ABSTRACT

The term semantic web implies an intelligent web i.e. a meaningful web. It aims to make computers understand the meaning of information on the web pages rather than merely presenting them to users. The idea is to make World Wide Web (WWW) intelligent and machine readable by providing tools to find, exchange and interpret information to a limited extent and by adding metadata. This work considers the exponential research that has been done to improve the performance of semantic web through ants where ants are hypothetical sophisticated agents that carry information having tendency of learning through experiences. The exponential advancements in web technologies have enabled users to experience enhanced delivery of personalized services & information through the integration of various existing technologies. In fact, the traditional web provides a wide range of information but it is 30 to 40% subject relevant which leads to annoyed users. However, the existing centralized platform and usually a large server can’t ensure the scalability, flexibility, reliability, non-redundancy of information provided to users. There exist algorithms that have been used to map the desired information to the available content. However, the need for research activities in web management & enhancements by developing a standard, flexible but intelligent, adaptive and distributed framework for the support of heterogeneous infrastructure is apparent. The current scenario demands the delegation of intelligence of web to a smaller but more intelligent community of components known as intelligent agents more specifically ants. The focus of this work is to propose an ant-based framework for retrieving information from semantic web.

Ants are referred to as dynamic agents as these possess the ability to change their residing locations. These agents move out of a system to perform a task and these may or
may not return to the originating node. Ants spread intelligence across networks. The mobility allows them to be created, deployed and terminated without disrupting the network configuration. External agents that originate at one node, keep on changing their locations and may die on any other node shall be referred to as ants. Ants follow the principle of “STIGMERGY”. Stigmergy is a form of indirect communication through an environment. The insect ants when move in search of food stimulate a hormone named as pheromones, which attracts other surrounding ants. The routing of an ant-based agent is pheromone distribution dependent where pheromone distribution depends upon the environment in which the agent’s properties are utilized.

The literature review highlighted the fact that ants have come a long way and it is widely used in different areas of research and although researchers have thought of employing ants in semantic web, however the concept has not been used very frequently. Also it was observed that there is ample scope of improving performance of semantic web. A critical look at the literature revealed that there are three major challenges to be addressed: centralized controls, delay in response time and congestion on path. Therefore, aim of this work would be to incorporate ants in semantic web. Incorporation of ants in semantic web will help in achieving the vision of nodes being able to understand and use information available in given conditions. The proposed interface will deploy ants in semantic web which would then be responsible for executing the task delegated to them, providing a quicker & relevant response so as to avoid delay in response time and diverting the traffic/tasks to other server in case of congestion. The work presents a simple blueprint of ant based control of semantic web and throws light on the open challenges for future research.