



ISSN: 2319-5967

ISO 9001:2008 Certified

International Journal of Engineering Science and Innovative Technology (IJESIT)

Volume 3, Issue 4, July 2014

Menu Driven Guide in Field of Geotechnology

GREESHMA Nizy Eujine¹, LAMANTO T Somervell² and Dr. N SANKAR³

Abstract --For acceptable documentation, written materials and graphic materials must be legible and understandable. The currently used paper based filing systems and complex file formats are often cumbersome. While hard copies and online databases are available in different fields of civil engineering, a menu driven system is currently unavailable in geotechnical engineering. The work is an initiative to create an electronic dictionary considering the student-teacher application end. Visual Basic and MS Access have been employed to develop the software. The documentation project will compile as much as tens of thousands of geotechnical terms, with respective figures, charts, reference codes etc.

Index Terms—E-Learning, Educational Technology, Electronic Documentation, Microsoft Access, Visual Basic 2008.

I. INTRODUCTION

Electronic dictionary databases, especially those included with software dictionaries are available. They are usually extensive and can contain up to 500,000 headwords and definitions, verb conjugation tables, and a grammar reference section. The work in a nutshell can be described as the development of an “electronic version of a printed book”. One which alone will provide all the details in the field of geotechnology. Only two such books exist so far and they too with their limitations. The contemporary books, which are in reality not easily available, are:

- J. D. Van der Tuin (1989), Elsevier's dictionary of soil mechanics and geotechnical engineering, Elsevier Science. (Digitised in 2009)
- Herbert Bucksch (1997), Herbert Bucksch's Dictionary of Geotechnical Engineering Volumes I (English-German), Springer

The main advantage of the electronic dictionary is, of course, speed. A word can be found quickly without being overwhelmed or "lost" in pages upon pages of words. There is no need for an exercise dealing with the alphabet order, as that skill is no longer a prerequisite of efficient word search. A common question that is likely to arise is ‘Do we still need dictionaries in the age of Google?’ To which we can say that the benefits of this project will be in developing an Offline Resource, with vast information in the field of Geotechnology. Here Links will be provided to similar searches or keywords and only the updated definitions will be obtained.

II. DATA DICTIONARY

A broad distinction is made between general and specialized dictionaries. Specialized dictionaries do not contain information about words that are used in language for general purposes—words used by ordinary people in everyday situations. Published on 15 April 1755 and written by Samuel Johnson, A Dictionary of the English Language, sometimes published as Johnson's Dictionary, is among the most influential dictionaries in the history of the English language. Until the completion of the Oxford English Dictionary, 173 years later, Johnson's was viewed as the pre-eminent English dictionary.

According to Walter Jackson Bate, the Dictionary "easily ranks as one of the greatest single achievements of scholarship, and probably the greatest ever performed by one individual who labored under anything like the disadvantages in a comparable length of time". A technical definition is a definition in technical communication describing or explaining technical terminology. Technical definitions are used to introduce the vocabulary which makes communication in a particular field succinct and unambiguous. A technical dictionary is one containing the technical terms of a particular field. The goal is to make the terminology easy to understand. While definitions of these terms can be helpful, explanations with examples are even better. Therefore, most Tech Terms definitions include examples of how the term is used.

Some organizations developing technical dictionary software's include EDItEUR, NISO (National Information Standards Organization), IEEE, IEFT (The Internet Engineering Task Force), etc



ISSN: 2319-5967

ISO 9001:2008 Certified

International Journal of Engineering Science and Innovative Technology (IJESIT)

Volume 3, Issue 4, July 2014

The oldest available paperback dictionary of civil engineering was brought out in the year 1958 by John S. Scott. Now there are numerous specialized dictionaries available in almost any field of science. Some of the examples include:

- ASM Materials engineering Dictionary
- Biographical Dictionary of People in Engineering
- Biomedical Engineering
- Comprehensive Dictionary of Electrical Engineering
- Dictionary of Financial Engineering
- Dictionary of Computer Science Engineering
- Dictionary of Health and Nutrition
- Dictionary of Materials and Process Engineering
- Dictionary of Mechanical Engineering
- Environment of Engineering Dictionary and Directory
- Pollen Terminology

A data dictionary, or metadata repository, as defined in the IBM Dictionary of Computing, is a "centralized repository of information about data such as meaning, relationships to other data, origin, usage, and format." The term may have one of several closely related meanings pertaining to databases and database management systems (DBMS). A digital or electronic dictionary is either a small handheld computer with integrated reference materials or a PDA or a Smartphone with a dictionary program. Today electronic dictionaries can be consulted online or offline or they can be obtained communicably. The computer installed dictionaries can often be consulted from within any application that uses editable text. The term may be used in broader sense to refer to the features of a machine readable dictionary or spell checker. An advantage of using online dictionary is that it can be used at any place by anyone and it effectively replaces the heavy old book form dictionary. It saves a lot of time since no time is lost in searching for the words/lines required.

Dictionary Software

Dictionary software generally far exceeds the scope of the hand held dictionaries. Many publishers of traditional printed dictionaries such as Langenschiedt, Collins-Reservo, OED - Oxford English Dictionary, Duden, American Heritage, and Hachette, offer their resources for use on desk top and lap top computers. These programs can either be downloaded or purchased on CD-ROM and installed. Other dictionary software is available from specialized electronic dictionary publishers. Some electronic dictionaries provide an online discussion forum moderated by the software developers and lexicographers.

Several developers of the systems that drive electronic dictionary software offer API and SDK - Software Development Kit tools for adding various language-based (dictionary, translation, definitions, synonyms, and spell checking and grammar correction) functions to programs, and web services such as the AJAX API used by Google. These applications manipulate language in various ways, providing dictionary/translation features, and sophisticated solutions for semantic search. They are often available as a C++ API an XML-RPC server a .NET API, or as a PYTHON API for many operating systems (Mac, Windows, Linux, etc.) and development environments, and can also be used for indexing other kinds of data. In this work Visual Basic 2008 Programming Language is used for developing the dictionary of Geotechnical Engineering.

III. SOURCES OF DATA

Numerous terms exist in the field of Geotechnology. Collection of all these jargons is to be done in a systematic mode. Thus only few handbooks. Those currently selected include:

1. Hsai-Yang Fang, *Foundation Engineering Handbook*, Springer, NewYork, USA, 1990. The book has been restricted to foundations on soil and similarly behaving soft and uncemented rock excluding those on hard rock, which present fundamentally different problems.
2. Robert W. Day, *Foundation Engineering Handbook - Design and Construction with the 2006 International Building Code*, McGraw-Hill, New York, USA, 2006. This practical resource offers complete coverage of foundation engineering, emphasizing the geotechnical aspects and the use of the 2006 International Building Code. The handbook explains how to develop a complete program of foundation investigation, conduct geotechnical field and laboratory studies, and analyze data for the design of foundations. Evaluating construction and preparing foundation engineering reports is also covered.



ISSN: 2319-5967

ISO 9001:2008 Certified

International Journal of Engineering Science and Innovative Technology (IJESIT)

Volume 3, Issue 4, July 2014

3. Nagaratnam Sivakugan, Braja M. Das, *Geotechnical Engineering: A Practical Problem Solving Approach*, J. Ross Publishing, Florida, USA, 2009. A practical problem solving approach covering all of the major geotechnical topics in the simplest possible way adopting a hands-on approach with a very strong practical bias is emphasised in the book.
4. Robert W. Day, *Geotechnical And Foundation Engineering: Design And Construction*, McGraw-Hill Professional, New York, USA, 1999. The book is designed to give engineers a crash course in all aspects of modern geotechnical and foundation engineering takes readers step-by-step through the typical process of a design project--from proposal-writing to the final preparation of the "as built" report includes numerous visual aids: photographs, charts, tables, and more than 350 illustrations
5. Robert Wade Brown, *Practical Foundation Engineering Handbook*, McGraw-Hill Prof Med/Tech, New York, USA, 2001. Real solutions are dealt with this groundbreaking, problem-solving guide. Based on the expertise of a distinguished team of soil and foundation engineers, this expanded and updated handbook clarifies and simplifies every part of the job, from site assessment through design, and construction, to remediation of failed foundations.
6. Braja M. Das, *Principles Of Foundation Engineering*, Cengage Learning, New Delhi, India, 2010. The book maintains the careful balance of current research and practical field applications that has made it the leading text in foundation engineering courses. Featuring a wealth of worked-out examples and figures, the book introduces civil engineering students to the fundamental concepts
7. S. W. Buol, *Soil Genesis And Classification*, Wiley-Blackwell, New Jersey, USA, 2003. A spectrum of soil classification systems are reviewed and presents the culmination of more than two decades of testing and revisions in the U.S. The classic textbook explains the function and use of soils, soil formation and categorization, and details how this dynamic natural entity evolves from natural factors and processes and interfaces with ecosystems and human interferences
8. Karl Terzaghi, Ralph Brazelton Peck, Gholamreza Mesri, *Soil Mechanics In Engineering Practice*, Wiley-IEEE, California, USA, 1996. This is one of widely used and authoritative textbook on sale. Over the past many decades this book has been considered as the bible of soil mechanics.
9. Manjriker Gunaratne, *The Foundation Engineering Handbook*, Crc/Taylor & Francis, Wales, UK, 2006. This guide is a comprehensive reference for foundation engineers that incorporates the state of the art concepts and techniques.
10. Braja M. Das, *Theoretical Foundation Engineering*, J. Ross Publishing, Florida, USA, 2007. The work provides in-depth reviews of the existing literature on lateral earth pressure, sheet pile walls, ultimate bearing capacity of shallow foundations, holding capacity of plate and helical anchors in sand and clay, and slope stability analysis.

Apart from the above mentioned few widely used text books / hand books, with the advances in the usage of internet on every increasing education and practice, there are many useful internet sites on Geotechnical Engineering and Foundation Engineering. These sites consist of many geotechnical engineering portals, resource sites, and university home pages on Geotechnical Engineering etc. Although is number of such sites have been referred in this work, only a few are cited here and they include:

www.babylon.com

www.casaplusconstruction.com

www.globalspec.com/definitions/civil_engineering

www.eggpedia.com/civil-engineering-encyclopedia/dictionary

www.earthtech.net/commercial/edu_res_terminology.php

IV. PROGRESS OF WORK

The software program has been developed. About 4250 terms have been compiled. The software database is updated every day adding new terms, related content, verifying data etc.

A. Features of the Software

- Automatic cross-reference tracking
- Bubble Help or Tool Tip
- Case Insensitive Search Bar
- Export facility of text to a particular format (MS Word etc)
- Functionality in different operating systems
- Homogeneous data structure
- Immediate dictionary entry preview



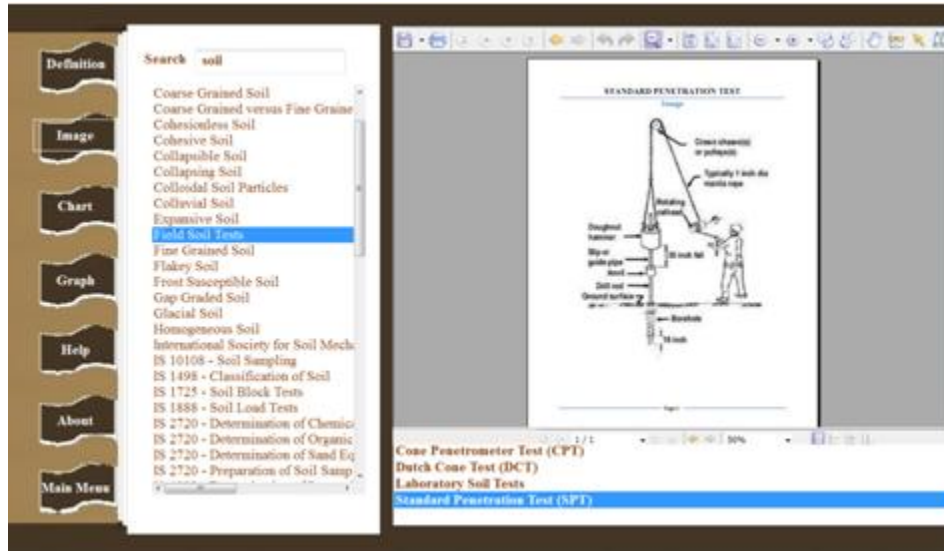
ISSN: 2319-5967

ISO 9001:2008 Certified

International Journal of Engineering Science and Innovative Technology (IJESIT)
Volume 3, Issue 4, July 2014

- Related Words and Reference Code Links
- Side-by-side view
- Text Zoom-in Facility is included
- Video Data

B. Program Screenshot



V. CONCLUSION

Information is everywhere, overwhelming and difficult to find when we need to use it. Learning and knowledge management share a similar focus: how to enhance human knowledge and its use within organizations. Both learning and knowledge management are looking for ways to categorize and store knowledge. Therefore a documentation process is crucial.

At the same time, research supports the intuitively appeal of technology based instruction. Blended learning combines e-learning tools with traditional classroom training to ensure maximum effectiveness. A documentation software package would assist in the new era educational technology. This work as stated earlier is an initiative to provide a source for e-learning especially in the field of geotechnical engineering. A model has already been prepared. As data collection continues, the number of terms included will increase so will the reliability of the dictionary program. More additions and modifications will be added to make it more user friendly and aesthetic.

REFERENCES

- [1] Baker, M. (1997). From document design to information design. In: Proceedings of the 15th Annual International Conference on Computer Documentation (pp. 7–10). Snowbird, UT.
- [2] Hackos, J. (1997). Online documentation: the next generation. In: Proceedings of 1997 ACM Conference on Systems Documentation (pp. 99–104). Snowbird, Utah.
- [3] Herbert Bucksch (1997) Herbert Bucksch's Dictionary of Geotechnical Engineering Volume-I (English-German), Springer.
- [4] Luciana Carabeanu (2009), Trends in E-Learning, Technical University of Civil Engineering, Bucharest.
- [5] www.civilcraftstructures.com/civil-subjects.
- [6] www.extensis.com.
- [7] www.geodata.cosmos-data.org.
- [8] www.msdn.microsoft.com/vb.



ISSN: 2319-5967

ISO 9001:2008 Certified

International Journal of Engineering Science and Innovative Technology (IJESIT)

Volume 3, Issue 4, July 2014

AUTHOR BIOGRAPHY



Greeshma Nizy Eujine

Completed B. Tech from University of Kerala, India in 2010
Completed M.Tech from National Institute of Technology Calicut, India in 2012
Worked for a year as Assistant Professor in Bishop Jerome Institute, Kollam, Kerala, India.
Currently pursuing Ph.D at National Institute of Technology Calicut, India
Research Area – Ground Improvement
Member of Indian Society of Civil Engineers (ISCE) since 2012
Member of Indian Geotechnical Society since 2013



Lamanto T Somervell

Completed B. Tech from M.G.University, Kerala, India in 2008
Completed M.Tech from University of Kerala, India in 2010
Worked for 6 months as Site Engineer at Kent Constructions Pvt. Ltd, Cochin, Kerala, India
Worked for 16 months as Guest Lecturer at College of Engineering, Trivandrum, Kerala, India
Worked for 12 months as Assistant Professor in MBCET, Trivandrum, Kerala, India
Worked for 18 months as Assistant Professor in Bishop Jerome Institute, Kollam, Kerala, India
Currently pursuing Ph.D at National Institute of Technology Calicut, India
Research Area – Coastal Protection
Presented a technical paper in the National Conference on Advances in Civil Engineering held at Mar Baselios College of Engineering and Technology (MBCET), Thiruvananthapuram on 3rd December 2011.
Presented a technical paper in the International Conference on Technological Trends held at College of Engineering Trivandrum, during 25 to 27 November 2010.

- Presented and Participated in Poster Presentation sponsored by Center of Engineering Research and Development (CERD), held at College of Engineering Trivandrum on 24th November, 2010.
- Presented a technical paper in the National Conference on Recent Innovations in Technology held at Rajiv Gandhi Institute of Technology, Kottayam, during 4 to 6 March 2010.
- Undergone Industrial Training in Water Transport Division of **National Transportation Planning and Research Centre (NATPAC)**, Thiruvananthapuram, as a part of our academic work and completed a project entitled “**Status Report of Water bodies in Trivandrum District**” and also undergone training in surveying using **Echo sounder** and **DGPS** from 15-12-2009 to 01-01-2010.
- Member of Indian Geotechnical Society since 2013



Dr. N Sankar

BSc (Engg), Civil Engineering, University of Kerala.
M.Tech. Civil (Soil Engineering), IIT Madras.
Ph.D. Offshore Engineering, IIT Madras.
Professor, Department of Civil Engineering NITC R.E.C. P.O Calicut – 673601
Actively involved in consultancy activities of the Department related to soil testing and foundation design
Carried out / involved in more than 400 geotechnical engineering consultancy works through the department
Professor, Department of Civil Engineering NITC R.E.C. P.O Calicut – 673601
Research Interests: Soil-Structure Interaction, Computer Applications in Geotechnical Engineering, Expert System Applications in Geotechnical Engineering