

A Research including e-learning platform based on Java Technology in Civil Engineering

Shachindra Kumar Dubey

Faculty of Computer Science and Engineering Department
Jabalpur Engineering College
Jabalpur, India
sachindrakumar000@gmail.com

Abstract— *Certain tools and technology, designing and construction parts arising throughout the e-learning platform that means to describe the intellectual and technical development of educational technology. With the development of computer technology, e-learning platform or e-learning foundation has been applied to different professional teaching field. This paper explores the Java e-learning platform on the basis of design theory, construction tools and practice, construction management techniques and the surveying parts.*

In the learning process including Java platform, on the base of engineering practice students can get further promotion of knowledge of theory.

Index Terms — **Java Technology, Construction techniques, Electronic learning, Java Applet, Learning systems, Testing.**

INTRODUCTION

Totally depends on what we are doing as a civil engineer. We are on shore construction/building something or sitting off shore building applications that help us company doing better business. If our answer is the former one, then we guess, a Java or a .Net is not required. If it's the latter one, then yes, we would require easily to learn a programming language.

Java is a set of computer software and specifications developed by Sun Microsystems that provides a system for developing application software and deploying it in a cross-platform computing environment. Java is used in a wide variety of computing platforms from embedded devices and mobile phones to enterprise servers and supercomputers.

The Java platform is a suite of programs that facilitate developing and running programs written in the Java programming language. A Java platform will include an execution engine (called a virtual machine), a compiler and a set of libraries; there may also be additional servers and alternative libraries that depend on the requirements. Many colleges and universities offer courses in

programming for the Java platform. The Oracle Academy provides a complete portfolio of software, curriculum, hosted technology, faculty training, support, and certification resources to K-12, vocational, and higher education institutions for teaching use, including a Java offering that will support hundreds of thousands of students.

A platform is the hardware or software environment in which a program runs. We've already mentioned some of the most popular platforms like Microsoft Windows, Linux, Solaris OS, and Mac OS. Most platforms can be described as a combination of the operating system and underlying hardware. The Java platform differs from most other platforms in that it's a software-only platform that runs on top of other hardware-based platforms. Young people are learning programming languages from the earliest ages and up. Visual educational tools such as Alice, Greenfoot and BlueJ tools teach young people how to program using the Java programming language, and Java-based languages developed for ease of use. The general-purpose, high-level Java programming language is a powerful software platform. Every full implementation of the Java platform gives us the following features like development tools, application programming interface, deployment technologies, user interface toolkits and integration libraries.

This paper aims to make a contribution to these debates by exploring how to explore the fundamentals of object-oriented software design and development, computational methods and sensing for engineering and scientific applications. This paper discusses and covers the designing, graphical user interfaces and construction parts.

BROAD DEFINITIONS TO SUPPORT DISCUSSION

Sun announced in Java One 2006 that Java would become free and open source software, and on October 25, 2006, at the Oracle Open World conference, Jonathan I. Schwartz said that the company was set to announce the release of

the core Java Platform as free and open source software within 30 to 60 days.

The Java platform provides a security architecture which is designed to allow the user to run untrusted bytecode in a "sandboxed" manner to protect against malicious or poorly written software. This "sandboxing" feature is intended to protect the user by restricting access to certain platform features and APIs which could be exploited by malware, such as accessing the local file system, running arbitrary commands, or accessing communication networks.

In general, civil engineering is concerned with the overall interface of human created fixed projects with the greater world. General civil engineers work closely with surveyors and specialized civil engineers to design grading, drainage, pavement, water supply, sewer service, dams, electric and communications supply.

Throughout ancient and medieval history most architectural design and construction was carried out by artisans, such as stonemasons and carpenters, rising to the role of master builder. Knowledge was retained in guilds and seldom supplanted by advances. Structures, roads and infrastructure that existed were repetitive, and increases in scale were incremental.

I. CONSTRUCTION ENGINEERING : A PERSPECTIVE

Construction engineering technology is a professional discipline that deals with the designing, planning, construction, and management of infrastructures such as roads, tunnels, bridges, airports, railroads, facilities, buildings, dams, and utilities. These technicians are unique such that they are a cross between civil engineers and construction managers. Construction engineering technologists learn the designing aspect much like civil engineers and construction site management functions much like construction managers.

At the educational level, construction managers are not as focused on design work as they are on construction procedures, methods, and people management. Their primary concern is to deliver a project on time, within budget, and of the desired quality.

The difference between a construction engineering technologist and a civil engineer is that civil engineering is an engineering discipline. Civil engineering students concentrate more on the design work, which is more analytical, gearing them toward a career as a design professional. This essentially requires them to take a multitude challenging design courses. Construction engineering students take basic design courses as well as construction management courses. This allows them to understand both basic design functions as well as the building requirements needed to design and build today's infrastructures.

II. WEB BASED RESEARCH E-LEARNING PROGRAM

Many of the online research methods are related to existing research methodologies but re-invent and re-imagine them in the light of new technologies and conditions associated with the internet. The field is relatively new and evolving. With the growth of social media's a new level of complexity and opportunity has been created. Inclusion of social media research can provide unique insights into consumer and societal segments and gaining an "emotional" measure of a population on issues of interest.

Web-based training (sometimes called e-learning) is anywhere, any-time instruction delivered over the Internet or a corporate intranet to browser-equipped learners. There are two primary models of Web-based instruction: synchronous (instructor-facilitated) and asynchronous (self-directed, self-paced). Instruction can be delivered by a combination of static methods (learning portals, hyperlinked pages, screen cam tutorials, streaming audio/video, and live Web broadcasts) and interactive methods (threaded discussions, chats, and desk-top video conferencing).

III. JAVA APPLETS IN CIVIL

As noted by Crisp (2002), Java applets are small, web-based applications written using the Java™ language and they are consistent with the active constructivist approach where students are engaged in activities that encourage and facilitate learning. Nair et al. (1996) identified a number of advantages

of Java-based applets, including they:

- (i) can be made widely available and can be run from a local computer;
- (ii) are platform-independent;
- (iii) provide browsers with a high degree of dynamism; and
- (iv) enable sophisticated animation.

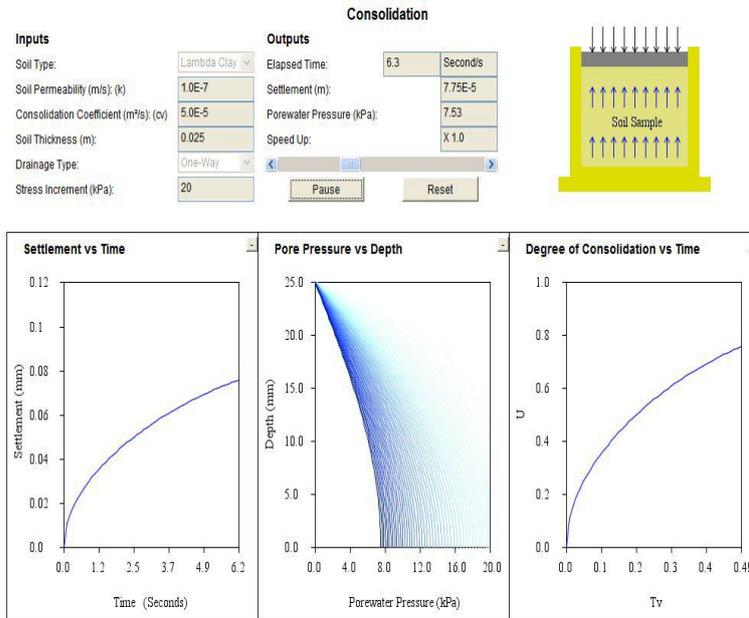
Java applets can be embedded in course web sites or used as a simulation tools in classroom environments, and provide interactivity to engage students in active learning (Crisp, 2002). A great number of examples of Java applets, developed across the broad range of higher education disciplines, are provided by Crisp (2007).

Very recently, Java applets have been developed to facilitate geotechnical engineering simulations. For example, TAGA Engineering Software Ltd. (2009) provides a relatively simple Java applet for the solution of an infinite slope.

A. CONSOLIDATION PROCESSES

This applet provides an introduction to the processes that occur during one-dimensional consolidation. The applet

allows the user to choose one of the 6 standard soils described above, or user-specified soil properties, one- or two-way drainage, the thickness of the consolidating layer, the stress increment, and the time interval between results. The applet subsequently displays the consolidating layer, as well as plotting in real-time, graphs of excess pore water pressure vs. depth of the layer, and the change in layer thickness vs. time, as shown in given Figure.



B. DIRECT SHEAR TEST IN SAND

This applet provides a graphical representation of the direct shear test performed on specimens of sand. The user may select either dry sand, or a saturated sand with water pressure, tested in a loose, medium, or dense state. After specifying the hanger load, the applet then animates the test apparatus and plots the results on shear stress vs. displacement and a normal stress vs. peak shear stress graphs. The user is then able to perform additional tests with different hanger loads, after which, the user may estimate the internal angle of friction, ϕ , as shown in given Figure.

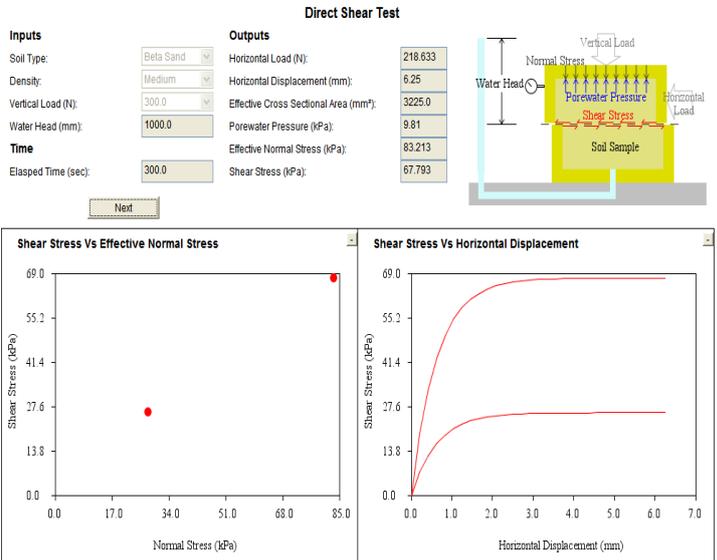
C. PERMEABILITY TEST

This applet provides the user with an introduction to the measurement of the permeability of soils by means of the falling head test. After specifying one of CATIGE's (Computer Aided Teaching in Geotechnical Engineering) 6 standard soils, an air pressure and a simulation time interval, the applet provides an animated representation of the test, and the head of the water in the standpipe is plotted against the simulation time. The user is able to start and stop a timer, thereby enabling values to be recorded throughout the test. After completing the test the

user is able to evaluate the coefficient of permeability of the soil.

IV. INSIDE CIVIL ENGINEERING DESIGN

Civil Engineering is a profession that dates back thousands



of years. Civil engineers design and supervise the construction of the infrastructure that is essential to daily life. Aiding the civil engineer in this job are the technologists who use drafting and design tools to bring the engineer's ideas to fruition.

From office buildings and airports to sewage plants and transportation systems, civil engineers and their technology teams have a hand in building it all. The technologist or drafter uses CADD (computer aided design and drafting) and other technologies to help design buildings and other structures.

Airports, bridges, sewer systems and water plants all have one thing in common - they started out on the drawing board of a civil engineering drafter.

CONCLUSIONS

This paper has commenced a discussion on the implications of Java technologies for Civil Engineering students. While making any projects they may easily use the applet part or coding part while creating their own projects. For the purpose of building drawing or design and also the bridge construction the students of civil engineering, they may use the code of Java applet while creating their projects.

This paper has also discussed how the process of e-learning creates certain tools for Java programming while making testing in civil engineering projects.

REFERENCES

- [1] Amazon, AWS Security Center, Seattle, Washington (aws.amazon.com/security).
- [2] <https://docs.oracle.com/javase/tutorial/getStarted/intro/cando.html>
- [3] [https://en.wikipedia.org/wiki/Java_\(software_platform\)](https://en.wikipedia.org/wiki/Java_(software_platform)).
- [4] Yangzongkai, Wudi, and Liuqingtang. Network Education standards and Technical [M]. Beijing: Tsinghua University Press. 2003.
- [5] Caicuiping, Tangdashi. Java Program Design. Beijing: Tsinghua University Press. 2003.
- [6] U.S. Department of Justice: http://www.fbi.gov/news/stories/2011/november/malware_110911.
- [7] Help Net Security: <http://www.net-security.org/secworld.php?id=11513>.
- [8] Zhaowanfang, Xujungang, Tianwei. The study and realization of digital circuit multimedia web leaning system[[]].2003.
- [9] Hujing, Hanxiaodong, and Huxichun. Distance Education in China[M]. 2010.6.
- [10] Department of Defense: Department of Defense Cyberspace Policy Report: A Report to Congress Pursuant to the National Defense Authorization Act for Fiscal Year 2011, Section 934. Department of Defense, United States of America (2011).
- [11] Department of Defense: Department of Defense Strategy for Operating in Cyberspace. Department of Defense, United States of America (2011).
- [12] Wiggins,G.(1998) Educative Assessment: Designing Assessments to Inform and Improve Student Performance, Jossey-Bass Publishers.
- [13] Giova Giuliano, Improving Chain of Custody in Forensic Investigation of Electronic Digital Systems, Internal Journal of Computer Science and Network Security, Vol. 11 No.1, January 2011.
- [14] Cobourn, W.G. and Lindauer, G.C (1994) " A Flexible Multimedia Instructional Module for Introductory Thermodynamics." Engineering Education Volume 83.
- [15] Davison, L. R. (1996). GeotechniCAL – computer assisted learning in geotechnical engineering. In M.B. Jaksa,W.S. Kaggwa & D.A. Cameron (Eds.), *Proceedings of the 7th Australia New Zealand Conference on Geomechanics* (pp. 957-963). Adelaide, Australia: AGS.