

Using Shareware Resources in the IE Curriculum

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Abstract

The World Wide Web (WWW or web) and the Internet allow access to a variety of resources that can be incorporated into the Industrial Engineering (IE) curriculum. The use of information technologies as an integral part of a course tends to increase student enthusiasm and makes communications and data exchanges more efficient. The web contains a plethora of information, including software packages that are available for nominal fees – some of which are free. This software is referred to as shareware. Numerous shareware programs can be used for industrial engineering applications.


This paper offers guidelines for selection and evaluation of shareware resources on the web for academic use and interjection of these resources into the industrial engineering curriculum. The objective is to leverage the Internet and the interest students have in it to increase both the efficiency and effectiveness of the IE educational process.

Introduction

The Internet can be used or accessed almost anywhere on this planet. Although the Internet is known as a great resource, it is not often used fully for educational purposes within engineering. Shareware programs are one small resource that is available from the Internet. Shareware is basically computer software that anyone can download whether from the Internet or by other means that is free for a limited time. When that limited time has passed, the user must pay to continue using the software. Shareware encompasses a wide range of programs that can be used for many different purposes. The purpose to this paper is to show how shareware programs are useful to the industrial engineering curriculum.

Evaluation

Selection of shareware programs and other software should be taken seriously. From “The History of Shareware and PsL,” many programmers were purposely crippling their software since some of the consumers did not pay when the allotted time had ended. An organization called the Association of Shareware Professionals (ASP) was formed to address the problems associated with corrupted programs. ASP was formed in April 1987 to strengthen the future of shareware (user-supported software) as an alternative to commercial software. Its members, all of whom subscribe to a code of ethics, are committed to the concept of shareware as a method of marketing software developed by small companies or individuals. Thus, consumers can have

more trust that when the logo  is on the software, the program is deemed reliable and technical support will be available if any problems arise with its use.

Several programs that are applicable in IE have been identified and evaluated. The evaluations are based, primarily on literature review of the software. The program technical descriptions and relevant literature discussions, not personal analysis, were combined to obtain an assessment of each shareware program. Thus, a program may or may not have the specified features as described in its description, or the features may not operate as described.

The download sites approved by ASP include some of the following:

200 Shareware Links	http://www.200sharewarelinks.com
AB Archive	http://www.ab-archive.com
ASP PAD Repository	http://www.asp-shareware.org/pad/padlib.asp
CNET	http://download.com
Download Fast	http://Downloadfast.com
Filebasket	http://www.filebasket.com
Global Software Solutions	http://www.globalsoftwaresolutions.net
Niche Shareware Exchange	http://www.nichesharewarexg.com
Programmers Heaven	http://www.programmersheaven.com
Quality Shareware	http://quality-shareware.com
Simtel	http://www.simtel.net/simtel.net
Wap-Shareware	http://www.wap-shareware.com

Shareware for Industrial Engineering

Based on the twenty subject areas tested on the Industrial Engineering specific Fundamentals of Engineering (FE) exam, pertinent IE subjects were identified. Then, the Association of Shareware Professionals web page was searched to find reliable programs that could be used in the IE curriculum. The following IE topics were searched to find relevant shareware: engineering economics, engineering statistics, industrial cost analysis, material handling systems, queuing modeling and simulation, operations research, production planning, total quality management, and work performance. Following are descriptions of the problems addressed by each topic, the tools and techniques used to address those problems, and the shareware programs that can be used to facilitate the solving of those problems.

Engineering Economics

Engineers not only design projects, they also justify implementation of those projects. They must consider whether a project will offer some net benefit to the people who will be affected by it; and they must consider the cost of consuming natural resources, both in the price that must be paid for them and the realization that once they are used for that project, they will no longer be available for any other project(s). In searching and selecting different programs for engineering economics, certain features were deemed critical for effectiveness: cash flows, financial conversions, whether or not files can be imported and or exported, operating system, future analysis, and graphical displays.

Programs	Cash Flow	Financial Conversions	Import/Export	OS	Future Analysis	Graphical Display	ASP
Calc98 v.4.5	Y	Y	NS	Win	N	N	N
Cash Flow Plan Lite v. 1.1	Y	Y	Y	NS	Y	Y	Y
Project Risk Analysis v.2.0	NS	N	Y	NS	N	NS	N

Other programs useful to engineering economy are as follows:


ASP	Developer	Shareware Program	Description
	Flow Simulation Ltd.	Calc98 v.4.5	Scientific engineering statistical and financial calculator, with conversions.
	Katmar Software	Project Risk Analysis v.2.0	Determine project risk and contingency required.
	ShowMe Software	ProKon v.9.9f	Engineering calculator with multiple conversions and calculation modules
	Katmar Software	Uconeer v.1.0	Freeware units conversions for engineers. 370 units in 42 categories.
	Calcom	Cash Flow v.2.2	Smart and simple finance planner with charts, printing, reoccurring payments






Engineering Statistics

Major aspects of engineering statistics are descriptive statistics, statistical test and confidence intervals for one and two samples, building regression models, designing and analyzing engineering experiments, statistical process control, and some probability and probability distributions. Features in engineering statistics programs consist of statistics and techniques, curve fitting, graphical display, importing/exporting of files, and ASP assured.

Programs	Statistics and Techniques	Curve Fitting	Graphical Display	Importing/Exporting	ASP
DataFit v.7.1	Y	Y	Y	Y	Y
WINKS v.4.62	Y	Y	Y	Y	Y

Other shareware programs:





ASP	Developer	Shareware Program	Description
	ApsSoft	Advanced System Agent v.2.47	Powerful multifunctional software that does almost EVERYTHING!
	Laurent Destailleur	AWStats v.2.23	AWStats—Free GNU log file analyzer for advanced web statistics (IIS or apache)
	Oakdale Engineering	DataFit v.7.1	DataFit curve fitting, statistical analysis and data plotting software.

 ASP	ESB Consultancy	ESBPDF Analysis v.1.5	Easy to use Probability Distribution Calculator with Help & Tutorials.
 ASP	Research Support Service	StatCalc II v.2.1.1	StatCalc II calculates descriptive and inferential statistics.
 ASP	Contact Plus Corporation	Stats 2000 v.1.8	3D freeware animated disk statistics
 ASP	VARed Software	VAR Grade 2000 v.3.00.22	Flexible gradebook program for teachers that has plots, statistics, attendance.
 ASP	TexaSoft	WINKS v.4.62	Statistical data analysis software for business, science, marketing, and education.
	Wheatworks Software, LLC	APR Spread Calculator v.1.0.01	Uses the Actuarial Method of calculating APR's for mortgage loans.

Industrial Cost Analysis

Cost analysis and/or control of industrial enterprises is a major activity for industrial engineers. It involves economic budgeting, planning, decision making, and financial analysis for engineering and engineering management. Features within this search consisted of report generator, tracking, wide range of usage, and ASP assured.

Programs	Report Generator	Tracking	Range of Usage	ASP
Fleet Maintenance Pro v.7.0	Y	Y	N	Y
STRACfast Maintenance v.2.0	Y	Y	Y	Y


ASP	Developer	Shareware Program	Description
	Timewatch plc	1 Absolutely FreeTime v.9.0	Freeware version of our Commercial Time Recording, Billing, Costing PSA System.
	Amibroker.com	AmiBroker v.3.45	Advanced technical analysis, charting, and back-testing of stocks and commodities.
 ASP	Innovative Maintenance Systems	Auto Maintenance Pro v.8.0	Tracks and organizes preventive maintenance for home vehicles and/or equipment.
 ASP	Innovative Maintenance Systems	Fleet Maintenance Pro v.7.0	Tracks and organizes preventive maintenance for fleet vehicles and/or equipment.
 ASP	Innovative Maintenance Systems	STRACfast Maintenance v.2.0	Track preventive and repair mtc for any type of object. Generates mtc history.
 ASP	Flying Pig Software	Your Loan Partner v.1.6	All purpose loan analysis and calculation program

Material Handling Systems

Material handling is the storage, control, and movement of items from the raw material stage to distribution of the finished product. Material handling itself adds no value to a product and

should be done as efficiently as possible. Features within this topic consist of report generator, tracking, queries, and ASP assured.


Programs	Report Generator	Tracking	Queries	Graphical Display	ASP
iTrex v.1.51	Y	Y	Y	N	N
Pile Volume v.1.5.0	Y	Y	N	Y	Y

ASP	Developer	Shareware Program	Description
	Xelos	iTrex v.1.51	iTrex is a full featured inventory management system
	ENVIRON.COM	MSDS Executive v..75	Import, manage, and access your Material Safety Data Sheets (MSDS) for OSHA
	Gorman Business Services	Pile Volume v.1.5.0	Exact volumes provided in storage pile, bin, and stacking of bulk materials.

Queuing Modeling and Simulation

A simulation is the execution of a model, represented by a computer program that gives information about the system being investigated. The simulation approach of analyzing a model is opposed to the analytical approach, where the method of analyzing the system is purely theoretical. As this approach is more reliable, the simulation approach gives more flexibility and convenience. The activities of the model consist of events, which are activated at certain points in time and in this way affect the overall state of the system. Features within this topic consist of code generator, graphical display, file and/or visual conversions, ASP assured.


Programs	Code Generator	Graphical Display	File/Visual Conversion	ASP
Metamill v.1.0	Y	Y	Y	Y
Sheet Lightning v.3.60	N	Y	Y	N

ASP	Developer	Shareware Program	Description
	Metamill Software	Metamill v.1.0	Model UML diagrams and generate Java/C++ using shared element repository
	NeuroDimension, Inc	NeuroSolutions v.4.0	Flexible and graphical neural network development tool with genetic optimization
	Porpoise Media	Well Logger v.2.7.3	Makes drafting soil boring logs and well construction diagrams easy.
	RevCAD Software	Sheet Lightning v.3.60	Sheet metal 3D CAD design and unfold with parametric dimensioned design library
	Neural Planner Software	EasyNN v.7.5	Create, train, validate, query neural networks, converts plain text to grid form

Operations Research

Operations research is the science of rational decision making and the study, design and integration of complex situations and systems with the goal of predicting system behavior and improving or optimizing system performance. It encompasses managerial decision making, mathematical and computer modeling and the use of information technology for informed decision-making. Features within operations research consist of matrices, optimization, report generator, ASP assured.




Programs	Matrices	Optimization	Report Generator	ASP
1D Stock Cutter v.1.7	Y	Y	Y	Y
Linear Algebra v.1.00	Y	Y	N	N
Matrix TCL v.2.0	Y	Y	N	N

ASP	Developer	Shareware Program	Description
 ASP	Research Support Service	Data Entry v.1.3	Data entry tool, analyzer, learn research data file basics.
	Techsoft Pvt. Ltd	Matrix TCL v.2.0	Matrix template class library for doing matrix calculations in C++ programs

Production Planning

Production planning and control involves the systematic planning, coordinating, and directing of all manufacturing activities and influences to insure having goods made on time, of adequate quality, and at reasonable cost. Specific activities include forecasting, inventory planning and control, and scheduling and sequencing of the work. Features within this topic consist of calculations, report generator, graphical displays, and ASP assured.

Programs	Calculations	Report Generator	Graphical Displays	ASP
PlanBee project management planning tool v.1.0c	Y	Y	Y	Y






ASP	Developer	Shareware Program	Description
 ASP	Creative Software	Analyzer v.3.1	Analyzer is database and reporting software for storing daily time sheet data
 ASP	Guy Software	PlanBee project management planning tool v.1.0c	Critical path project management planning tool – alternative to MS Project
 ASP	Pine Grove Software	SolveIT!, The Financial Calculator v.5.0d	Fast, easy-to-use collection of 33 financial calculators, schedules, and advisors.

	OWL Software	Simple Business Invoicing & Inventory v.2.1.1.25	Easy to use invoicing, billing, inventory and customer management
	AMF	Wordware v.2000	Wordware: The most comprehensive productivity tools and templates for Word

Total Quality Management




Total Quality Management is a structured system for satisfying internal and external customers and suppliers by integrating the business environment, continuous improvement, and breakthroughs with development, improvement, and maintenance cycles while changing organizational culture. Features within this section consist of user friendly, customization, report generator, and ASP assured.

Programs	User Friendly	Customization	Report Generator	OS	ASP
SPOTS v.4.0	Y	Y	Y	Win	Y

ASP	Developer	Shareware Program	Description
	PIM+ Ltd	A-book v.2.1	A-book is a contact manager that offers powerful data-management features
	Hibase Group	HiBase 2000 Personal Edition v.1.01b	User-friendly but power database management program
	Merlinholm Systems	Merlinholm OutBack v.1.12	OutBack is an in/out board that allows everyone to know where everyone is
	OroLogic Inc	OroGes Temps v.3.53	The simplest way to manage time by project.
	Quma Software, Inc	QVCS-Pro v.3.5c	QVCS-Pro is an affordable version control system that includes IDE integration
	Lobstersoft	Software Administration Kit v.1.5	Powerful order administration tool for software authors and e-commerce vendors.
	Digital Business Solutions, Inc	SoftwarePROTECTOR v.1.0	Software license management system to protect your development efforts
	SolarWinds.Net	SolarWinds Professional Edition v.2.2	A collection of 25 network discovery, monitoring, and management tools
	Accord Software & Systems Pvt Ltd	SPOTS v.4.0	General-purpose issue tracking tool to enhance workgroup productivity.
	Pacestare Software	WizFlow Flowcharter v.3.0d	User friendly drawing tool for creating quality flowcharts quickly

Work Performance

Work performance involves the design and measurement of work and procedures involved in creating a finished product or service. Specific activities include work simplification, work measurement, and processes improvement. Features included in this topic consist of monitoring.

ASP	Developer	Shareware Program	Description
	CoperNet	EvenTrigger for Windows 2000 v.1.0	EvenTrigger is a real-time eventlogs monitoring tool
	Winshare	Healthy Work v.3.0	Ergonomic stretching software for achieving healthy computer use
	Future Trend Software	Personal Mouse Mover v.3.0.0	Simulates human user working with the computer. Moves mouse as real human.
	RSIGuard Software	RSIGuard v.1.0	Repetitive Strain Injury prevention through awareness and trauma reduction
	Para Technologies	Stretch Break v.4.5	Reminds you to take stretch breaks. Animated figures show you how....
	NesterSoft Company	WorkTime v.3.0	Versatile project tracker that surveys the time you spent working with your PC

Other Resources in Industrial Engineering

Among things discussed earlier, another resource to the education to engineering is its faculty. These professors can aid in leading students to finding and picking the right topics for research. Faculty also aid in bringing research to their universities and/or colleges. Also, each engineering discipline has its corresponding societies. These societies have a wide range of information from their own websites that can aid in finding research as well.

Conclusion

The Internet can be a valuable asset if used to its fullest. Shareware programs can also aid in helping engineering educators make learning fun and affordable for their students. Not all shareware programs are applicable for the classroom, but many are. This paper identified some shareware that can be incorporated into the IE curriculum.

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Bibliographical Information

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