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A Study On Job Change Decision Making Of Peoples By Multi Objective Optimization Technique In Neutrosophic Environment

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Abstract:

Introduction: The article explores the employment preferences of specific area workers in Tamil Nadu. A person's choice of job refers to the profession that best suits him or her. In this competitive environment, changing careers can be a difficult option for professionals.

Objectives: If expectations and experience on the job don't match, which causes dissatisfaction, frustration, unhappiness, subpar work output and the need to look for another job. This study discusses the career choices made by particular area workers in the Virudhachalam and Cuddalore district.

Methods: The integrated methodology in the Neutrosophic fuzzy set was used to conduct this investigation. Here, Neutrosophic entropy plays a role in determining how the constraints (parameters) are weighted. Least Eigen Neutrosophic Fuzzy Set (LENFS) and Greatest Eigen Neutrosophic Fuzzy Set (GENFS) were used to evaluate the problem's objective. For the problem, there are six objectives with respect to the six constraints that have been determined.

Results: We can figure out the range of satisfied, abstain, and unsatisfied levels for the objectives in relation to the restrictions using the values derived by GENFS and LENFS.

Conclusions: We would learn from the survey that individuals are pleased and would desire to work for the government. In addition, the survey found Neutrosophic technology to be highly beneficial.

Keywords: Entropy, GENFS, LENFS, Imprecision membership technique, Multi-objective decision making

1. Introduction

A person's occupation is described as a set of structured tasks they perform for a living that are based on the information and skills they have acquired via education. A person's choice of job refers to the profession that best suits him or her. In this highly competitive field, changing careers can be a frightening option for professionals. A person will inevitably perform poorly if their expectations are not met by the facts of life. People can evaluate their work options more effectively if they are aware of the elements influencing their decision. Work performance worsens when expectations and experience are not aligned, which causes dissatisfaction. It leads us to look for work elsewhere.

This job transition choice-making issue is identified as a MODM issue in this particular case. Even if emotions and intuition play a major role in the decision-making process, which is fundamentally unconscious, human intellect is limited, and emotional influence shapes mechanisms prevent it from providing a complete answer. Fuzzy multi-objective decision making is useful in determining the set of elements that explain an individual's choice of profession, as well as in determining his or her preferences for a particular job and selecting the best option that best suits their needs overall. Each method's features are investigated and improved in tandem with the creation o]f new approaches by combining two or more MODM techniques to create hybrid methods. These techniques are becoming more and more common.

Fuzzy sets were first developed by Zadeh in 1965. Bourke et al. [1] in 1996 introduced a stability study of relation matrices and an eigen fuzzy sets. In 2004 Martino et al. [2] examined image information retrieval and Eigen fuzzy sets. Huang [3] (2008) integrated the TOPSIS technique with entropy weight for information system selection. An investigation of eigen fuzzy sets of fuzzy relations with applications was conducted by Saleem Muhammad and Naman [4] (2010). Peng et al.[5] (2014) applied an outranking strategy to multicriteria situations involving simplified neutrosophic sets in decision-making. On interval neutrosophic sets, Sahin and Rıdvan[6] (2017) employed the Cross-entropy measure. In 2017, comparison research between intuitionistic numbers and Arithmetic operations on intervals was presented by Vidhya and Irene Hepzibah[7] in order to solve an intuitionistic fuzzy MOLPP. Sengur et al.[8] (2019) conducted a survey on medical image segmentation using neutrosophic techniques.

Fuzzy multi-criteria decision-making with neutrosophic sets was presented by Kahraman et al.[9] in 2019. Sophia Porchelvi and Jayapriya [10] (2019) evaluated their research On Fuzzy Neutrosophic Matrices and Operators. The study On Studying Certain Fuzzy Neutrosophic Matrices and Operators was examined by Porchelvi [10]. In 2019, the idea of Multi-objective non-linear four-valued refined neutrosophic optimization was presented by Freen, Gul, et al[11] in 2020. Sherwani et. al., [12] in 2021 proposed a new technique related to Neutrosophic entropy measures. Bhaumik et al.[13] (2021) examined the multi-objective linguistic-neutrosophic matrix game and its potential applications in the field of tourism management. Based on trapezoidal fuzzy neutrosophic sets, Irvanizam et al. [14] (2022) investigated the objective weighting approach in group decision-making Ali et al. recently [15] (2023) introduced a fuzzy MODM model for choosing green suppliers worldwide.

The article is catalogues as follows:

- After the introduction, Some basic concepts has been discussed in section 2.
- Flow chart and integrated methodology are given in section 3.
- Section 4 deals with an application of MODM in selecting convenient job for workers.
- The validation of the suggested work is provided in section 5.
- Finally, result & discussions, conclusion of this paper are given in section 6 &7.

2. Basic concepts

2.1. Eigen Fuzzy Sets

Let Q be a fuzzy relation between the elements of a finite set S and let B be a fuzzy subset of S. The max-min composition of Q and B gives T, $(B \circ Q) = T,\ T \subseteq S)$. When T is equal to B, can say that B is an eigen fuzzy set associated with a given relation Q.

Q is a fuzzy relation determine $Q \subseteq S \times S$ with membership function $\sigma_Q: S \times S \rightarrow [0,1], \sigma_Q(s, s') \in [0,1], s, s' \in S$ and the eigen fuzzy set $\subseteq S, \sigma_B: S \rightarrow [0,1], \sigma_B(s) \in [0,1], s \in S$, satisfying $B°Q = B$ should exist.

2.2. Greatest Eigen Fuzzy Sets (GEFS)

With the concept of max-min composition solve the Greatest Eigen Fuzzy Set (GEFS) associated with Q, here, dealing with the finite case, so some interpretation can be taken in the form of matrix.

Here, it contains three fundamental procedures for evaluating GEFS,

i.First Procedure to Finding the GEFS

Let us keep B_1 be the fuzzy subset of S in which the membership grades are equal to the highest element for every column of Q.

$$\sigma_{B_1}(s') = max_{s\epsilon S}\sigma_Q(s, s'), \qquad \forall\ s' \in S$$

If define, B_0 is a constant fuzzy set with inf of these values, it is easy to verify that B_0 is an eigen fuzzy set, but it is not necessary to be greatest eigen fuzzy set always.

Let us define a sequence of fuzzy sets $(B_n)_n$

$$B_1°Q = B_2$$

$$B_2°Q = B_1°Q^2 = B_3$$

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$$B_n°Q = B_1°Q^n = B_{n+1}$$

The sequence $(B_n)_n$is decreasing and bounded by B_0 and B_1

$$B_0 \subseteq \cdots \subseteq B_{n+1} \subseteq B_n \subseteq \cdots \subseteq B_3 \subseteq B_2 \subseteq B_1$$

Steps:

A relation with membership function is given

- Evaluate the set by $\sigma_{B_1}(s') = max_{s\epsilon S}\sigma_Q(s, s'),\ \forall\ s' \in S$
- Then, setting the index n =1
- Evaluate $B_{n+1} = B_n°Q$

$$B_{n+1} = B_{n \substack{\rightarrow No \rightarrow n=n+1 \rightarrow go\ to\ step\ 3 \\ \rightarrow Yes \rightarrow B_n = B_{n+1}}}$$

ii.Second Technique of the GEFS Determination

In this technique, don't need to calculate composition. Only need to solve the invariant element from the successive reduction of Q.

At every step of this technique, the invariant elements are accurately the ones of above technique.

iii. Third technique of the GEFS creation

In this section, also obtain greatest eigen fuzzy set by determining at most successive power of Q in max-min composition. The following technique is not very much easy to solve but it is straight forward technique to solve greatest eigen fuzzy set.

Steps:

- Determine B_1 from Q.
- Then, compose Q with itself to get Q^2, i.e., $Q^2 = Q°Q$ and determine B_2 from Q^2.
- Determine B_3 from $Q^3$by composing Q^2 with Q to get Q^3, i.e., $Q^3 = Q^2°Q$. Continue the process until getting, $B_n = B_{n+1}$. ($B_n$is accepted GEFS associated with Q).

2.3 Least Eigen Fuzzy Set

To determine the LEFS of a relation Q, there is a small alteration in the procedure of GEFS.

Algorithm for LEFS:

Let B relation $Q \subseteq S \times S$ with membership function $\sigma_Q(s, s')$ is given

- Solve the set B_1 defined by $\sigma_{B_1}(s') = min_{s\epsilon S}(s, s'),\ \forall\ s' \in S$
- Then, setting the index n =1
- Evaluate $B_{n+1} = B_n°Q$
- $B_{n+1} = B_{n \to Yes \to B_n = B_{n+1}}^{\to No \to n=n+1 \to go\ to\ step\ 3}$

3. Integration of GENFS, LENFS and Neutrosophic Entropy by Imprecision Method

3.1 Algorithm for an Integrated Methodology

- Define a problem in a neutrosophic set
- Convert neutrosophic set into vague fuzzy values by using imprecision membership method for constraints/parameters of the problem
- Vague values are converted to defuzzified values
- Normalize the decision matrix, $r_{ij} = \frac{x_{ij}}{\sum_{i=1}^{m} x_{ij}}$
- Compute entropy, $e_j = -h \sum_{i=1}^{m} r_{ij} Inr_{ij},\ \ j = 1,2, \dots, n;\ h = \frac{1}{In(m)}$

where "m" is the number of constraint.

- Compute the weight vector, $W_j = \frac{1-e_j}{\sum_{j=1}^{n}(1-e_j)}$
- Decision matrix is created for the problem and formulates the objective function from Neutrosophic fuzzy parameters.
- Evaluate the neutrosophic fuzzy set by

$$\sigma_{B_1}(s') = max_{s\epsilon S}\sigma_Q[(s_1, s'_1), (s_2, s'_2), (s_3, s'_3)], \forall\ s' \in S$$

- Then, setting the index n =1
- Evaluate $B_{n+1} = B_n°Q$
- $B_{n+1} = B_{n \to Yes \to B_n = B_{n+1}}^{\to No \to n=n+1 \to go\ to\ step\ 3}$; hence GENFS is obtained
- Then solve the neutrosophic fuzzy set B_1 defined by

$$\sigma_{B_1}(s') = min_{s\epsilon S}[(s_1, s'_1), (s_2, s'_2), (s_3, s'_3)], \qquad \forall\ s' \in S$$

- Then, setting the index n =1
- Evaluate $B_{n+1} = B_n \circ Q$
- $B_{n+1} = B_{n\,\rightarrow Yes\rightarrow B_n = B_{n+1}}^{\,\rightarrow No\rightarrow n=n+1\rightarrow go\ to\ step\ 3}$; hence LENFS is obtained
- Convert greatest and least neutrosophic fuzzy set into vague fuzzy values by using imprecision membership
- Vague values are converted to defuzzified values
- Evaluate the correlation coefficient for weightage of constraints and GENFS & LENFS of objectives.

3.2. Flow Chart of the Fuzzy Multi – Objective Neutrosophic Decision Making (MONDM) Methodology

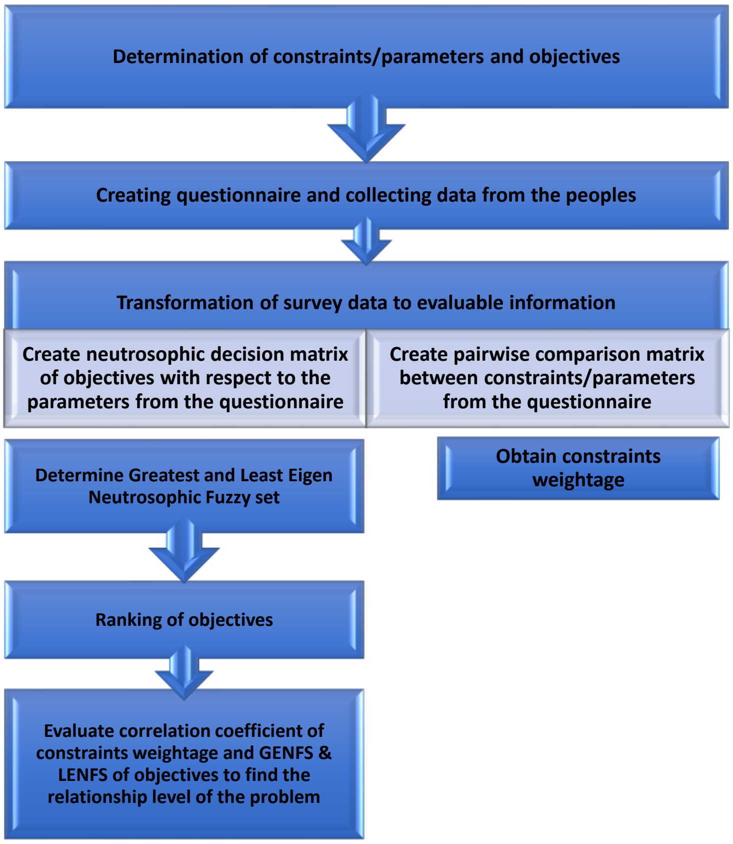

Figure 1: Flow Chart of Multi-Objective Neutrosophic Decision Making Methodology

4. Application Of Multi-Objective Decision Making In Selecting Suitable Job For Workers In Gopurapuram, Gopalapuram And Manavalanallur Village

4.1 Case Study

Job dissatisfaction causes workers to be unhappy, which has an impact on their performance and social lives. In today's world, an employee's job satisfaction is extremely important to take into account. People should therefore carefully analyze their options for a job and base their decision on the things that are essential to them. The decision to change jobs is categorized as a MODM problem. This chapter dealt with the challenges faced by employees who change jobs in Gopurapuram, Gopalapuram and Manavalanallur Village, Virudhachalam District, Tamil Nadu, India.

Most workers are frustrated because they are unsatisfied with their jobs and salaries. And some employees may become perplexed about whether a particular profession is a good fit for them. Some employees even have a strong desire to pursue the ideal career.

We have surveyed 415 families in the Manavalanallur village, 243 families in the Gopurapuram village, and 708 families in the Gopalapuram village with the support of VAO, Village Assistant, Panchayat Clerk and Anganwadi worker.

Using a hybrid technique that integrates GENFS, LENFS, and Neutrosophic Entropy, the employment choices of workers are investigated. The constraints and objectives to define a choice to change jobs are created by using a simple questionnaire. The questionnaire answered by the peoples helped in defining the following job change constraints and job change objectives.

The constraints are Job nature & security (e_1), Work location and environment (e_2), Self-respect & identity (e_3), Career growth (e_4), Salary (e_5), and effects on family (e_6).

The alternatives are Banking sector (j_1), Government jobs (j_2), Product based companies (j_3), Teaching field (j_4), Entrepreneurship (j_5), IT companies (j_6). Neutrosophic fuzzy scales are defined for linguistic terms are as follows.

Table - I : Linguistic terms and Neutrosophic set for decision constraints and objectives

Linguistic terms	Neutrosophic set	Inversion of neutrosophic set
Extremely Highly Preferred (EXHP)	(0.90,0.10,0.10)	(1/0.10,1/0.10,1/0.90)
Extremely Preferred (EXP)	(0.85,0.20,0.15)	(1/0.15,1/0.20,1/0.85)
Very StronglyPreferred (VSP)	(0.85,0.25,0.20)	(1/0.20,1/0.25,1/0.85)
StronglyPreferred (SP)	(0.75,0.20,0.20)	(1/0.20,1/0.20,1/0.75)
Moderately Highly Preferred (MHP)	(0.70,0.30,0.30)	(1/0.30,1/0.30,1/0.70)
Moderately Preferred (MP)	(0.65,0.30,0.35)	(1/0.35,1/0.30,1/0.65)
Moderately Lowly Preferred (MLP)	(0.60,0.35,0.40)	(1/0.40,1/0.35,1/0.60)
Lowly Preferred (LP)	(0.55,0.40,0.45)	(1/0.45,1/0.40,1/0.55)
Equally Preferred (EP)	(0.50,0.50,0.50)	(1/0.50,1/0.50,1/0.50)

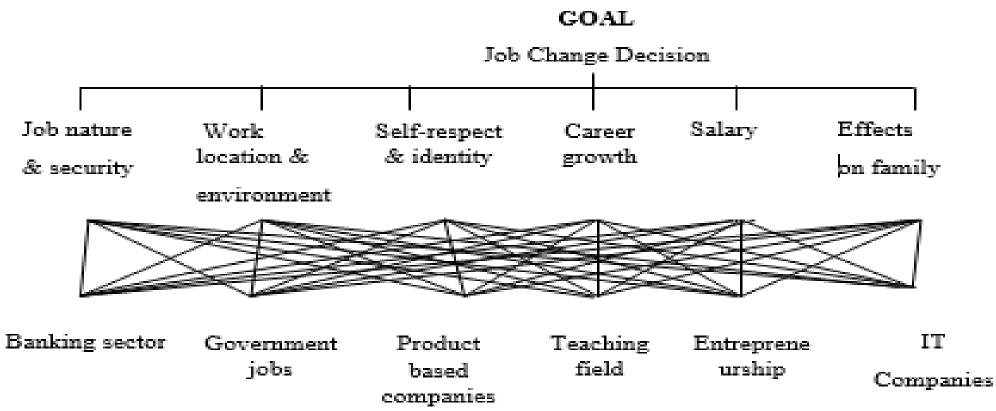

Figure I: Hierarchical structure of constraints/parameters and objectives

A questionnaire is developed and sent to the public addressing the pairwise comparison of constraints and parameters. Responses take the shape of linguistic terms. The matrix for pairwise comparison is expressed numerically and is shown in table II. Then, neutrosophic fuzzy set is converted as vague fuzzy values by imprecision membership method. After that, it is converted to defuzzified values and then, normalized decision matrix is determined and is given in table III. Towards it, computing entropy for table III and get the values as shown in table IV. Then, weightage of constraints is evaluated and is shown in table V.

Table - II : Matrix for pairwise comparison in neutrosophic fuzzy set

	e_1	e_2	e_3	e_4	e_5	e_6
e_1	(0.50,0.50,0.50)	(0.87,0.19,0.16)	(0.09,0.08,0.01)	(0.09,0.08,0.01)	(0.34,0.34,0.30)	(0.37,0.37,0.34)
e_2	(0.07,0.06,0.01)	(0.50,0.50,0.50)	(0.09,0.08,0.01)	(0.07,0.05,0.012)	(0.41,0.41,0.40)	(0.06,0.05,0.01)
e_3	(0.88,0.15,0.12)	(0.88,0.14,0.12)	(0.50,0.50,0.50)	(0.50,0.50,0.50)	(0.69,0.31,0.31)	(0.89,0.12,0.11)
e_4	(0.88,0.15,0.12)	(0.85,0.21,0.16)	(0.02,0.02,0.02)	(0.50,0.50,0.50)	(0.79,0.20,0.20)	(0.31,0.31,0.26)
e_5	(0.38,0.05,0.05)	(0.19,0.06,0.05)	(0.06,0.06,0.02)	(0.08,0.08,0.01)	(0.50,0.50,0.50)	(0.79,0.24,0.23)
e_6	(0.31,0.05,0.05)	(0.83,0.22,0.18)	(0.09,0.09,0.01)	(0.45,0.06,0.06)	(0.32,0.13,0.06)	(0.50,0.50,0.50)

Table - III: Normalized decision matrix

	e_1	e_2	e_3	e_4	e_5	e_6
e_1	0.22	0.19	0.19	0.15	0.12	0.16
e_2	0.09	0.18	0.19	0.08	0.14	0.07
e_3	0.23	0.18	0.32	0.24	0.17	0.22
e_4	0.23	0.19	0.01	0.24	0.27	0.14
e_5	0.13	0.06	0.07	0.12	0.17	0.22
e_6	0.11	0.19	0.21	0.16	0.12	0.21

Table – IV: Entropy values

	e_1	e_2	e_3	e_4	e_5	e_6
e_j	0.9676	0.9681	0.8688	0.9413	0.9704	0.9754

Table - V: Weightage and rank of constraints

	e_1	e_2	e_3	e_4	e_5	e_6
W_j	0.1051	0.1034	0.4254	0.1903	0.0959	0.0798
Rank	3	4	1	2	5	6

Hence, by above table clearly came to know that the peoples are searching and like to get into the job based on self-respect and identity. Based on questionnaire, answers are in the form of linguistic terms. Numerical expressions of objectives with respect to the constraints are created and are shown in table VI.

Table – VI : Numerical expression of decision matrix

	j_1	j_2	j_3	j_4	j_5	j_6
e_1	(0.86,0.17,0.14)	(0.88,0.15,0.13)	(0.59,0.35,0.40)	(0.79,0.24,0.22)	(0.79,0.24,0.21)	(0.59,0.35,0.40)
e_2	(0.83,0.22,0.18)	(0.85,0.22,0.17)	(0.69,0.27,0.29)	(0.73,0.24,0.24)	(0.73,0.24,0.24)	(0.68,0.30,0.32)
e_3	(0.82,0.22,0.19)	(0.88,0.14,0.12)	(0.69,0.27,0.29)	(0.83,0.22,0.18)	(0.89,0.13,0.12)	(0.80,0.23,0.20)
e_4	(0.71,0.26,0.27)	(0.82,0.21,0.18)	(0.59,0.37,0.42)	(0.76,0.21,0.20)	(0.78,0.24,0.22)	(0.79,0.24,0.22)
e_5	(0.83,0.22,0.18)	(0.87,0.16,0.14)	(0.58,0.37,0.42)	(0.62,0.33,0.38)	(0.85,0.23,0.18)	(0.85,0.22,0.17)
e_6	(0.71,0.26,0.26)	(0.88,0.14,0.12)	(0.58,0.37,0.42)	(0.79,0.25,0.22)	(0.87,0.16,0.14)	(0.81,0.23,0.20)

Objective function with respect to the constraints of the problem is as follows

$$Max\ T(Z(x)) = 0.86x_{11} + 0.88x_{12} + 0.59x_{13} + 0.79x_{14} + 0.79x_{15} + 0.59x_{16} + 0.83x_{21} + 0.85x_{22} + 0.69x_{23} + 0.73x_{24} + 0.73x_{25} + 0.68x_{26} + 0.82x_{31} + 0.88x_{32} + 0.69x_{33} + 0.83x_{34} + 0.89x_{35} + 0.80x_{36} + 0.71x_{41} + 0.82x_{42} + 0.59x_{43} + 0.76x_{44} + 0.78x_{45} + 0.79x_{46} + 0.83x_{51} + 0.87x_{52} + 0.58x_{53} + 0.62x_{54} + 0.85x_{55} + 0.85x_{56} + 0.71x_{61} + 0.88x_{62} + 0.58x_{63} + 0.79x_{64} + 0.87x_{65} + 0.81x_{66}$$

$$Max\ I(Z(x)) = 0.17x_{11} + 0.15x_{12} + 0.35x_{13} + 0.24x_{14} + 0.24x_{15} + 0.35x_{16} + 0.22x_{21} + 0.22x_{22} + 0.27x_{23} + 0.24x_{24} + 0.24x_{25} + 0.30x_{26} + 0.22x_{31} + 0.14x_{32} + 0.27x_{33} + 0.22x_{34} + 0.13x_{35} + 0.23x_{36} + 0.26x_{41} + 0.21x_{42} + 0.37x_{43} + 0.21x_{44} + 0.24x_{45} + 0.24x_{46} + 0.22x_{51} + 0.16x_{52} + 0.37x_{53} + 0.33x_{54} + 0.23x_{55} + 0.22x_{56} + 0.26x_{61} + 0.14x_{62} + 0.37x_{63} + 0.25x_{64} + 0.16x_{65} + 0.23x_{66}$$

$$Max\ F(Z(x)) = 0.14x_{11} + 0.13x_{12} + 0.40x_{13} + 0.22x_{14} + 0.21x_{15} + 0.40x_{16} + 0.18x_{21} + 0.17x_{22} + 0.29x_{23} + 0.24x_{24} + 0.24x_{25} + 0.32x_{26} + 0.19x_{31} + 0.12x_{32} + 0.29x_{33} + 0.18x_{34} + 0.12x_{35} + 0.20x_{36} + 0.27x_{41} + 0.18x_{42} + 0.42x_{43} + 0.20x_{44} + 0.22x_{45} + 0.22x_{46} + 0.18x_{51} + 0.14x_{52} + 0.42x_{53} + 0.38x_{54} + 0.18x_{55} + 0.17x_{56} + 0.26x_{61} + 0.12x_{62} + 0.42x_{63} + 0.22x_{64} + 0.14x_{65} + 0.20x_{66}$$

Determine GENFS and LENFS for the objective function and get the values as follows

Table - VII: GENFS of objective function

	j_1	j_2	j_3	j_4	j_5	j_6
GENFS	(0.86,0.26,0.26)	(0.86,0.22,0.18)	(0.69,0.27,0.29)	(0.79,0.25,0.22)	(0.85,0.24,0.22)	(0.85,0.26,0.26)
Defuzzified Values, (d_j^+)	0.5375	0.5443	0.4792	0.5232	0.5346	0.5346

Table VIII: LENFS of objective function

	j_1	j_2	j_3	j_4	j_5	j_6
LENFS	(0.71,0.17,0.14)	(0.82,0.17,0.14)	(0.69,0.27,0.29)	(0.76,0.21,0.20)	(0.78,0.22,0.17)	(0.71,0.22,0.17)
Defuzzified Values, (d_j^-)	0.4829	0.5189	0.4792	0.4935	0.5270	0.5035

Checking the analysis by multiple linear regression using SPSS.

There was a very strong collective significant influence between the $X_1(GENFS)$, $X_2(LENFS)$, and $Y(Weightage\ of\ Constraints)$, [F(1, 4) = 94.99, p < .001, R^2 = 0.96, R_{adj}^2 = 0.95], according to the multiple linear regression results.

Table IX: Correlation matrix

	Y	X_1	X_2
Y	1	-0.979587	-0.6172
X_1	-0.9795871	1	0.614223
X_2	-0.6172	0.614223	1

Table X: ANOVA table

Source	DF	Sum of Square	Mean Square	F Statistic	P-value
Regression(between $\hat{y}_i$ and $\bar{y}$)	1	0.0842985	0.0842985	94.988751	0.000620762
Residual(between y_i and $\hat{y}_i$)	4	0.00354983	0.000887458		
Total (between y_i and $\bar{y}$)	5	0.0878483	0.0175697		

Table XI: Coefficient Table Iteration 1 (adjusted R-squared = 0.933)

	Coeff	SE	t-stat	lower $t_{0.025}(3)$	upper $t_{0.975}(3)$	Stand Coeff	p-value	VIF
b	3.085004	0.415529	7.424277	1.762605	4.407403	0	0.00505646	
X_1	-5.389685	0.818083	-6.588185	-7.993191	-2.786178	-0.964285	0.00711666	1.605833
X_2	-0.171145	1.005458	-0.170216	-3.37096	3.02867	-0.0249138	0.875672	1.605833

Table XII: Coefficient Table

	Coeff	SE	t-stat	lower $t_{0.025}(3)$	upper $t_{0.975}(3)$	Stand Coeff	p-value	VIF
b	3.044241	0.295502	10.301914	2.223795	3.864687	0	0.000500818	
X_1	-5.475216	0.561779	-9.746217	-7.034963	-3.915469	-0.979587	0.000620762	1

Multiple linear regression

1. Connection between Y and X

R square (R^2) equals **0.959591.** It means that the predictors (X_i) explain 96% of the variance of Y. Adjusted R square equals **0.949489.** The coefficient of multiple correlation (R) equals **0.979587**. It indicates that predicted data ($\hat{y}$) and the observed data (y) have a very high correlation.

2. Goodness of fit

Overall regression: right-tailed, $F_{(1,4)}$ = **94.988751**, p-value = **0.000620762**. Since p-value < α (0.05), we reject the H_0.

The linear regression model, $\mathbf{Y = b_0 + b_1X_1 + ... + b_pX_p + \varepsilon}$, provides a better fit than the model without the independent variables resulting in, $\mathbf{Y = b_0 + \varepsilon}$.The following independent variable is not significant as predictor for Y: $\mathbf{X_2}$.Therefore it was excluded from the model. The Y-intercept (b): two-tailed, T = **10.301914**, p-value = **0.000500818**. Hence b is significantly different from zero.

5. Validation

- **Residual normality**
  - For residual errors, linear regression presupposes normality.
  - Shapiro Wilk p-value equals **0.9428**.
  - It is considered that the distribution of the data is normal.
- **Homoscedasticity - homogeneity of variance**
  - The White test p-value equals **0.446081** (F=1.069305).
  - It is considered that there is a homogenous variance.
- **Multicollinearity - intercorrelations among the predictors (X_i)**
  - There is no multi collinearity concern as all the VIF values are smaller than 2.5.

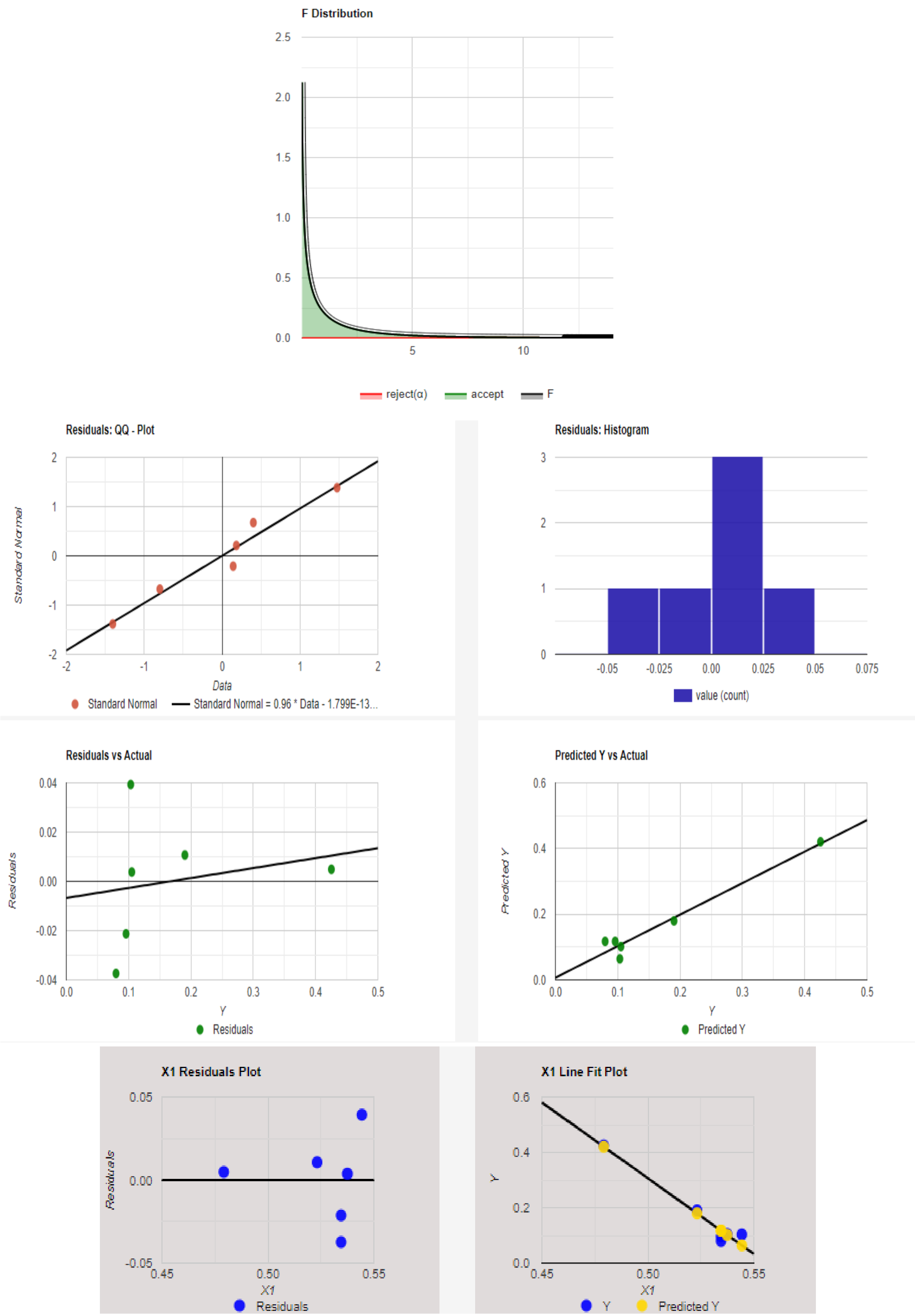

Figure 2: Statistical analysis graph

5. Result and discussion

The values obtained from GENFS and LENFS represent the range of satisfied/abstention/unsatisfied levels for the objectives with respect to the constraints.

- Peoples are satisfied in the range of 71% to 86 %, abstain 17% to 26%, and unsatisfied in the range of 14% to 26% with respect to the objective j_1.
- Peoples are satisfied in the range of 82% to 86%, abstain 17% to 22%, and unsatisfied in the range of 14% to 18% with respect to the objective j_2.
- Peoples are satisfied in the level of 69%, abstain 27%, and unsatisfied in the level of 29% with respect to the objective j_3.
- Peoples are satisfied in the range of 76% to 79%, abstain 21% to 25%, and unsatisfied in the range of 20% to 22% with respect to the objective j_4.
- Peoples are satisfied in the range of 78% to 85%, abstain 22% to 24%, and unsatisfied in the range of 17% to 22% with respect to the objective j_5.
- Peoples are satisfied in the range of 71% to 85%, abstain 22% to 26%, and unsatisfied in the range of 17% to 26% with respect to the objective j_6.

6. Conclusion

From the survey clearly it shows that the peoples are satisfied and like to get into the government job and they think that, as a government employee they get self-respect and identity in society as well as family members. Despite the fact that the IT industry has grown significantly in popularity and favor among others, most people believe that government positions are safer than any other type of employment.

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