Contextual Search: A Framework for Query Retrieval Based On Ontology of User Cluster

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ABSTRACT*:* The main goal of the paper is to bring the new quality search based on the profile of the user. Nowadays search engine plays a significant role in the lives of the human being; It has now become the basic necessity for any end user, So the question here is? Is search engine give the precise output what the end user wants directly based on the need of the user? If no then how can we make the search engine to give the output based on the context of the user that is out research. The framework proposed here based is based on the domain (cluster) of profile of the user according to the profile it will extract the query.

KEYWORDS*:* Context, Information retrieval ,Ontology, Cluster

I. INTRODUCTION

In today's era meaningful data stimulate the technology and thus contextual data is like assets for any end entity because by using search query result user should extract the knowledge out of which the correct information and precise information should be passed, thus the main focus of research is to link data and knowledge context in a semantic way, so that the end user must be facilitate with the more precise, complete, valued, data. Web search engine has become a basic necessity, today we cannot think of without web search engine. It has become an essential application for Human being.

There are several search giant such as Google, Yahoo etc. But the question arise do they really return result according to our context need? Many a time they fail, when we search something specific which has poly meaning (Two words with same name but different meaning).There are many studies going on regarding these issues and the main problem behind all these issues is the perpetual growth of the data and information everyday on WWW. Web search user generally searches diverse information in most cases some of them might search   irregular, random searches based on their constraint, while other might be searching regularly based on their interest. So the main barrier is here is to create the cluster of the user profile based on their interest. So for this first step would be to create the cluster based on the search behavior of the user. If we can able to identify the search context with behavior of the end user then we can surmise the relevant information context associated with that user. This will provide the personalized search engine facility to the user. Our paper defines the how we can cluster the users based on their search profile, and how we can associate the relevant information to that search.
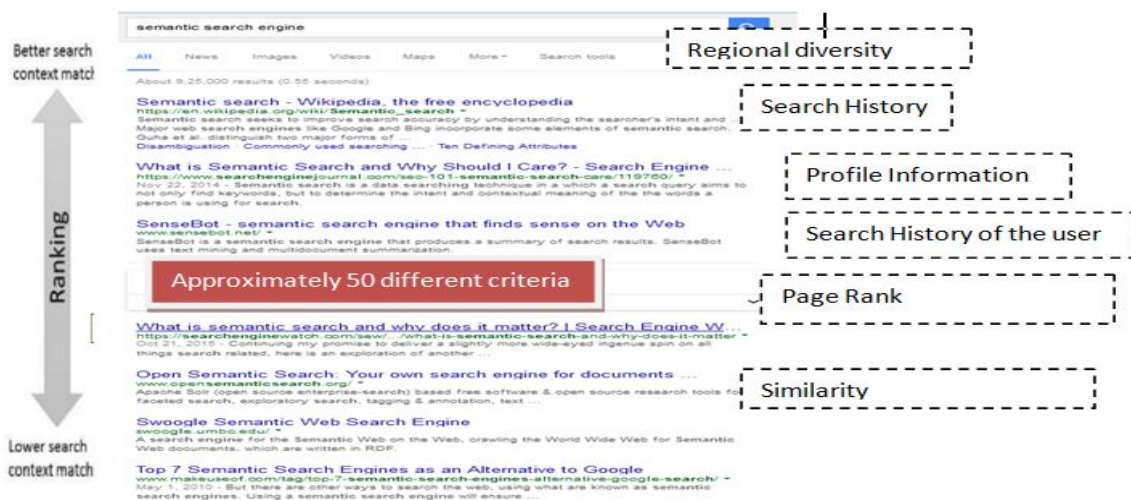
Fig. 1. Search information in web Search engine.

II. FRAMEWORK METHODOLOGY

The proposed framework consists of four step: User Prologue, Communication, Exchange, Send off (See Fig.2).The first step is user prologue where search engine will make profile of the user and cache it in the domain context extractor for the future use.
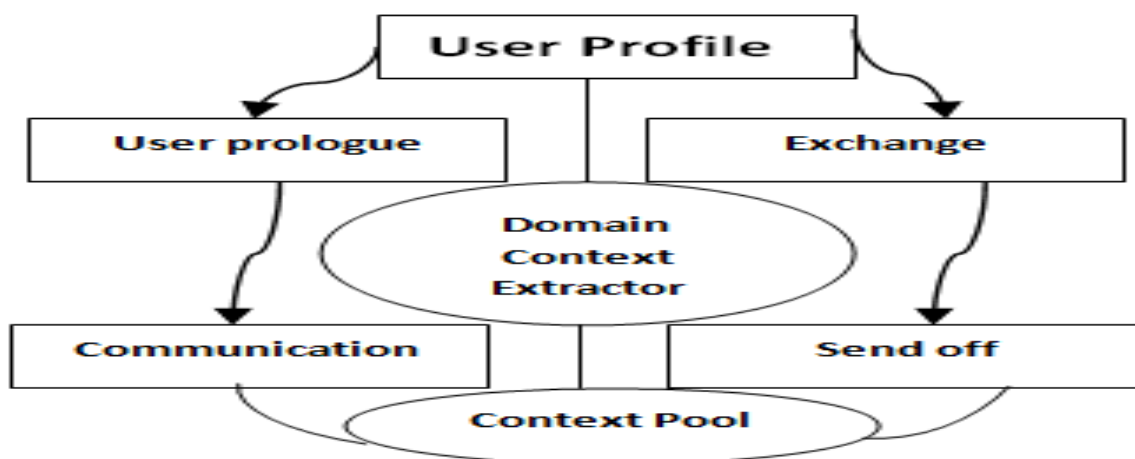

Fig. 2. Contextual framework Workflow.

The Communication step represents the interaction between the user, browser and the context of the user and based on the context it will update the profile of the user in the context pool.

During exchange stage the session of the user context will be marked based on the profile and it will extract the topic, interest of the user in the in the context pool. Send off stage; the profile of the user will be updated and cached in the context pool such as; context id, context domain, context type, dates. Due to the data intensity and variedness of the context and domain the representation of the user profile based on the context is difficult so we have used ontological

aspect of the representation of the profile. Formally define Ontology definition, Ontology's provide way by which we can define the higher level abstraction to lower level abstraction of the domain of interest perceived. They provide the precise way with which we can define the accurate, precise, logical meaning in a structured format.

User context profile ontology

This ontology defines the general key elements of the user to avoid the diversity issue. E.g. Basic information such as name, place, country, state, skills, hobbies, academics, current affiliation, interest. Because based on the profile the ontology representation occurs as shown in the figure
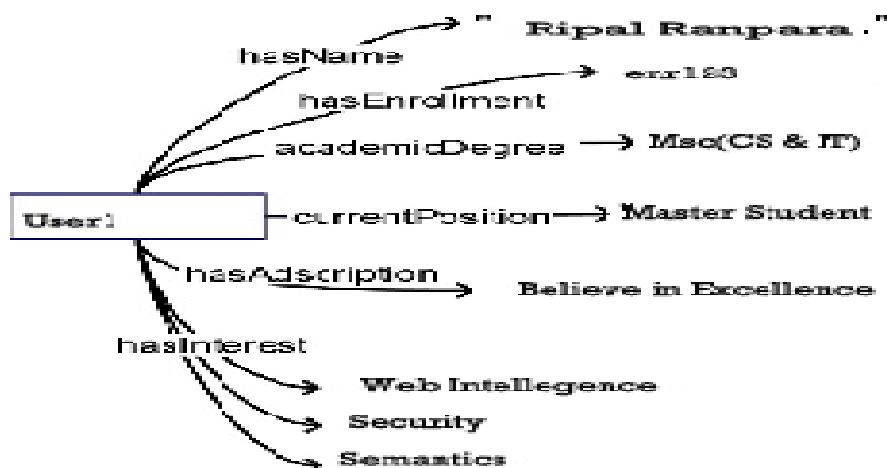

Fig. 3. Ontological representation of user profile

The above figure highlights the necessary distinctive information of the user profile e.g. user 1 such as name "Ripal Ranpara" and the other necessary attached information the new thing here is along with the basic information the context extractor will generate and unique user context id using which we can classify the domain and store it in an context domain pool.

User Prologue
This is the entry step point for the user for this framework because from this the first process is the assigning the context id so that it can be identified differently across the session of the web it will be an 128 bit hexadecimal id to maintain the integrity check of the session. The second process in this step is when the user land on the site. Context extractor will identify the domain context because each user has different role to play every day e.g. user, instructor, information seeker, web searcher, game player etc. So depends on the role the domain will be identified and cached so the main objective of this stage is to provide the mapping and to provide the interface using which the ontology and context extractor can communicate and from the context extractor the information will be passed to the context pool.
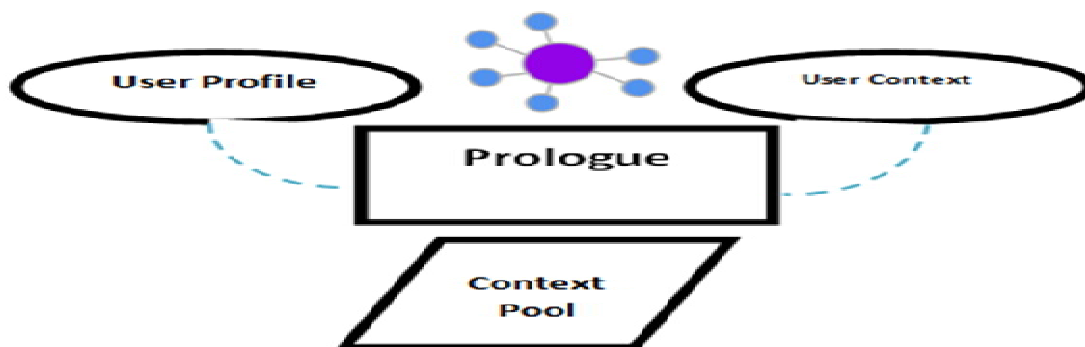
Fig.4. Prologue Stage to map the user profile & context

Communication and Exchange Step

The second stage here in this framework is the communication step in which the communication of the entire component as shown in the fig 2. Will exchange the information and will acknowledge the response of the same. As we have describe earlier that diversity is the major challenge for the context generation and user profile maintenance but to solve this problem we generated the context extractor according to domain specification. Because the user profile is a very dynamic and growing component because single user has poly meaning too. so this step is necessary for the further communication.

    Algorithm 1. User Profile mapping and communication

    Input: user session unique identity user_sess_id with   session context sess_con

    User_profile = $\sum$ user_sess_id,sess_con,con_domain

    Domain_extractor={User_profile,Domain_pool identification,context_pool}

    If User_profile(user_sess_id,context_pool)

    Context_pool➔ User_profile

    Else

    Context_pool➔New_user_profile(user_sess_id,sess_con,con_domain)

According to the [1][2] the rules of the we languages are defined in the form of the implication between from head to body. So for this problem the ontological aspect of representation is necessary because the ontology contain the hierarchal aspect of the representation and retrieval. Here we have two subsequent ontology one is for the user profile and other is for the context profile. As
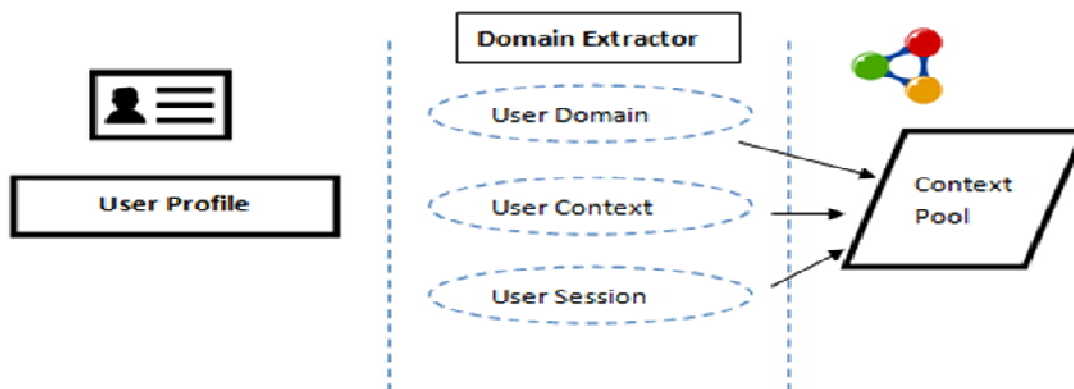

Fig.4. Representation of Exchange & Communication step

Send Off Step

In the last step of the framework here the actual interaction between the entire step takes place here the important interaction is between the context extractor and the context pool take place if any user profile does not exist then it will be cached here. The more important aspect is communication between current user context and new context will also processed if it gets matched then both context will be put together in the same session pool as the domain of the both user is identical. If we see reverse scenario then if the same user session has different context then the same user reference is will be referred in both the domain with same user profile name but with difference domain identification and context identification. The job of the domain and context extractor is to assign the context to particular user profile. Simultaneously the other background process occur is in the updating of ontology to maintain the consistency and integrity.

III. CONCLUSIONS

In this paper, the main focus is how we can record the context of the user keeping in mind the diversity of user context is a challenge so to solve this issue we have two different component context extractor and domain pool and using this framework user can search based on the context of the user. The only idea is to bring the new quality to search to achieve new excellence in the World Wide Web.

REFERENCES

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BIOGRAPHY

Ripal Ranpara is a Asssitant Professor in Computer Science & Information Technology Department of Virani Science College. She always want to know more, She likes to re-engineer the things - and for that reason, She thinks that research is best possible approach to explore. She is also curious to explore her own limits and skills and to get off the beaten path and "She always believe to work with Excellence" by giving hundred percent to complete the desired goal with satisfaction.Her research interest are Web Intelligence (Machine Learning), Contextual Search, Semantic Web ,Ontology Building and mapping