Sustain Analysis Based On Features Identification In Bioinformatics Tools

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Abstract—Today, there is a remarkable incremental development in all areas including bioinformatics for tools and technologies. The reason behind this progress includes various reasons like structural analysis, sequence analysis, functional analysis etc. In this perspective, there is a need for best tools development or utilization with better performance and of easy maintenance. Since the area of bioinformatics involves in solving real world problems there is a vast development of tools and technologies. For better analysis of selective tools with better performance and maintenance it is necessary to make analysis based evaluation that could be carried out automatically for reducing time and resources. Taking these aspects into consideration, a tool have been developed for identifying features from the tools document for analyzing the scope, sustain and evaluation that could be carried out. Since ontology plays a vital role for identifying real world thing it has also been incorporated in this tools which have been narrated in this paper. Based on the features identified scope of the each tools are assessed for possible evaluation that could be carried out on each tool for performance evaluation by graph plotting. Apart from this based on the scope sustain analysis is approximately carried out on the tools automatically. In this paper theoretical description of developed tool evaluation have also been represented which found to be good by means of reducing time, resource and effort.

Index Terms— Bioinformatics, Information Extraction, Ontology, Evaluation, Software Metrics.

I. INTRODUCTION

Bioinformatics is merging of computational biology with few other sciences which is currently a developing field. The area found to be lacking in development previously but now this area found to have tremendous development comparatively to other area. Solution provided in computational bases for biological problems through functional analysis, sequence analysis, structural analysis etc. This solution provided a way for tremendous development of various tools and technological for solving real world problems [1-4]. Today the desire and need for development especially new tool development cannot be evaded whose analyses are based on tools features and functionalities [5, 6]. Tools analysis is mainly for recognizing the pitfalls that could be overcome for further development or evading from utilization [7]. Selecting tools and evaluating tools and analyzing it's sustain by means of functionality is a tedious task, requiring vast time. In this viewpoint there is a need for

development for making the task easier and time consuming one.

An automatic tool for identifying and extracting features have been developed for assessing possible measures for carrying out performance evaluation and to analyze the sustain of the tools which laid as a solution to the represented problems. Ontology has been incorporated for providing a better solution which has been narrated in this paper. In section II architecture and functioning methodology have been explained. Where as, in section III carried out evaluation have been explained.

II. ARCHITECTURE AND FUNCTIONING METHODOLOGY

In this section description on overall architectural and functioning methodology for the developed tool have been represented which involves features identification and scope level analyzing for carrying out possible measures for evaluating tools performance. Sustain analysis which is recognized approximately based on the features identification made.

A. Architecture

Here the architecture of the developed automated tool has been represented in figure 1. The processes involved for extracting features from the tool document submitted from which keywords are extracted using *Ontology Phaser* for domain specific. The extracted keywords are stored in temp file replaced with associated words using *Association Locator* and database. Based on the features identified using database scope of the tool is analyzed based on which the tool is weighted. Apart from this possible evaluation measures for the tool for performance analysis is identified by utilizing the database is done by the *Evaluator*. *Sustainer* is responsible for sustain analyses the maintenance requirement and its level from the identified. *Organizer* process is to organize the extracted information in a structured form by categorizing, scope and its level, possible performance evaluation measures and sustain details. *Graph plotter* is responsible for possible metrics for evaluating the specific tools performance, scope level of the tool with tools sustain level.

B. Functioning Methodology

In this section the processing methodology for the developed tool have been explained through procedural approach for identifying features for carrying out analysis and by displaying the assessed result in graph and structure form

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Figure 1: Architecture

have been narrated. Database of the tool consists of predefined set of features, scope and standard metrics by utilization majority of the task get completed. In the tool development we have incorporated ontology for the specified domain specific for identifying features of the existing tools for the uploaded document which is one of the main activities involved.

A. Procedural Approach

Word document file is upload which is considered to be the input for this tool which the only position where human intervention is required where as other activities is automatic. The uploaded file is fully scanned through *Keywords Extractor* using *Ontology Phaser* for keywords identification based both on domain and non-domain bases which is stored in *Temp₁* file. From extracted keywords using *Association Locator* features are identified from the database are represented in *Temp₂* file. *Scope Analyzer* is responsible for identifying the scope of the tool based on the features identified, apart from this tool scope level is evaluated by

$$\sum (F_s * 2) + (P_s * 1.5) \quad (1)$$

Where, F_s is full utilization of scope and P_s is partial utilization of scope. If the scope level is less than or equal to 3, then the scope is considered to be *less*. If the level is greater than 3 but less than or equal to 5, then the scope is considered to be *normal* and if the level is greater than 5 then the scope is considered to be *broad*. *Evaluator* is responsible for

identifying possible set of metrics for carrying out the tools performance from the database based on the identified features. *Sustainer* activity is to identify the level of maintenance easy, better and hard based on the features identified and its requirements through utilization of database. *Organizer* is responsible for plotting graph using *Graph Plotter* and displaying sustains details. Figure 2 and figure 3 represents the graph output of the inputted tool document. Table 3 is the representations of the tool sustain.

III. EXPERIMENTAL RESULTS BASED EVALUATION

Various experiments have been carried out on this tool by uploading various tools document and extracting features apart from this manually extraction have been done from the study of the document which we have discussed in this section. The results have been analyzed based on experiments carried out and is evaluated in terms of time, resources and effort.

A. Time

The tool found to be good in consuming time since the tool is an automatic one where the only place where the human intervention is required is uploading the tool document. Since are the required identifications like scope, performance evaluation and tool sustain is automatically done, it is clearly viewable that the time consumption from tool assessment is very less.

B. Resources

Apart from time consumption resource consumption is

utilizing the developed tool found to be good in effort reduction since manual effort for effort identification, metrics

Figure 2: Scope level Representation

Figure 3: Performance Evaluating Metrics

also very less in terms of human resources. Since the human intervention is only involved in uploading the documents. The tool is also found to be cost effective since human resource consumption is less and tool is freeware.

C. Effort

Identifying features and functionalities for the tools by

identification and analyzing tool sustain. Here effort in terms of time found to have a tremendously reduced by utilizing the tools where there is vast requirement of time for features, performance metrics identification and for arriving at a conclusion for tool sustain.

TABLE 1: SUSTAIN REPRESENTATION

Sustain	GoTreePlu s	Details
Stability	√	-
New Requirements	√	.Net, Windows Platform
Upgradeable	√	
Cost Effective	√	
Internet Based	√	
Mobility	X	
Sustain Level	Easier	

IV. CONCLUSION

The main aim of the paper is to provide a description about the developed automated tool for bioinformatics tool features identification based on the document submitted as input. Set of process have been carried out for efficient usage of ontology which has been incorporated in this paper. Extracted information based on keyword, features are identified for identifying the tools scope and evaluating the scope level. Apart from this based on the identification made possible metrics for tools performance evaluation is identified and tool sustain is analyzed in terms of stability, new requirements, upgradeability etc. The reason behind this development is to reduce effort through automatic tools evaluation rather than manual analysis. The limitation doesn't stop to this and the results observed based on the evaluation carried out in terms of effort, time consuming and resource consuming found to be good.

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