**Simulation and Modeling**

**Simulation & Modeling Software Assignment -I**

**Salman Ahmed Khan 19K-1043**

**Abdullah Tilal Khan 19K-1103**

**Presented To: Miss Amber Sheikh**

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**MS4 Modeling Environment:**

MS4 Modeling Environment (MS4 Me) is a discrete event simulation system (DEVS) software developed by MS4 Systems, Inc. It has been used in the modeling of complex systems (such as a national health care system) and is also covered in a discrete event simulation and systems of systems modeling text.

MS4 Me supports the development and simulation of DEVS models via a natural language or Java. Finite Deterministic DEVS (FDDEVS) models can also be quickly developed and analyzed. DEVS models can be composed into more complex systems via the use of System Entity Structures, and System Entity Structures can be composed into complex systems of systems for simulation. Many different configurations of these systems can be stored and simulated via the use of pruning.

Traditional computer-based M&S has enabled managers and engineers to evaluate complex scenarios and design alternatives for many years. However, traditional, discipline-based M&S solutions face great challenges to analyze today's highly multi-disciplinary problems.

DEVS (Discrete Event System Specification) enables the advanced modeling & simulation and provides novel system analysis & design methodology.

MS4 Me is a tool set for discrete event modeling and simulation of complex systems. The DEVS (Discrete-Event System Specification) formalism provides an engine for advanced M&S technology to support "virtual build and test." This formalism has been applied to solving complex problems for over three decades.

MS4 Me provides a powerful environment that incorporates the information of system structure as well as component behavior in an integration platform. The result is a high flexibility platform to realize hierarchical M&S with various abstraction levels. Capability to implement different system abstractions, and to control problem complexity, gives MS4 Me the power to execute analyses ranging from simple to highly sophisticated.

MS4 Me provides various features that enable modeling and simulation of complex system in efficient manner.

**Micro Saint Sharp (Discrete Event Simulation)**

Micro Saint Sharp is a general purpose, discrete-event simulation software tool. Micro Saint Sharp's intuitive graphical user interface and flow chart approach to modeling make it a tool that can be used by generalists as well as simulation experts. Micro Saint Sharp has proven to be an invaluable asset in both small businesses and Fortune 500 organizations that span the U.S. military, health care, manufacturing, and the service industry.

Micro Saint Sharp simplifies the development of simulations that can help you optimize the processes and workflows as well as human factors and ergonomics. Extensive functionality and a user-friendly interface make Micro Saint Sharp easy to learn and operate.

With Micro Saint Sharp, there’s no limit on the size or complexity of the models you create. From simple models to the highly complex, you and Micro Saint Sharp can handle it all successfully. All unique aspects of the system you are modeling can be represented in Micro Saint Sharp using a series of modeling components and the Microsoft C# programming language.

Micro Saint Sharp provides solutions ranging from simple queuing problems involving hospital waiting rooms to complex human decision processes involving command and control systems.

In addition, you can easily customize Micro Saint Sharp to create interfaces that act as a front-end to the model. With these interfaces, you simply enter data and obtain results from the simulation model. What’s more, Micro Saint Sharp features a customizable development environment.

Data may give you the answer to the question, but it doesn’t always tell the whole story. With Micro Saint Sharp, there are three ways to view and demonstrate the models that tell the story behind the data.

Use the network diagram view to animate the process flow chart. Or, choose either of the animation views, Animator (2D) or Animator3D, to show a realistic picture of the process with moving images. Animator also provides the capability for charts, graphs and text to be displayed on one screen while the model is executing.