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Knowledge Management Referral System Using Artificial Intelligent Techniques

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Abstract: Knowledge management is an emerging area which is gaining interest from organization and governments. As moving nowadays toward building organizational knowledge, knowledge management will play a fundamental role towards the success of transforming tacit knowledge into organizational explicit knowledge during current big data and high level of competencies between organizations to provide promptly and required services. One of the key building blocks for developing and advancing this field of knowledge management is artificial intelligence. organizations need to be able to exchange information, queries, and requests with some other beneficiaries and agencies that they share a common unified domain. One possible approach to this issue is Automating Knowledge, the methods which have been used to employ Semantic techniques for modeling about provide automatic accurate information extracts inquiry's answer from the proposed knowledge management system.

This paper will clarify the future of knowledge management system and the methodology of its link to artificial intelligence in organizations when it's come to providing humanitarian emergency assistant, services and health care as the current global pandemic virus. The advanced proposed system will enable beneficiaries, employees and external official entities to get instantly automatically replay for various inquiries without required humanitarian intervention unless it's necessary! and enable to save ' transfer ' retrieve and generate new knowledge through three levels depending on the semantic technique, natural language processing algorithms and Ontology techniques in extracting inquiry's answer in the first level then using chat system with an employee in the second level and through sending email to the specialist in the last third level.

The validity of the method is proved in this comprehensive intelligent inquiry system. Showing the effectiveness of this approach by testing it on a humanitarian agency. The experimental results were extremely encouraging as such organization did not own automatic knowledge management system as its provisions on this research paper, so its recommended to use it in a large area as the proposed system show outperforms baseline methods and improve the accuracy answering by 86%.

Keywords: Data Mining , AI , Semantic Web Technique , Ontology , NLP.

نظام احالة لإدارة المعرفة يعتمد على تقنيات الذكاء الصناعي

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الملخص: إدارة المعرفة هي عملية استراتيجية و حيوية تكتسب اهتمامًا كبيرا بالوقت الراهن من قبل المنظمات والحكومات .فمع التحرك في الوقت الحالي نحو بناء المعرفة التنظيمية ، تلعب إدارة المعرفة دورًا أساسيًا نحو نجاح تحويل المعرفة الكامنة إلى المعرفة التنظيمية الصريحة في ظل فوضى المعلومات و البيانات الكبيرة و حدة المنافسة الحالية بين المنظمات على تقديم الخدمة المطلوبة و السريعة .

والذكاء الاصطناعي هو أحد العناصر الأساسية لتطوير وتقدم وتحديث هذا المجال لإدارة المعرفة .تحتاج المنظمات لان تكون قادرة على تبادل المعلومات والاستفسارات والطلبات مع بعض المستفيدين والهيئات الأخرى التي تتحد وتشترك في مجال موحد . وأحد الأساليب الممكنة لهذه المشكلة هو "أتمتة المعرفة " ، حيث تم توظيف تقنيات الويب الدلالي لاستخراج معرفة سريعة ′ دقيقة و تلقائية "الية "من نظام إدارة المعرفة المقترح.

يوضح هذا البحث مستقبل نظام إدارة المعرفة والية ارتباطه بالذكاء الاصطناعي في المنظمات ، وخاصة عندما يتعلق الأمر بتقديم مساعدات الطوارئ الإنسانية والخدمات والرعاية الصحية مثل جائحة فيروس كورونا الحالية. سيسمح النظام المقترح للمستفيدين والموظفين والكيانات الرسمية الخارجية بالحصول تلقائيًا على اجابات فورية للاستفسارات المتعددة دون الحاجة لتدخل بشري اللا عند الضرورة وما يرافقها من عمليات التخزين والنقل و الاسترجاع وتوليد معارف اخرى لاغناء النظام بالمعلومات المحدثة المطلوبة سريعا ، من خلال المرور بثلاث مستويات اعتمادًا على النهج الدلالي وخوارزميات معالجة اللغة الطبيعية وأيضا باستخدام تقنيات الأنطولوجيا بمستوى الاجوبة التلقائية المستخرجة من النظام بالمستوى الاول مرورا بنظام الدردشة التفاعلي مع موظف متوسط الخبرة بالمستوى الثاني و اخيرا هناك خيار ارسال الاستفسار عبر الايميل لخبير عالي المستوى بالمستوى الثالث . وقد ثبت صحة الطريقة المتبعة في هذا النظام المقترح التفاعلي المتكامل الذكي. وتم إظهار فعالية هذا النهج عن طريق اختباره بأحد هذه المنظمات وتبين بان النتائج التجريبية كانت مشجعة للغاية سيما ان معظم تلك المنظمات تملك نظام معرفة يدوي و ليس ألي كما هي الدراسة بالبحث العلمي الحالي! لذلك نوصي باستخدامه على نطاق واسع كون النظام المقترح اثبت فعالية و فاعلية كبيرة في ادارة نظم المعرفة بطرق شتى وخيارات متعددة بناء على طلب المستفيد وبدقة تصل الى نسبة 86٪. في اغلب الحالات.

الكلمات المفتاحية: التنقيب في البيانات , الذكاء الصنعي , تقنيات الويب الدلالية , الانطولوجيا , معالجة اللغة الطبيعية.

1- Introduction

The development of evolution in knowledge transformation furthers goes on with the invention of hieroglyphics, paper and books hits the 20th century with the emergence of computed document and information management which claimed the creation of knowledge management tools . In the 21st century, knowledge management seems to reach its next level. Artificial intelligence comes into play and transforms again how knowledge is captured [1,2,3,4] developed, shared, and efficiently used within organizations, agencies and governments . Most research intended to explore the features of Knowledge Management itself. Then followed by big data research trends that are booming in this digital era. Finally research related to the use of technology that supports knowledge management process is widely challenge discussed. These three issues are the most contemporary research issues in KMs-related projects [5,6].

Figure. (1) AI use cases per domain fall within the UN's sustainable –development goals

Source : McKinsey Global Institute analysis

Knowledge management takes advantage of AI tools used to capture, filter, represent or apply knowledge.

Using for example [7] knowledge repositories like corporate Wikis or document storages , and considering the relationship between the key knowledge processes of acquisition, sharing, storage, codification, creation, application and different types of innovation. AI tools provide applications for the selection, parsing, analysis and classification of text, automated reasoning and visualizations to facilitate decision-making.

Further, AI provides the means to process human input such as handwriting and voice recognition with the help of the advent of natural language processing [8,9] with its wide and intelligent advance using .Modern systems using AI are able to handle big data ,also providing a certain degree of security using new ways of data storing such as decentralized block chain data storages for example , further promotes artificial intelligence as an enabler of knowledge management tools which enhance collection, storing, and sharing of knowledge rather than information. Even more, creating knowledge networks by using AI concepts like knowledge mapping and ontology help organizations to identify and reward most valuable knowledge providers without the need of incentivizing them in the first place.

Organizations still have to deal with the omnipresent problem of cultures solely seeing "knowledge as power". Even more, organizations also foster non-documented and replicable knowledge sharing in some ways, one topic that has been considered more frequently is knowledge transfer (treated in 7 of the 36 works under review) though the reviewers say that, more research is needed, addressing

both sides of the process: the sender and the receiver. So far, the discussion is rather one-sided' In other words, these works have paid too little attention to the link between partner interactions and knowledge transfer. [10]. As any company non-work related activity aiming at enhancing the employee satisfaction by bringing them together.

Such events are deemed to be the most powerful when it comes to sharing knowledge among employees. in order to develop trust [11] organization must be committed to provide the ground in terms of having opportunities for people to meet and interact. Hence, even though they are powerful, these events most likely create tacit knowledge rather than explicit knowledge. I believe, also this problem in knowledge management can be overcome to a certain extend. Introducing new techniques like scrum, to ensure daily conversation, discussion, updates and insights into how people work assisted through documentation by any mean of knowledge management or collaboration helps to further develop a consistent knowledge repository within organizations and help manager to analyze [12] and simulate organizational problems [13]

As the provision of emergency humanitarian aid has expanded in the whole world and in some Arab countries in particular, and in light of the spread of the global pandemic during the current months, the number of humanitarian organizations in Syria has reached hundreds, including (14) major international organizations.

The issue of providing accurate, fast, effective and modern information service, especially in the field of emergency and service aid, has become of great importance to achieving the highest possible level of advantage to provide fast service and accurate information in all programs, operations and emergency situations to contribute to the alleviation of emergency humanitarian crises inside and outside Syria .

Certainly, as long as the tools help to capture, develop, store, manage and share the provided inputs for the organization, knowledge can be facilitated with artificial intelligence and accessed by the user when needed

Accordingly, the following question can be asked: To what extent can software technologies, management information systems, and the management of this knowledge and digital developments contribute to raising the effectiveness of the organization, such as non-profit humanitarian service organizations?

This is what will be attempted to be studied and answered in this thesis through a case study of some international organizations in Syria, which have become suffering from the problem of competition, the volume of data and the lack of coordination between them internally and externally in light of the current large information chaos. Personal experience and methods of trial and error are no longer able to achieve the goals of the organization that require sound decisions in the field of providing humanitarian service!

And here we present to you through our latest research, a research that is practically applied depends on real data from some international humanitarian organizations in Syria, using semantic web approach ' so that the researcher can in the future reach an effective approach, where the best study related to knowledge management was tested. To help the organization provide the required service that illuminates the refugees and beneficiaries of the bright future, and to be a source of inspiration for new researchers to take advantage of it that enlightens them for the future.

The main objectives of this paper are fourfold: (a) to provide an overview of the major issue and activities involved in conducting a stand-alone literature review; (b) to describe and contrast the different types of review articles that can contribute to the knowledge management base subject; (c) to illustrate some points of each paper type with one or two examples from the KM literature; and (d) to provide a series of recommendations after review articles in this domain.

Research Problem:

Through field visits, survey and exploration rounds conducted by the researcher for a number of international organizations and follow-up projects that have been undertaken, so the research problem statements are the following:

1- the nature of the relationship between "knowledge management and technology" and "pluralism of the organization according to the sequence of procedures for the conduct of the information cycle"

2- the impact of "knowledge management and technology" on achieving " competencies and organizational innovation "?

Given the importance, it represents to achieve a high advantage for the organization, in terms of emphasizing creativity and innovation, and the quality and effectiveness of the information system

He found the main problem lies in the accelerated development, which resulted in a change in the old bureaucratic model, where much of its culture and working methods coexisted with this new environment and appeared as a practical direction trying to do the work and implement the tasks with an old vision and information means

Slow transmission, analysis and investment of information to create new knowledge and a degree of information chaos.

- Uncertainty about working methods, as the old method is slow, dynamic and fast
- A difference between the speed of carrying out the tasks required by the information environment and the implementation of the actual tasks
- Heavy work pressure resulting from old work methods and work methods required by the new environment

The Research Importance

The research acquires importance through its discussion of a vital topic that helps organizations to enhance their position and raise their value and control their various operations and activities.

Through knowledge management, organizations can deal with a vast amount of ideas, information and knowledge easily and conveniently.

And you can store, retrieve, display, exchange, publish, apply, and define useful ones for the organization's leadership, its individuals, and its various interests.

And helps in developing creative capabilities and achieving the desired goals. The research also gains importance through its exposure to the topic of "organizational development" that many organizations strive to achieve.

To ensure that it stays in an environment of rapid and fluctuating fluctuations. So is intense competition. In addition, this research highlights the nature of the relationship and the role played by "knowledge management and technology" in achieving "speed, accuracy and pluralism in the sequence of procedures for the conduct of the business cycle".

As the information environment is a continuously evolve ng environment with a rate that may reach 100% every two years, users and workers have to constantly develop knowledge and information, or the new information environment.

It imposes on us information inflation and degrees of information chaos that lead to problems at work and degrees of inability to control and thus affects the quality and methods of providing services to beneficiaries.

The Research Objectives:

This study is considered one of the pioneering studies according to the researcher's knowledge, which examines the relationship of knowledge management with the achievement of the competitive service and operational advantage for humanitarian organizations operating in Syria. Therefore, the research objectives are:

1- Knowing the working methods that the information environment in the organization requires and requires
2- Knowing the extent of work compatibility in the organization with the capabilities and requirements of work in the information environment
3- Access to new ways of working and ways of thinking that are compatible with the requirements of work in the information environment
4- Opening the way for stakeholders and workers in these organizations to apply management concepts in achieving the desired goal and competitiveness

5- Demonstrate the relationship of knowledge management in achieving creativity and innovation in the course and stages of the operations process, the path of information systems, and the arrangement of their work and mechanisms

6- Demonstrate the relationship of knowledge management in achieving the quality of work for the beneficiaries:

This is through implicit knowledge that is subconsciously understood and applied, difficult to express and formalize, and is developed through direct experience and action, and is usually shared through a highly interactive conversation, storytelling and events, and shares experience and in particular, technologies KM related are technologies that support the following activities:

1- Connecting people with each other
2- Connecting people with knowledge
3- Connecting people using knowledge
4- Connecting knowledge with new knowledge

To achieve this there are many techniques of artificial intelligence used in knowledge management processes that support them and the result obtained: the game of artificial intelligence and its role in supporting the initiatives of knowledge management and the most fundamental conclusion from the presentation is the role that KM plays in spreading methods of artificial intelligence. (Semantic web, Ontology, NLP)

Because knowledge can be used and shared without, supporting technologies while the mentioned artificial intelligence methods cannot be developed without using KM technologies.

Disseminate this study in a way that applies to the various organizations concerned with this, and employ this study and these mechanisms and technologies in developing a modern and appropriate system

1- It is worth mentioning the KM cycle and its workflow in organization

The employee's perception: for the professional environment - for the relationship of managers to implement the work to transfer and circulate information - to transfer experiences - to work and its relationship to the automation - work within the team - for initiatives, innovation and creativity - for training and the lack of new knowledge - about services and image integrity - for the future horizon of the workflow - for the information to be provided to the beneficiary and the source of information - information exchange between programs and service integration - spreading the image of the organization - promotion and efficiency.

It is hoped that this study will come out with a set of recommendations aimed at clarifying the importance of knowledge management with its specific variables in improving the service and competitive operational advantage of these institutions.

2- Technology and Knowledge Management Sharing in organaztion :

Why international humanitarian agencies need an AI-Based Semantic Search Platform!

In the highly competitive times of today, international agencies and enterprises need to leverage the enormous amounts of data, in order to gain an edge. This [14,15] depend on how success in the use of a Knowledge Management System (KMs).

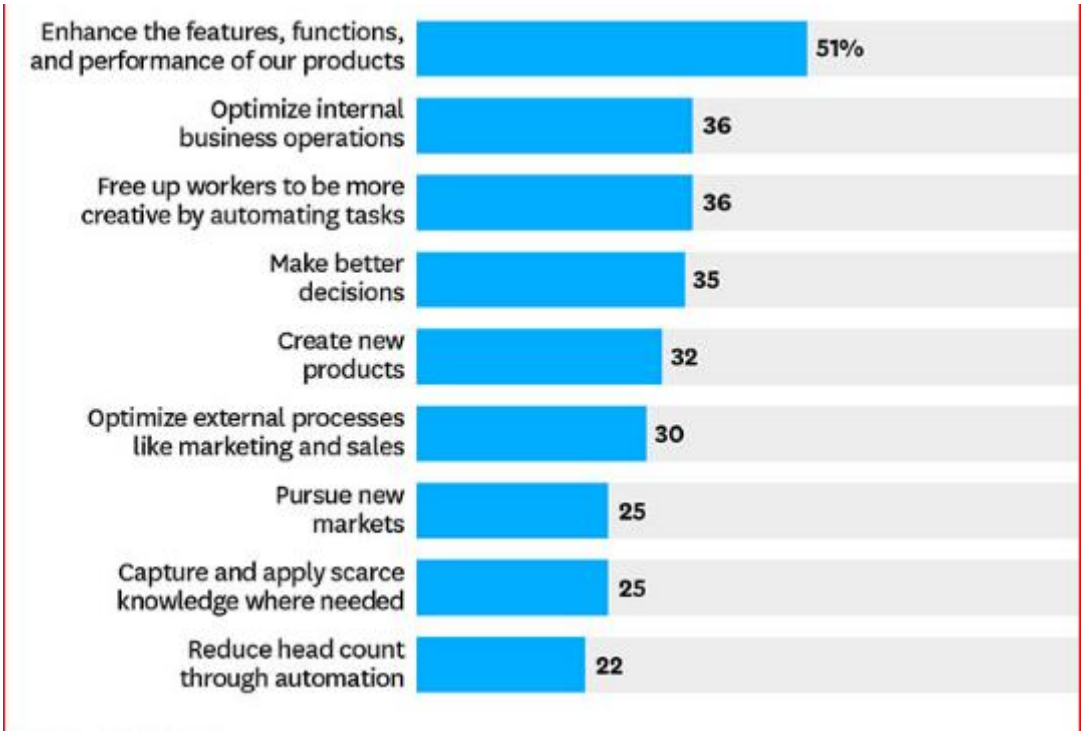


Figure. (2). Percentage of executives who cite the benefits of AI

Source : DELOITTE 2017 FROM: "Artificial Intelligence for the real word " by Thomas H Davenport and Rajeev Ronanki

Furthermore, Waheed, Arshad and Kashif (2011) described effects of knowledge management practices on organizational performance, Anwar and Ba (2010) described the role of information management for the preservation of indigenous knowledge in organizations. [16,17,18] .The ultimate goal of the enterprises [19,20] is to improve their profits. Naga Muneiah, J. (2019)[1] .

The new information environment does not waste experience but make it the main part of the knowledge resources and it requires accumulating the experience and keeping it updated and transfer it.

in this regard, they depend on the machine learning models for acquiring automated profit maximizing knowledge .As The biggest challenge while working with keyword based approach is that it is not always accurate when working with unstructured data.

Today data is growing exponentially and a major share of organizational data is unstructured.

This paper delves into the concept of semantics and how semantic search platforms based on Artificial intelligence are a must-have for this purpose. This calls for a more efficient approach and semantic search is the solution enterprises need today to solve this problem professionally:

Information Sharing is only possible with the help of (3 different approaches):

1-syntactical 2- structural 3- semantically

In order to make the Web data not only machine readable but also machine understandable the World Wide Web Consortium proposes the Semantic Web [21-22,23] a sequence of technologies that allow for self-describing content. On the Semantic Web metadata is defined using semantic information usually captured in ontology [24,25].For instance, automatic query formulation requires selecting good query terms , classification requires extracting good features Maisonnave, M. (2019) [2] and in general [26] any modeling and prediction task requires mechanisms for variable extraction as an initial step to build useful representations.

Here related deeply upon semantic modeling approach [27] and its models:

2-1 Ontology for Semantic Modeling

Ontology offers a basic vocabulary that is useful for strategic knowledge management and establishes two levels of abstraction: for knowledge management and for the representation of knowledge. The most important function of an ontology is the need to reach a consensus on the knowledge of the domain within an organization study has been done on extracting profit maximizing knowledge automatically from the machine.

Ontological semantics is an approach to NLP which uses a con, Suárez-Barón (2020)[3] .Till now [28] very less structed world model or ontology, as the central resource for extracting and representing meaning of natural language texts as well as synthesizing natural language texts based on representations of their meaning. Most of prototypical applications nowadays depend on ontological semantics tools [29,30,31]. Ontology is considered as reliable resources in decision making processes. Ontology have set out to overcome the problem of implicit and hidden knowledge by making the conceptualization of a domain explicit. , it's used to make assumptions about the meaning of a specific term . It can also be seen as an explication of the context for which a term is normally used, also universal ontology visualization framework implementing a core set of interactive features [32]. Ontology can be represented in : Purely informal natural language description of a term, corresponding to a glossary – Strictly formal approaches (first order predicate logic).

2-2 Semantic Networks

Semantic networks became popular in artificial intelligence and natural language processing only because it represents knowledge or supports reasoning.

For example (merging concept maps with the semantic networks, [33] is one of the most important contributions nowadays. The specific proposed method can be employed in most text mining

applications that require semantic representation of the documents, especially when limited information is available.

2-3 Semantic and (Natural Language Processing)

Natural language processing NLP is an area dealing with computational methods for achieving human-like language processing. Traditionally NLP research has been focused on developing efficient and robust algorithms to treat most NLP tasks, including syntactic and semantic analysis, grammar induction, summary and [34], text generation, document clustering and machine translation.

2-4 Semantic Decomposition and (Natural Language Processing)

Semantic decomposition is common in natural language processing applications. AI approaches that use knowledge-given reasoning creates a notion of meaning combining the state of the art [35,36] knowledge of natural meaning with the symbolic and connectionist formalization of meaning for AI

2- 5 Semantic Data Strategy for agencies

With organizations pursuing the most rapid access to data and flexible management approaches, there is now a rush to adopt and implement advanced technical solutions and capabilities to stay competitive. But many are already encountering challenges as a vast majority of AI and machine learning initiatives are failing to meet their expectations or provide solid gains on investments how strategies, processes, measurements and technologies need to be changed, and what is necessary to create Positive Knowledge Management in organizations.[37].

Bill Gates, Microsoft Founder, March 2018 ,Today computers can do simple things like search for specific words but concepts like vacation or career or family are not understood.

Hypotheses Study

Frist hypothesis:

1- (Ho1) has no statistically significant effect at a significance level (0.05) ≥ α (For knowledge management processes in competition and organizational innovation)

Second hypothesis

2- (Ho2) has statistically significant effect at a significance level (0.05) ≥ α (For knowledge management processes in competition and organizational innovation)

KMs can deliver detailed information about the services provided by the programs and its success plans making the refugees-beneficiaries part of the information cycle by evaluating the programs execution and enabling them to help designing the new programs oriented to the local community.

3- Research Methodology

Why in most contributed studies keeping point to the question of data interoperability? Consider these facts:

- 80% of all available information is in text or documents (unstructured)
- 40% of standard IT project expenses are devoted to data integration in one form or another, due to the manual effort needed for data migration and mapping
- Information volumes are now doubling in fewer than two years
- Other trends including smart phones and sensors are further accelerating information growth
- Effective business intelligence requires the use of quality, integrated data.

Depend on hypotheses studies and what statistical mentioned above . two methods are chosen to applied relate to KM cycle and business workflow in standard agencies as the following :

a. (Bayes) Algorithm

In this section tried is implemented to get the (Bayes) algorithm to search subject, which is a discipline derivative from (Data mining) field .

The algorithm was able to measure the changes of several information at the same time to get a final decision about project implemented (whether to apply it or not).... For example: needed to get the final decision whether to improve system or not ? and the data or (information) is related to the conditions of that subject as the following :(1-Transparency 2- Communication 3- Share information 4-training 5-orientation)

a) Model usage : for classifying future or unknown objects
b) This model is an excellent one that can help agency in finding the relevant answer about its theme weather it is positive , or negative, or in between these values.
c) the percentage for each class label (end result) . yes/no % !!?

(5 input parameters) was applied , processed according to the model mathematically upon these data or (information) the agency will be able to decide if its KMs should be updated/developed or not!!

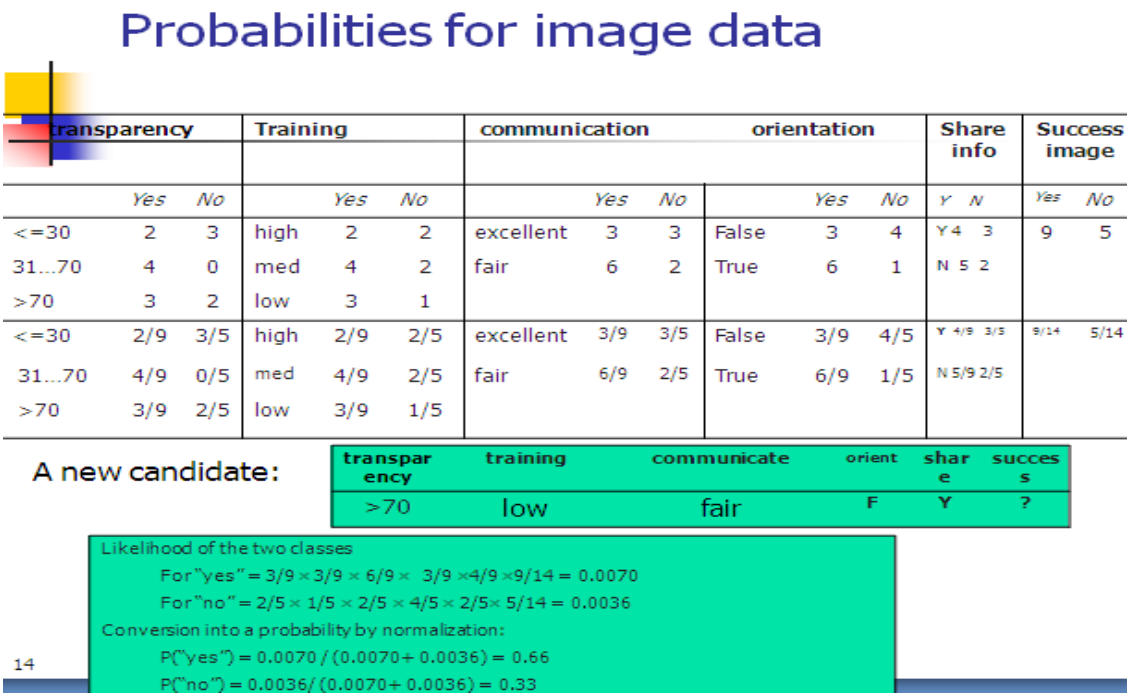


Figure. (3) Bayes algorithm inputs proceeded mathematically

Source : (book of Artificial Intelligence 2016) from–Damascus university by Dr. Bassam Kurdy

The feedback result is YES! With percentage of 0.66. Thus the agency should develop its organization

business workflow and KM cycle to raise up its performance according to KPIs results! An algorithm will be applied periodically to revise the organization's Image , KM workflow and how to embody it.

b. Questionnaire

Based on the systematic questionnaire which have been designed to collect, synthesize and analyze numerous staff member's opinions on a variety of topics that are closely related to their environment workflow involved knowledge management system issues that published in the last two decades. 150 employee were chosen randomly from different divisions including all the areas and sectors as health , relief and social services , emergency assistance and operations , staff members have been filled questionnaire form , data has been collected , analyzed , the result obtained related to current issues on knowledge management components (maintain , storing , transfer , generate new one ...) and business work flow cycle.

3-1 Validity and Reliability of the Research Instrument

Questionnaire analysis and result :

the researcher used SPSS statistical analysis program For validation purpose, so he used (Likert scale) for measurement and evaluate the questionnaire answers accordingly .

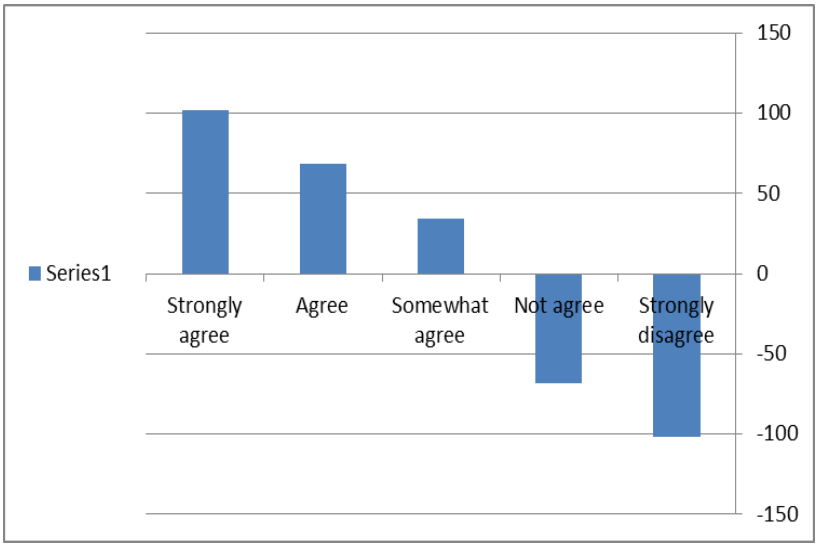


Figure. (4) Survey analyzed mechanism (Likert scale)

Source : Researchers method using (Likert scale) in design search questionnaire answers scale

Research also used Alpha Cronbach to validate of Stability and accuracy factor of questionnaire data and its consistency

Table. (1) : Alpha Cronbach values

Source : Researchers from data analysis output depend on SPSS v11

Alpha Cronbach value	Paragraph No	Variable
0.88	6	**Acquisition knowledge**
0.83	6	**Store knowledge**
0.78	4	**Transfer knowledge**
0.97	5	**Implement knowledge**
0.89	3	**Competency**
0.90	4	**Innovation**
0.93	28	**Full Questionnaire**

Table shows that Alpha Cronbach Value is nearest to " 1 " which is shows to any extend this tools shows the internal consistency of questionnaire data and reflects the real values of average of the validate and Stability.

Also under below table shows the output of average and relative importance levels of KM components as the following

Table (2): average values and relative importance levels of KM components

Source : Researchers from data analysis output depend on SPSS v11

Rank	Relative importance	Avarage	variable
4	Middle	3.44	**Acquisition knowledge**
1	High	4.06	**Store knowledge**
2	High	4.02	**Transfer Knowledge**
3	High	4.01	**Implement knowledge**

we notice that : organize and storing KM is got rank "1" then transfer KM has got rank "2 " , which is clarify the important of storing and sharing KM among entities

Table(3) : average values and relative importance level of organizational innovation and competencies

Source : Researchers from data analysis output depend on SPSS v11

Rank	Relative importance	Average	Variable
1	High	4.00	**Competency**
3	Middle	3.34	**Innovation of service**
2	**High**	**3.87**	**Innovation of operation**

we notice that: competencies variable is got rank "1" then innovation variable , which is clarified the important of organizational innovation in both services provided ' operations and competencies among organizations

Table(4) : validation test of data fitness related to statistical analyzes

Source : Researchers from data analysis output depend on SPSS v11

(Skewness)	(VIF)	(Tolerance)	KM Components
-0.	3.5	0.45	**Acquisition knowledge**
0.34	4.1	0.26	**Store knowledge**
0.14	1.6	0.59	**Transfer knowledge**
-0.13	**2.1**	**0.15**	**Implement knowledge**

Her are some validation test to measure some statistical stvariable related to consistent questionnaire inquiries related to KM components' and the results were positive and logical with excellent values related to scientific research values

hypothesis studies were tested mathematically and implemented accordingly

The conclusion of this study emphasized the growing of required KMs capabilities and features development and reflects that on organizational innovation and competency in organization

After Survey result was analyzed by statistical analysis program " SPSS" ,suggestions, recommendations are implemented for proposed systems that meet the demand and the purpose of research subject .

4- Results :

necessity to bridge the gaps in the operation and business workflow in organization by focusing on building a knowledge management system based on the semantic approach to meet the need of beneficiaries and the employees alike and elevate the structure and goals of the organization. The proposed project is KM system (interactive query system)

5- Discussion (proposed system)

Interactive query system depend on automatic answer management referral system. The proposed intelligent project will be for both (refugee -beneficiary and for employees). Integrated tow systems by one comprehensive KM system.

First internal system used among employees in agency by access on KM.

Second external system for external entities - beneficiaries using CRM , or as it have been called FAQ

CRM connect with internal KM which associated with it via external user interface (UI) linked by FAQ box.

Thus, the external beneficiary asks via CRM , enters the KM system so extracted required answer will be presented through external interface for the user. as a result , the system as a whole is a complete and comprehensive system used among internal employees and also for external users (beneficiaries) consisting of two systems (internal system and external one)

many organizations nowadays have identified the need to become more customer-facing with increased global competition and has become an essential for many organizational strategies

Proposed Model Levels

To build the proposed model, proposed hybrid approach consisting of its Cosine algorithm and the Latent Dirichlet Allocation (LDA) algorithm are used , whereby the proposed system extracts the proposed answers from the database according to the user 's questions.

The proposed system consists of three main levels that allow citizen- refugee – beneficiary to obtain accurate answers and satisfy their desires through various levels that include artificial intelligence as the following :

First level: Automatic level

Artificial intelligent is implement the proposed algorithms at this level, as it is the automatic level that allows beneficiaries/users to obtain answers automatically and without reference to the human element to obtain answers. At this level, the system proposes the five best answers according to the beneficiaries' questions using the Cosine algorithm and the Latent Dirichlet Allocation (LDA) algorithm

Second level: Communication (Robot , Auto reply and agent)

This choice is the second level in a voluntary way to communicate directly with the answering machine and then If the user is not satisfied with the answer, he will contact the employee as an agent humanitarian intervention in the same chat system .the beneficiary, whether if he is external y as a beneficiary , official authority on other organization -embassy or as an internal employee.

Third level: Direct human intervention

In the event that the beneficiary is not able to obtain accurate answers at the first or second level, the beneficiary through this level sends a message via e-mail and communicates directly with the human expert, at which point the expert responds to the messages received by the beneficiaries. After checking his official e-mail and the answer is Offline

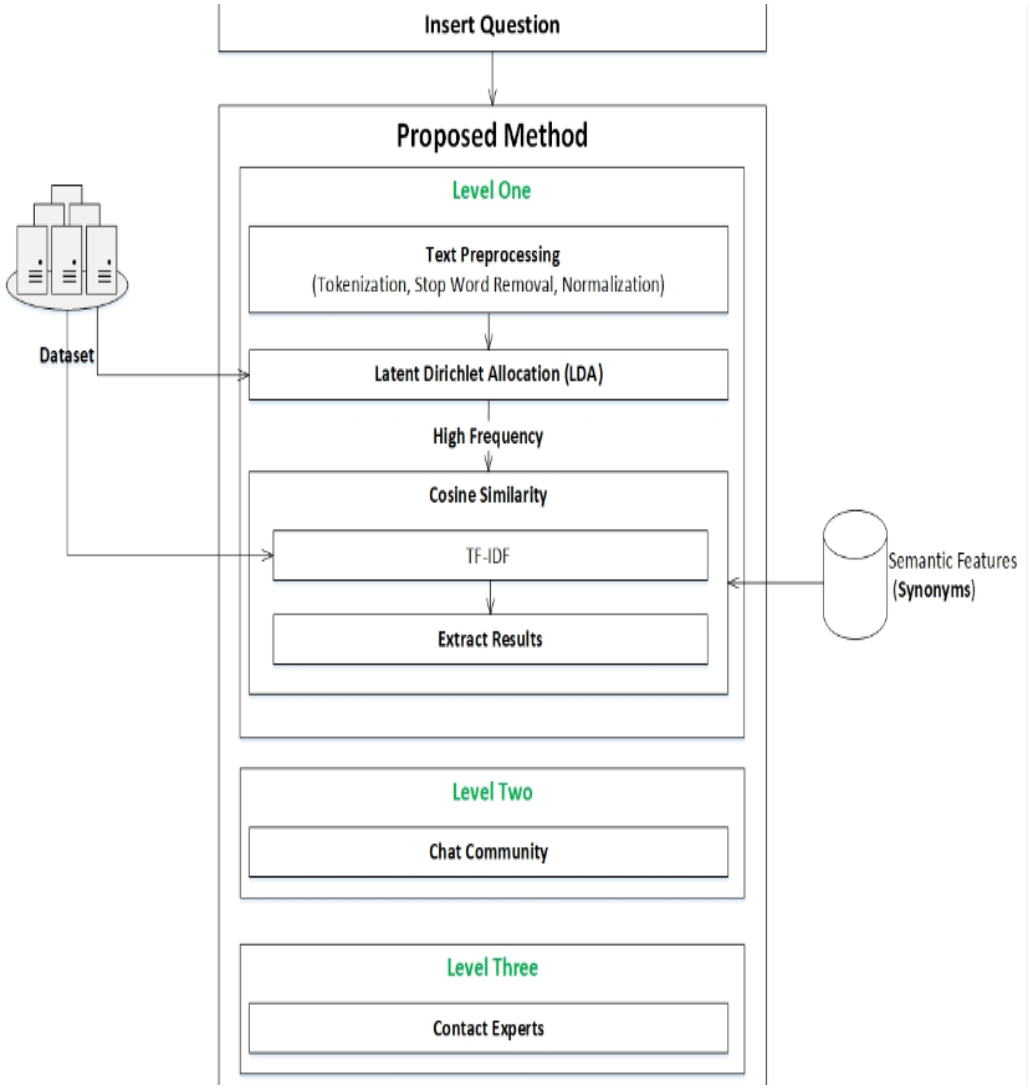


Figure. (5) System flowchart

Source : System flowchart for proposal methodology implemented by researchers

5-1 First Level: Automatic level

Concept of artificial intelligence is implemented in the proposed system by applying various stages

- Word processing.
- Latent Dirichlet Allocation (LDA)
- Cosine Similarity
- TF-IDF
- Finding appropriate answers

Concept of artificial intelligence is implemented in the proposed system by applying various stages,

after word processing , algorithms will work as the following:

Latent Dirichlet Allocation (LDA)

An LDA or passive Dirichlet allocation is a "generative probabilistic model" for a group of components consisting of parts. In terms of modeling topics and texts. In proposed system, LDA is used to extract frequency words in texts, as these words are the main entry point to the next stage

Cosine Similarity

The similarity (Cosine Similarity) between the text of the question can be measured by the users and the answer text by the database using the text-to-text similarity methods. This shows that it mainly depends on comparing the text between a user's question and the database using several methods, which cover corpus-based similarities and string-based similarities.

String Similarity scales chains strings and character formation in order to judge the similarity between two text strings.

The question of the beneficiary and the texts of the database will be represented as vectors, where the question of the beneficiary and the texts of the database are a set of terms; for each weight term reflects its importance in those texts. There are several methods for calculating this weight, such as the term frequency-reversing document (TF-IDF), where (TF) refers to the term frequency (frequency) in the text, and IDF represents the importance of the term in relation to the whole body (corpus). It is calculated by the number of texts in the set divided by the number of texts containing the term..The following equation calculates both TF, IDF, and TF-IDF

$$TF=\frac{\text{number of occurrence of term in Text}}{\text{number of terms in Text}} \qquad (1)$$

$$IDF = \log\frac{N}{nj} \qquad (2)$$

Where N is the total number of texts within the database, NJ is the number of texts containing the term

$$TFIDF = TF * IDF \qquad (3)$$

The main idea behind this model is to calculate the weight of each term in all texts in relation to the whole set. First, the model calculates the TF for each term in the text. The high value of TF indicates that this term will play a crucial role (i.e., with a significant impact) in this text. Second, the IDF is calculated on the basis of Eq.(2)

Finally, the TF is multiplied by the IDF to get the TF-IDF.

Furthermore, the cosine similarity scale will be used in this study. TF-IDF is used to compare the question text

vector by the beneficiary with the answers text vector in the database using a cosine similarity scale. The cosine scale is a proven measure in decades of experiments.

(Salton, 1988). cosine similarity measures the cosine of the angle between two vectors. In fact , this procedure was used to retrieve information and extract tests. Two vectors are represented by attributes, beneficiary question (SA) and database texts (MA), cosine similarity calculated using dot product and magnitude as follows

$$\text{cosine similarity}(SA,MA) = \frac{\text{Dot product}(SA,MA)}{||SA||*||MA||} \quad (4)$$

$$\text{Dot product}(SA,MA) = SA[0]*MA[0]+SA[1]*MA[1]+\ldots\ldots\ldots SA[n]*MA[n] \quad (5)$$

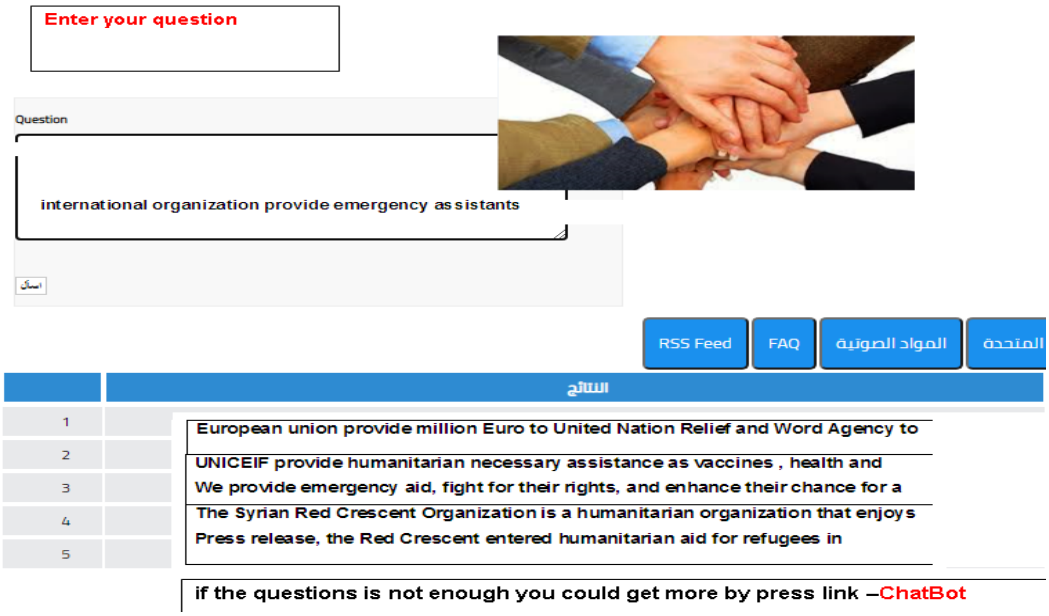
$$||SA|| = \sqrt[2]{SA[0]^2 + SA[1]^2 + \cdots + SA[n]^2} \quad (6)$$

$$||MA|| = \sqrt[2]{MA[0]^2+MA[1]^2+\ldots+MA[n]^2} \quad (7)$$

Figure.(6). Show best automatic answers extracted from system by using Algorithms works to extracted answer in Arabic language

Source : (Level 1) the results for proposal system in extracted answers from system implemented by researchers

As the algorisms is working to extract data in Arabic language only! , her is translated clarified figure in English language



Translated figure for figure (6)

European union provide million Euro to United Nation Relief and Word Agency to
UNICEIF provide humanitarian necessary assistance as vaccines , health and
We provide emergency aid, fight for their rights, and enhance their chance for a
The Syrian Red Crescent Organization is a humanitarian organization that enjoys
Press release, the Red Crescent entered humanitarian aid for refugees in

Translated answers for figure (6) upon your request also

Draw appropriate responses

After calculating the symmetry between the recipient's question text and the database texts, the scores are assigned to each symmetry operation, so if the result is the same cosine 1, there will be a perfect match between the question text and one of the database texts. But if the cosine similarity is 0 zero, then this indicates that there is no match or similarity in the texts.

The system can, through the implementation of the aforementioned algorithms, extract the accurate and correct answer by linking and building the various and multiple relationships of words to come up with a comprehensive and adequate answer, for example.

Forming tandem relationships, hierarchical relationships, and so forth from the different key word or through its semantic to link and consist the required answer from.

Using those semantic relations between words to get the fit and accurate user's answer.

5-2 Second Level: (communication through chat system and agent)

As There is an option to communicate by chatting with robot and agent as its an optional choice for user .We note that the second and third levels are optional levels, as opposed to the first level, which is mandatory to complete the process. When clicking on the "Chat Community" link, the electronic system will then direct the beneficiary to the direct communication system with robot first and then to the relevant employee (agent) for further Inquiries.

Any question have no answer by robot! will be forwarded to the agent employee in the same chat , to get an accurate answer , as its stored and accumulated in the system for the future to be used again from robot in case the question is asked aging from another user , as the system is feed upon answers which have been accumulated on system and it have been answered by agent and by human experimental employee

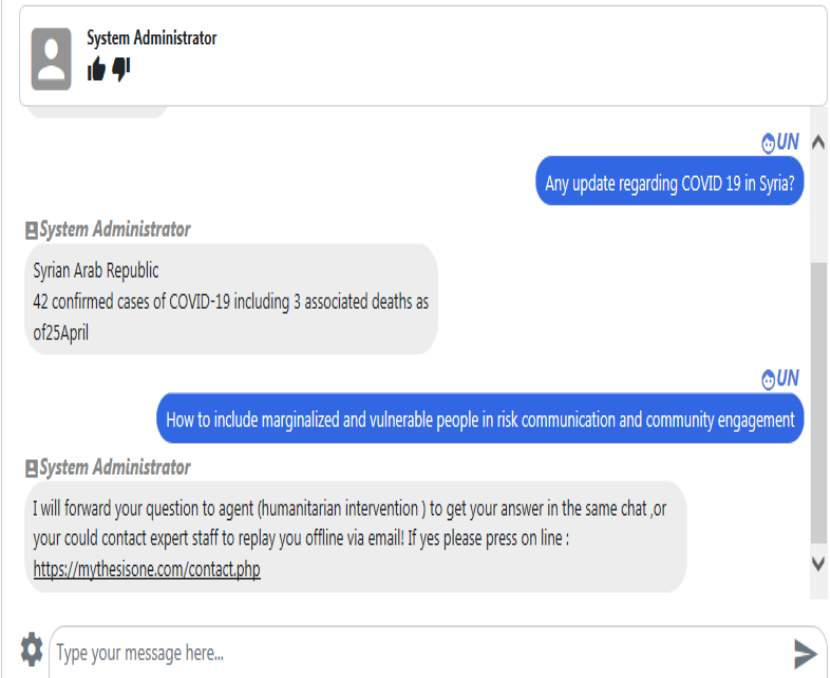


Figure (7). C hat system show auto replay answer from Robot

Source : (Level 2) the results for proposal system in communication chat system extracted from system and implemented by researchers

5-3 Third Level :(communication with the expert through e-mail)

This level is considered the last level in the proposed system, as its idea includes that the beneficiary request to communicate with the human expert after the implementation of both the first and

second levels, then the chat admin sends a link (through the chat system) to the beneficiary to send a message via e-mail and waiting for a response by the human expert .

After completing the transmission form by the beneficiary and sending it to the specialist expert, above message appears to him as confirmation of the success of the operation:

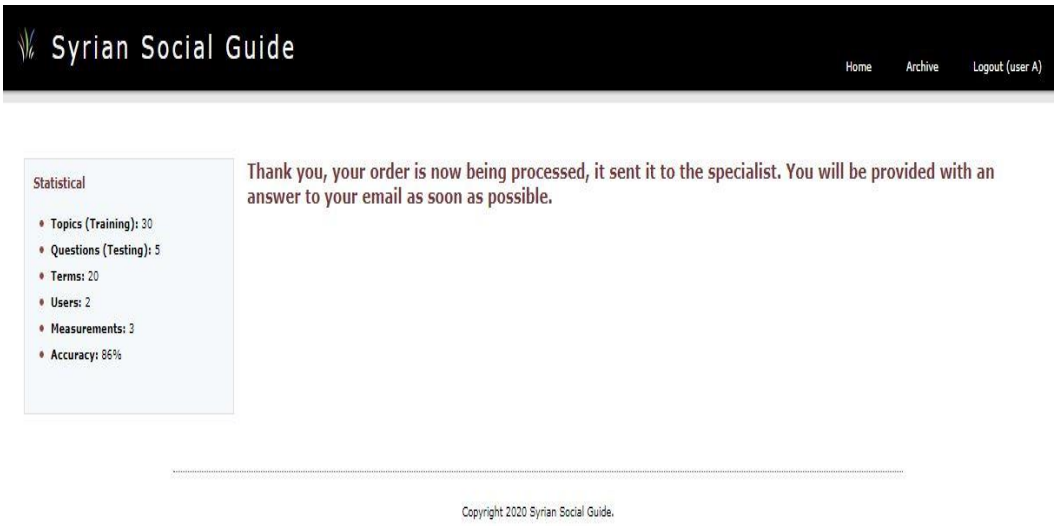


Figure 8. Show the transmission process of third level was successful

Source: (Level 3) the results of proposal system extracted from system and implemented by researchers

Features : Proposed system could extract the percentage of accuracy answering according to employee evaluate all answers extracted by system as the following

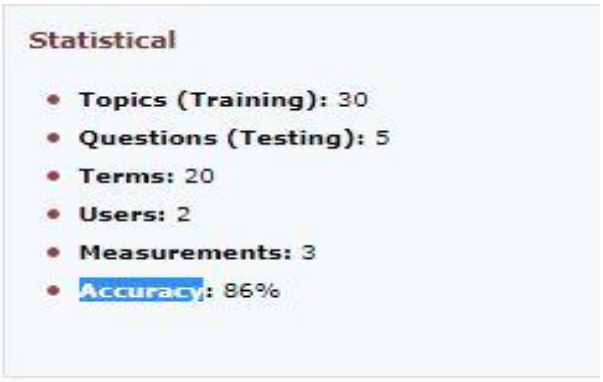


Figure 9. statistical panel of system activities and operational output

Source: Statistical board in proposal system extracted from system and implemented by researchers

In this way, the work of all departments and programs is intertwined with the inclusion of an internal electronic network that enhances work, speed and accuracy of performance within a framework as its controlled and open at the same time within the permissions and authorities governed by high-level senior managers

System features, strengths and (added values)

1- The system characterized as comprehensive ,inclusiveness and complementarily through its components in the three stages.

2- Integrated two systems by one comprehensive one system

- First internal system for specific agency used between employees , accessed via KM.
- second external system for external entities using CRM or what is recently called FAQ.

3- Using real data and fact example used and stored as its operate inside our system and this is the added value and what's distinguishes my work.

4- Using algorithms to elicit and extract the answer in Arabic ,Syrian language spoken , or any other language in the three stages that characterize the system.

5- The system owns a huge data package ,very big and cumulative data for big use.

6- Any question should has 95% of answer rate, and the answers will always be accumulated by the system, cumulative DB.

7- In the event that the answer does not satisfy the purpose, either as a result of a certain algorithm that needs to updated or a system malfunction due to a technical malfunction, user can find a satisfactory answer through the human expert
in second and third stages ,as it is comprehensive , integrated , holistic, and interactive system.

8- The proposed system is used internally among local and international staff employees inside the organization and externally through several international organizations , official entity as embassies , beneficiaries / refugees according to specific permissions accounts.

9- In general, any answer generated by the human expert is depend on the privacy permission and based on key words on storing data in the KMs , thus the system is fed with answers continuously , as answer is extracted upon especial authorities related to specific user.

10- All answers extracted are processed and characterized by semantic globally known relationships (tandem , hierarchical...,) depend on keyword directly or other semantic technique relations.

11- accurate, appropriate and satisfactory answer will be extracted instantly.

12- Advanced system used for international organizations working in the same domain .

13- Match global companies such as Microsoft for using techniques, tools and algorithms either by automated system , chat boot and by human expert intervention offline through email.

14- Quick adaptation to professional, legal, or operating rules that result from the agent 's internal organization and market-dictated rules.

15- accumulated agency data thus ensuring homogeneity, novelty, accuracy, update , on time and uniqueness.

16- Track operations performed using audit trails to verify the source of the information.

17- Ensure that all internal processes in the organization is covered .

18- Support using RSS techniques to enhance update , optimize and accurate info.

19- Apply Voice algorithms in system is features and necessary for specific situations.

20- The system supports linking with WhatsApp online application 24 hours as more communications channels for special cases.

6- Conclusion

This search paper illustrate how any beneficiary can query the knowledge and use it to answer various queries as needed , updated and useful information exclusions. Accumulated answers feeding the system continuously by generated humanitarian intervention expert answers stored on system automatically. advanced semantically rich framework to automate monitoring of capture information for both employees and beneficiaries between and through organizations

It allows the user to select the choice , that best suits his needs, among various possible system choices offered by different stages . Automatically extracting and storing essential elements of knowledge . first step towards building a policy negotiating system, which can negotiate with eligibility or instruction on behalf of the user.

Future studies

In the future, given a set of user requirements like expected inclusions, inclusion limits, and expected rate, the system would be able to negotiate the best answer for a user utilizing the knowledge management system characteristic as intelligent, big ,accumulate and accuracy KM DB. In this talk, insights have been shared about the lessons learned and the working approaches have been employed to navigate typical challenges in humanitarian agencies KM cycle is facing nowadays.

The proposed technique was evaluated on the humanitarian social domain with promising results and we anticipate that it will also achieve good performance on other domains as using real world data to meet the mentioned targets. The need arises to think outside of a technical box and further study the phenomena of data management and integration with a human-centric lens , from the business workflow ' and users' point of view.

Further, Working on establish a big ontology continuously depending on current prototype ontology will be a highly supporting idea for future academic searches and its recommended to apply it for enhancing organization KMs cycle.

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List of Abbreviations:

OWL: Ontology Web Language

NLP: Natural Language Processing

DM: Data Mining

AI: Artificial Intelligence

Cosine: Cosine Similarity

LDA: Latent Dirichlet Allocation

TF: Frequency terms

KM: Knowledge Management

FAQ: Frequently Ask Question

CRM: Customer Relationship Management

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