

**STANDARDIZED PROFESSIONAL COUNSELING
TECHNIQUES USING INTERPOLATIVE FUZZY
EXPERT SYSTEM IN ROMANIAN PROFESIONAL
VOCATIONAL COUNSELLING SERVICES FUNDED
BY EUROPEEAN UNION**

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Abstract: This paper aims to present an automated model (interpolative fuzzy expert system) willing to verify and assist the decision making process accomplished by POSDRU experts during professional advice and counselling services addressing beneficiaries of projects. Integrated employment services are the core of all POSDRU projects, quality, efficient implementation and achievement of the proposed project outputs largely depends on standardization of information and counselling services, tutoring, training and professional mediation. We understand the automatic model, as POSDRU expert / counsellor assistance in the decision on the employability of the beneficiaries, after following professional information services, mediation, tutoring and training. The automated (interpolative fuzzy expert system) model will refer to a system that takes as input the data obtained in the counselling and/or training services, and as outputs, professional profiles matching actual skills of the beneficiaries and the labour market demands.

Key words: professional counseling, interpolative fuzzy expert system, POSDRU

Theoretically aspects of professional counselling in posdru projects

Career counselling services dedicated to young people and adults experienced standardization when they began to be offered for free, subsidized by EU funds. If by 2007, these services were provided in isolation by the ANOFM throughout county agencies and accredited providers to perform various information services, counselling and vocational training for the unemployed, with service subsidized by European funds, the market of professional advisers experienced a vast development and specialization, depending on objectives and indicators of implemented projects.

Most of the projects were in the centre offering integrated services for socio-professional insertion of beneficiaries will have a base component focused on providing dedicated advice and guidance to vulnerable groups. By vulnerable groups we understand the class of beneficiaries who have less access to labour market information, low skills or unsolicited abilities, low motivation to work or train/professionally qualified in a specific area, groups at risk of marginalization and inexperienced young professional or elderly people who are consider being no longer lucrative in the current context of Romania. It should be noted here, changes to the classification of occupations in Romania, as well as occupational standards, which often put in difficulty authorized providers of training programs. Here is mentioned amendment to labour law and education law, which currently put special emphasis on training and skills / competency based assessment very well defined.

Studying professional counselling services market in Romania, we find various techniques and strategies for obtaining complete and comprehensive information on the skills of beneficiaries who participate in these services, and career plans aimed at socio-professional insertion

final lengthy. The primary means of obtaining information on the professional interests of beneficiaries is Holland type questionnaire used in high percentage by POSDRU counselling experts. These types of questionnaires come to define the scope of occupational beneficiaries, often representing the starting point in ones career plan.

Theorizing professional counselling services sector will need to consider two important variables: the beneficiary and the employer. If most of the techniques used by professional advisers are considering the recipient, with the entire complex skills and attitudes, with the entry of POSDRU grants, there emerged a new profile, the mediation advisor, who will deal with the study of labour market trends and occupational achievement diagnostics in the area offering these services. These diagnostics will provide an occupational endpoint to the career plan, namely specific work, which will be directed towards the recipient, according to its skills. This dual system works very simple, theoretically. Take for example a beneficiary that obtained Holland - type profile mostly realistic, after the interpretation of a questionnaire results. This beneficiary has a higher education degree in Engineering - Automation and Applied Informatics and has completed 1 year of service, being employed on a job in the industrial process engineering field, with an increased motivation to engage in a similar position. The output that results from the first phase of the professional counselling process will be mediation to a similar post, but under another employer. On the other hand, the occupational diagnosis developed to collect all vacancies in the area, show two process engineer vacancies and 50 vacancies product engineer. To what job will he be mediated in order to obtain a long-term employability? This decision, if left to the beneficiary, will not be a decision in itself because the beneficiary will apply simultaneously to both jobs and wait to be

invited by any employer to take the interview. What exactly is the role of mediation advisor? Under no circumstances is limited to collecting vacancies and to indicate their beneficiaries the multiplicity of jobs to apply at random, hoping that someone will click on to an interview. The existence of similar job work experience is an ideal context for beneficiaries, but difficult to manage in the process of professional mediation. Equally difficult is deciding on professional mediation in the absence of a beneficiary job work experience related to it.

People development organization arad branch

People Development Organization Arad Branch (FDP Arad) is a non-governmental organization that has provided educational and / or socio-professional integration for vulnerable people from its inception. Since November 2009 FDP Arad is a National Authority for Qualifications (ANC) accredited entity for providing initial training in input, processing and validation data operator.

Since 2009, FDP Arad is an Arad County Agency for Employment (AJOFM Arad) accredited entity for providing specialized services to boost employment - information, advice and mediation in the labour market. Since 2003 FDP has conducted in collaboration with AJOFM Arad several counselling and guidance activities aimed at socio-professional integration of disadvantaged people in the city of Arad and other rural areas of the county. Starting this service was made possible thanks to projects funded by the Region of Lombardy, MMSSF by Law 34 and Italian Ministry of Foreign Affairs.

Since 2011, FDP is a CNFPA (ANC) authorized supplier for adult specialization programs, offering a training program for Trainer

occupation and since 2012, FDP is accredited to provide training programs for trading workers.

Since 2008, FDP Arad has implemented POSDRU projects (DMI 2.3, 5.1 , 5.2, 6.1) as applicant or partner, aimed at providing professional counselling services to integrated long-term employability of beneficiaries. Integrated services refer to information services, individual and group counselling, Job -club sessions, training, tutoring and professional mediation. All these services have seen through the projects to standardize the procedures for each service provided concerning both the technical side and the proposed outcome. One of the successful techniques used by counsellors in the counselling process is the use of beneficiary vocational skills balance. This instrument determines the current beneficiary's specific expertise and identifies its training needs. Tutoring activity for people who are professional mediated, are mostly oriented to employment education, aiming at developing a positive attitude about people with whom they work with and superiors. People's mindset that has no recent experience in the labour market is anchored in a non-constructive pattern that they should be protected at all times by the professional problems they are faced with.

Once beneficiaries have completed the steps recipients of information, guidance and counselling or mediation, they are prepared for the interview with the employer. Tutor's role begins when the beneficiary has participated in the selection interview. If the beneficiary has not been selected, it is directed to the analysis phase of the interview. He must be aware of the positive and negative aspects with which he was confronted, and this context will have to extract positive experience for him to cultivate in future interviews. Usually expectations of employers and beneficiary's inexperienced workers are very large; tutor's role here is to

alleviate expectations about future employee payroll and received help from colleagues and superiors. When the designated person from the company describes the minimum employment criteria, the role of the tutor is to analyze together with the beneficiary if he or she is able to handle the responsibility or not. Tutor's work is nearing completion when the beneficiary has adapted to working schedule and conditions of work as well as teamwork and there is satisfaction with income.

Tutoring activity for beneficiaries that are involved in a training program aims at developing a positive attitude towards the trainer, knowledge and other students. As the beneficiaries have received information, counselling or career guidance and also a recommendation to follow a training course, they are included in the category of people who will benefit from tutoring.

Tutor's role is to manage throughout education, viewed from the perspective of the learner, not the trainer. First, the educational objectives will relate to adapt to the training program and stimulate student – trainer – content relationship. As the courses are conducted and the adaptation stage is completed, the tutor will start the motivation towards more precise knowledge learning of the beneficiary. The last stage in the framework of the tutoring will focus on providing accurate information about concrete work tasks they will face in a future job. Role plays will take place and the beneficiaries will be directed to jobs as training, regarding their interests, level of specific skills, age and previous work experience.

Interpolative fuzzy expert system in the mediation process work

To facilitate counsellor's decision in choosing a specific job for which to apply for a particular beneficiary, we have developed a decision

making model to assist him in setting the ultimate objective of a career plan. Do not forget to make the difference between finding a job and building a career.

The decisional model proposed in this paper is based on a fuzzy expert system interpolation.

The starting point in the development of this expert system will be setting input variables. These input variables (input) - the beneficiary's personal information are collected by professional counsellor through Holland type questionnaires, individual counselling records, CVs and skills' survey. Output variables (output) will consist of information on the specific areas of expertise, demanded by the job description: low, middle or top management on a specific occupation (for example, low management accounting, senior management engineering). In this paper, we will not analyze the importance of personality profile.

Thus, as input, our expert system will record the scores received by beneficiaries in vocational interest questionnaire, namely Realistic - Investigative - Artistic - Social - Enterprising - Conventional (RIASEC) scores on each dimension, the beneficiary's age, previous work experience and level of competence. The three independent variables entered as input to the expert system will serve to shape the output, the real occupational profile of the beneficiary in order to initiate the mediation process towards obtaining a job. When we talk about real occupational profile of the recipient, we will refer to those jobs which the recipient is advised to apply for. Thus, when the beneficiary enters the mediation process in order to achieve long-term employment, the mediation adviser provides him with a list of vacancies at the time. These lists are compiled daily, representing a collection of about 30 vacancies taken from local press, AJOFM Arad, Bestjobs, EJobs and collaborators.

Besides the name, duties and responsibilities, each post will provide a specification on the previous experience and specific skills required, for example Low Management, Middle Management and Top Management.

For our expert system to operate correlated to vacancies specifications, we chose the output data to be represented in the professional areas form proposed by Holland according to their RIASEC model scores. To facilitate the work of mediation experts, our expert system will show the level of expertise of the beneficiary on Holland occupational profile, for example Low Management technical professions or Top Management social professions.

The fundamental operation of this expert system is to setup multiple decision rules on the classification level of beneficiary's professional expertise (Low / Middle / Top Management) on each of the six occupational profiles RIASEC. The questionnaire scores of professional interest will be corrected mathematically depending on age, experience and level of competencies resulting from the skills balance technique.

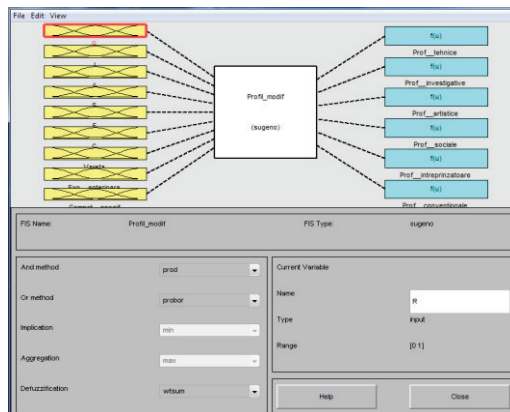


Fig 1. Fuzzy Expert System input and output data

Specifically, we used as input variables the six types of occupational interests with the qualitative descriptors: low, medium and high. These descriptors are defined according to the score obtained by the beneficiary on each of the six types of occupational interests in relation to the minimum and maximum points obtained. Besides RIASEC profile, we took into account the level recipient's specific competency, revealed by the technique used by the counsellor, namely skills' balance, previous work experience (less than 3 years 3 to 5 years over 5 years) and age (between 16 and 24, between 25 and 45 years, 45 years).

For modelling the system inputs and outputs there were used trapezoidal and triangular type sets. The outputs of the expert system refer to the six professional fields that correspond to each RIASEC profile. Every professional field has as a descriptor level of expertise: low management, middle management and top management. These descriptors will provide both the beneficiary and mediation adviser a much clearer picture of the level of professional expertise, organizing the selection of vacancies to which the recipient will be encouraged to apply to.

Expert system's core is represented by the inference rules, decision rules that establish correspondences between variables, in order to determine the level of professional expertise.

Next picture summarizes the inference rules proposed by this model.

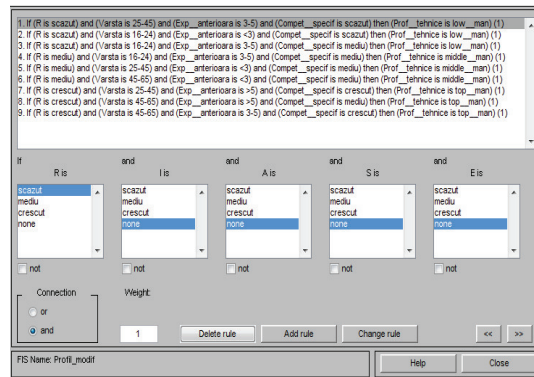


Fig 2. Decisional rules for calculating the Professional expertise level

If the beneficiary has obtained a low score on the REAL (R) dimension, is aged between 25 and 45, has previous work experience under 3 years, and the level of specific skills is low, the proposed model will provide as output a low management area of technical professions.

Results

After determining the inference rules for classifying beneficiaries in one of three specific categories of professional expertise corresponding to the RIASEC model (LM, MM, TM), we present some areas obtained from the simulation process. The most representative results of the estimation obtained (surface) are shown in Figures 3 and 4.

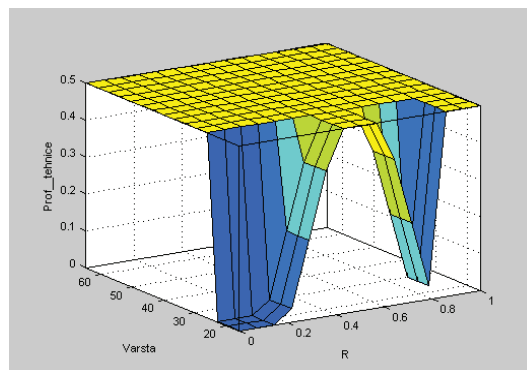


Fig 3. Technical professions – Age Surface

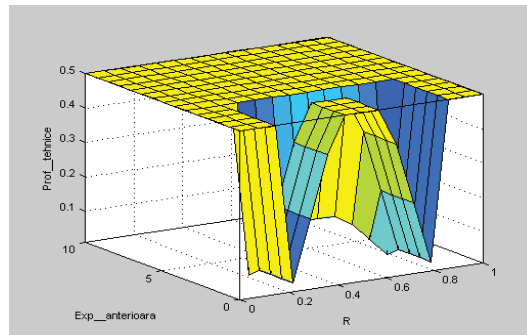


Fig 4. Technical professions – Previous work experience Surface

The above results reveal three areas chosen as outputs and their intermediate levels for the technical professions output, depending on the size of the R score, age and beneficiary's previous work experience.

Conclusions

This type of expert system assisted counselling system is designed to attract the attention of the beneficiary on its real level of professional expertise in a particular area and to facilitate decision making on the vacancy selection to which the recipient will be encouraged to apply to.

Using Holland type questionnaire in adult vocational counselling, we often find ourselves in the situation of not having a vacant job to make the matching between professional interests and professional expertise of the beneficiary and the requirements and responsibilities of a particular job vacancy. When the mediation decision is hampered by various factors related to the personal structure of the beneficiary or the context of the labour market, professional advice throughout the process becomes slow and often unproductive, though latency will induce a beneficiary not to apply for certain posts, or on the contrary, it will send erratic applications for all vacancies. The slowness of the process of

professional counselling will be reflected in the project low index, low employability rate.

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