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# SEMANTIC NETWORKS IN AI

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**Abstract -** *This paper describes the origins of semantic networks and the methods they were first developed for psychological purposes and then adopted by artificial intelligence techniques to analyze textual data in graph format. This will deepen your understanding and further improve the way you extract knowledge. Thus, semantic network analysis further developed its importance in the field of psychology and later found application in artificial technology based on the emergence of semantic networks. Idea generation, visual text analysis, and conceptual design ideas are further developed.*

***Key Words***: Semantic Networks, Idea Generation, Semantic Network Analysis, Conceptual Design, Covid-19

## 1. INTRODUCTION

Semantic network analysis is the prominent way to analyze data by building a network of textual data to visualize such data. Where associations on the basis of semantics are carried out to determine links connectively. Some, define semantic networks as the most effective way to analyze the relationship among notions (text subjects/ words). [1] on the other hand, so define it on the basis of associations carried out by semantics. Thus, this can generate two different schools of thought. Thus, further, elaborating on what constitutes a semantic network, we encounter connecting links, object nodes, and link labels (which define the semantics of the connection). Thus, we can say the formation of a semantic network can be interpreted as links based on their respective semantics. Their prominence first arose in the fields of AI and Natural language processing, for the sole reason of info-visualization or for the use of reasoning based on such visualization, where such functions shown by semantic network representation put forward a way to store info in the graphical format. Thus, further such semantic networks when representing subjects (notions/objects/concepts/words) can represent them in circular, elliptical, or some cases rectangular sections, where their connection to each other can be shown by directed links based on their respective semantics. Link-label is also utilized when the graph is constructed to represent the category of relation are connection which also depends on the connection semantics. Sometimes, such networks are also considered associative between the sub-subject and are carried out to form the connectivity.

Further, the notion of Idea Generation is discussed in this paper, which discusses how inspiration is essential to develop new solution spaces. This notion, in particular, is discussed here, because learning that as of today our understanding of AI has been mimicking human intelligence was to achieve that we have analyzed previous data and applied logical calculation methods to predict problem solutions to human accuracy and to be precise better and more efficient than human ability, but when mimicking human intelligence we miss out some essential aspects of imagination, idea generation, and creativity which vary for every individual. So, to develop ideas many psychological theories have been proposed and many approaches have been developed to implement such human imagination which does not require past information to form new innovative solutions. This is the main aim of the notion of Idea Generation discussed in this paper.

Next, the notion of Visual text analysis is discussed, which became an essential analysis for current-day scenarios, due to the growth of textual information, the unstructured data still arises problems when utilized for analysis or to be specific visual analysis. Nowadays, a certain number of text visualizations require models based on the word frequencies found in the test data to generate the relationship between the text objects and further for the representation. Since text/word relationships are revealed by the semantics available in test data. And lastly, the topic of the design process which is carried out conceptually is discussed. Which defines the process of designing notions that in turn deliver the implementation of desired functions. In this field,

i. Behavior, and
ii. Function

These are the two important terms to be considered in the design phase. Whereas, there can be still some probability of encountering ambiguities and their resultant confusion over their visualization, which immensely correspond to the research ideas interchangeably. And the design process of synthesis strategies generation. Input/Output flow regarding the action scheme chosen for the meaning behavior based on the visualization based on such discoveries, a refined framework is proposed for conceptual mechanical product design, where a function–decomposition–mapping process is elaborated to demonstrate the necessities and usefulness of the presented work.

Under the need for reasoning, regarding any encountered issue, there arises a requirement to consider that reasoning is an essential process that is usually internal, but when the things which are to be reasoned about must exist externally. With the ongoing growth in artificial intelligence as an approach to acquiring human intelligence in machines, inspiration to reason intelligently often can be accomplished from other interrelated fields such as named as – mathematical logic, psychology, biology, economics, and statistics. Since these fields have provided five distinguishable fields of work on what contributes to reasoning intelligently. [1]

Considering, how the assumption or prediction is carried out using mathematical logic which requires reasoning intelligently, turns out to be a result of the formal calculation. When the assumption requires a psychological approach, the reasoning process generally requires following the characteristic human behavior and which has resulted in a significant body of work on human problem-solving as well as a large collection of knowledge-based systems. Based on the third field- Biology considers that the architecture of the reasoning model is the key to reasoning intelligently. So, the typical stimuli for response behavior originated from the parallel connectivity of a huge number of very simple processors. The modern descendants of this line of research include those working on various forms of connectivity. A fourth field drawn from mathematical probability theory, introduces the concept of uncertainty into logic, resulting in a perspective in which intelligent reasoning entails following the axioms of probability theory. And lastly, the fifth field derived from economics, adds the elements of values and preferences, resulting in a perspective of reasoning intelligently defined by adherence to utility theory's precepts.

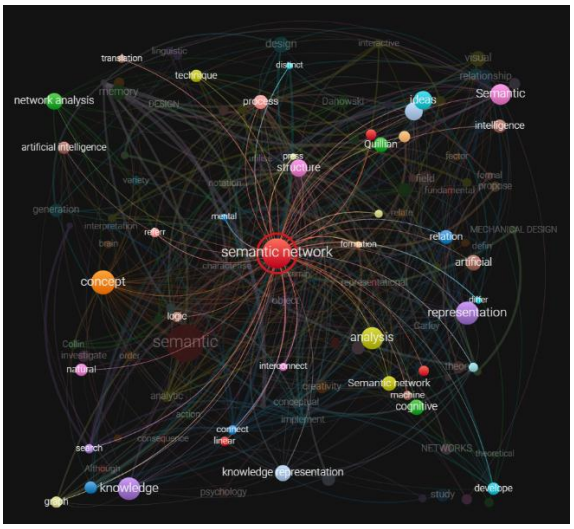



**Fig- 1:** A demonstrative graph of Semantic Networks.

## 2. KNOWLEDGE REPRESENTATION

Whenever a problem is encountered, it is a necessity to first assess the situation, the analysis of information regarding it then develop some solution sets which are well reasoned about thus, the reasoning phase to carry out better solutions is considered a necessity. When human intelligence is taken into consideration to carry out the reasoning/ assessment of the problem at hand, it is found to be an internal (mental) process but the situation, of course, is required to be of external existence. Thus, due to such reasons, human intelligence has been a concern to be achieved by machines. Thus, requires model development to provide a problem solution/reasoning is done. To be able to reason, knowledge is a must to be available during the process, and thus where we require knowledge representation technology. knowledge representation to be precise is not considered as a structure of data, alternatively, it functions to carry out the reasoning for the semantics-based processes, notions, actions, and categories which are preferably described in the premise of the particular entity. For the fields of data mining, AI, and many interconnected fields, the knowledge representation technique has become a prominent area for research. [2] Thus, knowledge representation in an effective way that provides the desired efficiency, can further assess the case in the traversal, reasoning, and searching for the prediction calculation as per the requirement. Consequently, numerous techniques/methodologies and in some cases, algos have been created and thus introduced to be utilized. Each of these carries its advantages and demerits. Alternatively, the field of knowledge representation is still considered an arising field, as the recent advancements are concerned their utilization was never estimated to be this efficient and thus able to hold this much importance. Moreover, knowledge representation is having been recently utilized as the basis for nearly all

(i) Decision support system

(ii) Expert systems

(iii) and other intelligent systems.

The field of AI is considered which adopted knowledge representation as its essential part. Furthermore, numerous knowledge representation strategies are generated and introduced, where semantic networks are one of the most prominent.

## 3. HISTORY OF SEMANTIC NETWORKS

The semantic network notion is nowadays considered a well-known notion in the literature of the science of cognition and AI. And it has advanced in numerous ways for a wide variety of purposes in the past two decades. Consequently, instead of its particular formal reference, such networks inherit the name from the family of representational systems. This kind of network was first introduced in 1968 [3], and it

was used to define the arrangement of human semantic memory or memory of word concepts. The notion of such networks, or notions linked according to their association based on semantics to form a network, has been well-known for a significant period [3]. The prime depiction of such networks was performed in the period of Aristotle, for instance, such networks were correlated with the form of representation, which permits the semantics of words to be stored, to facilitate the possible human-equivalent utilization of semantics. [3]. the prime notion of such networks is concerned with the reflection of the non-emotive aspects such as the objectives parts of semantics, and the properties of things, despite the sentiments related to assumptions in [3], the prime assumptions were considered to be related to the semantics about the subject to be influenced by its verbal conations. To general a specified visualization of a subject to be inferences about and its connection to other subjects are formed on the basis of semantics. Thus, such a networking approach can facilitate the visualization of any subject knowledge as a graph/map, with nodes acting as a substitute for subjects/notions and connected by links labeled). Two such subjects can be found related to each other in such networks by the presumptions of [3], if the association of verbal intersection at a point respective, is facilitated by the process of locating according to breadth-first-search initiating from each subject. Although, [3] when the psychological model was considered the initial variants of such networks were found to be better performing for the architecture of human semantic knowledge, through their ability to reason with that information wasn't able to succeed.

The imitation of job performance in numerous fields is facilitated by such networks. Studying such networks might require knowledge from several aspects (e.g., explaining verbal learning). Taking meaning extracted linguistically as the prime focus for such network theories contributed immensely to the process of studying the semantics of textual data. Since the examining process cannot be carried out without the other being present, it still does not concern the formation of the network but the empirical substance of theories.

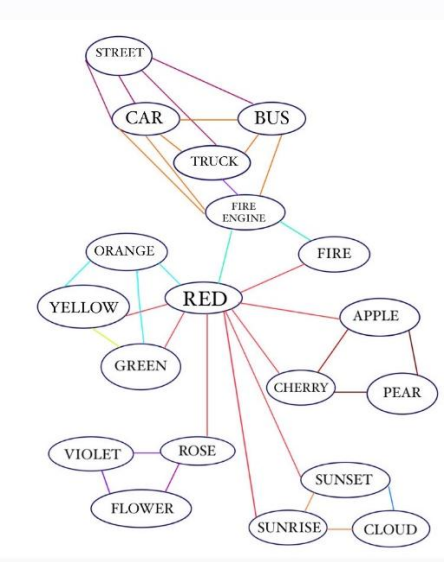



**Fig- 2:** A demonstrative graph of Semantic Networks.

## 4. SEMANTIC NETWORKS

Such networks are referred to as knowledge representation frameworks considered as data processing efficient which describe the connectivity between categories of visualization, the efficiency of a particular iteration, and the architecture used in the data processing framework which conducts such iteration. Such frameworks contain semantic networks and forms of graphical visualization. Certainly, a widely similar Semantic network may put forward a perfect framework produced for designing a spontaneous reasoning approach that can faster the process, without continuous effort [4]. Generally, translation of the semantic network visualization to language which is not graphical and vice versa is possible. As a consequence of continuous effort, such translation when considered out result in a complicated linear language, where the meaning of the graphical visualization is not compromised. Consequently, the semantic network language category cannot be differentiated from its opposite language category on the basis of its visualization competence where the information visualization language is concerned it is to be interpreted not only in the measure of its visualization competence but also in the measure of its processing deficiency. Thus, such a knowledge representation framework is not supposed to just define how the subject is to be arranged and structured so the desired data can be extracted and accurate reasoning can be carried out from it with relevant efficiency.

Such networks here were primely generated for computerized visualization in 1956 [4] to translate natural language development was carried out in 1963 [4]. the subsequent years, encountered significant advances in the development of such networks [4]. Then such networks were associated with the subject of a hyperlink in hypertext

from 1960 to 1980. Numerous tools based on software origin were introduced for the implementation of such networks in the same period. A semantic network is considered the prime and most prominent form of knowledge representation technique for this data. Thus, such networks, are sometimes indicated as nets, which are defined as a graphical structure formed by connecting subjects based on their meaning. Thus, such networks, or nets, are a visual rotation utilized to represent data in the form of arranged subjects and their corresponding connecting links. Furthermost the entire set of such networks is considered to be declarative in nature when implemented to carry out knowledge representation to facilitate define data interestingness or to permit data reasoning systems automation. Some are considered to be rather composed, whereas some are considered to be strictly uncompromising logical systems. Some of such networks are discussed. Networks that drew focus to the association that is present between a subject category and a lately defined sub-category, thus such networks work on the rule of inheritance by copying subjects' properties to each of its sub-categories and are often referred to as definitional networks definitions are presumed to be accurate hence implying networks adequacy. Some networks when generated carry out assertions. In contrast to the previously discussed network, where data is supposed to be true regarding its dependence for existence until explicitly mentioned by a model operator. Thus, these kinds of networks are referred to as assertional nets, which have been introduced as modules of the structure underlying natural language semantics. Some networks utilize implications as to the prime linkage to related nodes. Hence known as implicational nets, thus considered to be utilized as belief patterns, causal relationships, or judgments. Furthermost, there are some which require a certain mechanism, such as marker passing or attached procedures, which are utilized to permit judgments, send text, or search for patterns and correlations which are known as executable nets. And some are supposed to construct or learn and improve their visualization by observing and learning and eliminating nodes and linkages or by modifying the weights are often known as learning nets. A certain number of previously discussed nets were defined for the sole purpose to examine ideas regarding human cognitive systems, whereas some others were generated for the betterment of computer efficiency. Thus, data processing for reasoning and psychological inference can sometimes conclude similarly. For instance, [4] the comparison of definitional and assertional nets is done by the distinction between semantics and episode linear translation of data both provide equivalent information, and certain visualization approaches are better performing to one or the other. Since the premise is found to be ambiguous it is complex to recognize desired and enough strategies that are included by all such networks while eliminating systems that do not come under the category of semantics network.

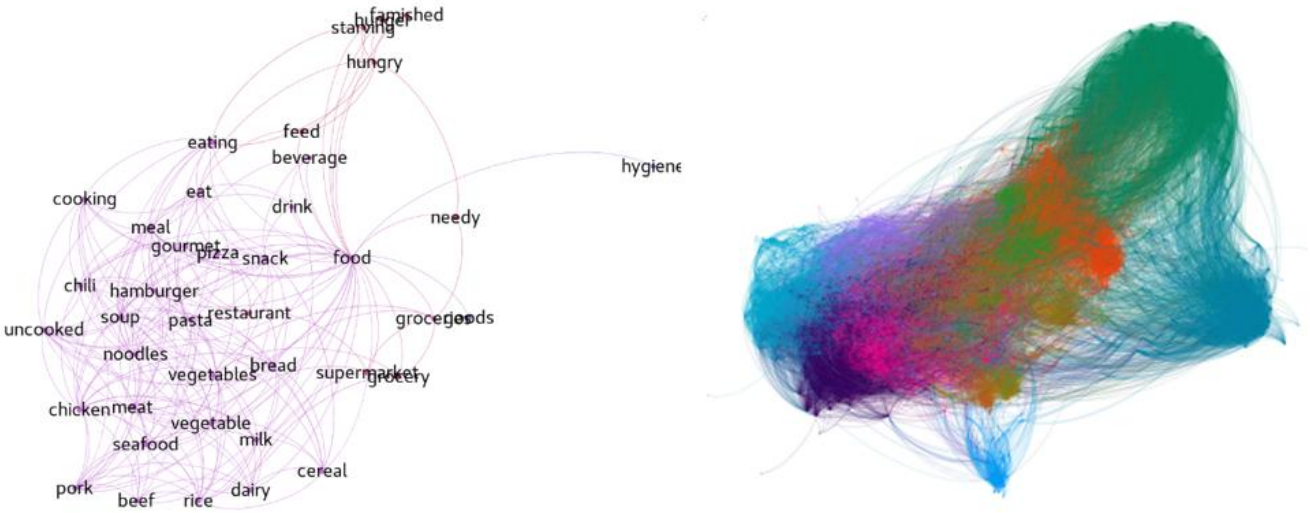



**Fig-3:** Semantic net is drawn by Human vs Computer

## 5. SEMANTIC NETWORKS IN PSYCHOLOGY

To elaborate on this topic, a semantic graph's illustration is considered, which is a generation of semantic network and then examining it for a specified purpose, for this illustration the working of [5] such as his writings on moral psychology is utilized as a basis of the mapping. Consequently, the map is created using the book's entire data set, as well as data from some of his other books. Due to the high density of the map, there is a necessity to set a way to read the map:

1. Size is considered the "weighted degree" of a node, which is the total number of times the notion is encountered. Considering, a case where A appears in 4 different book chapters. It appears with B in the first chapter but not with

any other notion being examined. It is encountered with B and C in the 2nd chapter but

not with any other notion being examined. And this occurs once more with B in the 3rd chapter, but not with other notions being examined. The weighted degree of A would turn out to be 4(3 from B and 1 from C). For a moral framework of psychology, the approximate estimate of linkage and thus of predominance is size.

2. The node's color depicts whether the node is part of a community or modularity group. Hence, the nodes are thus linked to other nodes they tend to occur simultaneously and are distinguished from those to which they do not link.

3. The color of the edge is defined by the color of the node's edge link.

4. Lastly, the location of a node is determined by three factors.

i. Each node is linked to the graph's center.

ii. Every node has repulsion between each other.

iii. Attraction between nodes is determined by the weight of the linked edge.

3 sets are shown in the figure:

i. Psycho-social constructs are denoted by the orange group.

ii. Normative statuses are denoted by the green group.

iii. Sentiments denoted by the blue group.

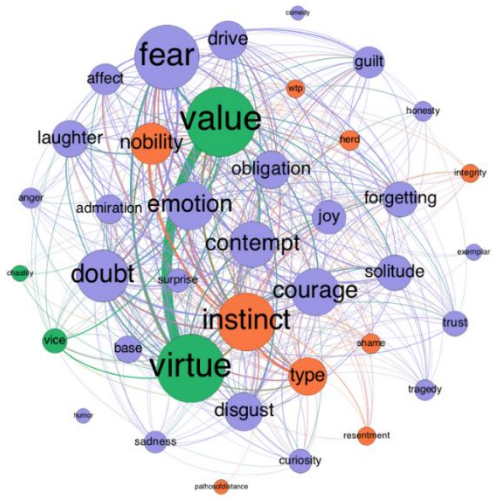



**Fig-5:** A demonstrative graph based on writings of [5]

The most prevalent sentiments were found to be embarrassment, disgust, grief, doubt, trust, excitement, curiosity, and contempt. When we discuss the English language (for instance, it contains over 200K English terms presently), many of which can turn out to be ambiguous, and consequently it can be seen that such words connect, sometimes the reason being the syntax or sometimes the reason being semantic. Due to the passage of time, changes occur between the words and their associations, also the origin of new words can occur, simultaneously, and some words might undergo alteration. Due to these factors, the examination of such facts can increase the complexity as a consequence of the presentation of language, when considered for the context of the cognitive process. Compression and production linguistically happen frequently in the brain, where several engaging processes are going simultaneously. Hence, considering the complexity of the performance of language as a consequence of brain activity. The management of such a complex object of language requires a conceptual framework that is considered to be contained in the brain. Which further is supposed to be used for computational semantic memory. For controlled contexts for investigating the complex, interacting nature of knowledge representation and the process can be carried out by computational models of semantic memory.

## 6. SEMANTIC NETWORK ANALYSIS

This is considered a network analysis where text/word /objects/nodes are analyzed based on their semantic connections to each other despite their associations with each other. Thus, network analysis tools are utilized to conclude the analysis process. here, the techniques associated with work analysis evaluate the object's interactions/relations with or perceptions about their connection. As previously, discussed a semantic network approach is a cognitive-based approach, so hence applying this to analyze the data which will in turn be a cognitive approach as well. Since the semantic network depicts the organization of the network based on shared meaning. This analysis approach is an emerging research approach for AI. However, the tactics, employed by researchers to establish these networks are yet to be accomplished. Measurements of semantics/meaning are the main issue for these arising number of techniques for implementation of the network analysis. According to [6], there were three approaches to the process of implementation of semantic networks. According to which the construction of such networks was carried out by applying such strategies as:

i. Calculating the words and their relationships(semantics) in a text.

ii. Keeping the standard content analysis of the text in consideration.

iii. Concerning the overlapping sentiments rated by scales.

Considering these three strategies can become redundant or imply two different depictions of semantic networks. For instance, [6] referred to semantic networks as the testing of text to assess the relationship between words. In contrast, [6] referred to the semantic network as the conclusion of connection based on common interpretations from the basic principles to distinguishing various types of semantic network research. [6] was known to be one of the first few to establish network analysis, previous advancements were for cognitive process assumptions. They joined the semantic network analysis to the [6] model of memory, which depicted memory as a hierarchical ordering of words in the human brain. Consequently, spatial models similar to the [6] system defined semantics as word-to-word relations with multi-dimensional scaling (spatial manifolds) rather than theoretical-graph-manifolds (link-node) [6]. The definition of semantic, according to [6] is explained by their link separation from all other conceptions. To put it in another way, it defines the preference for one concept over another. Considering, that such spatial models correctly depicted the semantics which was still uncovered by [6]. The claims of [6] mapping concepts about one another carry out a picturized depiction of the web of semantics contained in the test data(text). She further argued that there exists a theoretical framework for extracting semantics from the text on the basis of concepts like meaning formation, mental model, and knowledge representation. Thus, the existence of specific words or concepts does influence the semantics derived from test data(text). As she depicted, two sets of writings might contain the same concepts yet have distinct interpretations. Therefore, the linkages between concepts denote semantics. She then claimed, "Variations in the distributions of concepts and their interactions among texts give insight and structure of the texts." She then distinguished map analysis from a previously discussed approach which was determined by the relationship between the words as they occurred within an n-word-wide-window that moved sequentially through the text, one word at a time, this approach used the hierarchical link of words in the human thought process to support the previous approach's ability to represent the semantics. According to the conclusion of [6] semantic memory tests, stating that a hierarchical semantic memory database formed by words collected in order was found to be both diverse and compatible with real-life situations. As a consequence, the first approach [6] concluded the analysis of text based on word association effectively depicts the semantics inherent in such datasets(text) which were supported by it. The following three strategies employed network analysis to extract semantics within the dataset available(textual):

i. Textual data within which word associations reflected semantics.

ii. Where traditional content analysis carried out the result.

iii. Where responses to closed-ended scaled questions formed the basis of semantics.

## 7. SEMANTIC NETWORK ANALYSIS ON A TEST DATASET

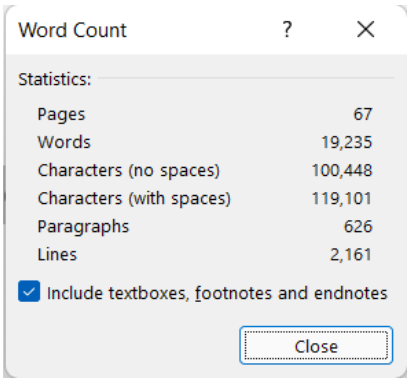
SEMANTIC NETWORK ANALYSIS can assist in the process of identification of the central word in the corpus and generating word clusters together to carry out the extraction of the semantics between the topics.

To carry this analysis out:

i. First, to prepare the corpus, data is collected from the news archive of the newspaper 'The Hindu' on the topic vaccination process during the second wave of Covid-19 for the time interval of January 1st to 31st. A total of 50 articles were taken from different sections of that paper.

ii. Second, it is required to identify the list of words or actors- the most frequent words in the testing data, so now a necessity to clean the final list of up to 200 actors to be precise.

iii. Third, linked lists are generated for the network analysis and thus further examine the graph of words looking for central words and clusters in the network.



| | WORDS | CASE FREQUENCY | CASE PERCENTAGE |
|---|---|---|---|
| 2 | said | 200 | 1.015022 |
| 3 | covid-19 | 151 | 0.766342 |
| 4 | vaccine | 151 | 0.766342 |
| 5 | health | 129 | 0.654689 |
| 6 | cases | 96 | 0.487211 |
| 7 | new | 86 | 0.43646 |
| 8 | vaccinatio | 79 | 0.400934 |
| 9 | had | 67 | 0.340032 |
| 10 | dry | 66 | 0.334957 |
| 11 | vaccines | 66 | 0.334957 |
| 12 | coronaviru | 59 | 0.299432 |
| 13 | india | 58 | 0.294356 |
| 14 | run | 55 | 0.279131 |
| 15 | people | 54 | 0.274056 |
| 16 | ministry | 50 | 0.253756 |
| 17 | country | 47 | 0.23853 |
| 18 | governmer | 46 | 0.233455 |
| 19 | january | 44 | 0.223305 |
| 20 | minister | 44 | 0.223305 |
| 21 | total | 42 | 0.213155 |
| 22 | doses | 40 | 0.203004 |
| 23 | states | 39 | 0.197929 |
| 24 | workers | 39 | 0.197929 |
| 25 | two | 38 | 0.192854 |
| 26 | being | 38 | 0.192854 |
| 27 | day | 36 | 0.182704 |
| 28 | reported | 36 | 0.182704 |
| 29 | lakh | 36 | 0.182704 |

| | | | |
|---|---|---|---|
| 3335 | virus-relat | 1 | 0.005075 |
| 3336 | changed | 1 | 0.005075 |
| 3337 | poorer | 1 | 0.005075 |
| 3338 | america | 1 | 0.005075 |
| 3339 | drug | 1 | 0.005075 |
| 3340 | weak | 1 | 0.005075 |
| 3341 | rely | 1 | 0.005075 |
| 3342 | vet | 1 | 0.005075 |
| 3343 | mutant | 1 | 0.005075 |
| 3344 | un | 1 | 0.005075 |
| 3345 | dozen | 1 | 0.005075 |
| 3346 | “met | 1 | 0.005075 |
| 3347 | biontech-p | 1 | 0.005075 |
| 3348 | ultra-froze | 1 | 0.005075 |
| 3349 | hurdle | 1 | 0.005075 |
| 3350 | developing | 1 | 0.005075 |
| 3351 | freezers | 1 | 0.005075 |
| 3352 | explains | 1 | 0.005075 |
| 3353 | makes | 1 | 0.005075 |
| 3354 | ultra-cold | 1 | 0.005075 |
| 3355 | equipment | 1 | 0.005075 |
| 3356 | reliably | 1 | 0.005075 |
| 3357 | accessible | 1 | 0.005075 |
| 3358 | “working | 1 | 0.005075 |
| 3359 | assessing | 1 | 0.005075 |
| 3360 | possible” | 1 | 0.005075 |
| 3361 | | | |
| 3362 | Total | 19704 | |
| 3363 | | | |

Stop words are eliminated before generating the graph.

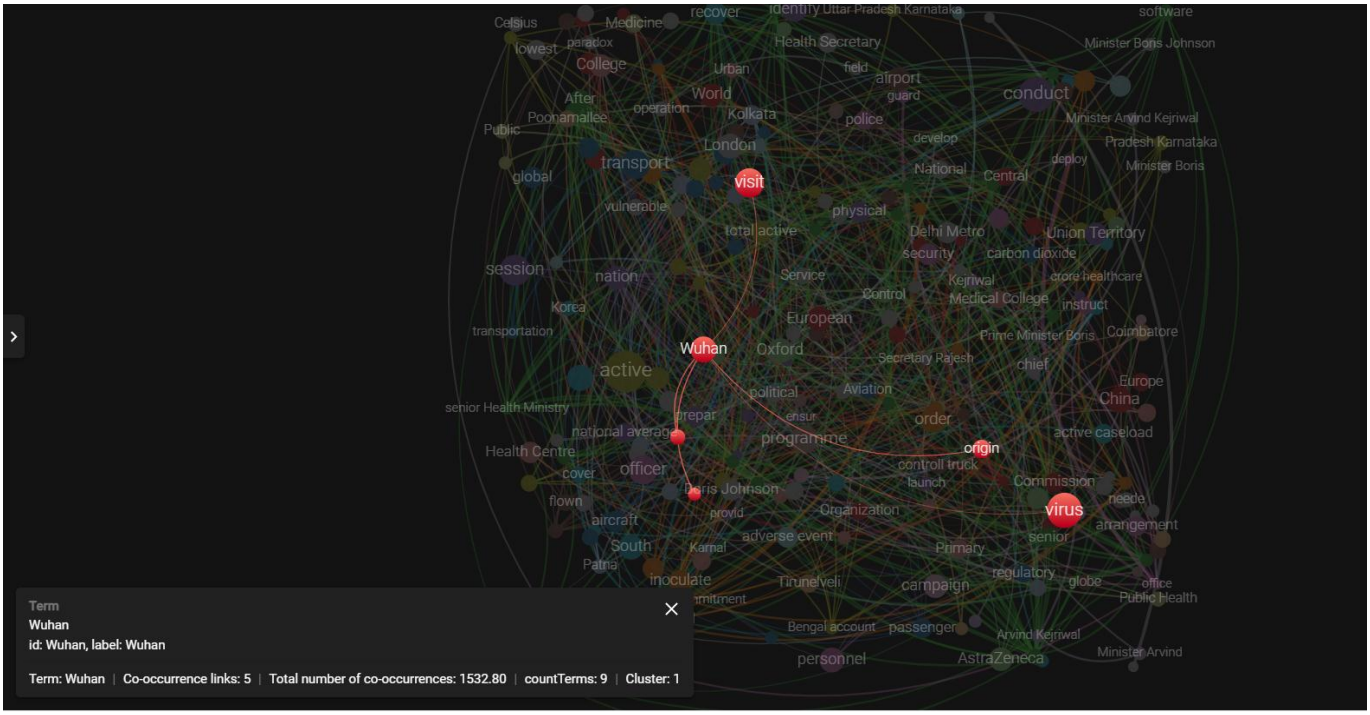
SENTIMENTS

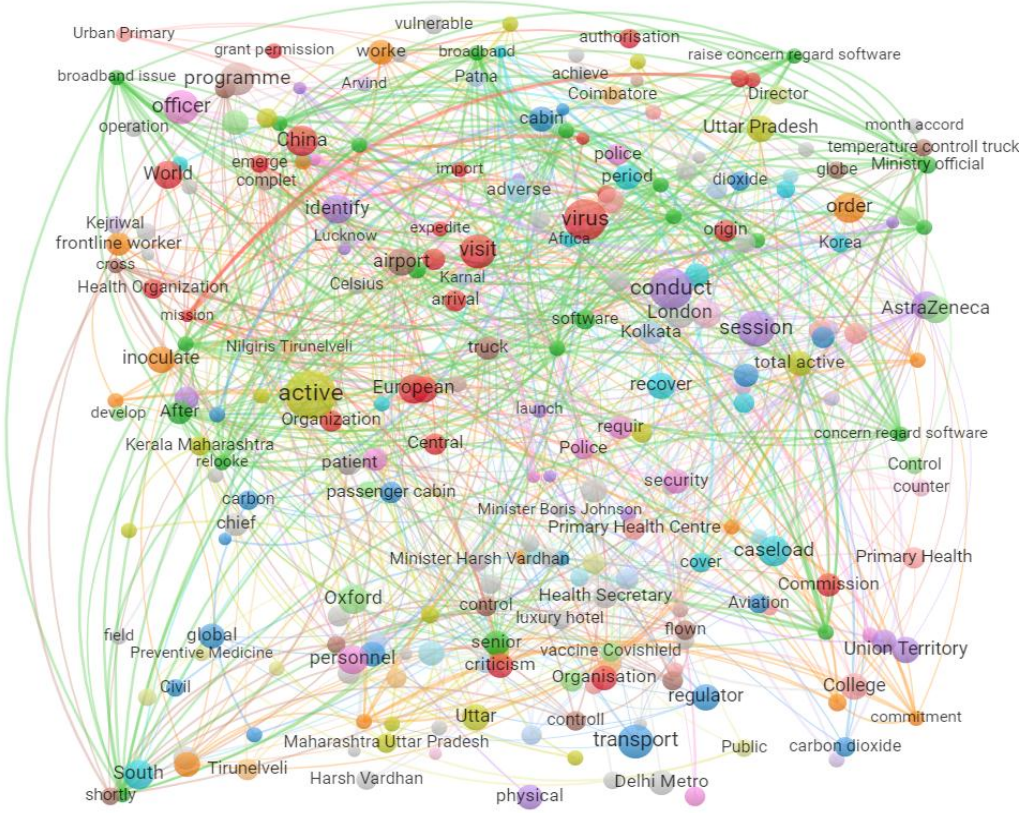
| | |
|---|---|
| | love |
| | hope |
| | friendly |
| | happy |
| | safe |
| | cool |
| | positive |
| | trust |
| | interested |
| | creative |
| | helpful |
| | successful |
| | freedom |
| | acceptance |
| | faith |
| | sorry |
| | determined |
| | funny |
| | powerful |
| | forced |
| | healthy |
| | protected |

| | |
|---|---|
| | dispirited |
| | rueful |
| | abashed |
| | exultant |
| | fretful |
| | demeaned |
| | chagrined |
| | aliveness |
| | cheerless |
| | affronted |
| | misgiving |
| | adventurism |
| | edified |
| | mirthful |
| | gratefulness |
| | truculent |
| | cheapened |
| | galled |
| | disquieted |
| | downhearted |
| | industriousness |
| | tenseness |
| | idolizing |
| | grumpiness |
| | shamefaced |
| | resoluteness |

**TABLE-**01, For several words, 2. For actor vs frequency, 3. For several sentiments

Resultant Network:



**Graph-** 1. Represents the connection of Wuhan to its related topics, 2. Shows the full graph density

Where we can pick any topic and further analyze its connections.

## 8. VISUAL TEXT ANALYSIS

The theory of graphics provides the formalized processing and investigation of networks and thus the analysis of the network. Concerning the features contained by the structure, social network analysis [8] and network sciences [8] proposed a wide set of approaches and metrics for examining and characterization of network structures. Sketching graphs put forward several advantages for the required visualization of the network, with the visual exploration and thus the analysis [8]. such approaches combined visualizations done interactively with the analysis of automated data which further allowed analysis procedures that included reasoning (analytical) and generation of knowledge [8]. Hence, unstructured textual data alone can be utilized to generate a network (semantic), automatically, which can further be utilized for visual text analytics. The phase of extraction of knowledge from the text can be carried out by retrieving information and mining text using the data mining technique for calculating automated relations [8]. To interpret semantics as s "system of signals", the procedure requires an interactive system with the recovered network to perform better analysis [8]. such a semantic network analysis approach to correct visual analysis enables user-centered exploration and allows examination of such complex networks. Such approaches provide an alternative for text-based information by visualizing linear textual data into a graphical network. Allowing the analysis process to facilitate the use of such concerned networks. Comparatively, the network generated can present the same data contained by a book in a better visual form, which further can ease the process of knowledge extraction. And thus, accounting for the relationships between the notions discussed in the bool. Hence, allowing quantitative and qualitative interaction with data to carry out the analysis. Thus, visual text analysis provides better ways or approaches to visualizing such lengthy and time-consuming textual information.

## 9. IDEA GENERATION

When human nature is examined, creativity is found to be the prominent attribute that defines it [9]. Thus, such an attribute of human nature was considered to be unachievable, and due to the recent advancements, huge data is available for research, which in turn allowed the attribute of creativity to be exposed similarly as a cognitive activity. Thus, considering that human cognitive creativity requires memory, attention to the situation assessment, and flexible nature of the cognitive function, [9]. as a consequence of the previous point of view, the notion of such attributes of creativity might undergo separation into sub-cognitive-abilities which can be examined separately by utilizing the empirically standard techniques. Semantic creativity judged based on linguistics is one of the numerous factors of multidimensional notions of the attribute of creativity which has been examined thoroughly. Such a flexible, original, and fluent nature results in high-order language products such as sarcasm, humor, and metaphors can be referred to as semantics creativity [9]. Such products are required in the process of interpreting concepts and language system processing, which include semantics that is distantly or weirdly related [9]. consequently, innovation carried out semantically is thus achieved by forming connections between notions that seem unrelated or distant to generate a meaningful statement. Thus, when examined meaning networks (semantic networks) can be used to differentiate the higher creative personals from those of less high creative personals, further allowing a more effective and distinctive way to process the semantics. thus, new techniques are necessary for progress in this field for implementation further, allowing the generation process a considerable amount of research has been performed and is still undergoing to attain such an idea formation process [9]. when many such ideas are generated, there is a possibility for one of them to better-performing than the rest, thus as many as possible must judge the better ones. To carry out such operations, experiments have been performed to account for the output of ideas provided by the creative participants. [9] Moreover, such creation is not the prime phase for the process of innovation, and such an account of ideas collected from the creative process is also considered necessary but not the prime strategy for innovation. [9] Prior to the process of implementation, the ideas which are better performing are chosen and collected from all the possibilities of such generated ideas. Later, experts judging the creative process, concluded that such participants engaging in the sessions organized for idea generation, would as a consequence end up recognizing the best-performing ideas. Whereas, when the testing was done to carry out the theory, it brought up the fact that the participants weren't able to recognize such greatly performing ideas. [9] Thus, the phenomenon is yet to be explained, further, to recognize such ideas efficiently two strategies were introduced during early research:

i. The analysis was done by participants to create all the possibilities,

ii. the criterion which was explicit and implicit were utilized.

## 10. CONCEPTUAL DESIGN

Numerous approaches have been developed to implement the notion considered with the generation of ideas in the conceptual design field. Such engineering conceptual design required experimental proof to validate the effectiveness of the simulation of idea generation. To attain this goal, a set of

measures for efficiency, the methodology utilized for experimental operation, collection of data, and lastly for the analysis phase. The DOE (design of experiments) Approaches were required to develop such guidelines based on statistics. Categories of 4 operational factors were examined to characterize such a challenging design and its environment.

## 11. CONCLUSIONS

Since the semantic network depicts the organization of the network based on shared meaning. This analysis approach is an emerging research approach for AI. However, the tactics, employed by researchers to establish these networks are yet to be accomplished. Measurements of semantics/meaning are the main issue for these arising number of techniques for implementation of the network analysis.

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