Analysis of the Requirements of Alumni Management System using Fuzzy TOPSIS

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Table of Contents

1. Information System : Alumni Relations Management System

Overview: As an Alumni Relations Management System, my basic objective is to establish and maintain a strong relationship between the university or educational institution and its former students. I collect, manage, and analyse information about alumni, and develop and implement strategies to engage and involve them in the life of the institution and as well connect them with the current members of the institution. My goal is to leverage their knowledge, skills, and resources to benefit the institution and its current students.

Role: The website serves as a central hub for alumni to connect with the institution and each other. It provides a platform for alumni to update their contact information, view upcoming events, and access resources and services offered by the institution.
The website also facilitates communication between alumni and the institution, allowing alumni to share their experiences, provide feedback, and offer support to current students. Additionally, the website may offer opportunities for alumni to give back to the institution through donations or volunteer work.

Chapter 1

The aim of this chapter is to discuss.....

The Alumni Management System plays a crucial role in maintaining strong connections with alumni and facilitating effective communication and collaboration. The selection of an appropriate system requires careful consideration of various criteria such as functionality, user experience, scalability, security, integration capabilities, cost, and maintenance requirements. Traditional decision-making methods often struggle to handle the imprecise and uncertain nature of these criteria. In contrast, Fuzzy TOPSIS provides a flexible and robust approach that accommodates such uncertainties and enables a more accurate assessment of the alternatives.

2. Stakeholder identification

1. Developers (frontend, Backend): Developers are responsible for designing, developing, and maintaining the institution's software systems and applications, both on the front-end and back-end.
2. Alumni: Alumni are former students of the education institution. They play a crucial role in supporting the institution by participating in events, providing feedback, and mentoring current students.
3. Students: Students are the primary beneficiaries of the programs and services. They engage in learning activities, attend classes, participate in clubs and organisations, and access student services.
4. Administration: Administration refers to the executives and managers of the institution.
5. Education Institution: The educational organisation that provides learning opportunities to students.
6. Faculty: Faculty members are responsible for teaching courses, conducting research, and mentoring students.

7. Staff: Staff members are responsible for providing support services to students, faculty, and administration. This includes roles such as administrative assistants, custodians, and IT support staff.
8. Donors and Sponsors: Donors and sponsors provide financial support to institution. This support may be in the form of scholarships, grants, or donations.
9. Board of Directors: The Board of Directors generally are HODs of the Institute.
10. Community Partners: Community partners are organisations or individuals that collaborate with institution to achieve shared goals. This includes partnerships with local businesses, non-profit organisations, and government agencies like minister.
11. Regulatory Body: Regulatory bodies are government agencies responsible for ensuring that institution complies with laws and regulations.
12. Job Recruiters: Job recruiters work with institution to recruit graduates for job opportunities. They may attend job fairs, conduct interviews, and provide job placement services.
13. General Public: The general public refers to individuals who are not directly involved with institution but may have an interest in its activities or outcomes.
14. Vendors and Service Providers: Vendors and service providers are external organisations that provide goods or services to the institution. This includes companies that provide software, food services, and building maintenance.
15. Alumni Associations: organisations formed by alumni to support the education institution and its graduates. They may provide networking opportunities, mentoring, and fundraising support etc.
16. Volunteers: Volunteers are individuals who donate their time and expertise to support the education institution's programs and services. This includes roles such as mentors, tutors, and event organisers.
17. Media: Media refers to journalists and media organisations that cover the institution's activities and events.
18. Government Agencies: Government agencies are organisations that provide funding or regulatory oversight to the education institution. This includes agencies that provide financial aid to students or research grants to faculty , scholarship.
19. Alumni Advocates and Ambassadors: Alumni advocates and ambassadors promote the institution's mission and activities to external audiences. They may participate in outreach activities or speak at events.

20. Peer Institution: Peer institutions are other educational organisations that share similar characteristics or goals like IITs, NITs. They may collaborate with the institution on research projects, joint programs, or other initiatives.
21. Prospective Students and Families: Prospective students and families are individuals who are considering enrolling in the education institution. They may attend campus tours, review program information, and meet with admissions counsellors.
23. Alumni Mentors: Alumni mentors are former students who provide guidance and support to current students. They may offer career advice, help with job searches, or provide networking opportunities.
24. Alumni Donors: Alumni donors are former students who provide financial support to the institution. They may donate to specific programs, scholarships, or the institution as a whole.
25. Legal Adviser: Legal advisers are professionals who provide legal guidance and support to the institution. They ensure that the institution complies with laws and regulations and manage legal issues and disputes.
26. Security Engineer: Security engineers are responsible for ensuring that the institution's computer systems and networks are secure from unauthorised access, hacking, and cyber-attacks.
27. Alumni Content Contributors: Alumni content contributors are former students who contribute to the institution's content marketing efforts. They may write blog posts, create videos, or provide testimonials.
28. Alumni Event Attendees: Alumni event attendees are former students who attend events organised by the institution. These events may include networking events, reunions, or fundraising events.
29. Alumni Networks: Alumni networks are communities of former students who maintain connections with each other and the education institution. They may provide mentoring, career support, and social opportunities.
30. Research Partner: Research partners are external organisations that collaborate with the institute on research projects. Include industry partners, government agencies, or other educational institutions.
31. Industry Professional: Industry professionals are individuals who work in a particular industry and collaborate with the institution on research, internships, or job placement.
32. Community Organisations: Community organisations are non-profit organisations that collaborate with the institution to address community issues and promote social good.

33. Marketing and Advertising Agency: Marketing and advertising agencies provide marketing support to the institution. They may develop branding strategies, design marketing materials, or manage social media campaigns.
34. Institute Club Moderators: Institute club moderators are individuals who oversee clubs and organisations on campus. They ensure that the clubs run smoothly and provide opportunities for students to engage in extracurricular activities.
35. People from Higher Institution: People from higher institutions are individuals who work or study at other institutions. They may collaborate with the institution on research projects, attend academic conferences or provide Information about higher studies.
36. Foreign Institute: Foreign institutes are educational institutions located outside India. They may collaborate on joint programs, exchange programs, research initiatives or provide Information about higher studies.
37. Entrepreneurial Alumni: Entrepreneurial alumni are former students who start their own businesses. They may collaborate with the education institution on research, provide funding support, or mentor current students.

3. Functional Requirement :

FR0:Login/signup module page for all(Alumni, students, faculty, service providers..)

FR1: Registration module for alumni, allowing them to create an account with their personal information and academic history.

FR2: Search module for alumni, allowing them to search for other alumni based on criteria such as graduation year, major, or location.

FR3: Profile module for alumni, allowing them to update their personal information, contact information, employment history, and any other relevant information.

FR4: Job board module, allowing alumni, job providers, faculty & students to update/search for job opportunities posted by companies and organisations affiliated with the Institute.

FR5: Event module, allowing people to view and RSVP to upcoming alumni events/Institute events, including reunions, networking events, cultural/technical fest and social gatherings.

FR6: Mentorship module, allowing alumni to connect with current students and recent graduates who are seeking mentorship or career advice.

FR7: Donation module, allowing alumni/ Services providers to donate to the university or specific programs and initiatives.

FR8: Newsletter module, allowing alumni to sign up for and receive regular newsletters with updates and news about the institute and alumni community.

FR9: Integration with social media platforms, allowing alumni to connect with each other and the institute on popular social media platforms.

FR10: Analytics module, allowing the Institute to track alumni engagement and participation in various activities and events, and to analyse data to improve the alumni system and communication with alumni.

FR11: Higher Education module, allowing the Institute to connect with higher education universities for providing the information about higher degree.

FR12: Foreign institute module, provide information about their Education, degree, internship etc.

FR13: Peer institutes module

4. Non-Functional Requirements :

1. Usability: The system should be easy to use and navigate, with intuitive design and clear user interfaces.
2. Accessibility: The system should be accessible to users with disabilities, including features such as screen readers, keyboard navigation, and colour contrast options.
3. Performance: The system should be fast and responsive, with quick load times and minimal downtime.
4. Reliability: The system should be reliable, with minimal errors or downtime, and the ability to recover from failures quickly.
5. Scalability: The system should be scalable, with the ability to handle increased user traffic and data volumes without compromising performance.
6. Security: The system should be secure, with features such as encryption, firewalls, and user authentication and access control.
7. Data privacy: The system should protect user data and privacy, with features such as data encryption, secure storage, and compliance with relevant regulations and standards.
8. Compatibility: The system should be compatible with a range of operating systems, browsers, and devices, to ensure that users can access the system from their preferred platform.
9. Maintainability: The system should be easy to maintain and update, with clear documentation and support resources for system administrators and developers.
10. Interoperability: The system should be interoperable, allowing it to communicate and share data with other systems or tools as needed.
11. Availability: The system should be available to users at all times, with minimal downtime or maintenance windows.
12. Compliance: The system should comply with relevant laws, regulations, and industry standards, such as GDPR or HIPAA.

13. Audit-ability: The system should be auditable, allowing administrators to track and monitor user activity and system changes.
14. Performance efficiency: The system should perform efficiently, with minimal resource consumption and energy usage.
15. Capacity planning: The system should have a capacity planning strategy in place, allowing administrators to anticipate and prepare for changes in user traffic and data volumes.
16. Extensibility: The system should be extensible, allowing developers to add new features and functionality as needed.
17. Modifiability: The system should be modifiable, allowing developers to make changes and updates to the system as needed.
18. Testability: The system should be testable, with clear and comprehensive testing procedures and tools.
19. Deployability: The system should be easy to deploy, with clear installation procedures and documentation.
20. Flexibility: The system should be flexible, allowing users to customise their preferences and settings as needed.
21. Maintainability: The system should be easy to maintain, with clear documentation and support resources for administrators and developers.
22. Response time: The system should have a fast response time, with minimal latency and wait times.

Chapter 2

The aim of this chapter is to discuss.....

2.1 Linguistic Variable Definition:

Each criterion is assigned linguistic variables to represent different levels of performance or satisfaction. These linguistic variables, such as “Very Poor," "Poor," "Fair," "Good," and “Very Good," capture the subjective assessments of the decision-makers.

Table 2.1

Based on the linguistic value

Linguistic Term	Lower Bound (a)	Peak (b)	Upper Bound (c)
VL	0	0	0.25
L	0	0.25	0.5
M	0.25	0.5	0.75
H	0.5	0.75	1
VH	0.75	1	1

Table 2.2
for importance of weight criteria for decision makers

Decision Maker	Criteria 1	Criteria 2	Criteria 3
DM1	VH	L	M
DM2	VL	VH	L
DM3	M	VL	VH

Table 2.3
Linguistic variable ratings

Linguistic Term	Lower Bound (a)	Peak (b)	Upper Bound (c)
VP	0	0	2.5
P	0	2.5	5
F	2.5	5	7.5
G	5	7.5	10
VG	7.5	10	10

2.2 Criteria Weighting:

To reflect the relative importance of the criteria, weights are assigned based on the preferences of the stakeholders or decision-makers. These weights can be obtained through expert opinions, surveys, or discussions.

Table 2.4
for Rough numbers for FR1 and NFR1

Functional Requirement	Usability - DM 1	Security - DM 1	Maintainability - DM 1	Usability - DM 2	Security - DM 2	Maintainability - DM 2	Usability - DM 3	Security - DM 3	Maintainability - DM 3
FR0	H	H	H	VH	L	H	H	H	H
FR1	VH	H	L	VH	VH	M	VH	H	M
FR2	H	VH	H	H	L	M	H	M	H
FR3	VH	VH	VH	VH	VH	VH	VH	VH	VH
FR4	H	VH	H	L	VH	VH	M	VH	H
FR5	H	VH	H	M	M	M	VH	H	H
FR6	VH	VH	VH	VH	VH	VH	VH	VH	VH
FR7	VH	H	L	VH	VH	M	VH	H	M
FR8	M	H	L	VL	H	VL	M	H	H
FR9	M	M	L	VL	H	VL	VL	H	H
FR10	VL	H	H	M	H	VL	M	H	M
FR11	VH	H	L	VH	VH	M	VH	H	M
FR12	VH	H	H	VH	VH	M	H	VH	M
FR13	H	VH	H	H	L	M	H	M	H

2.3 Fuzzy Decision Matrix Construction:

A decision matrix is constructed to capture the performance ratings of different Alumni Management Systems with respect to each criterion. The linguistic variables assigned earlier are utilised to express fuzzy ratings for each alternative-criterion combination.

Table 2.5

Decision makers deciding the criterion rating

Functional Requirement	Usability - DM 1	Security - DM 1	Maintainability - DM 1	Usability - DM 2	Security - DM 2	Maintainability - DM 2	Usability - DM 3	Security - DM 3	Maintainability - DM 3
FR0	G	G	G	VG	P	G	G	G	G
FR1	VG	G	P	VG	VG	F	VG	G	F
FR2	G	VG	G	G	P	F	G	F	G
FR3	VG	VG	VG	VG	VG	VG	VG	VG	VG
FR4	G	VG	G	P	VG	VG	F	VG	G
FR5	G	VG	G	F	F	F	VG	G	G
FR6	VG	VG	VG	VG	VG	VG	VG	VG	VG
FR7	VG	G	P	VG	VG	F	VG	G	F

FR8	F	G	P	VP	G	VP	F	G	G
FR9	F	F	P	VP	G	VP	VP	G	G
FR10	VP	G	G	F	G	VP	F	G	F
FR11	VG	G	P	VG	VG	F	VG	G	F
FR12	VG	G	G	VG	VG	F	G	VG	F
FR13	G	VG	G	G	P	F	G	F	G

Table 2.6

Decision makers deciding the criterion rating in triangular norm

Functional Requirement	Usability - DM 1	Security - DM 1	Maintainability - DM 1	Usability - DM 2	Security - DM 2	Maintainability - DM 2	Usability - DM 3	Security - DM 3	Maintainability - DM 3
FR0	(5, 5, 7.5)	(5, 5, 7.5)	(5, 5, 7.5)	(7.5, 7.5, 10)	(0, 2.5, 5)	(5, 5, 7.5)	(5, 5, 7.5)	(5, 5, 7.5)	(5, 5, 7.5)
FR1	(7.5, 7.5, 10)	(5, 5, 7.5)	(0, 2.5, 5)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(2.5, 5, 7.5)	(7.5, 7.5, 10)	(5, 5, 7.5)	(2.5, 5, 7.5)
FR2	(5, 5, 7.5)	(7.5, 7.5, 10)	(5, 5, 7.5)	(5, 5, 7.5)	(0, 2.5, 5)	(2.5, 5, 7.5)	(5, 5, 7.5)	(2.5, 5, 7.5)	(5, 5, 7.5)
FR3	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)

FR4	(5, 5, 7.5)	(7.5, 7.5, 10)	(5, 5, 7.5)	(0, 2.5, 5)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(2.5, 5, 7.5)	(7.5, 7.5, 10)	(5, 5, 7.5)
FR5	(5, 5, 7.5)	(7.5, 7.5, 10)	(5, 5, 7.5)	(2.5, 5, 7.5)	(2.5, 5, 7.5)	(2.5, 5, 7.5)	(7.5, 7.5, 10)	(5, 5, 7.5)	(5, 5, 7.5)
FR6	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)
FR7	(7.5, 7.5, 10)	(5, 5, 7.5)	(0, 2.5, 5)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(2.5, 5, 7.5)	(7.5, 7.5, 10)	(5, 5, 7.5)	(2.5, 5, 7.5)
FR8	(2.5, 5, 7.5)	(5, 5, 7.5)	(0, 2.5, 5)	(0, 0, 2.5)	(5, 5, 7.5)	(0, 0, 2.5)	(2.5, 5, 7.5)	(5, 5, 7.5)	(5, 5, 7.5)
FR9	(2.5, 5, 7.5)	(2.5, 5, 7.5)	(0, 2.5, 5)	(0, 0, 2.5)	(5, 5, 7.5)	(0, 0, 2.5)	(0, 0, 2.5)	(5, 5, 7.5)	(5, 5, 7.5)
FR10	(0, 0, 2.5)	(5, 5, 7.5)	(5, 5, 7.5)	(2.5, 5, 7.5)	(5, 5, 7.5)	(0, 0, 2.5)	(2.5, 5, 7.5)	(5, 5, 7.5)	(2.5, 5, 7.5)
FR11	(7.5, 7.5, 10)	(5, 5, 7.5)	(0, 2.5, 5)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(2.5, 5, 7.5)	(7.5, 7.5, 10)	(5, 5, 7.5)	(2.5, 5, 7.5)
FR12	(7.5, 7.5, 10)	(5, 5, 7.5)	(5, 5, 7.5)	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(2.5, 5, 7.5)	(5, 5, 7.5)	(7.5, 7.5, 10)	(2.5, 5, 7.5)
FR13	(5, 5, 7.5)	(7.5, 7.5, 10)	(5, 5, 7.5)	(5, 5, 7.5)	(0, 2.5, 5)	(2.5, 5, 7.5)	(5, 5, 7.5)	(2.5, 5, 7.5)	(5, 5, 7.5)

2.4 Normalisation:

The fuzzy decision matrix is normalised to eliminate the influence of different measurement scales. Fuzzy normalisation techniques are employed to transform the fuzzy ratings into comparable values, ensuring equitable treatment of each criterion during the analysis.

Table 2.7
Fuzzy decision matrix

Functional Requirement	Usability	Security	Maintainability
FR0	(5, 5.83, 10)	(0, 4.17, 7.5)	(5, 5, 7.5)
FR1	(7.5, 7.5, 10)	(5, 5.83, 10)	(0, 3.33, 7.5)
FR2	(5, 5, 7.5)	(0, 5, 10)	(0, 4.17, 7.5)
FR3	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)
FR4	(0, 5, 10)	(2.5, 5.83, 10)	(5, 5, 7.5)
FR5	(5, 5.83, 10)	(2.5, 5, 7.5)	(2.5, 5, 7.5)
FR6	(7.5, 7.5, 10)	(7.5, 7.5, 10)	(7.5, 7.5, 10)
FR7	(7.5, 7.5, 10)	(5, 5.83, 10)	(0, 3.33, 7.5)
FR8	(0, 3.33, 7.5)	(5, 5, 7.5)	(0, 3.33, 7.5)
FR9	(0, 2.5, 7.5)	(2.5, 5, 7.5)	(0, 3.33, 7.5)
FR10	(0, 4.17, 7.55)	(5, 5, 7.5)	(0, 4.17, 7.5)
FR11	(7.5, 7.5, 10)	(5, 5.83, 10)	(0, 3.33, 7.5)
FR12	(7.5, 7.5, 10)	(5, 5.83, 10)	(5, 5, 7.5)
FR13	(5, 5, 7.5)	(0, 4.17, 10)	(0, 4.17, 7.5)

Table 2.8

Weighted normalised fuzzy matrix

Functional Requirement	Usability	Security	Maintainability
FR0	(0.5, 0.58, 1)	(0, 0.42, 0.75)	(0.5, 0.5, 0.75)
FR1	(0.75, 0.75, 1)	(0.5, 0.58, 1)	(0, 0.33, 0.75)
FR2	(0.5, 0.5, 0.75)	(0, 0.5, 1)	(0, 0.42, 0.75)
FR3	(0.75, 0.75, 1)	(0.75, 0.75, 1)	(0.75, 0.75, 1)
FR4	(0, 0.5, 1)	(0.25, 0.58, 1)	(0.5, 0.5, 0.75)
FR5	(0.5, 0.58, 1)	(0.25, 0.5, 0.75)	(0.25, 0.5, 0.75)
FR6	(0.75, 0.75, 1)	(0.75, 0.75, 1)	(0.75, 0.75, 1)
FR7	(0.75, 0.75, 1)	(0.5, 0.58, 1)	(0, 0.33, 0.75)
FR8	(0, 0.33, 0.75)	(0.5, 0.5, 0.75)	(0, 0.33, 0.75)
FR9	(0, 0.25, 0.75)	(0.25, 0.5, 0.75)	(0, 0.33, 0.75)
FR10	(0, 0.42, 0.75)	(0.5, 0.5, 0.75)	(0, 0.42, 0.75)
FR11	(0.75, 0.75, 1)	(0.5, 0.58, 1)	(0, 0.33, 0.75)
FR12	(0.75, 0.75, 1)	(0.5, 0.58, 1)	(0.5, 0.5, 0.75)
FR13	(0.5, 0.5, 0.75)	(0, 0.42, 1)	(0, 0.42, 0.75)

Table 2.9
Rating fuzzy matrix table

Functional Requirement	Usability	Security	Maintainability	Ranking
FR0	(0.5, 0.58, 1)	(0, 0.42, 0.75)	(0.5, 0.5, 0.75)	3
FR1	(0.75, 0.75, 1)	(0.5, 0.58, 1)	(0, 0.33, 0.75)	1
FR2	(0.5, 0.5, 0.75)	(0, 0.5, 1)	(0, 0.42, 0.75)	3
FR3	(0.75, 0.75, 1)	(0.75, 0.75, 1)	(0.75, 0.75, 1)	1
FR4	(0, 0.5, 1)	(0.25, 0.58, 1)	(0.5, 0.5, 0.75)	3
FR5	(0.5, 0.58, 1)	(0.25, 0.5, 0.75)	(0.25, 0.5, 0.75)	2
FR6	(0.75, 0.75, 1)	(0.75, 0.75, 1)	(0.75, 0.75, 1)	1
FR7	(0.75, 0.75, 1)	(0.5, 0.58, 1)	(0, 0.33, 0.75)	1
FR8	(0, 0.33, 0.75)	(0.5, 0.5, 0.75)	(0, 0.33, 0.75)	3
FR9	(0, 0.25, 0.75)	(0.25, 0.5, 0.75)	(0, 0.33, 0.75)	3
FR10	(0, 0.42, 0.75)	(0.5, 0.5, 0.75)	(0, 0.42, 0.75)	3
FR11	(0.75, 0.75, 1)	(0.5, 0.58, 1)	(0, 0.33, 0.75)	1
FR12	(0.75, 0.75, 1)	(0.5, 0.58, 1)	(0.5, 0.5, 0.75)	1
FR13	(0.5, 0.5, 0.75)	(0, 0.42, 1)	(0, 0.42, 0.75)	3

2.5 Fuzzy Positive-Ideal and Fuzzy Negative-Ideal Solutions:

Based on the normalised decision matrix, the fuzzy positive-ideal solution (A+) and fuzzy negative-ideal solution (A-) are determined. A+ represents the best performance for each criterion, while A- represents the worst performance.

Ranking:

A* (Best Alternative): FR3

A- (Worst Alternative): FR9

The Fuzzy Positive-Ideal (PIS) solution in triangular form:

PIS = (PIS_Usability, PIS_Security, PIS_Maintainability)

A*= ((0.75, 0.75, 1), (0.75, 0.75, 1), (0.75, 0.75, 1))

The Fuzzy Negative-Ideal (NIS) solution in triangular form:
NIS = (NIS_Usability, NIS_Security, NIS_Maintainability)

A-= ((0, 0.33, 0.75), (0, 0.25, 0.75), (0, 0.42, 1))

Based on the average scores, FR3 has the highest score and is ranked as the best alternative (A*). FR9 has the lowest score and is ranked as the worst alternative (A-).

1. FR3 (highest ranking in Maintainability)
2. FR1 (highest ranking in Usability and Security)
3. FR5
4. FR6
5. FR4
6. FR0 (lowest ranking in Security)
7. FR2 (lowest ranking in Security)
8. FR8
9. FR11
10. FR12
11. FR10
12. FR13
13. FR9
14. FR7 (lowest ranking in Usability)

2.6 Report Outline

Results and Discussion:

Based on the calculated relative closeness coefficients, the alternatives are ranked in descending order. The alternative with the highest coefficient represents the most suitable choice for the Alumni Management System, considering the defined criteria and preferences.

Conclusion:

Fuzzy TOPSIS proves to be an effective methodology for analysing the requirements of an Alumni Management System. By incorporating fuzzy logic and linguistic variables, it allows for a more realistic evaluation that considers imprecise or uncertain information. The step-by-step process outlined in this paper enables decision-makers to make informed choices and identify the most suitable alternative for the system. Further research can focus on applying Fuzzy TOPSIS to other domains and exploring additional fuzzy similarity measures for enhanced analysis.

Chapter 3

The aim of this chapter is to discuss…..

3.1 Implementation of the Website:

The implementation of the Alumni Management System website utilises a robust technology stack to ensure an effective and user-friendly experience. The front-end development involves HTML, CSS, and JavaScript to create visually appealing and interactive user interfaces. These technologies enable the website to present information in a structured manner and provide a seamless browsing experience for users.

On the backend, the website utilise a server-side scripting language, such as Python with the Flask framework, to handle data processing, database interactions, and logic implementation. Python's versatility and Flask's simplicity make them well-suited for developing dynamic web applications. The integration of a database management system, such as MySQL, allows for efficient storage and retrieval of user information, event data, job postings, and other relevant data.

To ensure a responsive design that adapts to different screen sizes and devices, the website incorporates responsive web design principles. This involves utilising CSS media queries and flexible grid systems to adjust the layout and content presentation based on the user's device, such as desktops, laptops, tablets, and mobile phones. By implementing a responsive design, the website provides an optimal viewing experience across various platforms and improves accessibility for users.

In addition to the core tech stack, the website may incorporate other tools and frameworks as needed. For example, JavaScript libraries such as React can be utilised to enhance interactivity and create dynamic components. APIs may also be integrated to fetch data from external sources or provide additional functionalities.

The website includes a login/signup module (FR0) that caters to all users, allowing them to create an account or log in using their credentials. A registration module (FR1) specifically designed for alumni enables them to create an account by providing personal information and academic history. The website also features a search module (FR2) that allows alumni to search for other alumni based on various criteria such as graduation year, major, or location.

A profile module (FR3) is implemented to enable alumni to update their personal and contact information, employment history, and other relevant details. The job board module (FR4) allows alumni, job providers, students, and faculty to post and search for job opportunities. Additionally, an event module (FR5) facilitates the viewing and RSVPing to upcoming alumni and institute events, fostering engagement and networking.

The mentorship module (FR6) provides a platform for alumni to connect with students and recent graduates seeking mentorship or career guidance. A donation module (FR7) allows alumni and service providers to contribute to the university or specific programs and initiatives. The newsletter module (FR8) enables alumni to sign up and receive regular updates and news about the institute and alumni community.

Integration with social media platforms (FR9) allows alumni to connect with each other and the institute through popular social media channels. An analytics module (FR10) is incorporated to track alumni engagement, participation in activities, and events, providing valuable insights for system improvement and communication enhancement.

Furthermore, continuous improvements in user experience (UX) and user interface (UI) design can be made to enhance the website's visual appeal, ease of use, and overall usability. Regular updates and maintenance should be performed to ensure the website remains secure, efficient, and compatible with evolving web standards and browser versions.

Overall, the implementation of the Alumni Management System website utilises a tech stack consisting of HTML, CSS, JavaScript, and Python with the Flask framework on the backend. The website incorporates responsive web design principles to ensure compatibility across various devices.

3.2 Future Scope:

The future development of the website includes several enhancements and expansions based on the identified functional requirements:

1. Enhanced Functionality: Continual improvements will be made to existing modules, ensuring a more comprehensive and user-friendly experience. Features such as advanced search options, personalised recommendations, and enhanced profile customisation will be implemented to cater to specific user needs.
2. Alumni Networking Features: The website can be expanded to include advanced networking features, such as alumni forums, discussion boards, and interest-based communities. These features will foster stronger connections and collaboration among alumni.
3. Mobile Application: The future scope includes developing a mobile application for the Alumni Management System, allowing users to access the platform conveniently on their smartphones and tablets. The mobile app will offer all the functionalities of the website, providing a seamless user experience on the go.
4. Alumni Engagement Tracking: The analytics module will be further enhanced to track alumni engagement and measure the impact of alumni activities on the institute. This data will enable the institute to tailor programs and initiatives to better engage alumni and strengthen the alumni community.
5. Alumni Mentoring Platform: The mentorship module can be expanded to include a dedicated platform for alumni mentoring. This platform will facilitate structured mentorship programs, pairing experienced alumni with current students based on their areas of expertise and career interests.

6. Integration with External Systems: The website can be integrated with external systems and databases to provide seamless access to resources and services. Integration with career development platforms, alumni databases, and online learning platforms will enhance the overall user experience and expand the range of services offered.
7. International Collaboration: Future development can focus on establishing partnerships and collaborations with peer institutes and foreign universities (FR12 and FR13). This will allow for the exchange of information, programs, internships, and opportunities, creating a global network for alumni and promoting international exposure.

In conclusion, the implemented Alumni Management System website successfully incorporates the identified functional requirements to provide a comprehensive platform for alumni, students, faculty, and service providers. The future scope encompasses continuous improvement of existing features, introduction of new functionalities, mobile application development, enhanced analytics, alumni mentoring platform, integration with external systems, and international collaboration. These enhancements will contribute to a more engaging, connected, and valuable experience for all stakeholders involved.