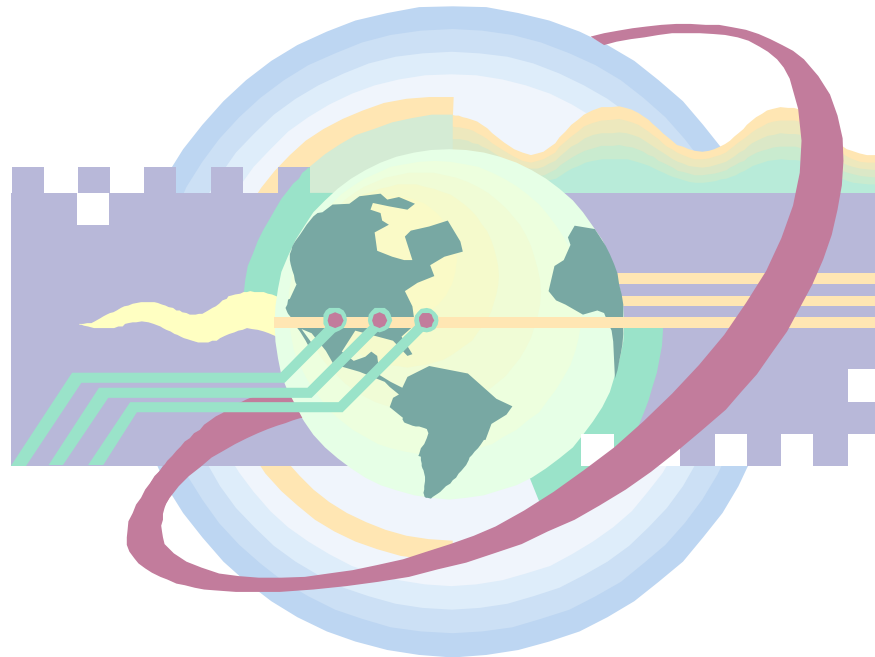


**EXECUTIVE DECISION MAKING
MANAGEMENT SCIENCE**

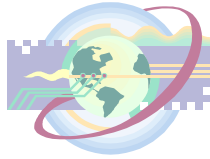
**SELECTING A FLUOR EXECUTIVE
FOR A MULTINATIONAL
ENVIRONMENT**



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Abstract: Fluor Infrastructure, a division of Fluor Corporation, is currently evaluating six upper management personnel for selection to Senior Executive Director to be responsible for infrastructure projects in Western Europe. Management research has found that expatriation failures are typically high, therefore, this study project used a structured decision making process to derive a best choice from among the six candidates. An Analytical Hierarchy Process (AHP) was used as the decision methodology. Expert Choice (ECPro) software was the platform used for building a AHP decision model.

INTRODUCTION

Fluor Corporation is a global engineering, construction, and diversified project services organization with corporate and operating offices located worldwide. For the past ten years, the corporation's operating revenue has exceeded \$10 billion per year (Fluor, 1999). Fluor Infrastructure is one of eight corporate strategic divisions that specialize in project and program development from the conceptual phase through operations and maintenance. The Infrastructure division provides project services specifically related to airports, railways, marine transportation, and road structures.

Study Project Background

The Fluor Infrastructure division is currently evaluating six employees for selection to Senior Executive Director to be responsible for the major infrastructure projects that are soon to start in the Netherlands, England, and Scotland. Each country will implement an infrastructure program that includes multi-phased commuter rail road and light rail projects. Project costs are estimated to range from \$700 million to \$4,300 million. Fluor Infrastructure will enter into joint venture agreements with engineering consultants, equipment manufacturers, and vehicle manufacturers establishing a public-private consortium in order to be the single-source program management provider to the host

countries. The expatriate assignment period for the Senior Executive Director will be five years with an option for a five year extension. The final selection for Senior Executive Director is to be completed by May 2000 and the selected candidate is expected to go on full-time assignment by the end of August 2000 (Fluor, 2000).

THE POTENTIAL PROBLEM

Due to the diverse backgrounds of the six candidates, the selection process can become complex. It is important that the Senior Executive Director quickly adapt to multinational project environments and therefore be a corporate diplomat for Fluor's Western European initiative. Additionally, expatriate failures, which are common, can be fatal to the momentum and effectiveness in initiating the programs. Management research has found that 16 to 40 percent of all American expatriates sent abroad, return from their assignments early, and each premature return can potentially cost hundreds of thousands of dollars (Hill, 1998). Furthermore, expatriate failures can also represent a failure in the organization's selection policy and process (Mendenhall and Oddou, 1985).

Although all candidates have international experience, for most, their career and family situation is much different now than it was 10 years ago. Making a long-term commitment to work abroad and, in particular, in such a highly responsible position is a much more difficult task. Additionally, each candidate is faced with more risk now than in prior years, such as interruptions in their children's secondary school education, buy-sell issues related to their homes and real estate, and disconnection from established corporate and personal contacts. The ultimate goal, as represented by this study project, is to overcome these potential expatriation difficulties by taking into consideration the priorities of objectives and criteria that are considered important for expatriate success. Using a structured decision making methodology will assist in overcoming these difficulties.

EMPLOYEE INITIAL SCREENING

The Fluor employee database was used for initial screening. This process focused on identifying candidates that were qualified to hold executive level program management positions, and assured that they met the basic requirements for managing in multinational environments. In addition to their

corporate classification and job title, the following three criteria were used for identifying and screening potential candidates:

- **Fluor Cadre:** Because of the magnitude of project cost, size, and complexity in each host country, all candidates must have been employed by Fluor for at least five years prior to this selection (Fluor, 2000). All six candidates now being evaluated met this requirement. This requirement was also insisted upon because all organizations have unique identities, have trained their executives within these parameters, and socialized individuals to adopt certain identities as their own (March, 1994).
- **Cross-Border Experience:** All candidates must have had prior international and preferably multinational experience (Fluor, 2000). Although all six candidates have had experience abroad, none possess project experience in the United Kingdom or Western Europe specifically.
- **Middle Management Positions:** All employees given serious consideration must have responsible management experience. While all candidates met this requirement, their positions vary from project manager, to engineering manager, to senior design engineer, and project development manager.

The Fluor screening process identified six current employees that have the potential for final selection (Fluor, 2000). In addition to the screening criteria discussed above, the candidates' education and comprehensive work experience was also considered in the overall evaluation for selection. The combination of education and experience was quite diverse among the six candidates. One employee has no formal education above high school, but has worked for Fluor for most of his 35 years of professional experience. Two candidates hold doctorate degrees, while the other three hold a B.S., M.S. and MBA.

THE DECISION MAKING PROCESS

When reviewing the Fluor Infrastructure process for evaluating candidates, we found that the selection team had no structured methodology for the evaluation process. The practices used for selection had traditionally included a background check, interviews, and evaluation by a selection team that consisted of a group comprised of department managers, division managers, and HR representatives.

Nevertheless, final selection appears to have been made by consensus between a Senior Executive Vice President and the Infrastructure President (Fluor, 2000). These executives fit the suggestion put forth by Marsh, that is, they were top-level executives having experienced their own competence in decision making and therefore tended to internalize the role of decision making (Marsh, 1994).

The Analytic Hierarchy Process (AHP)

Because expatriation failures are typically high and European success is important for increasing Fluor shareholder wealth, our study team suggests that the Infrastructure selection team include an Analytic Hierarchy Process (AHP) in their evaluation process. This study project, suggests that by using an AHP model the Fluor Infrastructure selection team can make more rational and objective decisions. As we have learned in our management science studies, the key for using the AHP methodology is to focus on objectives, rather than alternatives or attributes. These objectives should provide a yardstick with which a particular candidate can be measured by (Forman, 2000 Spring). The process should remove discretion, but take into consideration the collection of subjectivity that decision makers can quantify.

Expert Choice (ECPro) is the software used for modeling and processing the AHP methodology in this study. The application of ECPro software was conducted by a team of two graduate students at the George Washington University (Rye and Abraham) representing a decision making process that can be used by the Infrastructure selection team. In today's Fluor organization, decisions are increasingly being made by groups rather than individual executives, and Expert Choice is highly effective in coordinating complex decision-making input (Expert Choice, 2000).

Expert Choice (ECPro) Decision Modeling

ECPro is the software used for modeling our decision-making hierarchy. ECPro uses a process that helps find the best choice for a final selection. By using the ECPro model, the objectives were placed into a structured hierarchy and pairwise analysis performed to determine relative importance of the different objectives listed. In this study, we used exclusively verbal judgements for determining the weighted value of objectives. The software used these qualitative judgements to compute the quantitative priorities leading to the best choice.

Expected Results

The expected result of this study is to derive a priority of the alternative candidates that are the best to be considered by Fluor Infrastructure. The selection of alternatives is discussed in more detail in the following section. The ECPro pairwise judgements are used to derive priorities using the principle right hand eigenvector of the comparison matrix in each cluster of the hierarchy. The ECPro synthesis combines these priorities to determine the overall alternative priorities (Forman, 2000). Thus, the best priority will be accepted with confidence for selecting the best candidate to fill the post. We also expect to recommend to the Infrastructure selection team the use of the AHP methodology to help the group enhance the quality of their decision making process.

BUILDING THE ECPro HIERARCHY

With the AHP methodology, which forms the basis of ECPro decision support software, our objectives, alternatives, and criteria were arranged in a hierarchical structure. Using ECPro software we built a model to choose candidates for international assignment. We constructed a relative model, which compared all the elements pairwise throughout, including the alternatives. We then synthesized our personal judgement and intuition to obtain the results of a sensitivity analysis. The ECPro hierarchy model is shown in Figure 1. The ECPro alternatives of choice identify the candidates by a fictitious name only in order to maintain confidentiality of the individuals true identity. After the model was agreed upon by the student team a combination of subjective and objective factors were included in the hierarchy.

The ECPro Goal Statement

The overall goal of this study is to derive the priority of the alternative candidates that will ultimately lead to selection of a multinational Senior Executive Director. This goal is summarized in a goal statement which is also included in the ECPro goal node. ECPro enables us to effectively combine both measurable and subjective factors in our decision process (Expert Choice, 2000).

Numerous Objectives in the Hierarchy

The objectives used in our study and model are a collection of criteria that management studies have found to be important for successful international and multinational assignment. Input was also

received from the Fluor human resource representatives. From our review of the research done on expatriation selection, we found the following dimensions that seem to predict success in foreign posting:

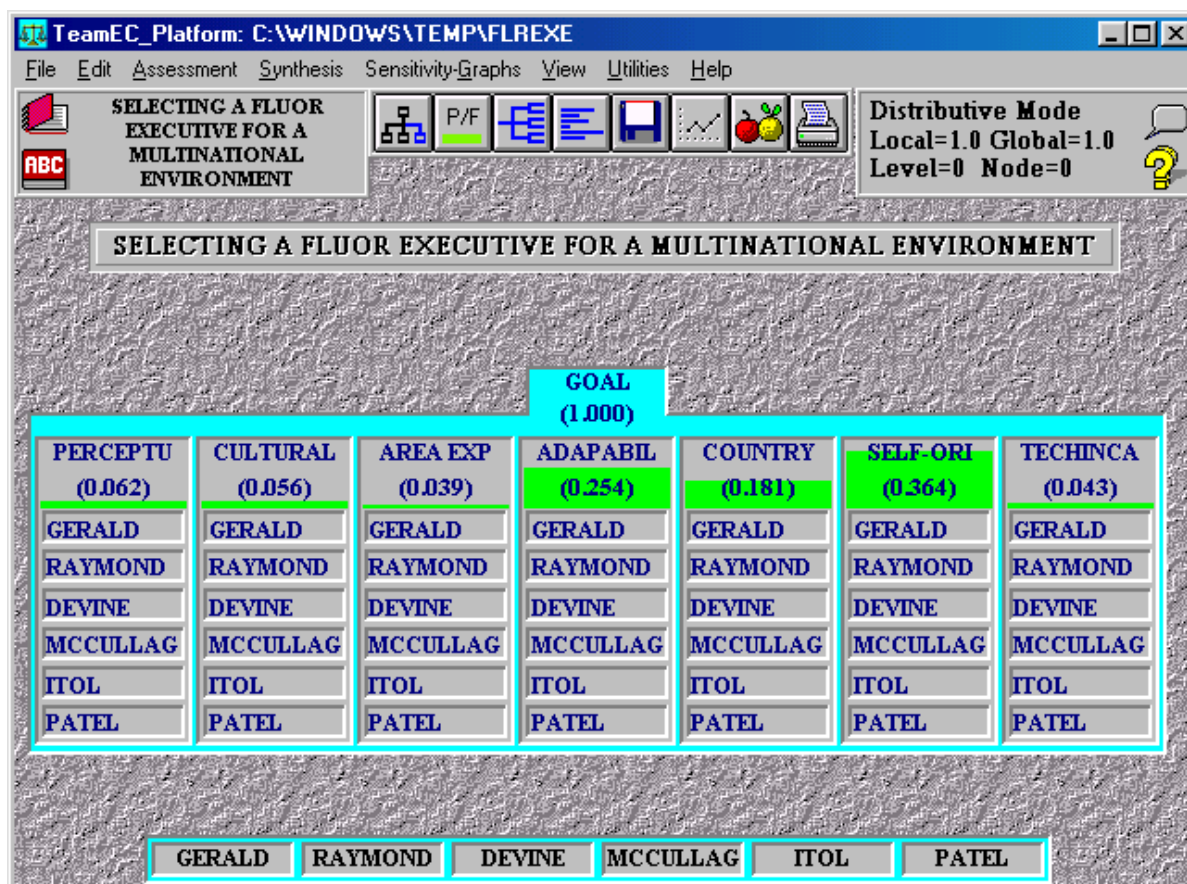


Figure 1: Overall ECPro Hierarchy Model

- Perceptual Ability:** The ability of the Senior Executive Director to understand why people from other countries behave in the ways they do; that is, the ability to empathize with the country nationals behavior and foreign country cultures (Mendenhall and Oddou, 1985). Fluor multinational executives who lack this ability may experience significant management problems and their dependants may in turn experience social frustration.

- **Cultural Toughness:** This criterion refers to how well the executive and his dependents are able to adjust to a particular country or a particular group of countries. For example, many of the employees may regard England as a relatively easy assignment to adjust to. On the other hand, working in the Netherlands or maybe even Scotland could be considered more difficult. The reasons for the differences may be numerous; however, the most apparent reason may be foreign language difficulties, varied work ethics, different cultural values, and different levels of political control (Mendenhall and Oddou, 1985). Country toughness can also be a function of the support system provided by the corporation (White, 2000 March).
- **Area Expertise:** Familiarity with the countries cultures, languages, traditions, environment, and politics is related to this dimension. The executive's area expertise may come from training or from prior hands on experience in the host country. The more the executive specifically knows or is learning about the specific countries, the better position they will be in for selection (Hill, 1998).
- **Adaptability of Family:** Family problems remain the major reason for the high percentage of expatriate failures (Frame, 1995). The failure of spouses and children to adjust to foreign assignments seems to be related to a number of factors. Often spouses and children find themselves in a foreign country without the familiar network of family and friends. Language differences make it difficult for them to make new friends. This can be exacerbated by immigration rules prohibiting the spouse from taking up employment (Rugman and Hodgetts, 1995). Social conditions, cultural values, entertainment, schools, and separation from relatives are some of the important elements that the executive and his family must consider.
- **Country Orientation:** This criterion refers to the executive's ability to interact effectively with the host country nationals. The primary factors in these criteria are the executive's willingness to communicate and build relationships. For example, making the effort to use the national language can make a strong impression on the country's nationals. Relationship development refers to constructing effective friendships and professional networks with host country nationals (Ozinkota, Ronkainen and Moffett, 1996).

- **Self-Orientation:** This criterion refers to a high self-esteem, self-confidence, and mental well being of the executive and their family. That is, the executive and their family should be able to adapt their interests in food, sports, music, and other interests outside of the project and business environment (Mendenhall and Oddou, 1985). Individuals that have these attributes can usually make quick adjustments.
- **Technical Competence**

The Fluor Senior Executive Director position, related to the European infrastructure programs, will include the planning, design, construction, start-up, and operations of commuter railroad and light rail systems. Therefore, the Senior Executive Director must have a level of technical competence to be effective in communicating and making assessments of the work of others (Fluor, 2000). Although a high level of technical expertise is not required, technical competence is necessary in the management use of electronic systems for program management networking and data processing. Electronic links will exist between contractors, designers, suppliers, and decision maker's around the world.

Alternatives of Choice

There is no question that the level of education and experience is very important when evaluating personnel for executive positions and particularly multinational assignments. Even in modern Europe the management environment can be significantly different from common practices used in the United States. Not only are technical skills important, but the foundation for effective cultural and behavioral skills can be significantly improved through educational systems if the actual years of experience are limited (Frame, 1995).

From the screening list of candidates, we found that those with the advanced degrees typically had less working experience. The relationship between the level of education and the years of experience seems to be a product of the screening constants; employees must be able to hold program management positions, each employee has had international experience, and all currently holds middle management positions. As a result, the screening and sorting process resulted in the identification of the following three primary conditions:

- **Non-Degreed Candidates:** A high school level of education is represented by one of the candidates, however he has 35 years of working experience on both domestic and international assignments. Also, this particular employee has attained a responsible position in the corporation through his years of working with the company.
- **Secondary Education:** Bachelor and master degrees represent three candidates. The one candidate that holds a bachelor degree has also completed some post-graduate study.
- **Terminal Degree:** Although employees with doctorate degree are few, two have shown up in the screening for a Senior Executive Director.

Figure 1 provides a profile of the important attributes that were used in the initial selection evaluation.

	EDUCATION	EXPERIENCE	INTERNATIONAL	DEPENDENTS
			EXPERIENCE	
GERALD	HS	35	16	1
RAYMOND	BS	26	12	1
DEVINE	MS	17	9	2
McCULLAGH	MBA	21	9	4
ITOL	PHD	14	6	3
PATEL	DENG	7	3	0

Figure 2: Screening Profile of Fluor Candidate's

The following descriptions provide more detail related to each candidate that is being considered for selection.

- **GERALD:** This candidate's formal education was limited to a high school diploma, but he has completed some college work and a substantial amount of professional development programs. The candidate holds a very responsible management position in the Fluor Corporation and has a proven work record for excellent project performance and increasing value to the corporation's shareholders. The candidate has held a position of vice-president in former corporate divisions, but has survived the reorganizations by assuming optional management roles. This candidate

has no dependents other than his wife. Out of the 35 years of working experience, this candidate has combination of 16 years of foreign assignments including Indonesia, South America, and Saudi Arabia.

- **RAYMOND:** This candidate holds a B.S. in Civil Engineering with some graduate and postgraduate work completed. He also has a strong resume of professional development programs sponsored by Fluor Corporation. Out of the 26 years of professional working experience, he has been on foreign assignment for a total of 12 years. All of his work abroad has been in South America; Brazil, Chile, Venezuela, and related to the petrochemical industry. The candidate currently holds an upper-middle management position and is considered to have achieved a high level of professional maturity. If selected, expatriation would include this executive and his wife only.
- **DEVINE:** This candidate holds a B.S. in Civil Engineering and a M.S. in Civil Engineering (Structural). He currently holds a position of senior project director on a major industrial complex in the U.S. Out of the 17 years of professional working experience, he has been on foreign assignment for a total of 9 years. All of his work abroad has been in Indonesia related to chemical processing and textile facilities. If selected, expatriation would include this executive, his wife, and one teenage child.
- **McCULLAGH:** This employee holds a B.S. in Civil Engineering and a MBA with a concentration in International Business from a recognized Southern California university. His working experience includes approximately 9 years abroad, mostly in Hong Kong. He currently holds a project development position for providing telecommunication services to the government sector. Most of his success has come from marketing and sales, but he has little experience in managing in a complex project environment. He has a reputation of dealing well with clients and working with joint venture associates and partners. He also has a good professional reputation among his corporate peers and particularly with upper management. Expatriation would include himself, his wife, and two post teenage children.

- **ITOL:** This candidate is of Asian origin where he received his undergraduate degree in Engineering. He holds a M.S. in Engineering and a Ph.D in Engineering Management from U.S. universities. He is currently a Fluor manager for a mechanical engineering design department related to infrastructure. The last five years of his working experience has been with Fluor. All of his international experience occurred in years prior to joining Fluor, and all was in Southeast Asia. This candidate has technical skills related to rail control systems and communications that can be valuable to the European programs. He is considered by Fluor executives to have leadership qualities that should be developed and matured. If this candidate receives selection he would relocate abroad with his wife, two teenage children, and one younger child.
- **PATEL:** This candidate has advanced technical skills that are related to the state of the art science of microprocessor control systems for rail roads and guide way systems. His advanced degrees, including a Doctorate in Engineering, are related to Engineering Physics and he has contributed substantial work to the MIT National Transportation Institute. However, his foreign experience is very limited, all of it concentrated in Australia. He is considered to have excellent managerial qualities, works well with people, communicates well at all managerial levels, and is a tireless worker. Although the candidates national origin is India, all of his advanced study was completed in the U.S. This candidate has no dependents to consider in the expatriation plans.

DISCUSSING AND ANALYZING THE MODEL

Pairwise Comparisons

We performed the pairwise comparisons using the bottom up approach, by first entering the judgment for the alternative with respect to the criteria, then the criteria with respect to the goal. ECPro guided

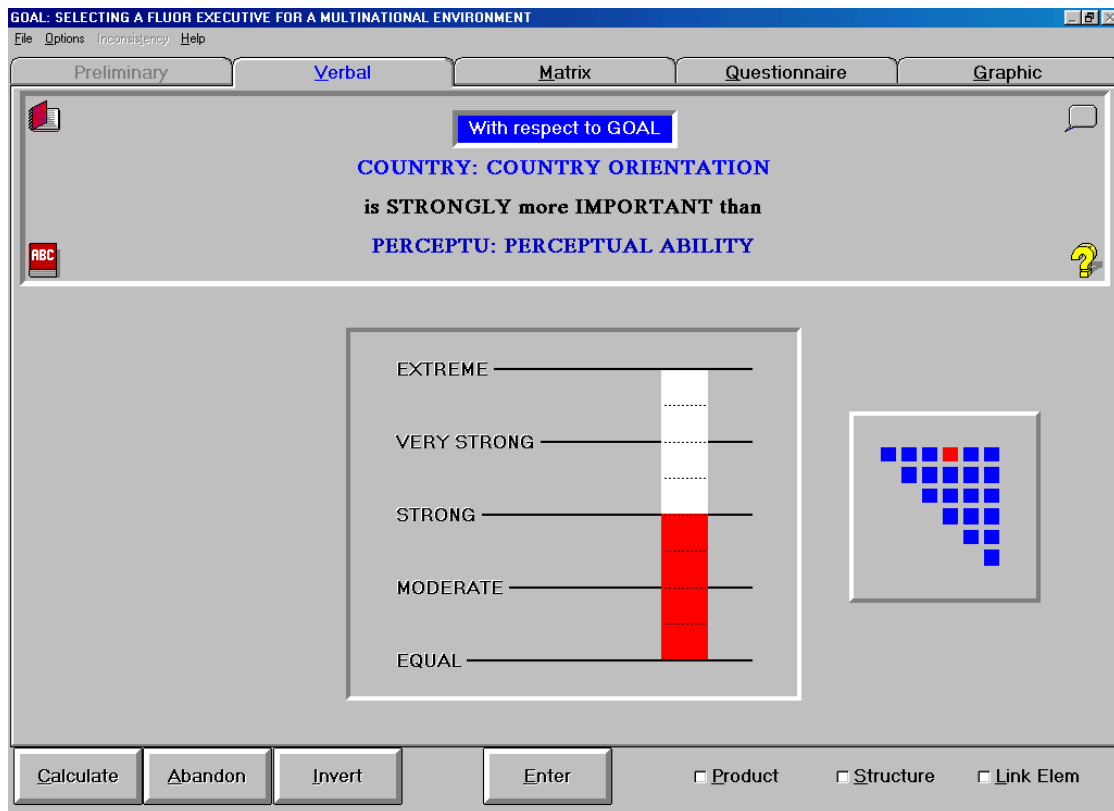


Figure 3: Pairwise Comparisons using verbal judgements.

our exercise by identifying our objectives, alternatives, and the criteria on which the alternatives are judged. Using our judgments we then weighted the relative importance of each criterion and alternative. Once the model was complete, ECPro posed a series of simple comparisons of the alternatives in relation to our criteria and objectives. We chose to use verbal judgements as represented in Figure 3 above. In this way, ECPro made the complex decision of selecting among the six candidates, with the multiple interrelationships of alternatives, criteria, objectives, easily manageable.

Comparative Sensitivity Analysis

Once we made all of our comparisons, ECPro processed the data, synthesized our judgments, and calculated the priorities that show how we ranked the alternatives. When the sensitivity analysis was run, the various objectives were rated against each other in relative importance. The results of the

sensitivity analysis are presented in Figure 4 by comparing the different priority measurements. That is, the sensitivity analysis measurements are compared with respect to each major objective.

Interval of Alternatives

The intervals between the alternatives were surprising. For example, we intuitively expected the candidate Mr. Raymond would have been represented by a high priority. However, this candidate resulted in a low priority. Surprisingly, Mr. Raymond fell at the same level of priority as Mr. Patel with three years of international experience. These findings are best represented in the Figure 4 performance graph.

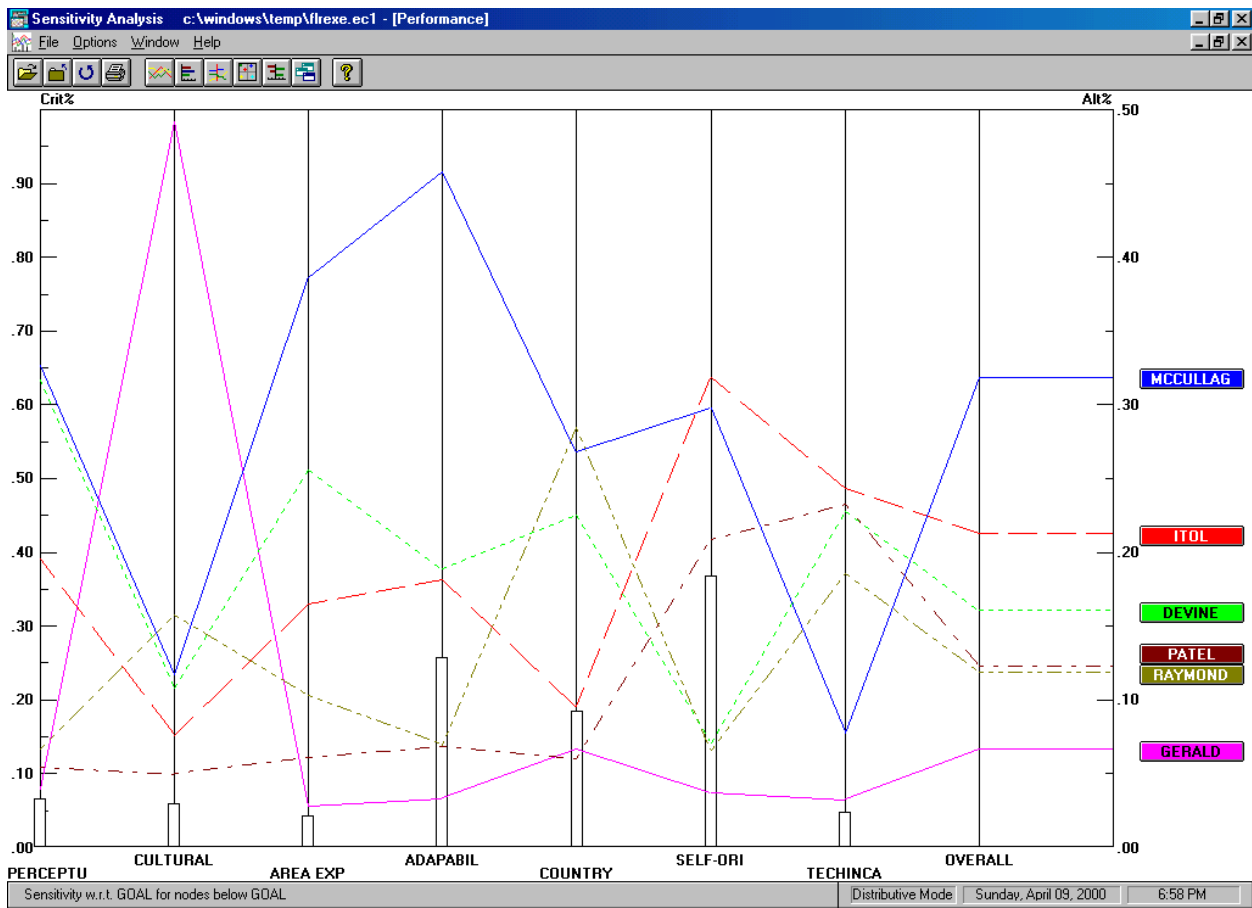


Figure 4: ECPro Sensitivity Analysis (Performance)

Weights of Objective Changes

ECPro provides five sensitivity analysis charts that allow us to quickly see graphically how altering the weights of the objectives changes the results of the decision making process (Expert Choice, 2000).

Such analysis can help answer the “what if” questions. If we make a slight change in one or more aspects of the model, does the optimal decision change. The five sensitivity analysis charts are shown in Figure 5 below.

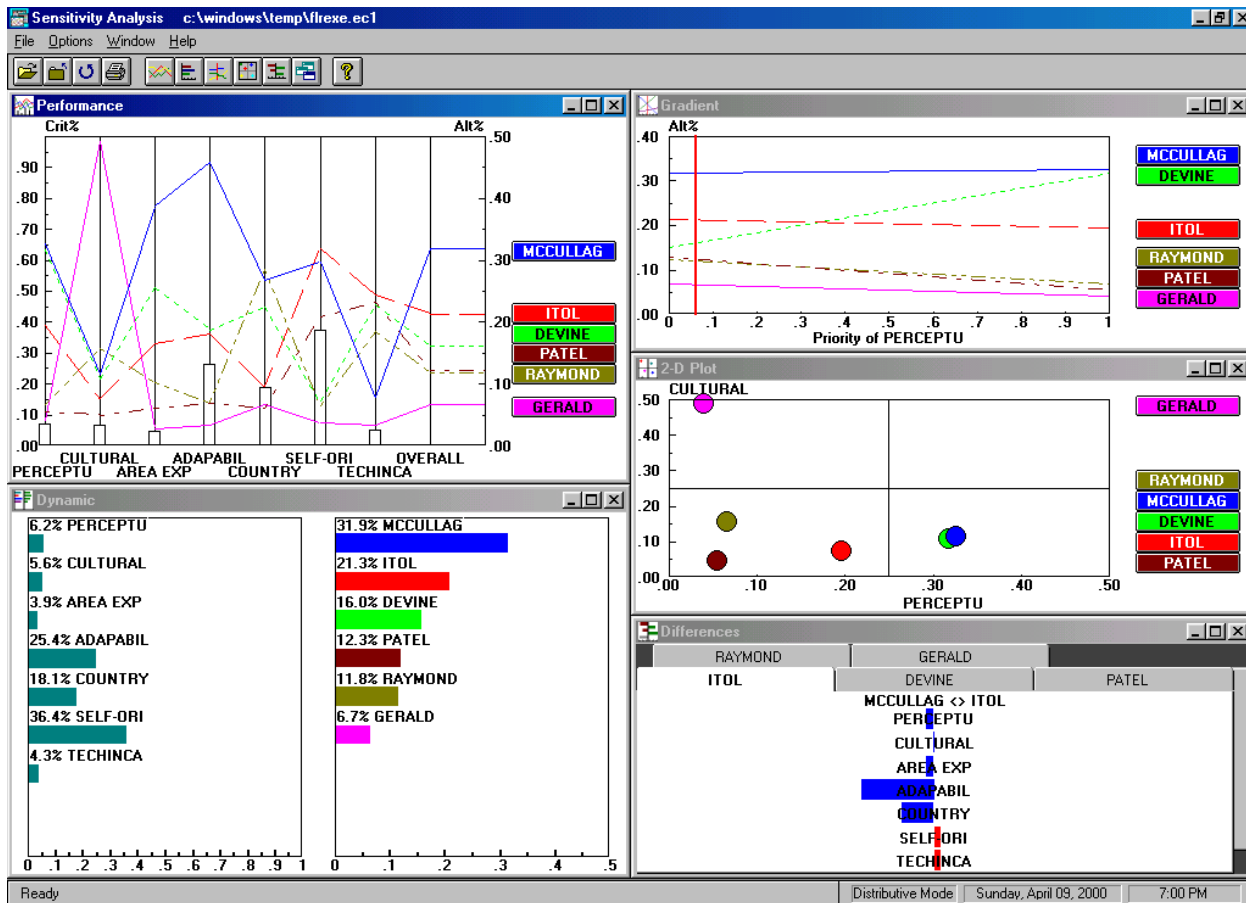


Figure 5: Comparative Graphs of the ECPro Sensitivity Analysis

Priority of Choice

As a result of the ECPro sensitivity analysis the best choice for Senior Executive Director among all alternatives is the candidate identified as Mr. McCullagh. We recall that this candidate holds a B.S. in Civil Engineering and a MBA with a concentration in International Business. His working experience includes approximately 9 years abroad in the Orient. In the early years of his career, this candidate held responsible project management positions, however, most of his success has come from marketing and sales. He currently holds a project development position for providing telecommunication services to the government sector. We also recall that Mr. McCullagh’s reputation

is known to be good in dealing with clients and working with joint venture associates. He also has a good professional reputation among his corporate peers and particularly with upper management. Expatriation would include himself, his wife and two post teenage children.

Mr. McCullagh's relative preference rated high on perceptual ability, cultural toughness, country orientation, and technical competency. These are among the objectives we have chosen to represent. We interpret this result as a combination of Mr. McCullagh's education in international business and almost a decade of working experience abroad. The low rating for technical competence for McCullagh is not really surprising because of the focus he has given to developing strong marketing and business development skills. However, the candidate's behavioral attributes represented by the objectives, have been measured to be relatively high, compared to the other alternates.

Surprise About Candidate Itol

The weighted value and the level of priority related to Mr. Itol was surprising. However, the consistent pattern of weighted values for our objectives seems to indicate that this candidate may need more experience or more preparation in behavioral skills as related to our objectives. Perhaps this can be attained through a educational or professional development program. There have been indications made by the selection team that this candidate is favored by the Infrastructure executives. Mr. Itol has a proven success record of managing in complex project environments. That is, complex projects, technical issues, and tough clients.

Derived Priorities

The derived priorities for the best choice with respect to meeting our goal is represented by the distributive synthesis summary comparison, Figure 5. Self-orientation has the highest weighted value, referring to high self-esteem, self-confidence, and mental well being. It is important that the executive can adapt his interests to the multinational food, sports, music, and other interests all in the effort of making a quick adjustment.

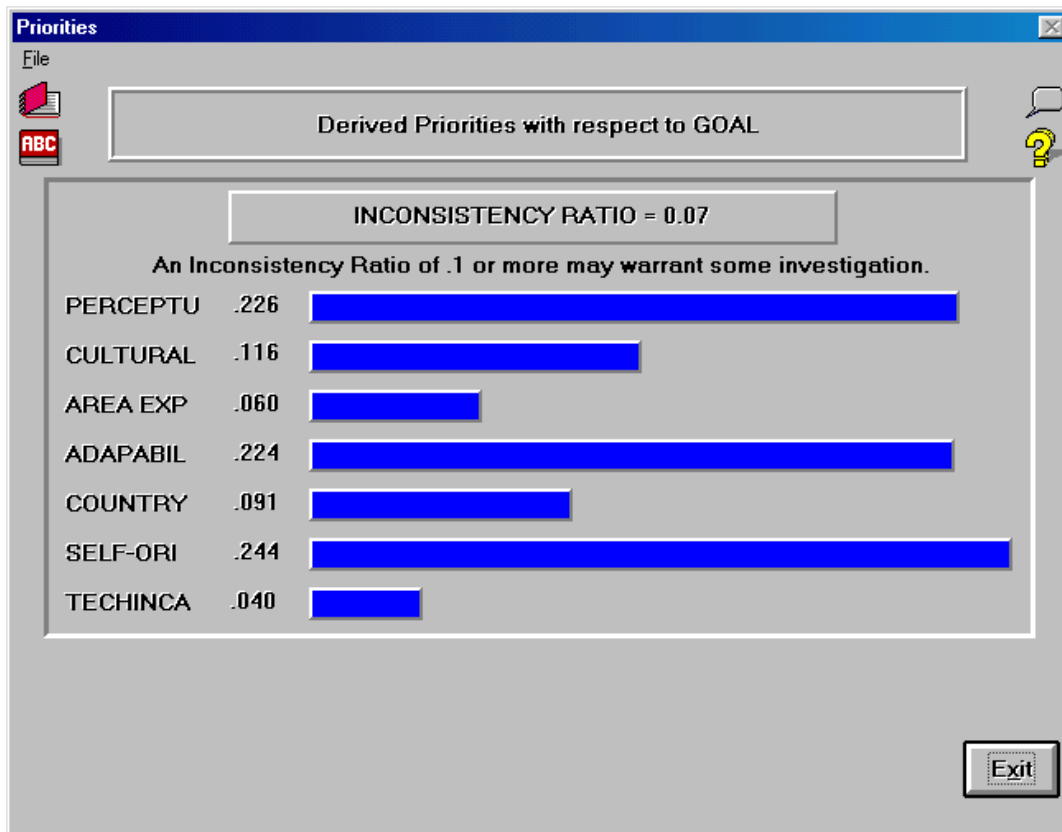


Figure 6: Derived Priorities With Respect to the ECPro Goal

CONCLUSION

Making a selection of the best candidate that will add the highest value to Fluor’s European initiative, contribute to project success, and succeed with expatriation, can become complex for making a rational decision. Therefore, based on the results of our ECPro sensitivity analysis and the confidence we have learned to have in the AHP methodology, we can recommend to the Fluor selection team to look specifically at candidate McCullagh.

We also recommend that the Fluor selection team recognize the relationships that our study indicates may exist between the objectives for successful expatriation. Where prior experience is usually given intuitively high priority in domestic selections, the perceptual, cultural, cognitive, and analytical skills that derive from the combination of experience, advanced studies, and behavioral attributes should be given a high level of consideration for selection of multinational executives.

The AHP methodology and model deriving a performance measure from the sensitivity analysis achieved the overall goal of “Selecting a Fluor Senior Executive Director for a Multinational Environment.” By using the AHP, the decision of selecting a Senior Executive Director resulted in higher quality, justifiable decision in less time and with reduced complexity (Skinner, 1999). AHP helped us to prioritize the objectives and synthesis the many factors involved for making the decision. Decision analysis not only provides a structured way to think about decisions, but also more fundamentally provides a structure within which the decision makers can develop beliefs and feelings, those subjective judgements that are critical for a good solution (Clemens, 1996). Although any of the candidates could have been a good intuitive choice, the ECPro model allowed a priority ranking based on the sensitivity performance analysis. The ECPro platform provided an easy to use framework in which the decision could be defined. We feel a decision considering the tradeoff of criteria resulted in higher confidence of making a better choice.

Path Forward

The result of this study project was shared with the Infrastructure selection team. The methodology was explained and the Windows based software, ECPro, was demonstrated. The selection team expressed a interested in the software and accepted the recommendation of the candidate as a representation of the methodology. They committed to provide feedback to our study team regarding the final selection of the Senior Executive Director compared to the ECPro priority candidate.

APPENDIX I: References

- Clemens, R.T. (1996). *Making Hard Decisions: An Introduction to Decision Making*. Duxbury Press, New York, NY.
- Expert Choice (2000). *Expert Choice Professional (ECPro)*. www.expertchoice.com. Expert Choice, Inc., Pittsburg, PA.
- Fluor (1999). *Annual Report*. Fluor Corporation, Aliseo Viejo, CA.
- Fluor (2000, March). *Discussion with the office of Fluor Corporation Human Resource Department*. Fluor Corporation, Greenville, SC.
- Forman, E. (2000, Spring). *Lecture series for Management Science 224.DE, Executive Decision Making*. The George Washington University, Washington, DC.
- Forman, E. (2000). *Decision By Objectives (How to convince others that you are right)*. The George Washington University.
- Frame, D.J. (1995, May). *Global Business Environment*. GWU/Educational Services Institute, Arlington, VA.
- GWU/ESI (1996, October). *Managing in a Multicultural Environment*. GWU/Educational Services Institute. Arlington, VA.
- March, J.G. (1994). *A Primer on Decision Making: How Decisions Happen*. The Free Press, A Division of MacMillian Inc., New York, NY.
- Mendenhall, M. and Oddou, G. (1985). "The Dimensions of Expatriate Acculturation: A Review." *The Academy of Management Review*, 10, pp 39-47.
- Hill, C.W.L. (1998). *International Business: Competing in the Global Marketplace*. Irwin/McGraw-Hill, New York, NY.
- Ozinkota, M., Ronkainen, I. and Moffett, M., (1996). *International Business, Fourth Edition*. The Dryden Press, New York, NY.
- Rugman, A. and Hodgetts, K. (1995). *International Business: A Strategic Management Approach*. McGraw-Hill, Inc., New York, NY.
- Rye, R.L. and Abraham, P. (2000). *Study team for Project A*. MGT 224.DE Executive Decision Making, The George Washington University, Washington DC.
- Skinner, D.C. (1999). *Introduction to Decision Analysis: A Practitioners Guide to Improving Decision Quality*. Probabilistic Publishing, Gainesville, FL.

White R. (2000, March). *Student reader for Project A*. MGT 224.DE Executive Decision Making, The George Washington University, Washington DC.