# SIMULATION

What is Simulation ?

Simulation is a powerful tool. With it, you can analyze, design, and operate complex systems.

Simulation models are used to assess real-world processes that are too complex to analyze via spreadsheets or flowcharts, testing hypotheses at a fraction of the cost of undertaking the actual activities.

As an efficient communication tool, modeling shows how an operation works and stimulates creative thinking about how to improve it. Models in industry, government, and educational institutions shorten design cycles, reduce costs, and enhance knowledge.
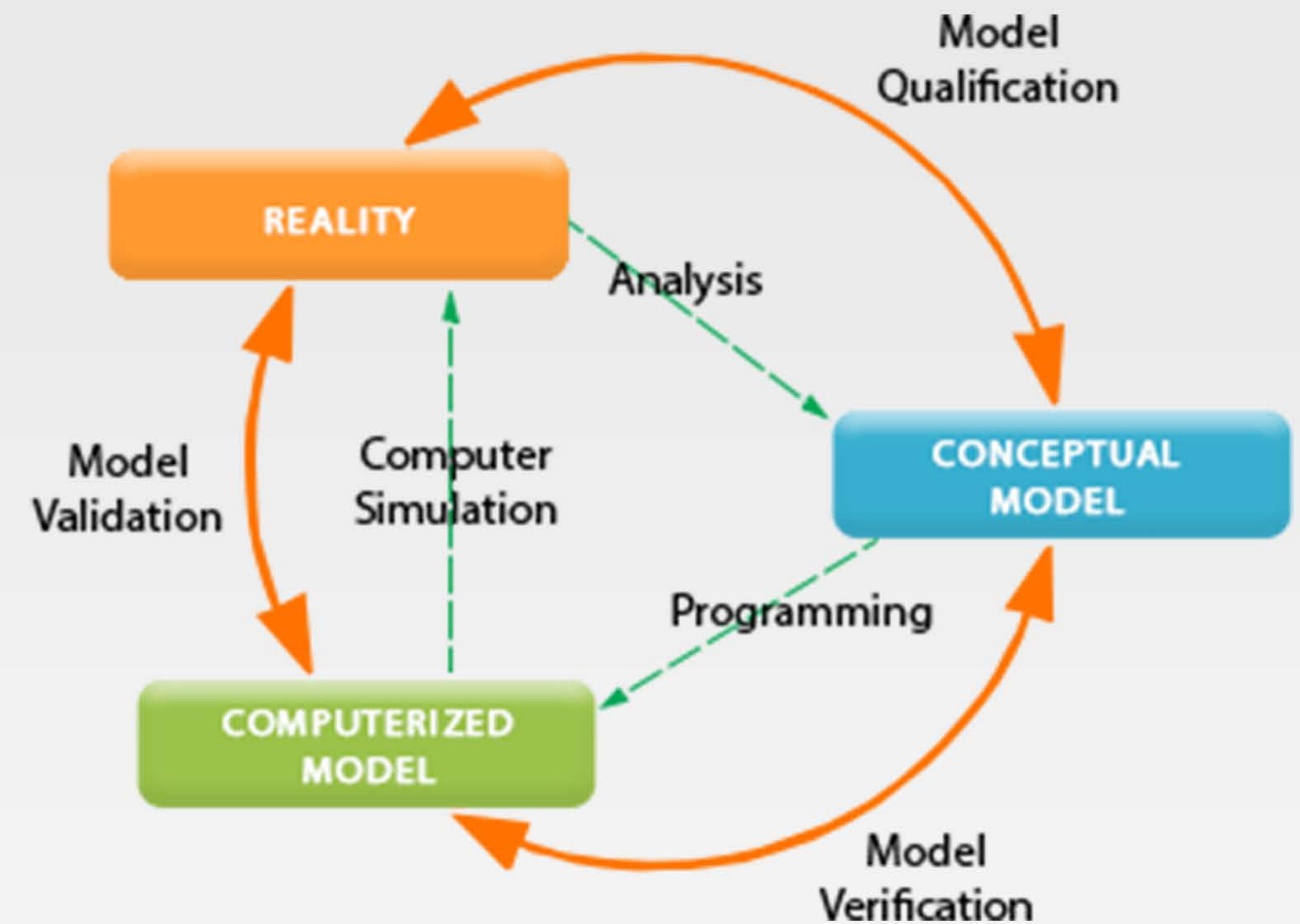
Highlights

It involves designing a model of a system and carrying out experiments

To see how a real-world activity will perform under different conditions

"step-wise refinement" enables you to achieve very complex problems quickly

SIMULATION FEATURES

![extendsim logo]

How Extendsim helps in simulation?

ExtendSim allows you to simulate any system or process by creating a logical representation in an easy-to-use format.

Quantitative benefits typically include: reduction in operating costs, throughput time, capital costs, design-to-market time and faster implementation of plant changes.

Qualitative benefits typically include: reductions in risk, greater understanding of processes, improvements in communication, better team integration and better development of skills within the organization.

Simulation Benefits

- Make prompt and correct decisions
- Experiment and get fast feedback
- Analyze the behavior of complex systems
- Convince management of your operational capabilities
- Communicate ideas efficiently and credibly
- Teach new concepts easily
- Save money in short and medium term
- Safely analyze dangerous scenarios
- Implement your decisions with confidence
- Discover alternatives to unexpected roadblocks

Highlights

Production forecasting

Determine process capability

Bottleneck Identification

Resource Utilization & Investment planning

RELIABILITY MODELING

What do we provide ?

Mindssoft has worked with International corporate clients in identifying the problems and providing simulation solutions using ExtendSim software & by developing PMI – Production Modeling interface.

Hierarchical blocks are created and connected with the database or global array.

Running different cases for each process to determine overall production and daily average production.

Determination of Time taken between failures (TBF) & Time taken for repair(TTR) hours.

Simulation history can be taken from the case details of every report.

Probability density frequency are determined using stat-fit & the values connected to shutdown block.

Problem fomulation

Objectives and plan definition

Model conceptualization

Control

Data collection

Implementation

Reporting

Model development

Your trajectory to success with simulation

Experiments run and analysis

Code verification

Design of experiments

Model validation

Highlights

Data Analysis

Model Creation

Running cases & Generating Reports

Database creation & Database connectivity

FOR PULP & PAPER MILLS

PROCESS AUTOMATION

Production modeling interface – PMI

Users can enter desired simulation time and modify Aim rate, Surge capacity, Surge indicators, Annual shutdown and Plant Maintenance Outages in production modeling interface.

Using PMI tool the user can generate reports instantly without modifying the model. The desired production can be achieved by converting internal reliability values.

Automated data processing

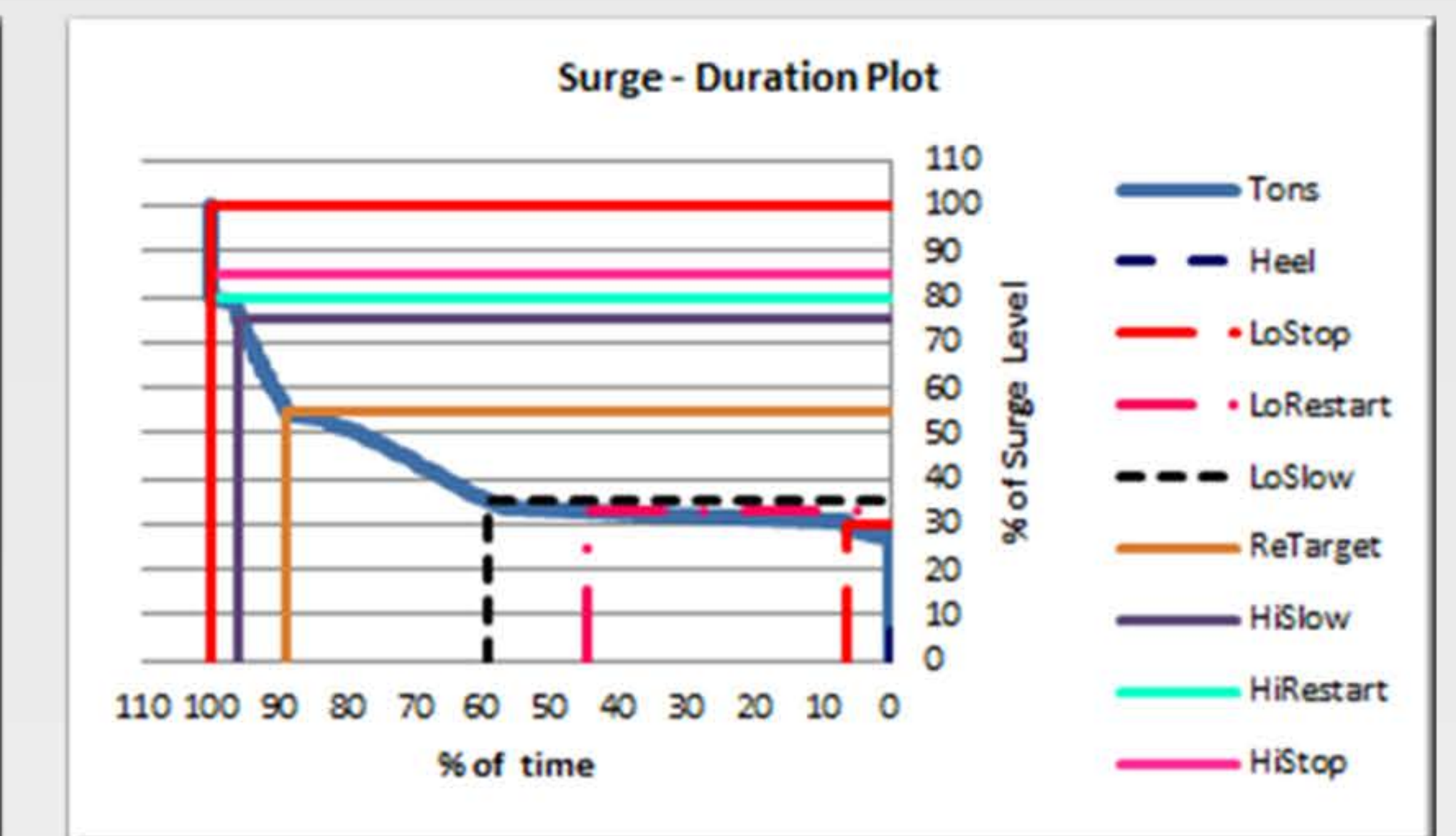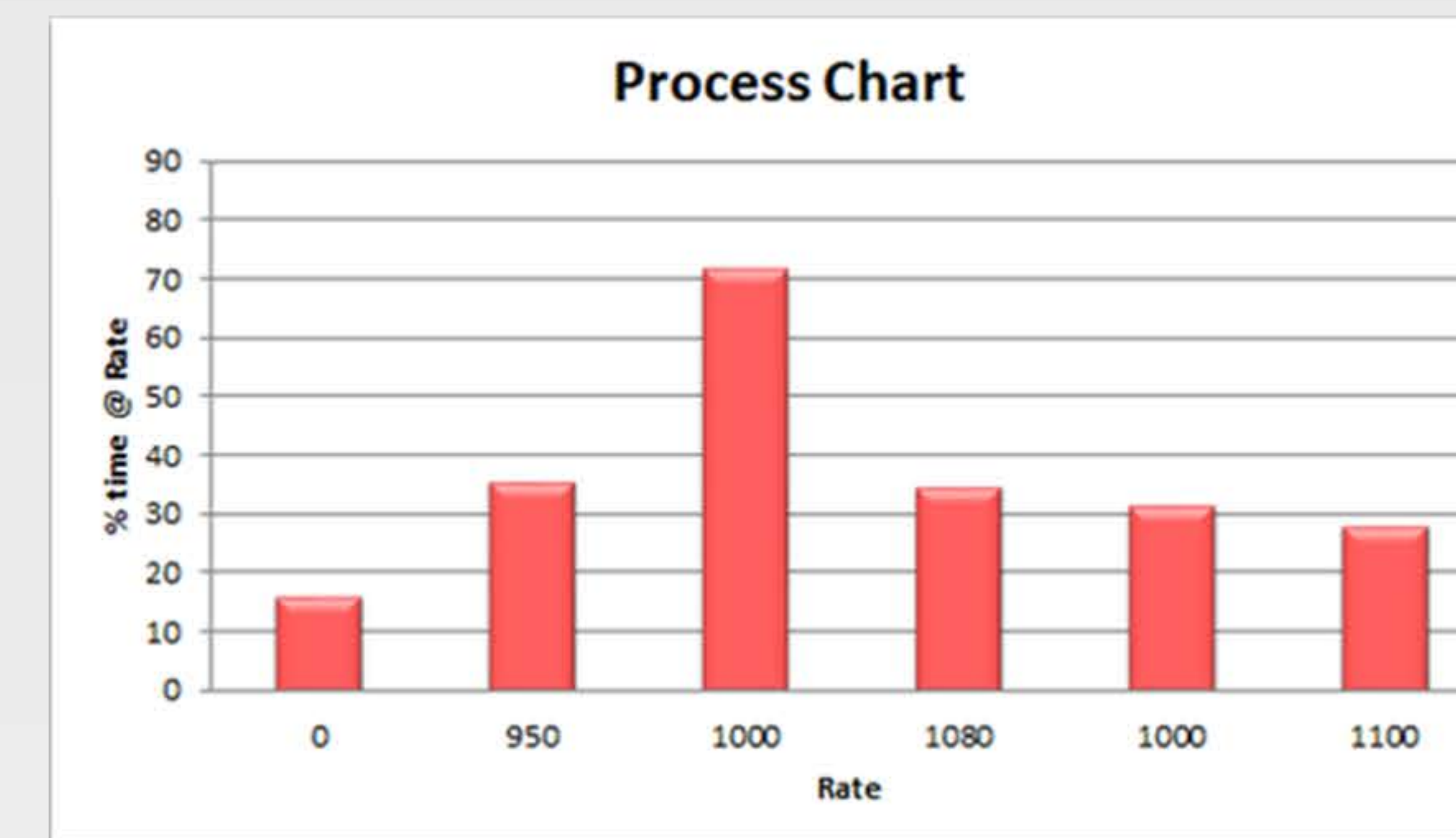Instant reports & charts generation after each simulation run.

Avoid time-consuming process in generating reports

Mindssoft
Technology
Quality • Teamwork • Process

nrvenkat@mindssoft.com
+91 94432 39331
www.mindssoft.com

Process Chart

Surge - Duration Plot

Production and Surge difference - Comparison of Base case & Post Simulation				
Case	Case 1 10 yr run Increase in Digester Chest Capapcity			
	Base case	Post Simulation	Difference	Units
Total Pulp Production	3675828.4	3683873.4	8045	ADMT
Annualized pulp Production	367392.5	368196.6	804	ADMT
Daily Avg Pulp Production (Calendar Days)	1006.5	1008.7	2	ADMT
Daily Avg Pulp Production (Operating Days)	978.6	980.8	2	ADMT
No of Calendar days	3652.00	3652.00	0	Days
No of Operating days	3552.00	3552.00	0	Days
Surge Capacity				
Digester Surges	540.0	840.0	300	ADMT

Bottleneck Report				
Process ID	Name	Total Internal Reliability (%)	Rate Conversion Factor(ADMTPD)	BottleNeck
1	Digesting	99.02	1085.0	1074.367
2	BSW	94.11	1117.6	1051.78183
3	Screening	98.25	1107.6	1088.238615
4	Bleaching	97.48	1125.0	1096.7
5	Machine	99.12	1215.0	1204.31
6	ChemGen	98.30	1150.0	1130.45
7	Evaps	95.01	1150.0	1092.60
8	Recovery	98.17	1150.0	1129.00
9	Recaust	97.07	1150.0	1116.30
10	Kiln	0		

Process Report gives each process rate from 0% to 100%.

Production Report gives Annual & Daily Production of pulp produced, Operating days of Pulp Mill/Year.

Surge Report gives % of time taken at specific level of Surge Chest for each process.

Bottleneck Report shows which section of the pulp mill has the Lowest capability.