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An on-line platform for supporting DSS-research collaboration (EWG-DSS Collab-Net Version 5)

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ABSTRACT

This paper reports the development progress of the project Collab-Net from the EWG- DSS in its current fifth version. The Collab-Net project aims at investigating the publication relationships in the DSS community in an automatic way, allowing researchers to analyze their own collaborative network. Moreover, in version 5, a web- based platform was developed and deployed in order to allow better possibilities of collaboration, in terms of joint-published work, among DSS researchers in their updated areas of work, in a portable and convenient way at any time. This paper presents the web- based platform development of the EWG-DSS Collaboration Network Project (EWG- DSS-Collab-Net), showing its new trends and advances (network collaboration, dashboard collaboration and word map), by taking in account the previous studies and versions of the Collab-Net project.

Keywords: Collab-Net, Network Collaboration, EWG-DSS

INTRODUCTION

Nowadays, it is important to identify the collaborative network between researchers. These networks provide important mechanisms of analysis since it will be possible to identify patterns as well as the connection between the researchers. Currently, it focuses on how the general structure affects researchers within research groups, scientific groups, among others [1] [4]. In this context, collaboration networks are tools that bring important mechanisms to improve academic productivity [2] [3].

Based on the importance of collaborative analyses, the EWG-DSS Collab-Net 5 was developed. The Collab-Net V.5 platform aims to investigate the publication relationships in an automatic way, allowing researchers to analyse their own collaborative network. Moreover, also allows possibilities for future collaboration among EWG-DSS members only using a Web-based platform, anywhere at any time.

This project has already advanced in development through four versions with various publications [9] [10] [11] [12] [12] [14] [15] [16], and is now in its fifth version, bringing

greater possibilities for the DSS community members to check their collaborative network from online authoring platforms, like Google Scholar. The main feature of this new version is the possibility of visualizing the collaborative network from graphs and figures that bring higher levels of interaction among group members.

Thus, this paper describes the new recent web-based platform developed of the EWG- DSS Collaboration Network Project (EWG-DSS-Collab-Net), Collab-Net V.5 showing its new trends and advances if compared with the other versions.

COLLAB-NET V.5

Based on previous versions, Collab-Net version 5 was developed maintaining its original purpose of enabling the affiliated members to investigate the publication relationship of the collaborative interaction among papers authors, within a publication database from local database and google scholar. In addition, this version improves the process of data automation, increases the interaction between the members, brings significant changes in the design, allows the user to export the collected data to CVS Excel format and the user can see its graphical information about the nodes connections of own member or other member network (collaborative network).

In the Collab-Net version 5, the entity-relationship model is the same of the Version 3. The Information relating to authors, areas of knowledge, document published, keywords and logs of the system entities could be stored in their specific table with some relevant data from Google Scholar. Once developed the conceptual data model, all feature was implemented in the MySQL database using Structured Query Language (SQL).

Fig. 1. Web-Based Collab-Net System Flow

Once the database was ready, the web-based system can be started. Differently of the Collab-Net Version 3, the Collab-Net Version 5 was developed with different tools. First, the PyCharm IDE was used to develop the Web application, incorporating the Python development language together with Django Framework. The Bootstrap by Twitter was used to Collab-Net design. Therefore, all platforms of software development and database systemare free, which means that are not limited use or constraints. Despite it was the main motivation of these technology usages, other key motivation also be relevant, such as: easy integration these

technologies, reliability and portability of Django Framework, further online support and established technologies.

As a way to present the navigability in the web-based Collab-Net system. Figure 1 shows the flow of both administrator and affiliated members' profiles when using the system. It shows from the member login until the possible results of the searches, as well as all functionalities of the system.

As a resulting from the software development process, a web-based system to support the needs of Collab-Net project was available to the affiliated members. This system offers a simple and integrated environment to allow affiliated researchers to analyse their own collaborative network anytime, anywhere in all platforms (Desktop, Laptop, Smartphones and Tablet), as well as possibilities for future collaboration among EWG-DSS members. The structure is presented in detail below.

COLLAB-NET VERSION 5 STRUCTURE

The Collab-net has a new login page. On the new login page, the user can access the Collab-Net V.5 environment from a previous registration (performed by the administrator). The user will automatically be directed to the administrative version of the system or to the normal version of the system.

After the user logs in, this is redirected to the Collab-Net v.5 home screen (Fig. 2). For admin users this part is more complete. There is a possibility of registering new users to the system, as well as the possibility and edition of new members and areas of action. The conventional user does not have these options; however, he can perform the analysis from google scholar, add new works in the database and check his collaboration network.
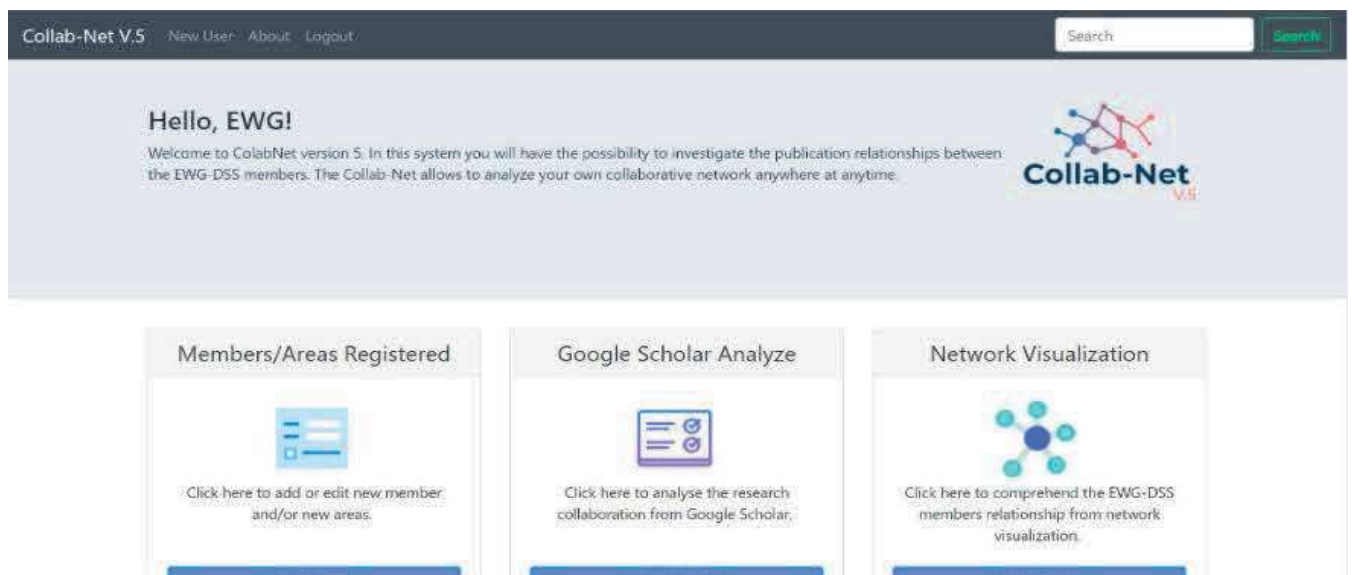

Fig. 2. Collab-Net V.5 Home Screen

One of the main parts of Collab-Net version 5 is in Google Scholar. In this part of the system the user can perform two types of queries: to analyse the registered members in the system, as well as verify the collaboration with other members.

First of all, the user can verify relevant information from any member that is registered in Collab-Net version 5. From the researcher's choice, information such as the researcher's full name, affiliation, citation numbers, e-mail, factor H will be displayed.

In this way, there is greater interaction among members since they may have greater knowledge of each other. In addition, all publications will be displayed, informing title and year (Fig. 3). These data are not saved in the local database but are used for consulting purposes only.
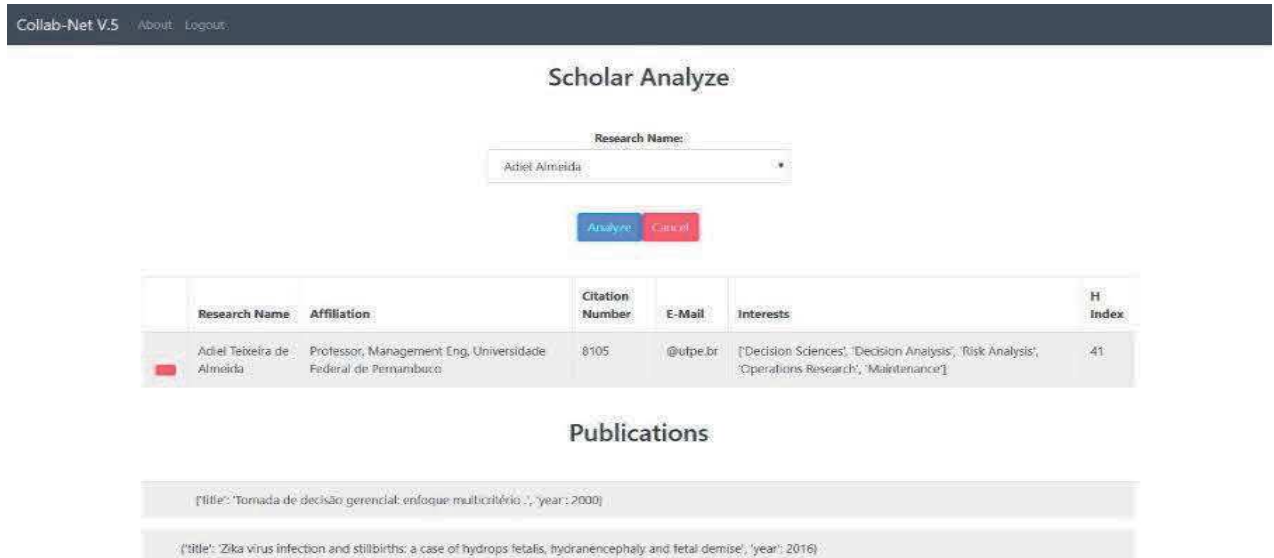

Fig. 3. Collab-Net V.5 Individual Scholar Analyse

In a second moment, the user can identify the collaboration with the other registered members. The system will connect to google scholar and conduct the query. The result will come in excel format and/or in a dashboard which will include the name of the main author, related publications and the co-authors involved. This data will also be saved in the local database to future analyse.
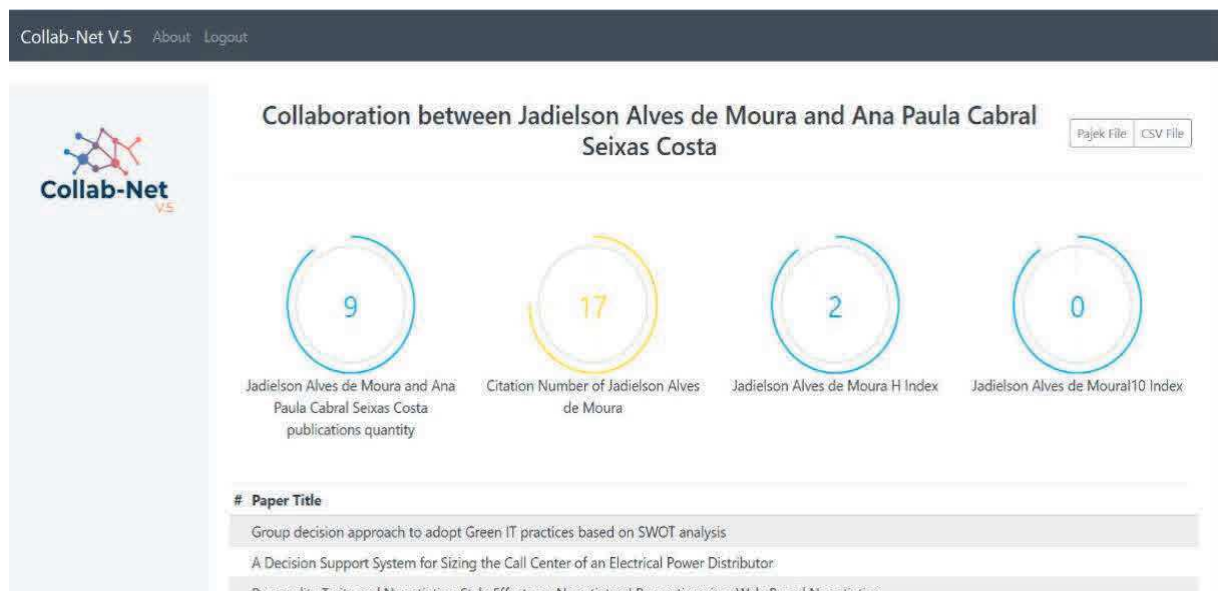
Fig. 4. Collab-Net V.5 Collaboration Analysis

The main part of this version is in collaborative networks. Collaborative Networks are defined as an intra or inter-organizational set with a common objective, obtaining collective solutions. In this way, the main benefits of Collaborative Networks are the sharing of

knowledge (and learning by individuals), trust established between relationships and, finally, the enhancement of strategic skills of companies through learning [5][8].

In this context, Collab-net version 5, in addition to bringing the conventional form of collaboration analysis, allows members to identify their collaboration network from graphs and the collaboration network of the EWG Group. The members can have graphical information about the nodes connections of own member or other member network. For this, some fundamental Pajek[6][7] principles are used.

Pajek is a network analysis and visualization program specially designed to handle large data sets. Main objectives in the Pajek project are: 1) to facilitate the reduction of a large network into several smaller networks that can be further treated using more sophisticated methods 2) to provide the user with powerful visualization tools 3) to implement a variety of efficient network algorithms [6][7].

Based on these principles, Collab-Net V.5 refines the data that is saved in the database. This happens so that the result is faithful, since any change in the data, the collaboration network may be wrong. The system has a refinement algorithm for creating a pattern in member names. This algorithm is based on open source google refine, a google algorithm for data refinement.

This way, the user can generate his network quickly from three types of graphs at the discretion of the user (Fig. 5), starting from his publications and co-authors (only those who belong to the group and are registered in the system).

Fig. 5. Collab-Net V.5 Network Visualization

Moreover, the user can also analyse the EWG-DSS collaboration network in a general way. Although this part is still under development, specifications and initial coding were already provided for its proof of concept. There are constant improvements in the data refinement algorithm and in the collaborative network elaboration algorithm. The section 4 will present a preliminary study with this functionality.

CONCLUSIONS

In this paper, we described the new advances of the Collab-Net project in a current extended version with a web-based system. The Collab-Net 5 has deployed a more trendy environment with new tools, including a collaborative network that enables members to acquire more information about collaboration among DSS community members in a simple, effective and

fast way. For the implementation of the current platform version, Python Language, Django Framework and Bootstrap by Twitter were used. Among other relevant and efficient solutions brought to the platform with these tools, they also have contributed to improve the Collab-Net V.5 with novel features, as the word map for instance. The word map brings new possibilities to visualize and analyse the main areas and topics of research, being more intensively investigated by the DSS community.

In a future work, new features still need to be implemented in the web-based platform. The focus of the Collab-Net future versions developments targets on: mechanisms to filter and transform the collected data; support the data collection process in more than one publication database; provide an intra-communication mechanism to encourage members to interacting via the available web-based platform and enable the sending of invitation to affiliation.

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