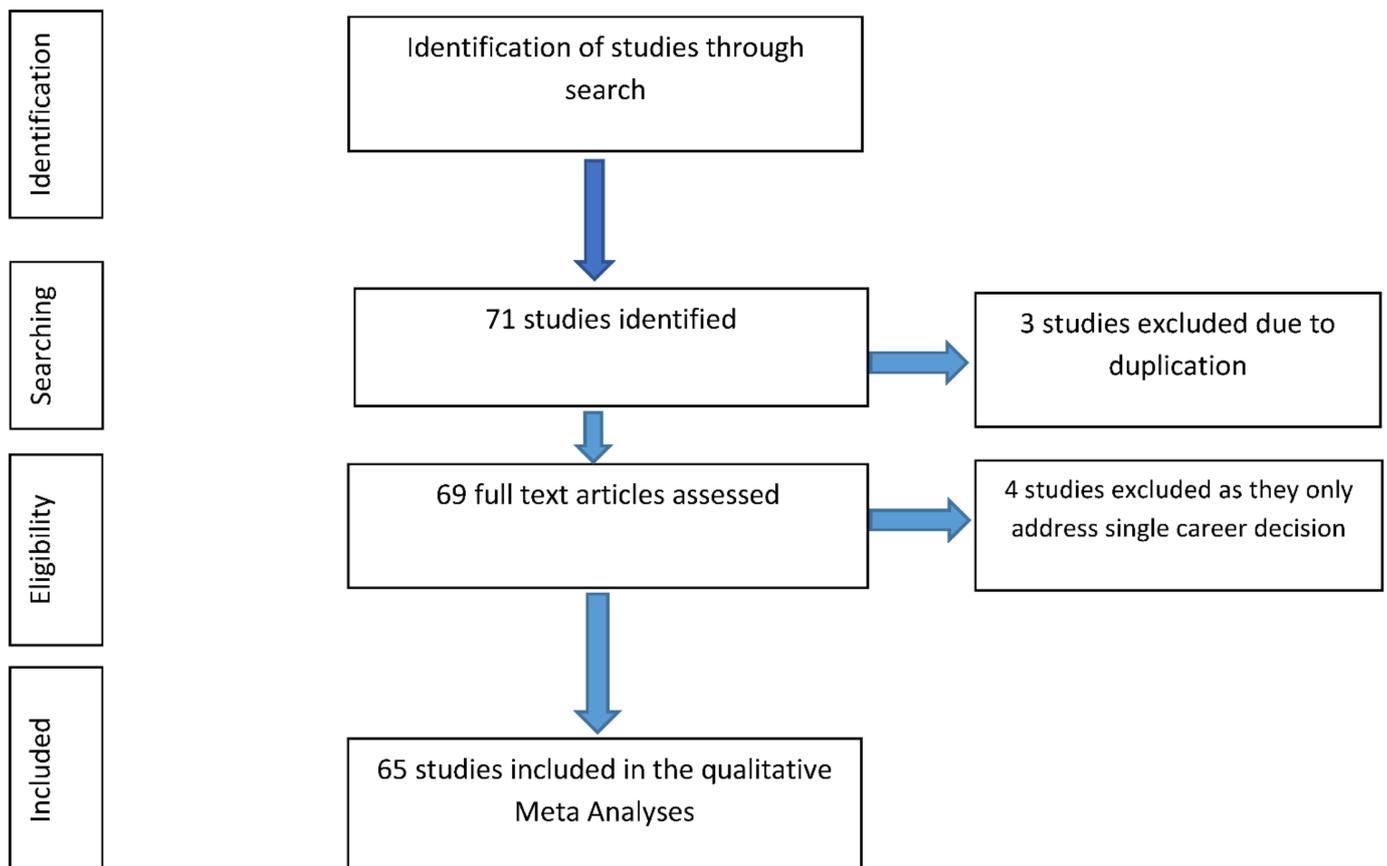
In order to extract the data, three of the authors independently read the titles or abstracts of all potential studies. If an abstract appeared to represent a career planning component, each author read the full report independently to determine if the study met the inclusion criteria. In several cases, more authors were included when an agreement could not be reached about the inclusion of the study. A results extraction sheet was used to capture study characteristics and the conclusions. A few studies were excluded, as they only addressed career decisions and did not specifically address the career planning components. After this, 65 studies were selected for the qualitative meta-analyses. A PRISMA flow diagram in Figure 2 shows the systematic review and Meta analyses in detail.

2.2. Utilization of the Proposed Approach

Occupational choice and career decisions are a multidimensional topic. For any individual, it is practically impossible to take under consideration such a wide array of perspectives every time a decision is made. Moreover, it is difficult to consider all of these factors independently without systematic assistance and databases.

The trait–factor model and derived theories propagate a match between personal factors and occupational characteristics, focusing on developing profiles based on interests, abilities, aptitude, etc., which may be compared with various occupational characteristics to find a good match. A considerable number of career counseling services are capitalizing on this, and a number of assessment tools have been constructed to build the personal profiles of clients and to match them with the occupational characteristics [60,61]. Psychological theories can detail the personal determinants and motivation in choosing a career. The development of the psychological profiles of individuals adds a psychological perspective in providing career guidance. Sociological theories may add value by uncovering the factors related to the preferences of individuals regarding relationships, associations and

demands within social groups. It is proposed that a significant margin for improvement in career counseling lies within the sociological perspective that has not been fully utilized in past. This refers not only to the use of the sociological analyses of individuals and their preferences, but it also entails a decision-making model that includes these aspects in a dynamic form specific to each individual. A reason behind this greater margin is the idea that career decisions are an extension of the social behavior of humans. Secondly, sociological theories have extensively discussed the generic process of decision making and selection of alternatives, an aspect that career counseling models have not fully utilized.

Identification

Searching

Eligibility

Included

Identification of studies through search

71 studies identified

3 studies excluded due to duplication

69 full text articles assessed

4 studies excluded as they only address single career decision

65 studies included in the qualitative Meta Analyses

Figure 2. PRISMA flow diagram.

Another perspective, the developmental view of occupational choice, presents variations and improvement in career decision as coming from three different directions. Firstly, the compositions of personal interest, abilities and traits are transformed during one's career. This improves or modifies the availability of occupational choices for individuals as they progress in life. Secondly, the occupational choices may become more refined due to a better understanding of the self-concept. Thirdly, development in the cognitive domain can improve decision making for available occupational choices. As individuals can improve in all three dimensions, the gap, at any point in life, represents the scope of career guidance.

Additionally, from the developmental perspective, it may be a safe assumption that the choice of occupation and that of career path are two different issues. The former may be a static decision at a point in one's career, whereas the latter involves a series of synchronized steps aimed at reaching the ultimate career goal. The devised approach is catered to achieve two major objectives. First, it gives due weight to sociological and developmental perspectives in addition to generally used criteria based on trait–factor and psychological perspectives. Second, and more importantly, it is proposed that the guidance based on the path planning perspective is far more important and critical as compared to guidance for a single choice at a given point in one's career. It is possible that the output

of the former yields a different recommendation with respect to the latter. Therefore, it is recommended to utilize developmental potential to supplement the other perspectives for better career guidance.

2.3. Computer-Assisted Career Guidance (CACG)

These systems were initiated in the 1960s, aiming to facilitate some of the assessments that career counselors were applying manually [62]. Initially, computer-based career guidance was defined as those systems that enable clients to understand themselves in a better manner and that also help them to make better decisions by using large databases, which otherwise is not possible [59–61]. Several researchers have mentioned self-awareness through better and quicker assessments as the main objective of these systems [62–64]. Other advantages mentioned in the literature are the availability of a comprehensive number of options and systematic assistance for better decision-making skills [65,66]. Additionally, most of the CACG systems are employed to aid college and school students in order to provide them with direct access to information and available career choices. These systems became popular and were used in schools during the 1980s [67,68].

Initially, the trait–factor approach was the best fit for these computer-based career guidance systems, as it was a more quantifiable approach. However, career guidance through computers has a far wider scope if one is to incorporate multiple dimensions rather than simply matching jobs characteristics with personal traits [66]. Within the last two decades, the field of online career guidance has evolved into a productive, progressive and a dynamic one that not only provides an immense amount of information and data to clients but that also helps them understand and draw meaning out of this information [26,65]. The Association of Computer-Based Systems for Career Information defines two components of online career guidance systems. One concerns the information and database, and the other deals with analyses, facilitation and career management. A number of online career guidance services are in place with different names and scopes, i.e., e-guidance, virtual career centers, e-career counseling, etc. [62]. Most of these services focus on matching the current needs of clients with available options in the job market. Some of these do apply the psychological profiling of employees by using different questionnaires [65]. However, most CACG systems have been developed by replicating and fine-tuning the procedures of manual counseling or by making their application easier through the use of computers and the Internet [69]. The basic premise for these approaches is the speeding up and/or facilitating the manual counseling methods [70].

Most of the past endeavors of computer-based/online job counseling services were focused on job or vocational matches while overlooking career paths. However, as mentioned earlier, 'career path counseling' is a better candidate to benefit from CACGs, as it requires a large amount of data sourced from multiple sources updated on a regular basis. Although vocational and job choice counseling is to be part of the proposed guidance system, the focus remains on devising career paths needed to achieve the ultimate goals in one's career.

3. Results and Findings

3.1. Discussion of the Results

The results of the meta-analyses support the role of the five approaches hypothesized for the career-planning process. The trait–factor approach and the TWA approach provide the foundation for the career-planning process with reference to the internal satisfaction of the individual. The results strongly support these aspects. The psychological and socio-psychological approach complements the trait–factor and TWA approaches, as they share the internal satisfaction of the individual with occupational selections along the career path. Regarding the fourth, i.e., the sociological approach, whereas theoretical studies present strong logic, this is comparatively a less addressed area in the empirical findings. One of the reasons behind this may be the indirect association of sociological pressures with career path decisions vis-à-vis the direct association of three approaches presented in the beginning. Nevertheless, social demands present a significant factor in the career path and

planning decisions of an individual. Additionally, the sociological approach presents a very important area from a long-term perspective of career planning. Finally, the developmental approach is the least addressed and utilized area in the career planning literature. One of the logical reasons is the volatility of the results by using such an approach in defining the career path. The developmental approach can help in defining the differences and movement in the selection of a career path. The application of the developmental approach can translate into an appreciation in the career path with every next step and vice versa, which is translated into high volatility of results. This approach addresses a critical area that is directly linked with the internal satisfaction of individuals focused in the first two approaches and with the sociological adjustment of individuals focused in the latter two approaches disused above. Overall, the proposed model is adequately supported by the results.

3.2. Findings

On the basis of a multidimensional understanding of career guidance and the amount, complexity and sensitivity of the data involved, it is proposed that this approach may be better executed using computer-assisted systems that can source and logically analyze a large amount of information from several sources to produce coherent and practical career path decisions. Several broad conclusions can be derived from this meta-analysis, and some of them are explained as following. The present study opens a new dimension for researchers to explore by taking into account isolated job decisions and considering the career as a whole. It directs career guidance from five different perspectives, namely trait–factor and related approaches, the theory of work adjustment, the psychological/socio-psychological approach, the sociological approach and the developmental approach, and it presents a synthesized model that aids individuals in choosing a career path that serves to define and accomplish their long-term individual goals.

3.3. Benefits and Operational Aspects of the Proposed Approach through CACG

In order to realize the full potential of CACG systems, they should be seen not only in the context of traditional manual counseling approach but also, and perhaps more importantly, as an independent system with its own scope. There are several reasons for proposing this.

First, some counseling techniques that are used in real life may not be translated into CACGs because of the difference in the environments within which the two function. For instance, the literature is ripe on how the personality, personal influence and effective communication of counselors affect the quality of counseling services. In the case of CACGs, this may be irrelevant or must be interpreted differently. Therefore, some of these aspects may prove irrelevant in CACG systems, whereas others can be tackled through a standardized approach rather than through the subjectivity of humans, as is the case during counseling sessions [71]. Moreover, it should be acknowledged that a new set of challenges arises when human beings are confronted with CACG systems as opposed to humans [72,73].

Second, many manual careers counseling techniques are derived from psychological counseling, which is used to help with psychological problems [61,64]. These techniques, though effective within their domain, have limitations when applied in a different context, particularly when career choice decisions are more concerned with progressive choices rather than fixing psychological issues [74]. Moreover, career choice decisions are related with sociological demands, and planning for that may lead to a better output. This becomes even more important if one adheres to the notion that individuals perform jobs or choose careers in order to satiate their sociological needs more than anything else. Along a similar line, the developmental theories of career growth propose that individuals learn to adjust with different environments and develop abilities that are demanded by the environment.

Third, the effectiveness of manual counseling depends upon the ability of counselors to obtain and analyze a significant amount of information and make it available during

counseling or when needed [3]. With a limited human memory, it may not be possible to retain and retrieve a large amount of updated data from various sources during discussion/counseling meetings. Perhaps, it is because of this reason that the manual career guidance approach predominantly focuses on psychological adjustment rather than social and contextual demands [75]. In the case of CACGs, the issue can be sufficiently dealt with by not only having an immense amount of updated data but also by synchronizing it with the unique sociological demands of an individual as well as market conditions.

Additionally, contemporary developments in the fields of sociology and psychology have challenged the older concepts regarding the economic rationality of man as a source of explaining decision making [74,75]. In this age of information, people not only have access to information but also understand its relevance to them. This increases the importance and scope of contextual and sociological factors in career decisions. A standard approach focusing on these aspects is recommendable for CACG systems. As discussed earlier, the sociological and developmental perspectives of career guidance have not been utilized effectively, even in manual counseling [29,48]. The proposed approach aims to bring in sociological and developmental perspectives; therefore, career guidance systems may be exploited to their full potential.

The differentiating factor of this approach is its focus on a multistep career path rather than finding a job or choosing jobs out of available options. It is proposed to assess specific psychological characteristics as well as unique social needs in order to define the ultimate target in one's career. Next, it expands the individual profile by determining the developmental potential within the situation. As a third step, it creates career path(s) for the client by using a large database of information about market conditions, trends, industry data, job data, etc., calibrated through expert opinions and case studies of individuals who have opted to go for similar paths. As mentioned earlier, a huge margin lies in the application of sociological perspectives in career decision making. Unique social pressures and requirements faced by an individual can make one alternative preferable over another. Not surprisingly, these preferences are unique for every individual, and defining a general set of personal traits that always prefer a specific occupational or career choice may be misleading in the context of sociological perspectives. The proposed CACG system is able to treat each case individually, as the specific sociological demands, developmental potential and resources at hand vary for each individual. Having said this, it is plausible that different individuals follow different paths for different or similar ultimate objectives in their career.

The Proposed Conceptual Framework is shown in Figure 3. Four different aspects are covered in developing client profiles. These include psychological fit, social pressures and demands, developmental potential and resources at hand (economic, etc.). A list of possibilities of ultimate career objectives is created with the help of these profiles along with market data, expert opinions, trends and case studies of those who have adopted these paths.
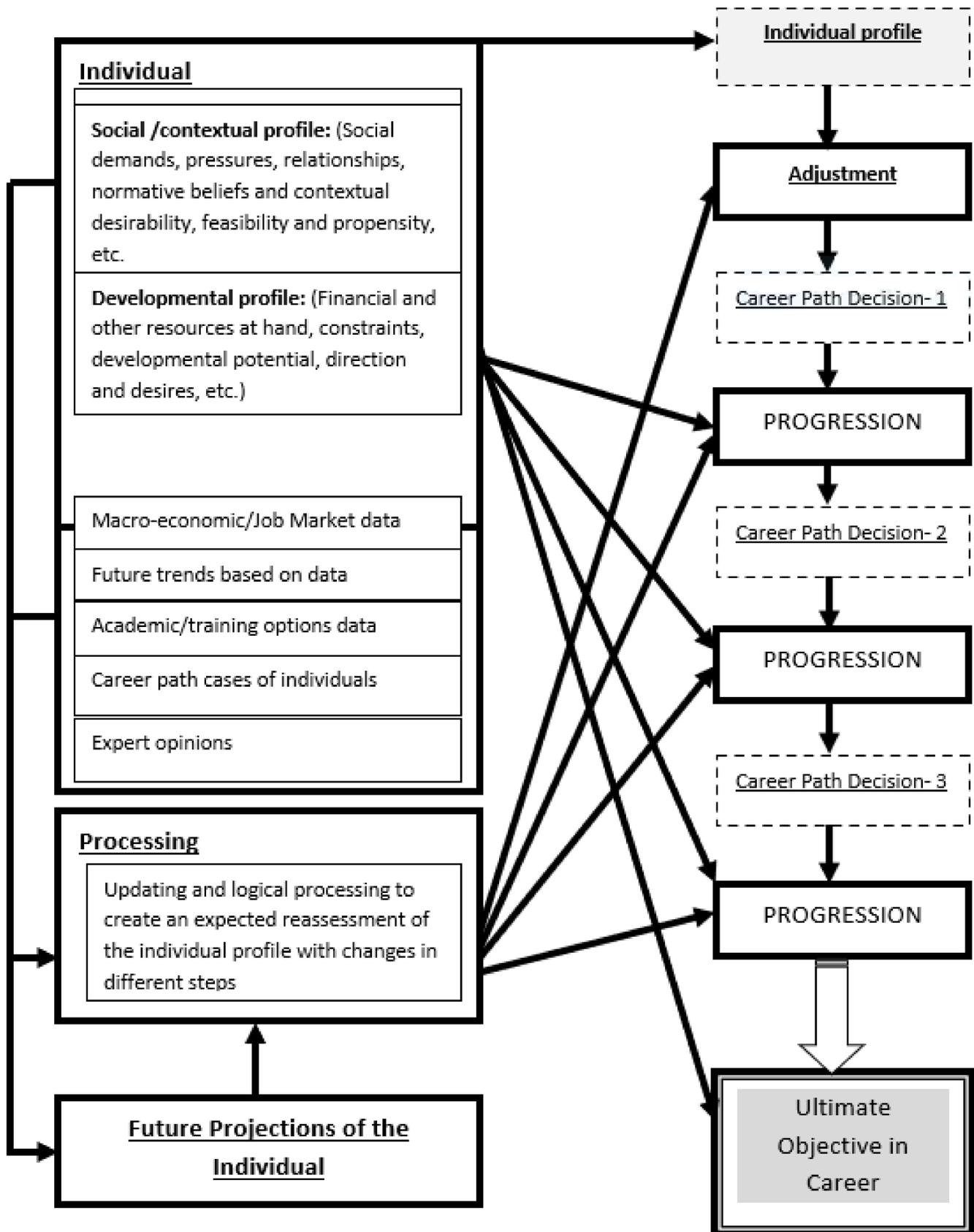
Figure 3. Conceptual framework for the CACG system as per the proposed approach.

4. Conclusions

Career guidance is a multi-dimensional task that requires a thorough understanding of different perspectives related to careers and the individual. It can be plausibly concluded that the sociological perspective provides critical input in the career-planning process. This is according to the suggestion of Hartung and Blustien [5]. It has also been implied that the developmental potential and opportunities available with the individual can play a significant role in career path planning. Developmental potential can also modify the goal of a career path. Researchers point towards such improvements through social learning and development [11].

Overall, a comprehensive model sourced from multiple aspects is supported in explaining the decision making of individuals regarding career path planning. In line with Appelbaum, given the extensive amount of variables pertaining to the environment and the individual, such an approach would not have been possible without the incorporation of Information and Computer Technology [9]. Apart from theoretical contributions, the findings of the study bear important implications for the development of any career path-planning and guidance system. Such a system can provide useful and holistic guidance for career decisions, unlike job portents that can help with just one job decision.

Career guidance, when effective, offers job satisfaction to the individual. It also aids the economy by deploying human resource in areas where the maximum potential may be achieved. This article lays the groundwork needed to move from taking isolated job decisions to thinking about the career as a whole. It addresses career guidance from five different perspectives, namely trait–factor and related approaches, the theory of work adjustment, the psychological/socio-psychological approach, the sociological approach and the developmental approach, and it presents a synthesized model that may aid individuals in choosing a career path that serves to define and accomplish their long-term individual goals. Different types of data required (job, industry, economic, etc.) for career planning have also been identified in this research. The integration of the proposed framework and real-time data can not only assist individuals in their job search, but it can also guide them along consequent steps in their career. The main focus of this paper is to provide a theoretical framework that may be integrated with relevant data in order to define career paths rather than a job only. This broad approach assists in a meta-analysis of an individual's abilities, interests, needs, social demands and psychological characteristics, along with the developmental margins related to personal and situational resources at hand, in order to provide guidance about multiple steps in a proposed career path to reach the desired goal.

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