

## Arena Project Guide

A proven roadmap for successful completion of a simulation project is to follow an established methodology while conducting the study. This simple guide provides a basic framework that we recommend for ensuring success with simulation projects. Rockwell Automation is committed to your success using Arena and provides expert Arena training and project Jumpstart Consulting services. To find information on these essential services, visit [www.ArenaSimulation.com](http://www.ArenaSimulation.com).

### 1. Develop the Functional Specification Document

- Background of the problem
- Objectives – Why are you doing this study?
- Detailed process flow description and diagrams
- “What-if?” scenarios to be evaluated
- Key Performance Indicators (KPI) – driven by project objectives
- Boundaries of the system to be studied
- Input and Output data requirements
- Animation requirements
- Define system assumptions
- Define deliverables pertinent to the objective
- Project timeline

### 2. Identify and Collect Data

- Identify what data is necessary-  
Data requirements are driven by:
  - ❖ Process map
  - ❖ Project objectives
  - ❖ Model outputs
- Identify where the data will come from:
  - ❖ Manual (time studies, work sampling, etc.)
  - ❖ System database

*Accurate and timely data is vital to the success of a simulation project*

### 3. Build the Model

- Define fixed aspects of the model before defining logic (resources, variables, attributes, other elements)
- Develop simulation model
- Use the Functional Specification as a road map for the project/model
- Develop a user interface (typically in Microsoft Excel)
  - ❖ Allows users to change key input variables in Excel and run the model using the simulation engine
  - ❖ Advantage is that user does not need to understand the software to run and review scenarios

### Important Model Building Notes

- Maintain easy to understand naming conventions, such as beginning all variable names with “v\_”
- Build the model in a modular format and utilize the module “Name” field to document your logic as you build it
- Collect data and build the model simultaneously
- Consistently review the model to ensure that the logic design mimics the real system or reflects a proposed system as closely as possible
- Utilize a simple method of version control in order to document model progress as well as to provide a backup version
- Maintain backups of the model versions on multiple machines and/or servers

### 4. Document the Model

- Functional Specification
- Model logic documentation
- Model run documentation
- Project analysis report

*Ensures the model is easy to maintain and update in the future*

### 5. Verification and Validation

- Verification: Ensuring that the model behavior makes sense; entities are moving in the direction they should and process steps are taking place as expected
- Validation: Stakeholders must agree that the simulation model outputs are close enough to the real system outputs before running “what-if?” scenarios

### 6. Analysis

Once the model is validated, the various scenarios under consideration can be evaluated. This may involve:

- Varying the input data to represent proposed changes and analyzing the results
- Modifying the base line model to remove or include new processes under consideration and running it with existing data
- It is important to document how each scenario is defined and use this information to justify the proposals you provide to meet the objectives of the study

### 7. Project Deliverables

- Fully documented model with user interface and (optional) 2D or 3D animation and data dashboards.
- “What-if?” scenario/experimentation
- Results
- Analysis and recommendations
  - ❖ Return on investment
  - ❖ Cost savings
  - ❖ Cost avoidance
  - ❖ Efficiency projections

