



COMPANY PROFILE

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Company Overview

Who we are & what we do

Simulation Engineering Technologies (SET) is an independent consulting company and a leader specialising in creating accurate discrete-event computer simulation models of complex systems in mining, rail, logistics, manufacturing and service industries. Our team consist of a number of industrial engineers with a unique blend of experience in conducting simulation, scheduling and business improvement studies to provide maximum value to clients.

SET is also a supplier of the Simio® and SimMine® simulation software packages in Africa, Canada and the Middle East. Simio® is used to provide risk based planning and scheduling solutions that can integrate with MES systems. We also supply the Optislot® warehouse slotting optimisation software and ACT-OR optimisation software for the logistics and warehousing environment. SET was established in 2004 and its senior staff have been in the simulation industry since 1995. We provide consulting services to the world's leading companies including Rio Tinto, Vale, BHP Billiton, Anglo American, Unilever, SAB and WorleyParsons.

Our professional services include the application of various industrial engineering techniques and principles. Through our in-depth understanding of developing, improving, implementing and evaluating complex processes and systems, we offer world-class solutions for our clients, operating from our offices in Centurion and Cape Town.

Using simulation and optimisation technology has many advantages and has become mandatory for leading companies when performing due diligence studies of a new mine, process design or prior to changing current design or operational parameters. The following are only a few of the advantages of using computer simulation and optimisation:

- **Reduces risk:**
 - Avoid costly mistakes;
 - Test ideas on a computer without disrupting operations;
- **Provides an insurance policy:**
 - Understand the impact of a change before implementation;
 - Evaluate the impact of assumptions on performance;
- **Enables managers to make better decisions:**
 - View the system operation to generate ideas for improving productivity;
 - Use the model to test alternatives and select the best options;
- **Capital avoidance:**
 - Eliminate excess capacity or expenditure through operational improvement;
- **Captures randomness and variance:**
 - Incorporate randomness (most systems contain random components i.e. equipment failures and load times);
- **Improves profits:**
 - Increase throughput by eliminating bottlenecks;
 - Optimize equipment fleet; and
 - High return on investment.

Services Consulting

SET offers scalable simulation consulting for the mining, rail, logistics & warehouses, service and manufacturing industries. SET has a highly trained team of industrial engineers specializing in conducting simulation studies, operations management and general industrial engineering consulting.

Capacity Planning

SET uses various industrial engineering techniques and industry tools to determine the production capacity needed while, simultaneously, considering changing demands for products and/or services.

Operations Improvement

SET offers extensive experience of applying industrial engineering concepts and simulation in order to evaluate alternatives and provide decision support.

Work Study

SET uses Work Study tools such as work measurement and method study techniques to determine standard times and methods for doing a specific job or task should such information not be available at the time. The values and methods obtained are then used to populate the input values of a simulation model.

Training

SET offers training courses for both beginners and advanced users in various state-of-the-art simulation software packages, including Simio®, SimMine® and Optislot®. SET distinguishes their training courses by providing not only the standard vendor training course but rather custom workshops that are based on actual case studies.

Software Sales and Support

SET also, sells and supports the Simio®, SimMine® simulation software, Simio® scheduling software, Optislot® warehouse slotting optimisation software and ACT-OR logistics optimisation software packages.



Simio breaks down the walls of traditional simulation software, giving you the power to rapidly build accurate 3-D animated models and objectively analyse alternatives in order to make informed decisions more quickly.

Unlike other scheduling solutions, *Simio Scheduling* allows you to perform Risk Analysis in Real Time. This invaluable production scheduling software allows you to build a simulation model that fully captures both the detailed constraints and variations within your system.



SimMine optimizes resource planning and scheduling of underground development. SimMine is easy-to-use and serves as powerful software to plan, simulate and evaluate the development process in underground mining.



OptiSlot DC™ addresses the complexities of slotting by utilizing advanced mathematical algorithms which consider a product's dimensions, physical characteristics of your environment including slot configurations, pick path and material handling equipment, and operational goals like pallet building, seasonality requirements and retail groupings. As a result of implementing advanced slotting technology, your operations benefit from reduced labour expenses, improved order fulfilment cycle time, a reduction in partial order shipments, and improved space utilization.



ACT-OR offers a suite of products that combines sophisticated mathematical algorithms and simulation models to deliver unique optimisation solutions to the logistics, warehousing, retail and shipping industries. The product suite consists of the following products: BEFORE!, OPTNet, OPTRunner, OPTShipping, OPTLoading, OPTVessel, NET SOLVER and the OPTWarehouse suite.



SET is a user of the *Arena* simulation software by Rockwell Automation and can provide consultation services with Arena. SET is also partnered with the Arena representatives if training, sales and support is required.

Core Competencies

Mining

Underground Mining	
Rock Handling Systems	SET has vast experience in modelling rock handling systems to gain insight into potential bottlenecks, optimize bin / silo capacities, and determine rock handling system capacity and weigh-up alternatives. These models include, but are not limited to: conveyor and feeder systems, crushers (primary, secondary and tertiary crushing systems), hoisting systems, ore loading and ore handling.
Truck Haulage Systems	SET provides simulation models of truck haulage systems to determine overall system capacity, quantify potential queuing at truck dumps and optimize ore pass capacity. We have created numerous models of truck ramp systems to determine passing bay requirements, truck interference and ramp capacity.

Open Pit Mining	
Excavator / Loader / Shovel Loading	Open pit simulation studies can be performed to determine the optimal mining equipment fleet size and to maximize production capability by minimizing truck queuing for loader(s) or at crusher(s).
Truck Queuing Models	Test the effect of additional equipment on queuing times or probability of interference.
Crushing and Conveying	Test the effect of downstream ore handling systems on your haulage fleet to optimize ore handling equipment maintenance philosophies.

Surface	
Stockpiling and Blending	SET has been involved in studies to test different stockpile blending strategies based on ore grade quality and to determine surface stockpile size.
Processing Plants and Smelters	

	<p>SET has made capacity recommendations on numerous surface processing plants. The models gave insight into the stockpile requirements, equipment sizing and overall production capability of various alternatives.</p>
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Industrial Engineering

<h3>Work-study / TOC / Supply Chain / Business Analysis</h3>	
<p>Work Measurement</p>	<p>SET has been involved in work measurement studies such as time and activity sampling to establish standard times for operations. These studies was then used to establish base cases in order to measure and compare performance.</p>
<p>Method Study</p>	<p>SET uses Method study techniques to determine the most effective and efficient processes to apply in order to optimise throughput. As a part of the Method study process The Theory of Constraints (TOC) is applied as well.</p>
<p>Supply Chain</p>	<p>Supply chain analysis, modelling and optimisation.</p>

Rail Transportation

SET has been involved with various rail network studies in order to optimize rail infrastructure requirements. The Simio 3-D software provides realistic models of rail loading facilities, rail traffic control and passing loop(s) locations, stockyard design and port operations. SET has formed a fundamental part of a project team investigating the capacity of a major freight rail artery in South Africa by setting up a simulation model for the rail loading / offloading operations and rail traffic control. The model enabled the client to test the feasibility of major capital expenditure alternatives on system capacity and to study and eliminate low-impact alternatives which resulted in significant capital savings.

Manufacturing & Assembly lines

Simulation has a proven track record in achieving savings and optimizing logistics, manufacturing processes and assembly lines by providing decision support to the outcome and includes implementation of Just-in-Time (JIT) and other inventory strategies.

Supply Chain, Logistics & Warehouses

SET has been involved in many logistics studies, utilising simulation technology to reduce inventory levels, optimise transportation fleet size and determining capacity requirements and optimise infrastructure layout. SET is a partner of the USA based Opricity,

providing software solutions advancing warehouse design, optimization and analysis. SET is a also partner of the Italy based ACT Operations Research that have developed state-of-the art software for Transportation, Warehouse and Network design optimisation software.

SET has also developed break-through technologies to rapidly model any warehouse configuration to test the optimal placement of products, test various rack technologies and pallet handling equipment.

Ports

SET has been involved with port studies to determine future terminal capacity based on client forecasts. The simulation models were able to indicate the expected ship loading delays for various capacity scenarios to minimize capital and demurrage costs. Typical model outputs enable our clients to optimize loading / offloading rate requirements, number of berths / ship loaders and stockyard capacity.

Contact Details

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