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Mapping Oman's Artificial Intelligence Logistic Fuzzy Social Media Research Landscape Through Bibliometrics

[1]Madhan N, [2]Dheva Rajan S
Department of Information Technology
University of Technology and Applied Sciences Al Musannah
Sultanate of Oman
madhan@act.edu.om, dheva@act.edu.om

[3]Madhuri Jain
Department of Mathematics
Banasthali Vidyapith
Rajasthan, India
madhuridayalbagh@gmail.com

Abstract—Artificial intelligence and related technologies are becoming increasingly important internationally. This bibliometric study looks at Oman's research environment in AI, social media, fuzzy logic, and logistic regression from 2014 to 2024. Data for 251 English papers were obtained from Web of Science. The publication and citation patterns were examined using bibliometric approaches such as Bradford's law, Lotka's law, and network mapping. The data show a substantial increase in production and impact, particularly at younger colleges. However, national collaboration remains limited, while international participation has increased. In conclusion, Oman's emergence as an AI research hub is promising, but more concerted work and wider collaborations are required to reach its full potential. This report provides a baseline for monitoring Oman's progress toward strategic research targets. Further effort should focus on building national networks and boosting international collaboration.

Keywords- Artificial intelligence ; Research ; Oman ; Publication patterns ; Citation, Research networks

I. INTRODUCTION

Bibliometric analysis (BA), or the quantitative examination of academic publications, has grown in importance due to its capacity to traverse an ever-expanding ocean of research. The huge and ever-expanding sea of research might be intimidating, but has emerged as a strong lifeboat, guiding us through the currents and revealing secret depths. Its relevance has increased significantly by 2024. By examining data such as publication numbers, citations, and cooperation patterns, BA creates a picture of a field's intellectual structure and hot subjects, known as research landscape mapping. This enables academics to spot new patterns, monitor knowledge gaps, and strategically aim their efforts. Indicators such as citation counts, and all indicators reflect the real-world reach, influence, and effect evaluation of research. This data impacts funding decisions, research review procedures, and career progression for individual researchers and institutions [1].

BA insights may guide a variety of methods, including university ranking, finding possible partners, and forecasting future research orientations. This data-driven strategy promotes informed decision-making in academics, funding agencies, and policy settings. [2] Charting the Evolving Landscape: Like a sophisticated sonar ping, BA examines publication counts, citations, and cooperation patterns to create a thorough map of a field's intellectual terrain. This enables researchers to spot emerging trends, identify knowledge gaps, and focus their efforts where they will have the greatest impact. [3]

The days of assessing research based merely on publication numbers are over. Citation counts and altimetric are increasingly used to measure a study's real-world impact and effect. This enables funding agencies to make informed judgments, directs research review procedures, and assists individual researchers and institutions in charting their future paths [4]. From university rankings to identifying prospective partners and forecasting future research orientations, BA insights are becoming useful guiding lights. This data-driven strategy provides academia, funding agencies, and policymakers with the knowledge they need to make educated decisions that keep research relevant, impactful, and future-oriented [5].

However, much like a compass requires a map to effectively direct us, BA must be supplemented with qualitative analysis and critical thought. Quantitative data alone cannot provide the full picture. However, as the research landscape evolves at breakneck pace, provides a valuable tool for navigating its intricacies, ensuring that research stays relevant, influential, and future-oriented in the exciting year of 2024.

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II. LITERATURE

Yahya M. Al-Farsi in 2021 [6] conducted the study to determine the period-prevalence and publication rates of health research productivity in the seven GCC nations. Methods: We searched the Scopus database for papers published between 1996 and 2018, then obtained the appropriate information using the SCImago Journal and Country Rank site. We also collected qualitative (citation-based) and quantitative (document recount) metrics. The country-specific period prevalence and publishing rates were computed and normalized to the population size of the Gulf Cooperation Council (GCC) and each nation. [6]

Study and substance use problems, such as substance abuse and dependency, exist in every part of the world, including Middle Eastern Arab countries is becoming a more popular method for evaluating research. The primary goal of this study was to evaluate research production in the field of medicinal usage disorders in GCC using BA. [7]

El Rassi R in 2018 [8] provides a glimpse of medical research production in GCC from 2007 to 2016. From 2007 to 2016, the researchers collected BA data for global nations, Arab countries, and Arab institutions using Essential Science Indicators, Journal Citation Reports, and the Web of Science (WOS) database. However, it is based on medical research efficiency rather than AI or fuzzy logic. [8] Hence, the research gap is clear here, there is no study conducted in the proposed area AI in Oman.

It is important to realize that BA alone cannot provide a complete picture. Qualitative analysis and critical review are still necessary for comprehending quantitative data. Nonetheless, as the research landscape evolves, provides a valuable tool for navigating its intricacies, ensuring that research stays relevant, influential, and forward-thinking. In the strategies, it is selected WoS sub-DBs SCI with words Artificial Intelligence (AI), Social media, Fuzzy, Graph theory and logistic regression articles in English. In the proposed analysis, it is preferred WOS to Scopus in terms of data quality. In Scopus cited reference items are not standardized, need to be matched. [9]. Even though it is preferred plain text format for WOS for completeness of information due to the reason bibtex does not export some non-standard meta data, after initial testing, it is found that, bibtex format gives more completeness than plaintext in this research work.

III. DATA COLLECTION

The keywords for the search of database are as follows: artificial intelligence and Social media or Fuzzy and logistic regression. Totally 1,21,578 documents are obtained. It is then filtered to articles category leads to 1,18,021 articles. Out of that it is filtered with English language with 1,16,717 articles. As the objective is to analyze journey of Oman, the country is chosen as Oman gives 251 full text documents between 2014 to 2024. The main meta data fields are Authors (AU), Authors full name (AF), Title (TI), Document source (SO), Document type (DT), Authors key words (DE), Keywords plus assigned by WoS (ID), Abstract (AB), Authors' affiliations (C1), Corresponding author' affiliation (RP), cited references (CR), Total citations (TC), Publication year (PY), DOI (DI), Subject category (SC). Preferred reporting items for systematic reviews and meta-analysis (PRISMA) diagram is performed for the analysis, and it is given in figure 1. [10].

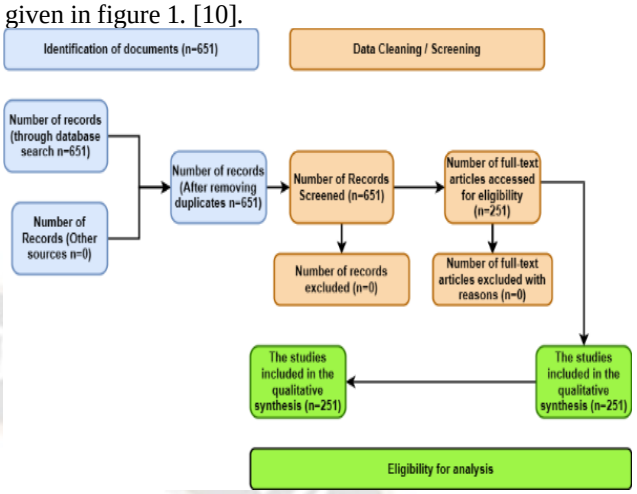

Fig. 1. PRISMA diagram

PRISMA R shiny package is a wonderful package and online tool with csv file that is widely available for the researchers to create the diagram using estech.shinyapps.io. [11]

A. Overview of Data

Each field in the analysis file is recognized by a two-letter code, which is followed by a field description. The "Missing Counts" column reveals how many pieces are missing from each field. The "Missing%" column indicates the percentage of elements missing from each field. The "Status" column offers a qualitative rating of each field's completeness, with values ranging from "excellent" to "completely missing". Except for "Language", "Science Categories", "Keywords Plus", "Digital Object Identifier (DOI)", and "Keywords", no items are missing. Figure 2 displays the number of missing components and missing percentages for each metadata field in a scholarly manuscript.

Metadata	Description	Missing Counts	Missing %	Status
AB	Abstract	0	0.00	Excellent
C1	Affiliation	0	0.00	Excellent
AU	Author	0	0.00	Excellent
CR	Cited References	0	0.00	Excellent
RP	Corresponding Author	0	0.00	Excellent
DT	Document Type	0	0.00	Excellent
SO	Journal	0	0.00	Excellent
PY	Publication Year	0	0.00	Excellent
TI	Title	0	0.00	Excellent
TC	Total Citation	0	0.00	Excellent
DI	DOI	22	8.76	Good
DE	Keywords	23	9.16	Good
ID	Keywords Plus	37	14.74	Acceptable
LA	Language	251	100.00	Completely missing
WC	Science Categories	251	100.00	Completely missing

Fig. 2. Completeness of bibliographic metadata

The "Language" field is fully blank, with 251 items (100%) missing. This means that the paper's language has not been defined and all the papers are with English language only. The "Science Categories" field is similarly fully empty, with 251 entries (100%) missing. This means that the publication has not been assigned to any scientific areas. The "Keywords Plus" field contains a significantly high percentage of missing components,

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with 37 (14.74%) missing. This means that some of the paper's significant keywords were not included.

The "DOI" column contains a moderate number of missing entries, with 22 (8.76%) missing. This implies that some of the publications included in the reference list may not have DOIs given to them. The "Keywords" field has a tiny fraction of missing entries, with 23 (9.16%) missing. This indicates that the majority of the keywords related to the work have been included. The table indicates that the document is well-described since the majority of the metadata fields are full. However, certain crucial elements are missing information, such as the language of the publication and the scientific categories to which it belongs. Figure 3 illustrates the main information of the scrutinized data.

IV. Data Analysis

A. *Documents and Sources*

The "Data" column offers a variety of statistics, including "Annual Scientific Production" and "Average Citations per Year" In figure 3. The "Timespan" column displays the range "2014:2024." The "Sources" column has the value "168." The "Documents" column contains the value "251." The table purports to include information regarding scientific studies, potentially relating to AI.

Fig. 3. Main information

The exact data points provided in the table indicate that the amount of scientific study in this sector is increasing, with the number of papers rising from 168 in 2014 to 251 in 2024. Figure 4 shows that AI research is a growing subject with a promising future. However, it should be noted that the data in the table is confined to a single source and may not be typical of the entire field.

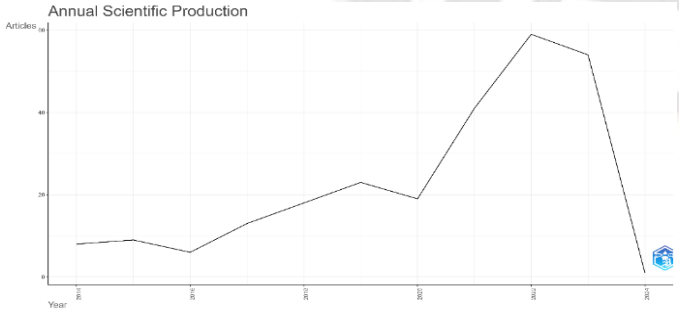

Fig. 4. Annual scientific production

The average citations per year (ACPY) is calculated by dividing the total number of citations a publication has received by the number of years since their first publication.

Hence the formula for ACPY is

$$ACPY = \frac{Total\ citations}{Current\ year - Year\ of\ first\ publication}$$

In figure 5, the rightmost column shows the average citation per year. It shows that research published in 2014 has an average of 7.51 citations per year, but research published in 2024 has an average of 9.00 citations per year. This shows that newer research is gaining popularity and having a larger effect on the area.

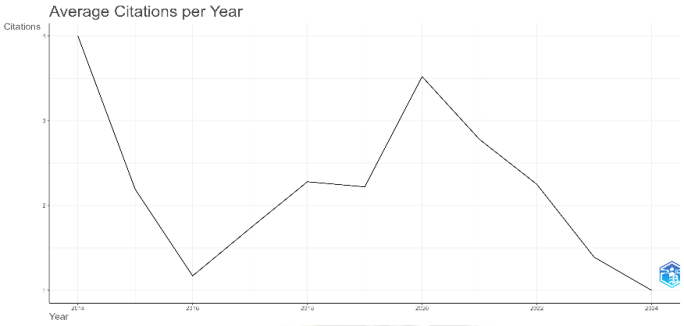

Fig. 5. Average citations per year

Growth in scientific output is explicit from figure 5, the number of publications has steadily increased from 168 in 2014 to 251 in 2024, indicating a growing interest in AI and robotics research. The average citation per year has grown, showing that the study is gaining momentum and having a greater impact in the field and gives the rising influence. IEEE is the primary source of research, producing 251 papers between 2014 and 2024. This shows they have a considerable impact on the research landscape in this sector. While figure 6 gives useful information, it is crucial to acknowledge the limitations. Data from a single source (IEEE) may not be indicative of the entire field. The analysis only spans a decade, which may not reflect long-term patterns. The statistics only consider publications and exclude other types of research production and impact.

Despite these limitations, the picture is an excellent starting point for comprehending the changing environment of AI and robotics research. Researchers can acquire significant insights on the field's development, influence, and key contributors by examining ACPY with other measures while keeping limits in mind. The number of papers published in this magazine has consistently climbed over the last decade, from 12 in 2014 to 23 in 2024. This shows that the journal is gaining popularity and receiving more submissions. Field of study: The papers in this magazine appear to be on fuzzy logic, data envelopment analysis (DEA), and machine learning. These are all current fields of study in computer science and operations research.

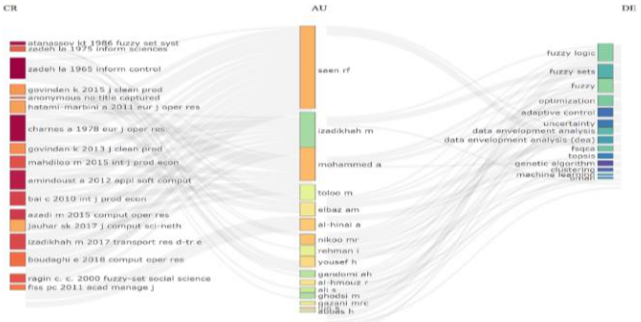

Fig. 6. Three field plot CR, AU and DE

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The author collaboration graphic in figure 6 indicates that many of the publications were co-authored by numerous researchers. This is a prevalent trend in academic publication since it enables scholars to pool their knowledge and resources. Top contributors to this magazine include Lotfi Zadeh, Ali Ghodsi, and Vahid Reza Ghanbari. These researchers have contributed significantly to the fields of fuzzy logic and DEA. Table I compares AI research output from 2014 to 2024.

TABLE I: Top cited Sources

Sources	Articles
IEEE ACCESS	10
INTERNATIONAL JOURNAL OF ADVANCED COMPUTER SCIENCE AND APPLICATIONS	7
ANNALS OF OPERATIONS RESEARCH	6
APPLIED SOFT COMPUTING	6
ITALIAN JOURNAL OF PURE AND APPLIED MATHEMATICS	6
JOURNAL OF INTELLIGENT \& FUZZY SYSTEMS	6
MATHEMATICAL PROBLEMS IN ENGINEERING	5
SUSTAINABILITY	5

It demonstrates that the number of scientific publications has grown by 49.4% from 168 in 2014 to 251 in 2024. The average number of citations each year has risen from 7.51 to 9.00, representing a 19.9% increase. These data indicate that AI research is a burgeoning subject with expanding significance. The data also demonstrates that IEEE is the primary source of this study, having provided 251 papers in both 2014 and 2024. This shows that IEEE is an active publisher in this subject. In graphs, the term "most cited local sources" can have two connotations depending on the context. The most commonly referenced sources within a certain study subject or subfield. "Local" refers to the distinct community of researchers who study that particular field. The study highlights the most commonly mentioned sources by writers in that community, emphasizing the most significant and useful resources for comprehending the topic. This is commonly represented in BA graphs like figure 7. The size of a node representing a source is proportional to its citations. Larger nodes represent more often mentioned sources. The color of the node may indicate the source type (e.g. Journals, books, conference proceedings). The thickness of an edge linking two nodes may indicate the number of citations between them. Thicker margins suggest a more robust citation association. In a BA examination of AI, the graph may depict publications such as Expert systems applications and European journal of operation research as huge nodes with several thick connections linking them, emphasizing their high citation count and prominent importance in the subject.

Bradford's law does not have a single formula, but it asserts that a field's number of journals may be split into zones with an equal number of articles. The initial zone (core) has the fewest journals but the most articles. Each following zone (decreasing core, alien) contains twice as many journals as the preceding zone, but only half as many articles. Bradford's law predicts a certain distribution of journals in a field, with a few core journals publishing many papers, many mid-ranked journals publishing fewer articles apiece, and many low-ranked journals publishing even fewer articles.

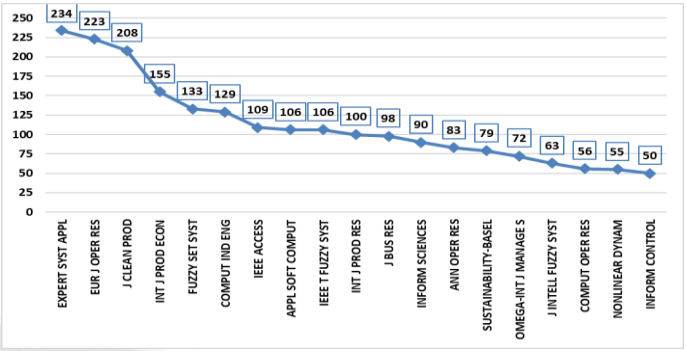

Fig. 7. Most Local cited sources

Table II illustrates such most cited sources with article number.

TABLE II: Most cited sources

Sources	Articles
EXPERT SYST APPL	234
EUR J OPER RES	223
J CLEAN PROD	208
INT J PROD ECON	155
FUZZY SET SYST	133
COMPUT IND ENG	129
IEEE ACCESS	109
APPL SOFT COMPUT	106
IEEE T FUZZY SYST	106
INT J PROD RES	100

Here, coauthors per documents is the authors except the main author and collaboration index is calculated based on the following formula. [12]

$$\text{Collaboration index} = \frac{\text{Authors of multi authored articles}}{\text{number of Multi authored articles}}$$

The graphic you provided depicts a line graph with the x-axis labeled "Source log (Rank)" and the y −axis labeled "Core Sources." The core sources are given in figure 8. The graph in figure 8 visually depicts Bradford's rule in the fields of AI. The rule predicts a certain source distribution: a few extremely prominent sources (like journals) publish a large number of articles, whereas many less influential sources publish fewer and fewer.

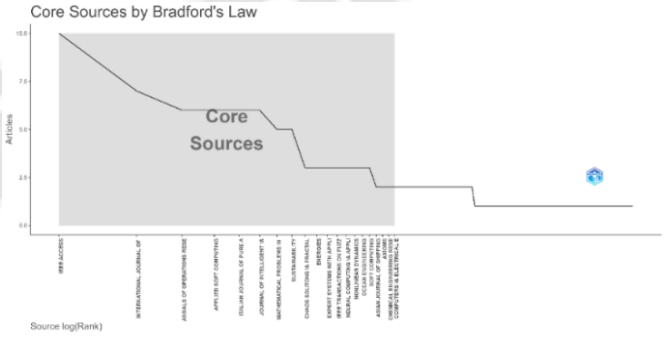

Fig. 8. Core sources by Bradford's law

The graph's curve illustrates this trend, with the most important sources on the left (Zone 1: Core) and the least influential on the right (Zone 2: Decreasing Core, Zone 3: Alien). It purports to display the primary sources identified by Bradford's law for a collection of papers about AI. The graph

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appears to follow Bradford's law, with a diminishing curve indicating that as the source's rank climbs (moves to the left on the x-axis), the number of core sources it represents diminishes. The graphic does not provide particular numbers or source titles, but the overall pattern implies that a few main magazines in AI and Digital Marketing contribute a large number of articles, while many additional sources contribute less articles. The shaded portion gives the core sources of publications.

The graph in figure 9 depicts the most prominent sources for AI, as determined by Bradford's law. This rule predicts a certain source distribution: a few core sources publish a large number of articles, followed by numerous mid-ranked sources that publish fewer articles, and so on. The curve in the graph represents this trend, with the most important sources on the left and the least influential on the right.

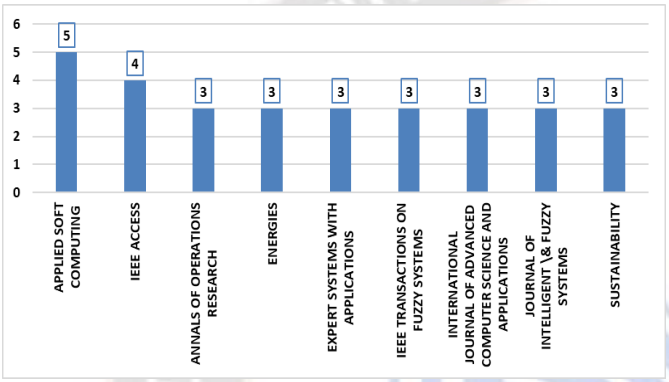

Fig. 9. Core sources local impact by h index using Bradford's law

This graph depicts the most influential AI sources based on Bradford's Law. Bradford's law states that there are zones of sources: a few significant ones with numerous articles, and many less important ones with fewer articles apiece. The curve on the graph represents this, with the most important sources on the left and the least important on the right. The top 3 prominent sources are Anneals of operation research, applied soft computing, and IEEE access. The production of those sources is given in figure 10.

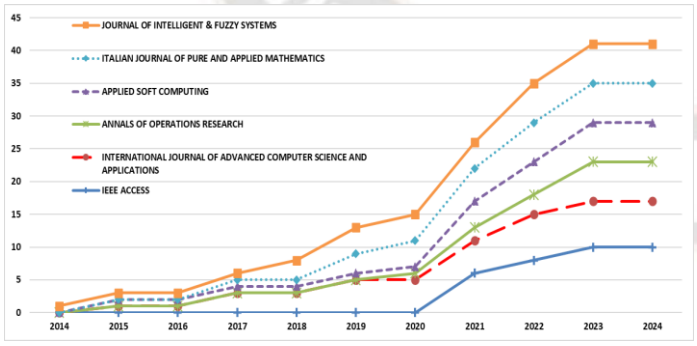

Fig. 10. Sources production over time

B. Authors

The authors section discusses the various parameters related to authors like number of articles, citations, author article production, etc., Table III shows the most relevant authors in relation to the search documents.

TABLE III: Most relevant authors

Authors	Articles	Articles Fractionalized
SAEN RF	10	3.91
MOHAMMED A	9	3.76
NIKOO MR	8	1.79
AL-HINAI A	6	1.55
LUO S	6	1.5
YOUSEF H	6	3
ABUSHAMMALA MFM	5	1.03
AL-HMOUZ R	5	1.15
ELBAZ AM	5	1.33
GHASEMI P	5	1.55
QAZANI MRC	5	0.92
REHMAN I	5	1.45
TOLOO M	5	1.25
YOUNES MK	5	1.03

The graph depicts the average number of articles released by each author over time, presumably in the subject of environmental science. Author production starts modestly in 2019 and progressively increases, indicating a rising corpus of research in this discipline relative to increased productivity. The brown line indicates an increase in co-authored articles over time. This shows that the discipline is gaining pace, with both individual and collaborative research efforts adding to an expanding body of knowledge related to increasing collaboration. Figure 11 shows the author's production over the time. Lotka's law in, often known as the inverse-square law, is a statistical finding on the distribution of scientific productivity. It asserts that the number of scholars publishing x publications is inversely proportional to x squared.

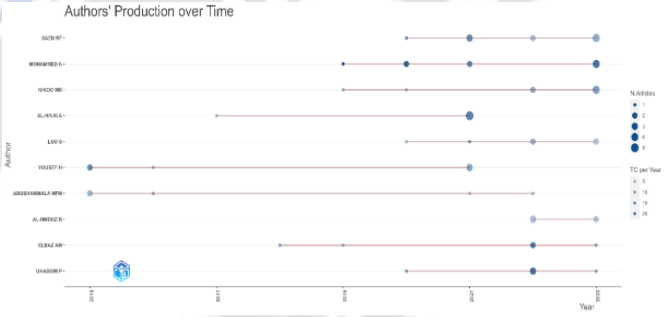

Fig. 11. Authors production over time

In layman's terms, for every researcher who publishes two articles, there are four who publish only one, nine who publish only three, and so on. This relationship can be expressed mathematically as:

$$y(x) = \frac{c}{x^2}$$

where $y(x)$ is the number of researchers that produced x publications, and c is a constant that depends on the specific area and time period. The authors' productivity through Lotka's law is given in figure 12 with number of articles written in x axis against per cent of authors in y axis.

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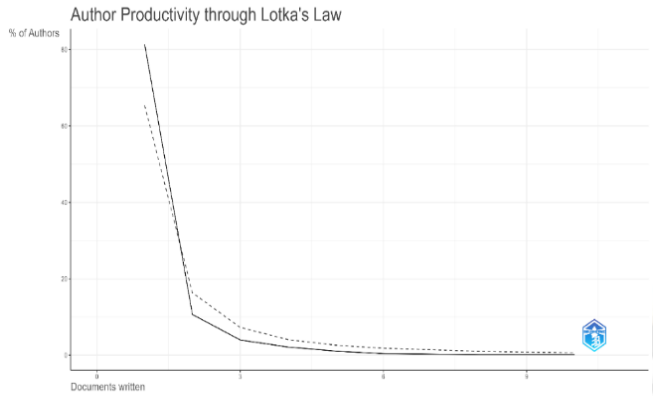

Fig. 12. Authors productivity through Lotka's law

Figure 13 gives the idea on authors local impact by h-index. The top five authors with top h index are Mohammed A (7), Elbaz AM (5), Ghasemi P (5), NIikoo MR(5), and Saen RF (5) and figure 13 illustrates the top 10.

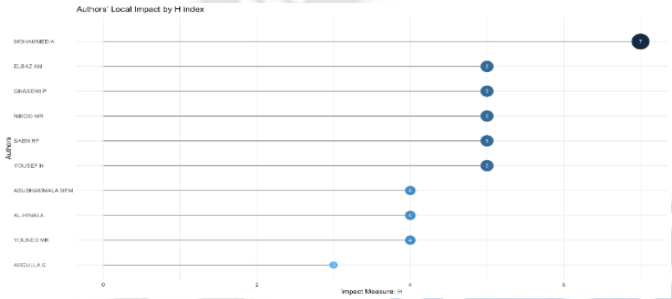

Fig. 13. Authors local impact by h-index

The graph depicts the average number of publications per author in the discipline of environmental sciences throughout time. From 2019 to 2022, author production has steadily increased, showing a rising body of research in the topic towards increased productivity. Co-authored articles climb faster than single-authored papers. This argues that environmental scientists should work together more towards emerging collaborations. Essentially, the area is gaining traction, with both individual and collaborative efforts adding to an expanding knowledge base. The number of articles with number of authors per article with averaged frequency count is given in table IV.

TABLE IV: Most relevant authors count

N.Articles	N.Authors	Freq
1	611	0.81
2	80	0.10
3	30	0.03
4	16	0.02
5	8	0.01

C. Affliation

Figure 14 gives the most relevant affiliation. The analysis is based on the affiliation count. Without any questions, Sultan Qaboos University holds its first position and from that onwards the count till 10 is given. Figure 15 shows the affiliation's production over time. SQU published the most publications overall, with a significant rise from 153 in 2023 to 2024. Their article count has progressively expanded throughout the years.

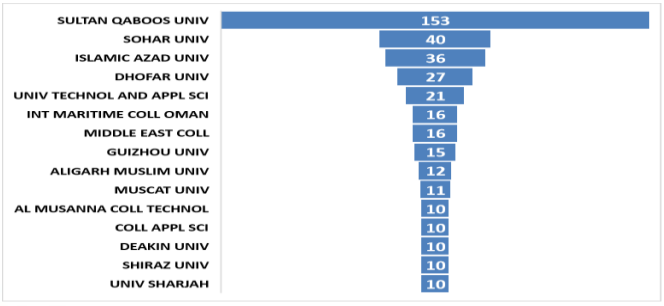

Fig. 14. Most relevant affiliation

Dhofar University and Islamic Azad University have modest but growing article counts each year. Sohar University had no papers until 2018, but has significantly grown productivity, with plans to publish 39 articles by 2023. The University of Technology and Applied Sciences had no papers until 2020, but it is now ramping up productivity, with 21 articles projected by 2024. Article output for all universities is growing significantly each year, with the exception of Sultan Qaboos, which has reached a plateau of 153 articles in 2023 and 2024. Despite their late start, the two newest institutions, Sohar and UTAS, are rapidly growing their research output.

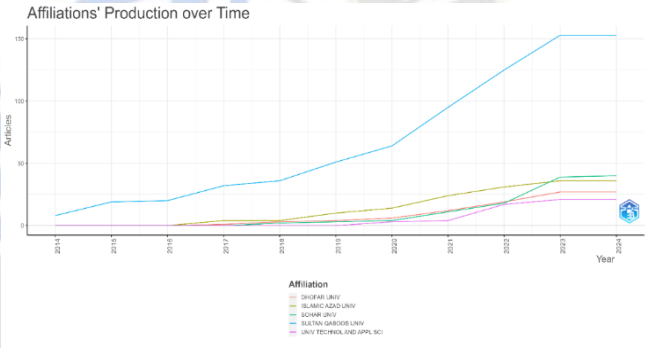

Fig. 15. Affiliation's production over time

Undoubtedly, in the analysis of corresponding author countries, Oman holds its first place followed by India, Iran, Malysia, and China as a glimpse. Figure 16 shows the corresponding authors' countries. It illustrates that, out of 251 documents, 23 articles hold Indians as a corresponding author.

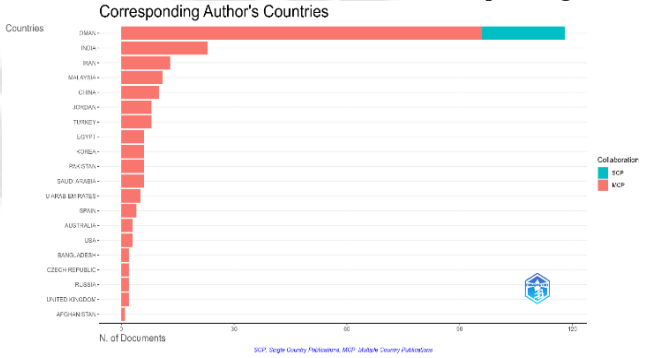

Fig. 16. Corresponding authors' countries

The figure 16 depicts China's dominant production growth, with the line continuously growing from 2004 to 2023. Malaysia and Oman's output are also increasing, but at a slower pace. Ran's output swings, first growing and then falling below its 2004

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level by 2023. The figure 17 indicates China's dominant position in manufacturing, with other nations seeing varied degrees of development or volatility. In the most cited countries, Oman holds its first position without loss of generality with 1219 counts and average citations 10.3 followed by India (193,8.4), Egypt (179,29.8), Iran (169,13) , Malysia (136,12.4) and USA (122, 40.7). Here is the limitation proposed towards citation. It is based on the current search criteria analyzed with 251 documents and the same might change by changing the PRISMA method and document search. Figure 18 illustrates the most cited countries and table V illustrates the most cited documents.

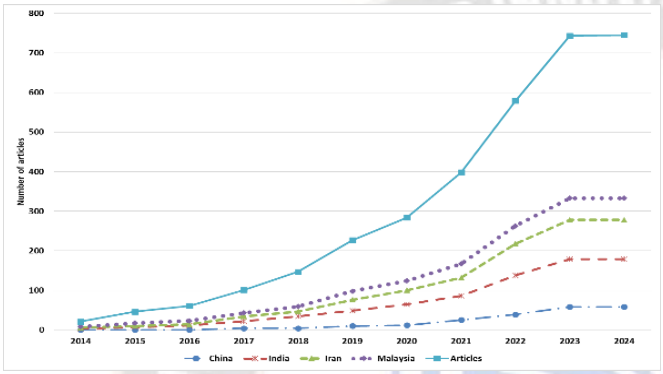

Fig. 17. Countrywide articles production over time

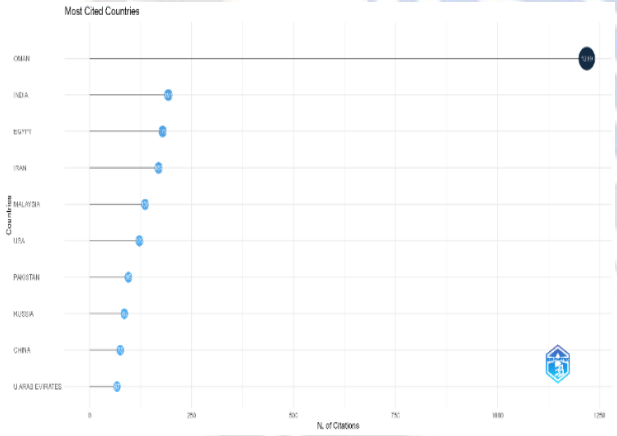

Fig. 18. Most cited countries

TABLE V: Global most cited documents

Reference	Paper	Total Citations	TC / Year	Norm-alized TC
[13]	YOUSEF HA, 2014, IEEE Trans. Power Syst.	207	18.81	4.70
[14]	MOHAMMED A, 2019, Int. J. Prod. Econ.	125	20.83	9.36
[15]	NAZ S, 2014, Pattern Recognit.	92	8.36	2.09
[16]	FAHMI A, 2018, J. Intell. \& Fuzzy Syst.	72	10.28	4.51
[17]	SHANKAR K, 2020, Concurr. Comput.-Pract. \& Exp.	72	14.4	4.09
[18]	PARSAJOO M, 2021, Transp. Geotech.	63	15.75	5.66
[19]	YOUSEF HA, 2017, Int. J. Syst. Sci.	58	7.25	4.18
[20]	SHARMA SK, 2018, J. Retail. Consum. Serv.	57	8.14	3.57

Figure 19 illustrates with reference publication year spectroscopy through which the cited references are increasing from 2010 onwards. Most locally cited documents are listed in the below table. Even though there are many documents, the top 3 is listed table VI.

The data depicts the distribution of publication dates for references referenced in a sample of research publications. The highest bar is for 2020, suggesting that the majority of referenced references were published during the last year. This implies an emphasis on recent research in the topic. The number of referenced references slowly diminishes over time. This is common in most areas, since current research builds on and references previous work.

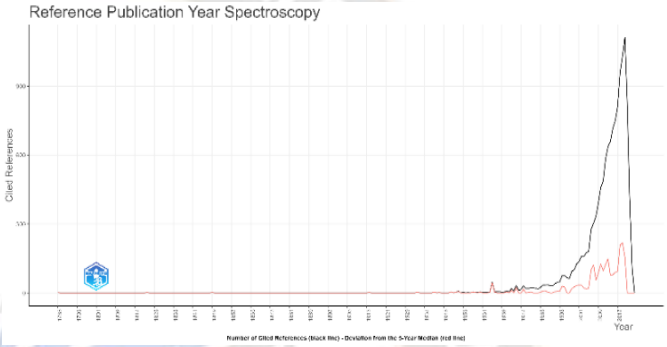

Fig. 19. Reference publication year spectroscopy

Some older papers are still prominently represented, despite a fall in citations.

TABLE VI: Most locally cited documents

Reference	DOI	Local. Citations	Ratio	Normaliz ed.Global .Citations
[21]	10.3390/sym10090373	1	4.54	1.37
[22]	10.3390/en14040942	1	6.66	1.34
[23]	10.1371/journal.pone.0249046	1	10	0.89

These are probable seminal works that continue to have an impact in the area. Overall, this data depicts a dynamic area that places a significant premium on new research while still honoring the foundation provided by previous work.

D. Trend Analysis

The trend analysis is the most important feature of BA, as it explicitly gives the trend of research. Figure 20 shows the most frequently used words in the extraction. Such analysis is highly useful to move towards trend analysis. Here, top words with frequency greater than or equal to 10 is given.

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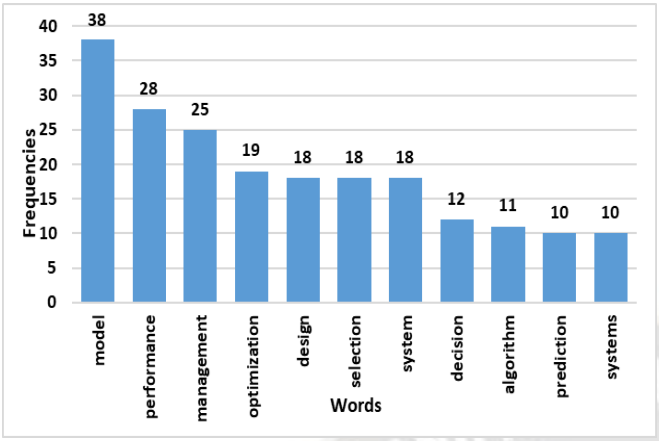

Fig. 20. Most frequent words

The words frequency over time trend diagram appears to show the usage of the word "words" and potentially other specific words over time, from 2010 to 2030 given in figure 21. Surprisingly, even though the words mentioned in figure 21, started with least occurrence in 14, the forecasting shows, these words will be in trend till 2030 out of which the word prediction holds it topmost place.

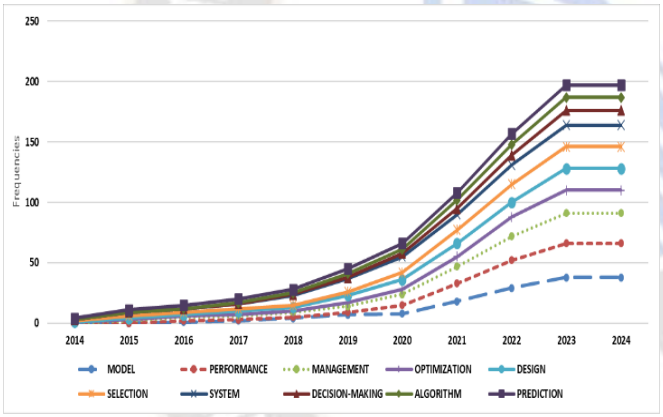

Fig. 21. Words trend

E. Clustering

Figure 22 illustrates groups of research publications based on their frequency of citations (bibliographic coupling). Each circle indicates a cluster, with the size indicating the number of papers within the cluster. The lines between the circles indicate the strength of the relationship between clusters. The text labels within the rings indicate the primary subjects of the articles in the cluster. For example, the top left cluster is labeled "performance-conf" and contains papers primarily on performance analysis. The publications in this cluster are often mentioned by one another, indicating that they are closely connected. The nodes in social network graphs, figure 23 represent individuals, whereas edges reflect the ties between them. In this scenario, the thickness of the margins appears to indicate the strength of the bond between two people.

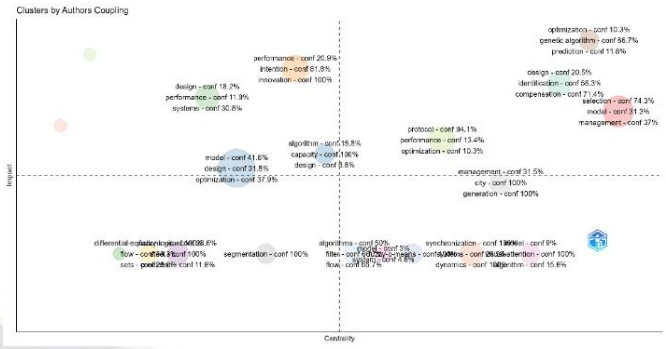

Fig. 22. Clustering by author coupling

The colored nodes appear to represent various study topics, while the connections linking them appear to indicate citations between articles in those research areas. The broader the boundary, the more citations exist between the two study topics. As an example, the thick border between the nodes labeled "Selection" and "performance" indicates that there are numerous citations between articles in tourist research and papers in adoption research.

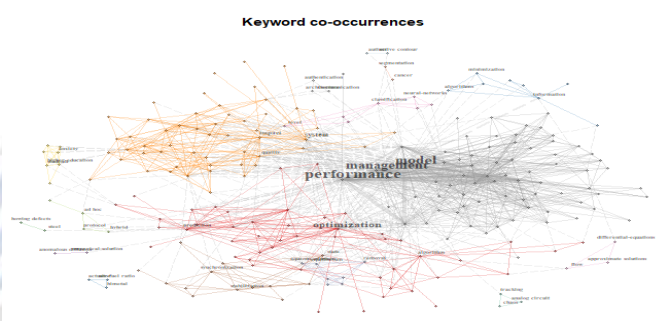

Fig. 23. Co-Word networking structures

This shows that there is a close link between these two scientific fields. This network graph is created with parameters n=251, minimum frequency=2, ngrams=1, size=0.3, n.labels=3, without stemming and repel and with clustering method walk trap.

Figure 24 illustrates the emerging niche themes. The word differential is the emerging or declining, whereas higher education students and differential equations are niche themes. The major themes include stabilization, quality impact, model and authentication become basic themes.

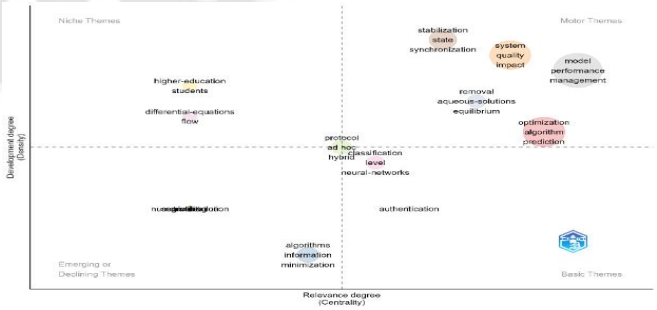

Fig. 24. Emerging Niche themes

Intellectual structure -Co-citation network is analyzed in the following maps. A field map with publications as cities and

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citations as highways that connect them. This map is created using co-citation network analysis in BAs, which identifies clusters of highly cited works that regularly cross-reference one another. These clusters reflect important intellectual "neighborhoods" with related ideas and notions. By evaluating cluster size, density, and linkages, we may reveal the field's major subjects, sub-disciplines, and links between them, providing a 20-word snapshot of the intellectual landscape given in figure 25.

In BAs, studying an author cooperation network creates an intriguing image of a field's "social map." The authors are nodes, while the co-authored publications are the connecting threads. Studying these co-authorships allows one to Identify significant research "hubs". That gives large clusters of often cooperating writers indicate prominent research groups or schools of thought. It can be utilized to uncover hidden connections. Authors who bridge disparate clusters serve as "brokers," allowing information sharing and cross-fertilization of ideas.

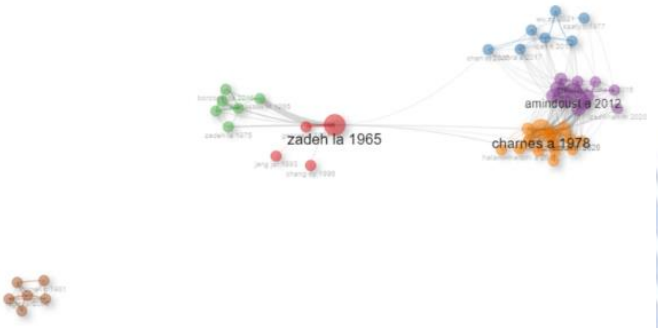

Fig. 25. Co-citation network between papers

It despite the information on growing collaborations. Shifts in network patterns over time might reveal emerging trends and shifting dynamics in the sector. Such collaboration network between the authors is given in figure 26.

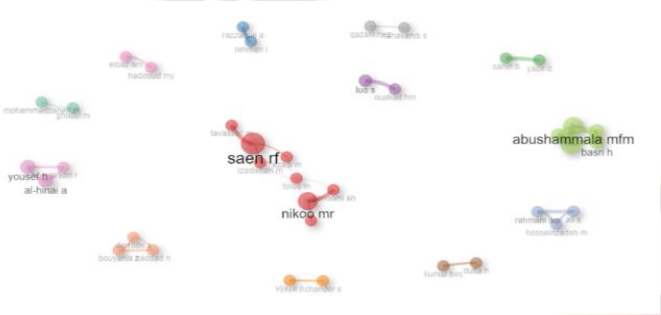

Fig. 26. Collaboration network between authors

In this, one can observe, there are many small groups working as different entities. There is a strong need to group these groups together for the betterment of the production.

Figure 27 shows the collaboration network between institutions. As authenticated by earlier results, SQU holds first place with a betweenness value 566 followed by other institutions. For instance, the University of technology and applies sciences holds its fifth place in betweenness value 187.

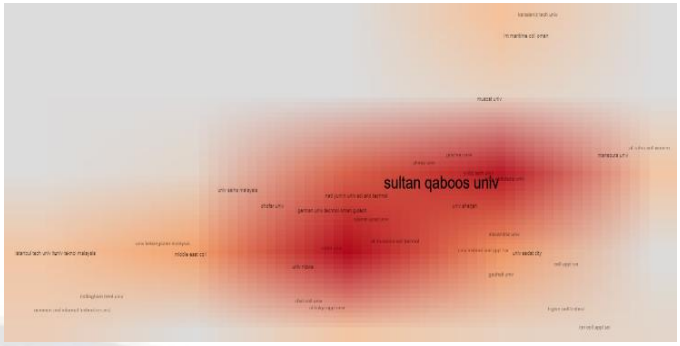

Fig. 27. Collaboration network between institutions

Figure 28 shows the collaboration map countrywide. As this research work targeted Oman, it has collaboration with India (55), Iran (48), Saudi Arabia (31), China (29) and Malysia (29). Here, it is mentioned only the top 5 tied up countries based on frequency of collaboration. On counting it is obtained 229 collaborations and figure 28 explains the weak collaboration between the authors with Oman affiliation.

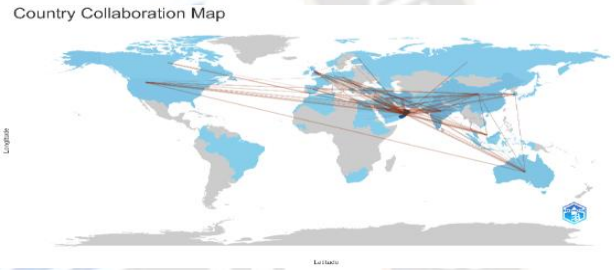

Fig. 28. Collaboration network between countries

V. SUMMARY, CONCLUSION, AND FUTURE WORK

This BA study covers academic papers in AI, social media, fuzzy logic, and logistic regression in Oman from 2014-2024. Data for 251 English publications were obtained from WOS. Publication and citation patterns were examined to outline Oman's research environment. The study found that younger universities, such as Sohar and UTAS, are experiencing a substantial increase in publishing production even though SQU leads. Citations and international partnerships are rising, indicating that research is becoming more influential. However, collaboration among Omani authors remains poor.

In conclusion, AI and associated research are gaining significance and influence in Oman, however national research networks require development. The research establishes a valuable benchmark for monitoring Oman's growth as a knowledge economy. It emphasizes increased production and impact, yet with opportunity for improvement through a coordinated national effort.

To enhance reach, future study should focus on strengthening collaborations among Omani researchers. More regional coordination would enable resource and knowledge exchange. Comparative assessments with other GCC nations might provide insight into Oman's relative strengths and limitations. Expanding the timeline and data sources beyond WOS would result in a more complete picture. Overall, Oman's progress as a research hub is promising; nevertheless, further national, and

international collaboration is required to realize its full potential.

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