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Individual Project Paper

**What Country Makes the Best Place for Work? By using
Hierarchical Decision Model (HDM)**

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ABSTRACT

Work is very basic practice in human civilization. Starting with billions of years ago, a human was busy with farming, lumberjack, hunting, and sailor. Indeed, the role of labor and the development of different kinds of jobs have been prime to our growth and wealthiest; as a result, human will seek to the most convenient place in the earth that will provide a good place for work. From this concept, finding the best country for work is important in these days. Because human cannot live without work, finding the most desirable country to work is essential. Based on the evaluation of the most priority needs from a set of criteria, a good decision for selecting the criteria that are influencing the decision can be taken. In fact, a good evaluation tool will help human to select the adequate country for work. This paper is about decision-making model for selection a country for work that a family or an indivisible will choose to ensure a better quality of life, happiness, and comfort.

This paper develops a framework to determine the most outstanding country for work from different countries around the global. The decision model used in this research paper is a comprehensive evaluation tool for a personal decision analysis that answers this question "What country makes the best place for work?" Indeed, a hierarchical decision model (HDM) was constructed for the framework. Experts judgments were used in this research paper to provide a pair-wised comparison evaluation for choosing one of the country outcomes that are: KSA, USA, UAE, and UK. The hierarchy model includes three levels: criteria, sub-criteria, and alternatives. The results of this analysis show that working in The United Kingdom is the best place to work because of the weighted score for political stability, tolerance for other customs, and Language barriers. This model would be helpful for an individual case who is qualified to start looking for

a good work opportunity in either KSA, USA, UAE, and UK and have these characteristics of a limited budget, special traditions, and socially interactive.

Though this paper highlighted several issues in selecting the best place for work, this would make a good topic for future research. Indeed, addressing the size of the company and the size of the family who lives in the household. And the education level for the work seeker, also the working experience period.

I. INTRODUCTION

People spend about one-third of their adult lives at work, which causes workplace issues to become a common source of stress for many. It is possible to work at one place where every individual is happy and satisfied. To decide for selecting the best place for work, choosing a desirable country that can ensure the individual wealth, happiness, and comforts is necessary. Indeed, finding the best place for work means ensuring a better life for the individuals and the family. To analyze and evaluate some issues associated with finding the best country for work, some factors must be evaluated related to this decision to choose the top factors that have the significant influence on the decision. According to weighting components of job satisfaction article, People prefer working at one job rather another one based on the work component that includes: working conditions, salary amount, job requirements, co-worker's kindness, and allowances and motivations [3]. Moreover, many studies have been done in terms of addressing the interdependence of residence and workplace. Based on Modeling Interdependence in Household Residence and Workplace Choices research paper, more than 80% of the households (workers) were found to choose residence first and then to choose workplace conditional on residential location. This means that choosing a place or a country for work is the priority selection for families then choosing a place to live comes after [4]. The research paper also states that it improves the capacity to represent a plausible substitution pattern among choice outcomes when the availability or attributes of residential alternatives or workplace alternatives change [4]. However, the important of this paper is to give the best factors that influence people from choosing one country for work by using a Hierarchical decision model (HDM) to provide the expert judgment for choosing among a set of alternatives. This selection will be made on the basis of compromise between economic, environmental, work conditions, and social standard

issues. In order to perform a reasoned assessment of various alternatives and offer convenient selection, multiple data from the alternative options will link the significant of selecting the best country for work, and the sub-criteria for each criterion should be analyzed. Housing, schooling, entertainment, food, transportation, clothing, and health insurance all are considered as sub-criteria for this model. Pollution and political stability are the environmental issues, work permit, hiring requirements, equal pays and motivations are some of the work conditions sub-criteria. And for looking at the social issues, Language barriers, Torrance for other customs, friendliness are critical sub-factors in analyzing the work choice for this model.

II. METHODOLOGY

In this paper, the research methodology that is used is Analytic Hierarchy Process (AHP), a multi-criteria decision making approach in which factors are arranged in a hierarchic structure [1]. The AHP is a specific application for a group decision making [7]. Based on the scaling between some factors, scaling is designed precisely to create numerical relations in the measurement of the objects [1] [7]. However, to use the methodology of AHP decision-making, (HDM) hierarchical decision model is the method that is rated as one of the most recognizable methods for subjective approaches [1] [8] [9]. HDM is a quantitative and qualitative method that can help decision-makers to quantify their judgments. HDM was developed from the analytic hierarchical process (AHP) by Saaty as a method for multi-criteria decision-making [10]. HDM has been used widely for applications in different fields for the last 25 years [11][12][13].

Figure 1: showing the Hierarchical Decision Model (HDM) with three levels criteria, sub-criteria, and alternatives for choosing the best country for work.

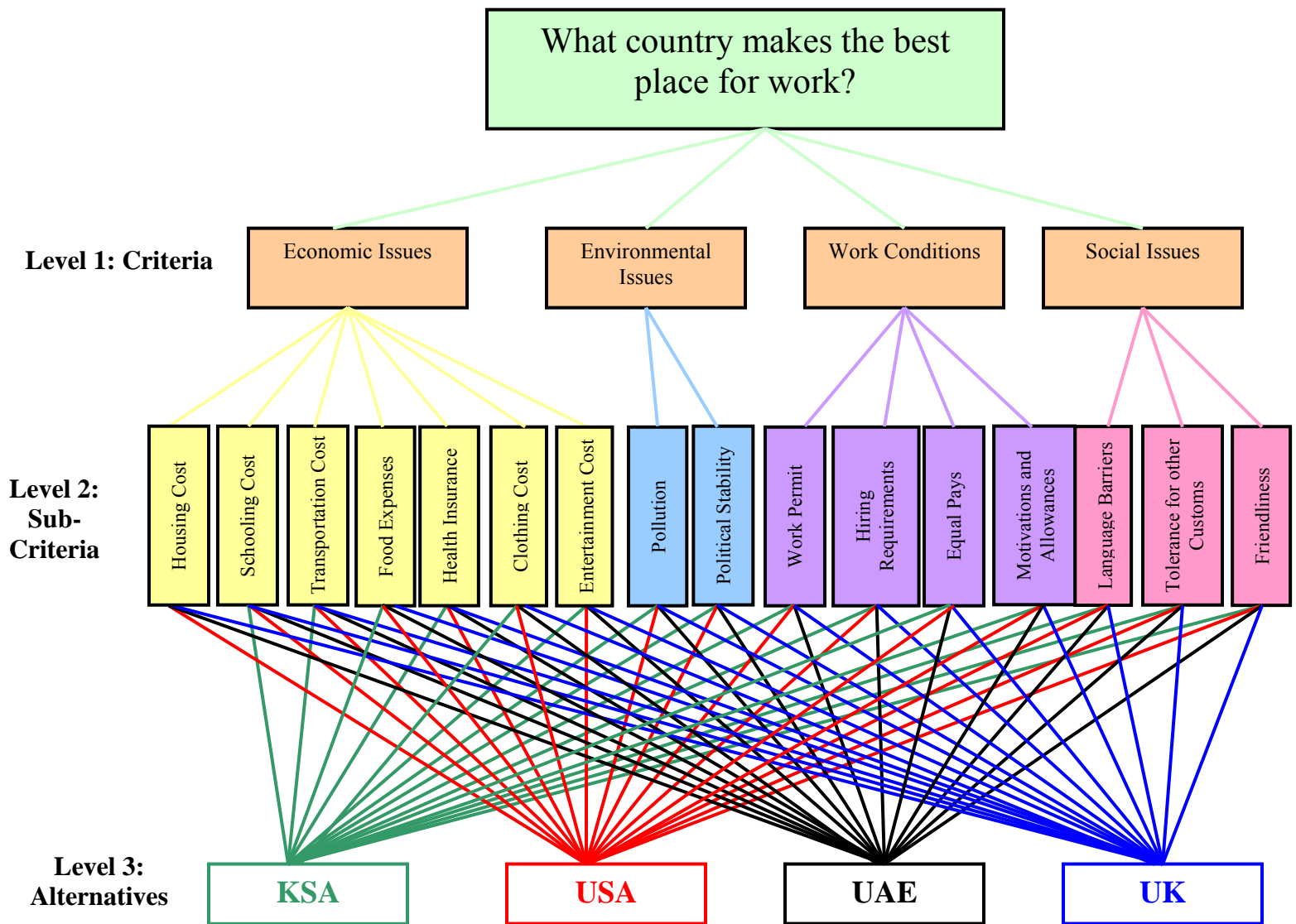


Figure 1: HDM and the three levels.

Hierarchical Decision Model (HDM)

This model is presenting some factors in making the decision for moving to one of four different countries, Kingdom of Saudi Arabia, United State of America, United Arab Emirates, and The United Kingdom. This model addresses the benefits and the advantages of choosing one country that another. Also, it presents the necessary sub-factors like working in a country that can save the money spending in living needs. And then, connect all the sub-factors with the country

selection among four alternatives. All the levels in this model were gathered from the experts and scientific research.

Level 1: Criteria

This level comprises the primary issues in making the decision for choosing the best country for work. Indeed, there are many different perspectives influencing the decision of choosing the best country for work; however, focusing on what you need to spend from the limited budget is necessary. Also, feeling of safety in the environment of the country can make a choice preference compared to unsafe dangerous life environment. Moreover, getting a fair amount of salary and having a fast and easy work permit will be an encouragement for choosing one country. This what is describing the working conditions for the criteria level. Finally, some other social issues like the welcoming and receptiveness from others towards the foreign worker are affecting the decision making in this model.

Economic Issues: Economic issues for all the living expenses needs that include **Economic Issues:** Economic issues for all the living expenses needs that includes what the individual pays for food, transportation, schooling, clothing, housing, health insurance, and entertainment. Moving to a new place for work and living would require spending money for everyday needs like transportation, clothing, and food. Indeed, having a health insurance is a sessional need for getting the coverage of doctor's visits in case of any medical condition. Another major economic expense would be housing and schooling.

Environmental Issues: This criterion describes the atmosphere of the life in the country if the country is healthier and safer than the other ones. Looking at the levels of pollutions of the environment and the stability of the country political situation; for instance, numbers of war and terrorism and demonstrations from people who live in the country. Indeed, managers and

professional workers are more likely to go for selective migration to different cities for a quality of life and environmental reasons [17].

Work Conditions: This criterion in the model is about the entire factors associated with workplace including the workplace atmosphere, the requirements for this work, and the salary amount. In this criterion, the work environment like motivations and allowances are important in choosing a workplace. Job Demands, Job Decision Latitude, and Mental Strain: Implications for Job Redesign article illustrate that any work load demands, conflicts or other stressors which place the individual in a motivated or energized state of "stress" are important in making a decision for choosing the workplace for individuals [5].

Social Issues: Are the factors of the social differences between the original country and the new selected country. It covers the language differences, the tolerance for other costumes, and the level of friendliness.

Level 2: Sub-Criteria

- The economic issues criteria section includes seven sub-criteria that are necessary to have for cost living.
 - Under economic issues criteria, the cost of housing is needed when choosing a desired place to live. Choosing a residential location is influenced by choosing workplace [14].
 - Also, schooling cost is something to consider when the individual is having a family and number of children to pay for their school or university expenses.
 - Transportation cost is a huge part of the economic expenses. The cost can be for using public transportation to reach the workplace or for gasoline costs when driving a car.

- Food expenses is a primary need for humans, without food people cannot survive. It is an important part for people to have a great amount of money for food.
- Health insurance is a significant necessity for the individual and the family if any, to have a cover for the doctor visit costs or for the medication costs. Especially when the country does not provide any free medical treatments for people.
- Moreover, clothing cost is a basic need for people, every person will need to pay for the outfits.
- Finally, entertainment cost is the cost for pleasure and joy. And by looking at the modern life, people will always want to have entertainments such as playing video games, playing golf, or watching a TV. Another way that people enjoy the time is by going to a movie theater, opera center, or singer show.
- The environmental issues criteria section contains two sub-criteria that are pollution and political stability.
 - Pollution in this model means all kinds of environmental pollution such as water pollution, air pollution, noise pollution, and soil pollution. Indeed, the individual will be affected from living in one area that has a lot of environmental pollution mostly water pollution and air pollution.
 - Another sub-criterion is political stability. It means the general political situation level in the country. Including wars, terrorism, demonstrations, and crimes. An example of political stability would be a place that does not have a lot of demonstrations because demonstrations will spread fear among people and by staying at home would be the great preference for many people to be safe.

- The working conditions criteria section comprise of four major sub-criteria. work permit, hiring requirements, equal pays, motivations and allowances are all under the working conditions sub-criteria.
 - A work permit is what the individual need to have to get the permission to work in a country. This kind of work permit can be any kinds of visa or a card.
 - Hiring requirements in this model mean the requirements for taking the approval for work into one position in a company. For instance, obtaining a certain degree or having a previous work experience for a period of five years.
 - However, the salary amount that the worker will get from the company will make a huge difference in the choosing preference. Equal pays for all workers genders and ethnicity is not always the case in all countries. Hence, Equal pays is what individuals seek to get from the company.
 - Motivations and allowances mean the amount of money that the worker gets from doing one specific task like bonuses and prizes or holidays and upgrading.
- Lastly, three sub-criteria split from social issues criteria in this model. Language barriers, tolerance for other Customs, and friendliness are the most important sub-factors in the section of social issues of this model.
 - In fact, people speaks different languages so having the language barriers as sub-criteria is very essential. When a person wants to work in for a company, choosing a place where people speaks the same language is more convenient than working in a place with people talks a different language. The reason for this is because language barriers would make misunderstanding, lack of communication, some conflicts, and many cause slow work progress.

- On the other hand, tolerance for other Customs is what people want to get from the others especially if the individual has different cultures and has arisen in a different country. for instance, in some cultures, people must take off the shoes when entering a host house. In this model, it means which country has the maximum amount of ignoring and disrespectful to others customs.
- Also, friendliness in this model means the kindness and welcoming to others. Indeed, by working in a country where everyone is welcoming and accepting each other, living in this country will be a very desirable and a source of comfort and happiness to the individuals.

Level 3: Alternatives

The alternative part in this model has four different alternatives. Kind dome of Saudi Arabia (KAS), United State of America (USA), United Arab Emirates (UAE), and The United Kingdom (UK).

Kind dome of Saudi Arabia (KAS)

- work permits issued to foreigners in the past five years have gone up 24 percent annually. In 1996 there were almost six and one-half million foreigners with legal residence in the kingdom, and over four and one-half million of them had work permits [15].
- work opportunities in Saudi Arabia are not equally between men and women because of Islamic rules. Women are encouraged to work at home instead of going outside the home for work [16].
- Foreign labor is almost making 25 percent of total employment. And most of the Saudi labor is in the public sector [18].

United State of America (USA)

- The United States admits over a million immigrants a year and over fifty million temporary visitors, some of whom visit the country several times a year [19].
- The United States maintains an often-criticized immigration system, by increasing US wages for immigrant workers and lower labor costs for their employers [19].

United Arab Emirates (UAE)

- Most of the workers in Arabian Gulf area including United Arab Emirates, Qatar, and Kuwait are foreign workers [20].
- In UAE case, foreign laborers and professionals where it is estimated in the late 1990s that the nationals constituted only 10-20% of the total population [21].
- Also, only 10% participation in the total labor force [22].
- There is a pattern of adjustment behavior migrants utilize in the face of socio-economic and political conditions which lie beyond their control [20].

The United Kingdom (UK)

- When looking for a job opportunity in the UK, some complex requirements for hiring is what people face [23].
- Working in higher passions in a company will lead to work satisfaction in the UK [23].

III. DATA AND DATA SOURCE(S)

In HDM a group of experts is used in this research to complete a set of pairwise comparisons for the perspective, sub-criteria, and alternative levels. For this research, six experts participated in providing their judgment based on their life experience of searching for a desirable place to work. The experts have different background and multi levels of education. In fact, experts used this link:

<http://research1.etm.pdx.edu/hdm2/Expert.aspx?ID=346f3ae3e1bc9a80/9bc55fff86364dfe>

The ETM-HDM tool was developed by a group of faculty who study and work at Portland State University (PSU) in Engineering and Technology Management (ETM) Department. A screenshot of the decision model website is illustrated in Figure below.

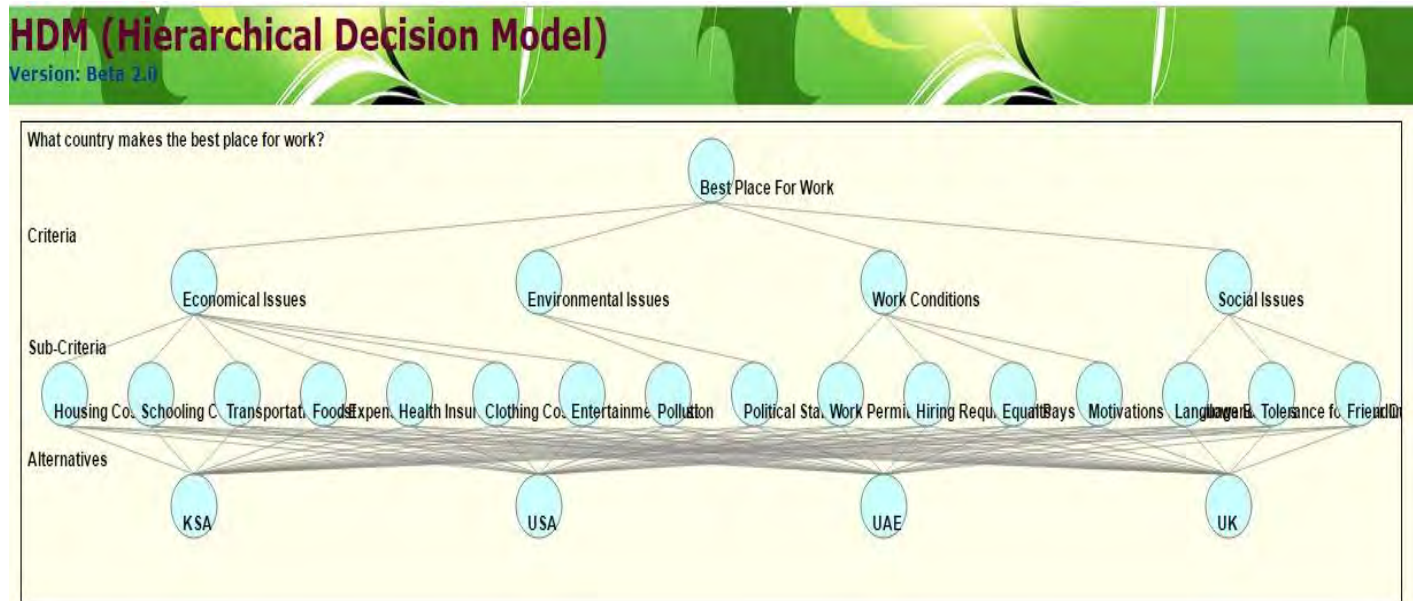


Figure 2: Screenshot of HDM software used by experts.

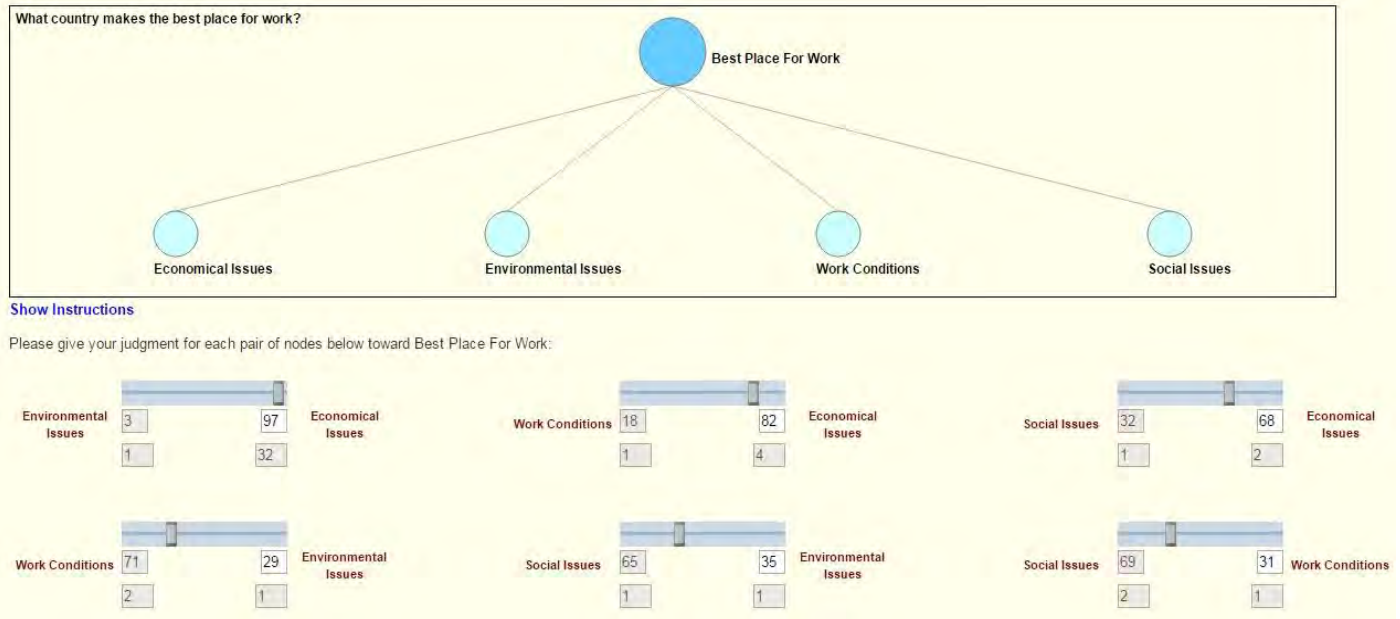


Figure 4: Screenshot of HDM software used by experts.

The expert divides 100 points between the pair to reflect his judgment of each element's relative importance in comparison with the other element of the pair. Assignment of points to elements does not imply a judgment on their absolute importance. For instance, if the elements of a pair are given 50 points each, it only explains that both have the same level of importance in the respondent's judgment. Now each expert provides an individual evaluation for the three levels in HDM, four criteria, sixteen sub-criteria, and four alternatives.

To know more about the background information about the professional experts who provided the judgment for this research, the following part will cover the basic definition and background for each expert:

- Expert-1:** Is a fifty years old male, who have a Master's degree in Accounting and a working experience for more than 30 years. This expert is married for more than 30 years and has nine family members who are married as well. He worked as a professional bank manager. He also owned his own business in clothing commerce and heavy-duty

accessories. He travels a lot for work conferences and trades. This expert has a large knowledge in communication with other cultures and making decisions. And can speaks three languages.

- **Expert-2:** Is a thirty-four years old male, who have a Bachelor's degree in Accounting and a work experience for 8 years. He speaks two languages. And he travels to so many countries around the world. This expert is also married and has two children.
- **Expert-3:** Is a twenty-five years old female, who have a Master's degree in Engineering Technology Management. She is married and has two children. This expert speaks two languages but has no work experience.
- **Expert-4:** Is a thirty years old female, who have a master's degree in Human Medicine & Surgery. She is married and has three kids. Ten years' experience in practicing medicine. She is a decision maker and an organizer for any issues in work or life. Recently, she became a manager and a leader in a public hospital.
- **Expert-5:** Is a thirty-five years old female, who have a Bachelor's degree in Science and Technology. This expert is married and has five kids. She has a work experience in teaching for more than 25 years.
- **Expert-6:** Is a thirty-six years old male, who have a Ph.D. in Computer Engineering. He has a work experience for more than 20 years. He is married and has two kids. This expert speaks three languages. He has a lot of research experience in Software and computing industry. This expert owning a business in oil and gas field.

IV. ANALYSIS AND KEY FINDINGS

From HDM normalized weights in **Figure 5**, Experts rated economic issues as the most important priority with 0.54 weight value followed by work conditions with 0.22 and then environmental issues 0.13 and social issues 0.12 with almost the same weigh. The reason for having the economic issues in the highest rate is because all costs and expenses in HDM that comes under this criterion is basic and normal needs for the individuals. Indeed, humans cannot live without cloths or food. Housing and transportation is also what people immediately pay for when moving to a new place. So, these all costs would affect the decision of choosing one county. People would prefer living in a place that has lower housing cost, transportation cost, food cost, schooling cost, entertainment cost, clothing cost, and health insurance rather than pay extremely expensive cost for some of these expenses. In the sub-criteria, political stability, language barriers, and tolerance for other customs are in the top 3 with relative contributions of 0.93, 0.46, 0.38 respectively. This ranking means that political stability is what people look for when deciding to live and work in a country. Because the feeling of fear and panic is unwanted among individuals. **Table 3** shows that in UK the political situation is stable more than other countries in the HDM with 0.42 weight and that is the highest weigh in the entire model. That means the UK is the favorite country for people to work. However, UK got 0.41 in the language barriers sub-criteria which indicates that the communication in this country is hard between foreign people and the country residents. For tolerance for other customs UK weighted 0.30 But USA weighted with 0.49. This means that UK cannot consider a welcoming and accepting place for other cultures and customs. USA in tolerance for other customs takes the preference in the decision. Moreover, living and working in the UK would be a good choice because it got the

lowest weigh for the pollution, that refer to healthy place and clean environment in UK. Finally, UK is the best alternative between because it has the highest weight 0.39 and then USA comes with 0.32 weigh. KSA and UAE got the same weight 0.15. We conclude from **Table 3** that housing cost, food expenses, health insurance, entertainment cost, and equal pays, motivation and allowances and language barriers are in the same weight in KSA and UAE. Hence, the result weigh for KSA and UAE is similar with 0.15. Indeed, KSA and UAE is the best choice interims of economic issues because they got the lowest amount of weights compared to USA and UK; however, USA and the UK are close in work conditions because they both have almost same weight in the sub-criteria under working condition. In conclusion, based on the result amyases, UK is ranking number one preference of choice because of the final result from the experts' pair-wised comparison. The weight for UK is 0.39 than comes USA with 0.32 weight and finally KSA and UAE are at the same weight 0.15. Furthermore, **Table 5** and **Table 6** display how each expert scored each alternative. The inconsistency score of each expert, the minimum and maximum that each alternative received from each expert along with the disagreement score. **Table 5** shows no inconsistency in judgment by individual experts and disagreement among experts and the values are less than 0.10 which means that the disagreement is in an acceptable limit.

V. FUTURE RESEARCH

After analyzing the expert's judgment and the research review, the model show that United Kingdom is the best country for work. The study found that UK is the desirable country for working with highest relative score 0.39 weighted by HDM. however, it would need to be adjusted to fit another dimension, such as considering the work place and the living place at the same time because people tend to search for a job location where it is close to the place where they live. So, workplace and living place is connecting. Another dimension is people age. It is important for deciding a good place for working. For example, younger people would like to travel and search for better work opportunities that provide them the full comfort and more profit and enjoyment. Whereas senior people, who prefer to stay in one place even though it won't give them the full comfort.

Moreover, some working conditions factures like good connections among workers can be good sub-criteria in this case. Because the effective communication among employees in one company will give the desirable atmosphere for choosing a place for work, cooperation between employees would be an important factor for this decision-making analysis [2]. In fact, this study is limited. Some other factors can be added to this model to make it more effective. For instance, job satisfaction includes overall or general job satisfaction and satisfaction with facets of jobs such as the work itself, co-workers, supervision, pay, working conditions, company policies and procedures and opportunities for promotion [24]. Also, to make it even more effective analyses, adding more alternative choices in this model can make a good comprehensive analysis. These sources that support this analysis were very limited sources and most of the research were about the level of work satisfaction in one industry like nursing. Also, a lot of sources were found for

the emigrant's issues in Gulf countries but not for USA or UK. Undoubtedly, this kind of decision making analysis can be more complicated by adding more factors in criteria and sub-criteria and more alternatives.

Finally, I disagree with the result from this research paper because the decision of choosing the best place for working would be different based on the company requirements not the country conditions and environment. In fact, it would be more comprehensive if the size of the company considered in this study and the size of the family. Also, the level of education and numbers of years of experience. Also, the expert judgment in this study may have an influence from old experience or other people force in choosing one facture than another one. Making this study general is inaccurate for all the cases. But, adding more number of criteria will make it more precise but the fewer numbers of criteria will provide easier expert review process and more specific in evaluation and less time for creating the model.

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VI. APPENDIX A – FINAL, QUANTIFIED MODEL

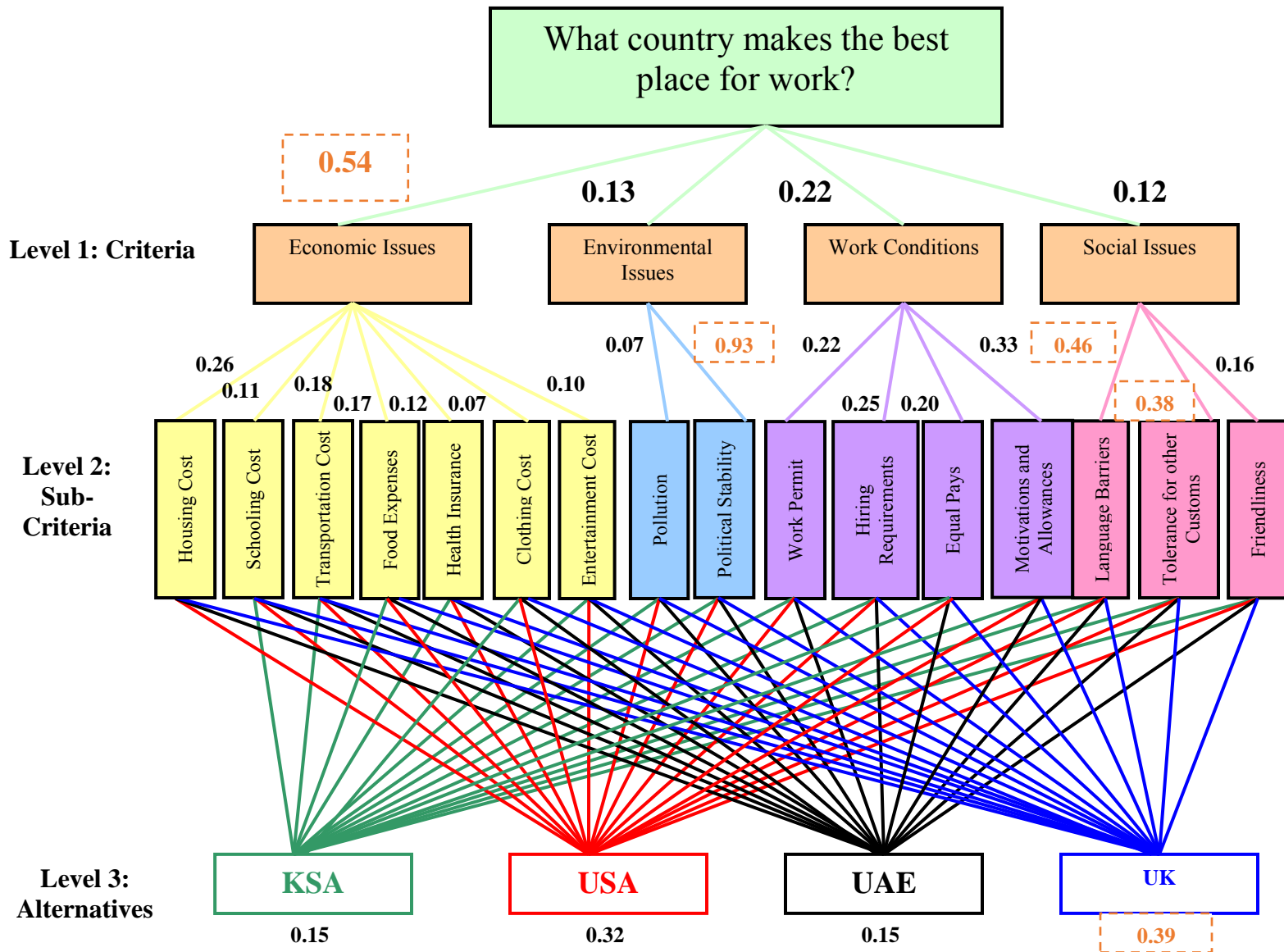


Figure 5: HDM normalized weights for all decision elements in the three levels.

VII. APPENDIX B – AHP/HDM PCM DATA TABLES

Level 1: Criteria					
	Economical Issues	Environmental Issues	Work Conditions	Social Issues	Total
Expert 1	0.58	0.09	0.25	0.08	1
Expert 2	0.21	0.22	0.41	0.16	1
Expert 3	0.65	0.05	0.11	0.19	1
Expert 4	0.66	0.11	0.13	0.10	1
Expert 5	0.56	0.19	0.16	0.10	1
Expert 6	0.58	0.09	0.23	0.11	1
Avg	0.54	0.13	0.22	0.12	1

Table 1: Criteria average weights from expert's pair-wise comparisons.

Level 2: Sub-Criteria	Avg			
	Economical Issues	Environmental Issues	Work Conditions	Social Issues
Housing Cost	0.26	0.00	0.00	0.00
Schooling Cost	0.11	0.00	0.00	0.00
Transportation Cost	0.18	0.00	0.00	0.00
Food Expenses	0.17	0.00	0.00	0.00
Health Insurance	0.12	0.00	0.00	0.00
Clothing Cost	0.07	0.00	0.00	0.00
Entertainment Cost	0.10	0.00	0.00	0.00
Pollution	0.00	0.07	0.00	0.00
Political Stability	0.00	0.93	0.00	0.00
Work Permit	0.00	0.00	0.21	0.00
Hiring Requirements	0.00	0.00	0.25	0.00
Equal Pays	0.00	0.00	0.20	0.00
Motivations and Allowances	0.00	0.00	0.33	0.00
Language Barriers	0.00	0.00	0.00	0.46
Tolerance for other Customs	0.00	0.00	0.00	0.38
Friendliness	0.00	0.00	0.00	0.16
Total	1	1	1	1

Table 2: Sub-criteria average weights from expert's pairwise comparisons.

AVG	Friendliness	0.11	0.51	0.12	0.27
	Tolerance for other Customs	0.13	0.49	0.14	0.30
	Language Barriers	0.13	0.33	0.13	0.41
	Motivations and Allowances	0.17	0.31	0.18	0.35
	Equal Pays	0.17	0.33	0.17	0.35
	Hiring Requirements	0.15	0.31	0.17	0.37
	Work Permit	0.36	0.20	0.25	0.20
	Political Stability	0.13	0.31	0.15	0.42
	Pollution	0.43	0.17	0.27	0.13
	Entertainment Cost	0.17	0.28	0.17	0.39
	Clothing Cost	0.16	0.26	0.17	0.41
	Health Insurance	0.12	0.33	0.13	0.44
	Food Expenses	0.16	0.31	0.16	0.41
	Transportation Cost	0.08	0.38	0.10	0.44
Level 3	Schooling Cost	0.11	0.32	0.13	0.43
	Housing Cost	0.12	0.31	0.13	0.44
		KSA	USA	UAE	UK

Table 3: Sub-criteria average weights by alternatives elements from expert's pairwise comparisons.

Final Results								
Level 1	Best Place for Work						Level 1	AVG
	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6		
KSA	0.18	0.18	0.14	0.13	0.13	0.13	KSA	0.15
USA	0.31	0.34	0.31	0.32	0.3	0.32	USA	0.32
UAE	0.17	0.15	0.14	0.13	0.16	0.15	UAE	0.15
UK	0.34	0.33	0.42	0.42	0.41	0.39	UK	0.39
Total	1	1	1	1	1	1	Total	1

Table 4: Alternative weights by each expert and the average weights for each alternative.

Best Place For Work	KSA	USA	UAE	UK	Inconsistency
Expert 1	0.18	0.31	0.17	0.34	0.02
Expert 2	0.18	0.34	0.15	0.33	0.04
Expert 3	0.14	0.31	0.14	0.42	0.03
Expert 4	0.13	0.32	0.13	0.42	0.04
Expert 5	0.13	0.3	0.16	0.41	0.02
Expert 6	0.13	0.32	0.15	0.39	0.02
Mean	0.15	0.32	0.15	0.39	
Minimum	0.13	0.3	0.13	0.33	
Maximum	0.18	0.34	0.17	0.42	
Std. Deviation	0.02	0.01	0.01	0.04	
Disagreement					0.022

Table 5: HDM final results and inconsistency and disagreement scores.

Source of Variation	Sum of Square	Deg. of freedom	Mean Square	F-test value
Between Subjects:	0.26	3	.086	98.96
Between Conditions:	0.00	5	0.000	
Residual:	0.01	15	0.001	
Total:	0.27	23		
Critical F-value with degrees of freedom 3 & 15 at 0.01 level:				5.42
Critical F-value with degrees of freedom 3 & 15 at 0.025 level:				4.15
Critical F-value with degrees of freedom 3 & 15 at 0.05 level:				3.29
Critical F-value with degrees of freedom 3 & 15 at 0.1 level:				2.49

Table 6: The statistical F-test for evaluating the null hypothesis ($H_0: \text{ric} = 0$).