SIMUL8 Healthcare

Launch & Grow a Successful Simulation Program

April 14th, 2016

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Webinar Topics

5 Steps to Success

- Give Them a Taste
- Learn The Tool, Build On Success
- Engage Your Stakeholders
- Build Standardization and Clarity
- Ramp it Up

Our Journey

- Initial Use
- Advancing the Knowledge
- Engagement and Growth
- A Project To Build Upon

Additional Model Ideas

Step One

Give Them a Taste

Step One: Give Them a Taste

- Discrete Event Simulation (DES) is not a trivial investment. Building a program takes time and resources.
- DES is also, to many, an abstract concept that often requires seeing it in action.

Establish a business case by identifying a strategic, challenging question, and use SIMUL8 to provide direction.

Step One: Give Them a Taste

- SIMUL8 was first brought to MHS to model the new OR suites to ensure consistent flow.
  - Several key constraints were identified and avoided, including having enough elevators.

Step Two

Learn The Tool, Build on Success

Step Two: Learn The Tool, Build on Success

- SIMUL8 is a fairly intuitive program, especially when building basic models
- The SIMUL8 has immense potential to be customized to model very complex processes and environment

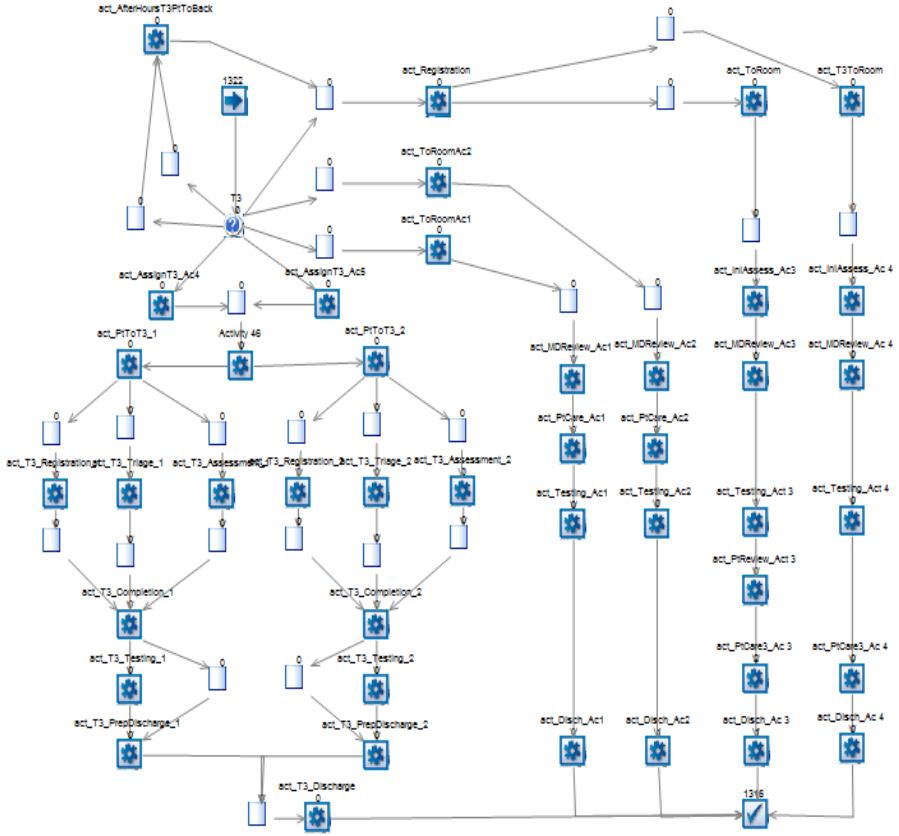
Identify staff members who can take time to learn the greater complexities of the tool, and use to build more complex models. SHARE those successes!

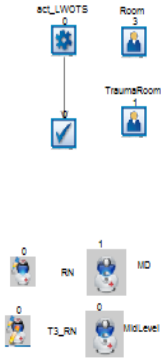
Step Two: Learn The Tool, Build on Success

- A few members from operations improvement attended more advanced training, and began to build more advanced models

Step Two: Learn The Tool, Build on Success

First Advanced Model – Parallel ED Triage





Scope

- Improvement of ALMH Door to Room Time

Innovation

- Simulation of variable resource utilization (RNs)

Results

- Reduction from 28 minutes to 8 Minutes (as of Oct 1)
- **Simulation was accurate within 1 minute of actual results for acuity 4 and 5 patients**

Step Three

Engage Your Stakeholders

Step Three: Engage Your Stakeholders

- Building models for smaller, specific case projects are a great way to get your program started. It is required to gain trust in the program.
- The next step then is to start using the tool for higher exposure projects and engage your leadership in the process.

Identify a key, large scale, cross functional project and engage leadership. Having your leadership engaged is key to organizational buy-in.

Step Three: Engage Your Stakeholders

- Ensure that you are also engaging cross functional members as well.
- Use your red team
  - "A **red team** is an independent group that challenges an organization to improve its effectiveness."*

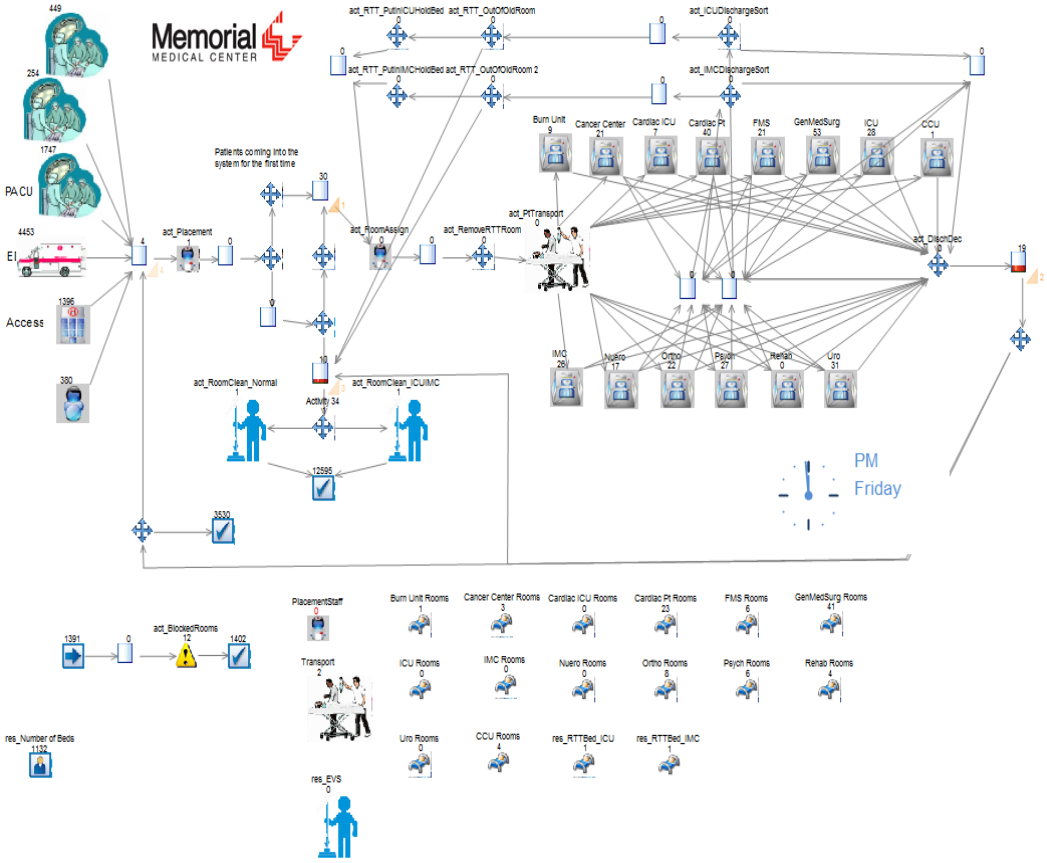
*https://en.wikipedia.org/wiki/Red_team

Step Three: Engage Your Stakeholders

- Our Placement Project
  - Ran into organizational resistance at first
  - Added key leadership
  - Added the use of the red team

Step Three: Engage Your Stakeholders

Memorial Medical Center – Patient Placement



Scope

- Reduction of the amount of time it takes to place a patient to a room at MMC

Innovation

- Large scale multi-disciplinary simulation
- 50 + distributions
- Use of external data storage and minor back end programming

Results

- 23% reduction of the mean as of 10/9
- Multiple behaviors predicted and validated with the model

What's Next?

How to Grow Your Program

Steps Four & Five

- How to Grow?
  - We didn't really know how to get our program growing
  - Used Lean Six Sigma and DMADV to achieve our goal
    - Formed Steps 4 and 5

Business Case

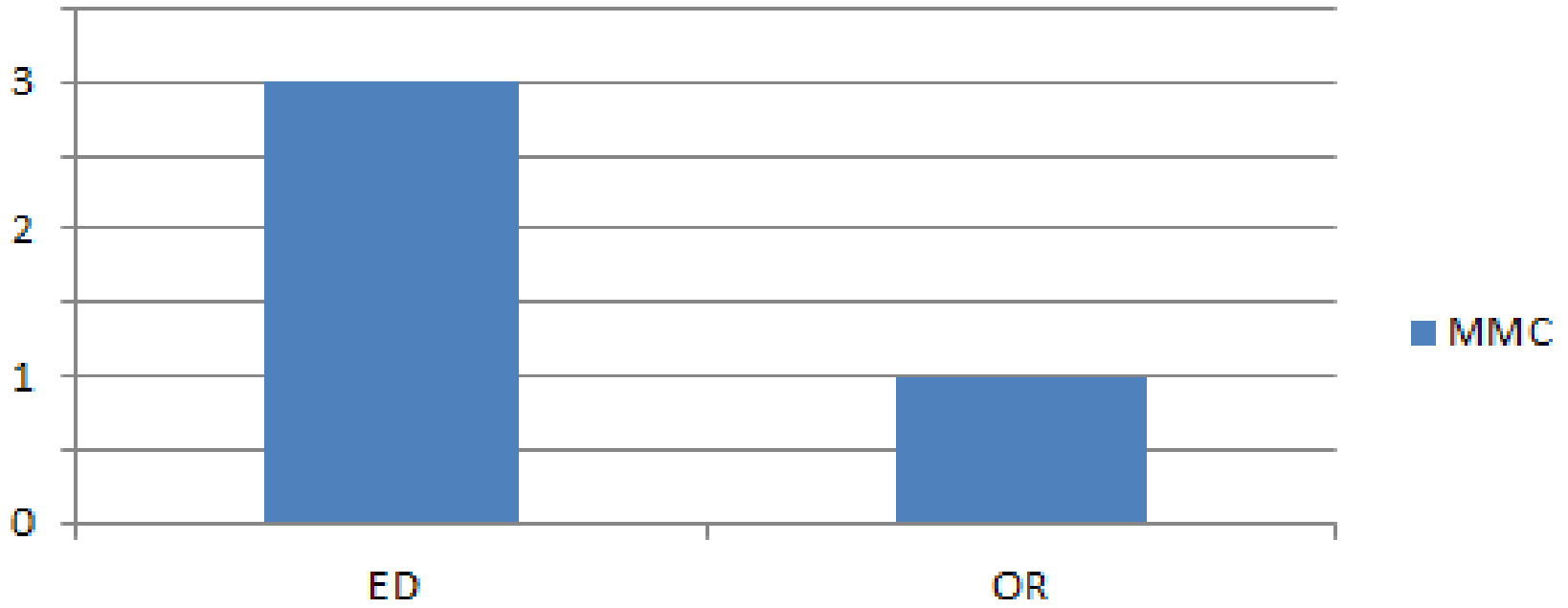
Memorial Health System, in its goal to be a national leader in patient care, has exponentially increased its use of evidence and data based lean six sigma process improvement projects over the last 5 years. While these projects have been immense successes, they introduce risk into the patient care environment.

Discrete event simulation was introduced at MHS in 2013 as a way to limit this risk and test particularly complex interventions prior to implementation. The use of this technology at the start of 2015 was limited to mostly throughput projects in the MMC emergency department. This project is necessary to increase the use of DES at the health system and diversify its use in order to lower the risk of implementations and allow for larger, more complex projects to be undertaken.

Problem Statement

In FY 13, Memorial Health System introduced the use of Discrete Event Simulation (DES) for use on complex Lean Six Sigma projects. By January 2015, it had only been used on 4 projects (mostly in the MMC ED) with only 2 individuals trained for its use. This structure severely limited the use of this innovative technology due to a lack of standardized process and training for its use, as well as a lack of trained personnel and deployment method to spread its use to more areas across the health system.

Projects Completed Between 2013 and 2015 By Affiliate and Area of Focus



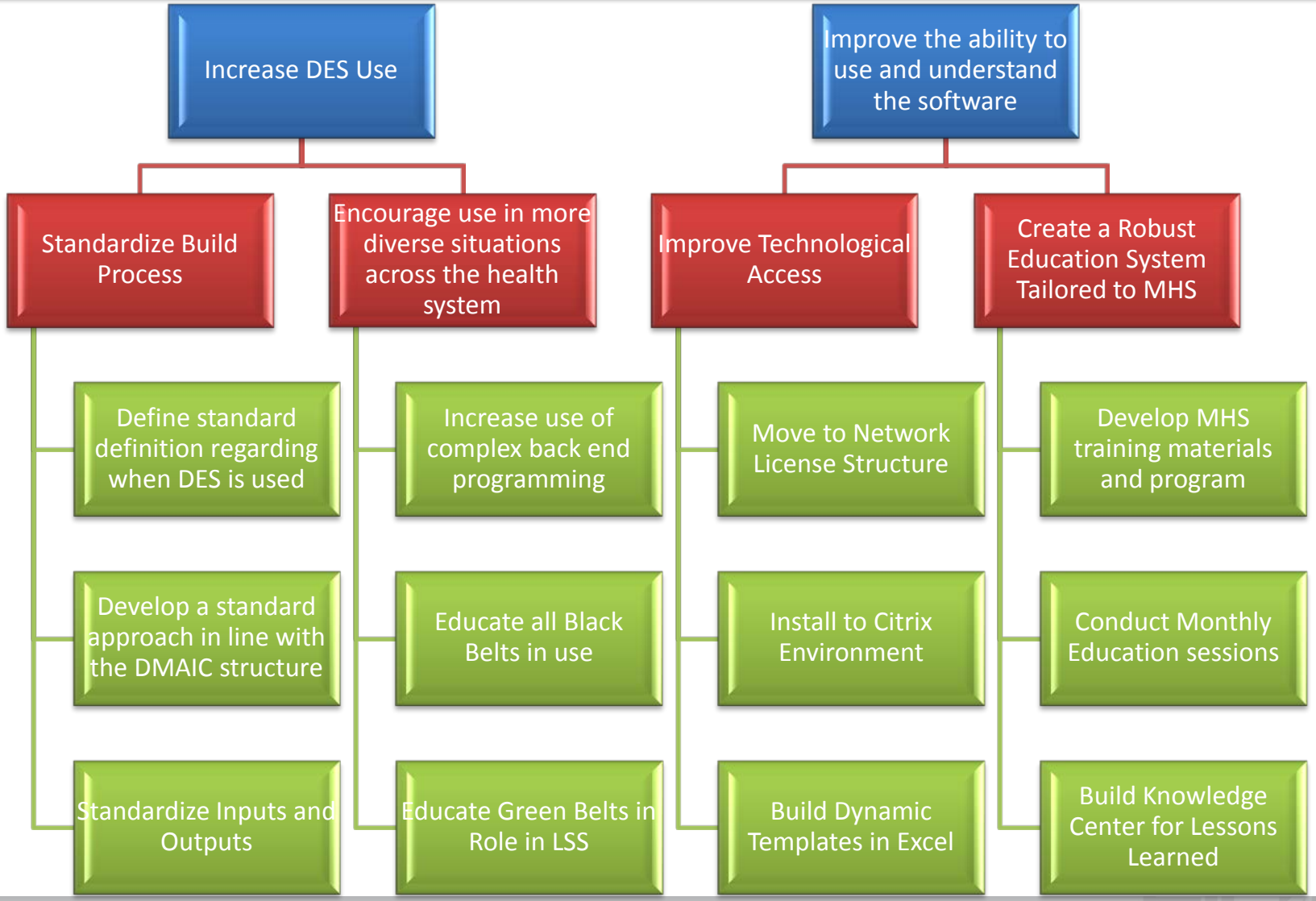
Voice of the Customer

Customer	Sample Comments	Key Output Characteristics Important to Customer (CTQ's)
Leadership	•What is involved in building simulation •Projects and interventions should be data driven •We need to limit the risk to patients by testing interventions prior to implementation	•Timely •Effective •Safe
Operations Improvement	•DES needs to have a standardized approach •The education materials out there are confusing •We need to increase the use of the product by the belts	•Efficient •Effective

Voice of the Customer

Customer	Sample Comments	Key Output Characteristics Important to Customer (CTQ's)
Process Owners	•There are multiple LSS efforts on going, how do we know their interactions •We need to have a way to be more confident in the results of the	•Which one or more of the 6 aims of the Institute of Medicine relate to the customer's feedback comments?
Belts	•DES is very complex and confusing •I do not have enough time to learn this new technology	•Which one or more of the 6 aims of the Institute of Medicine relate to the customer's feedback comments?

Affinity Diagram

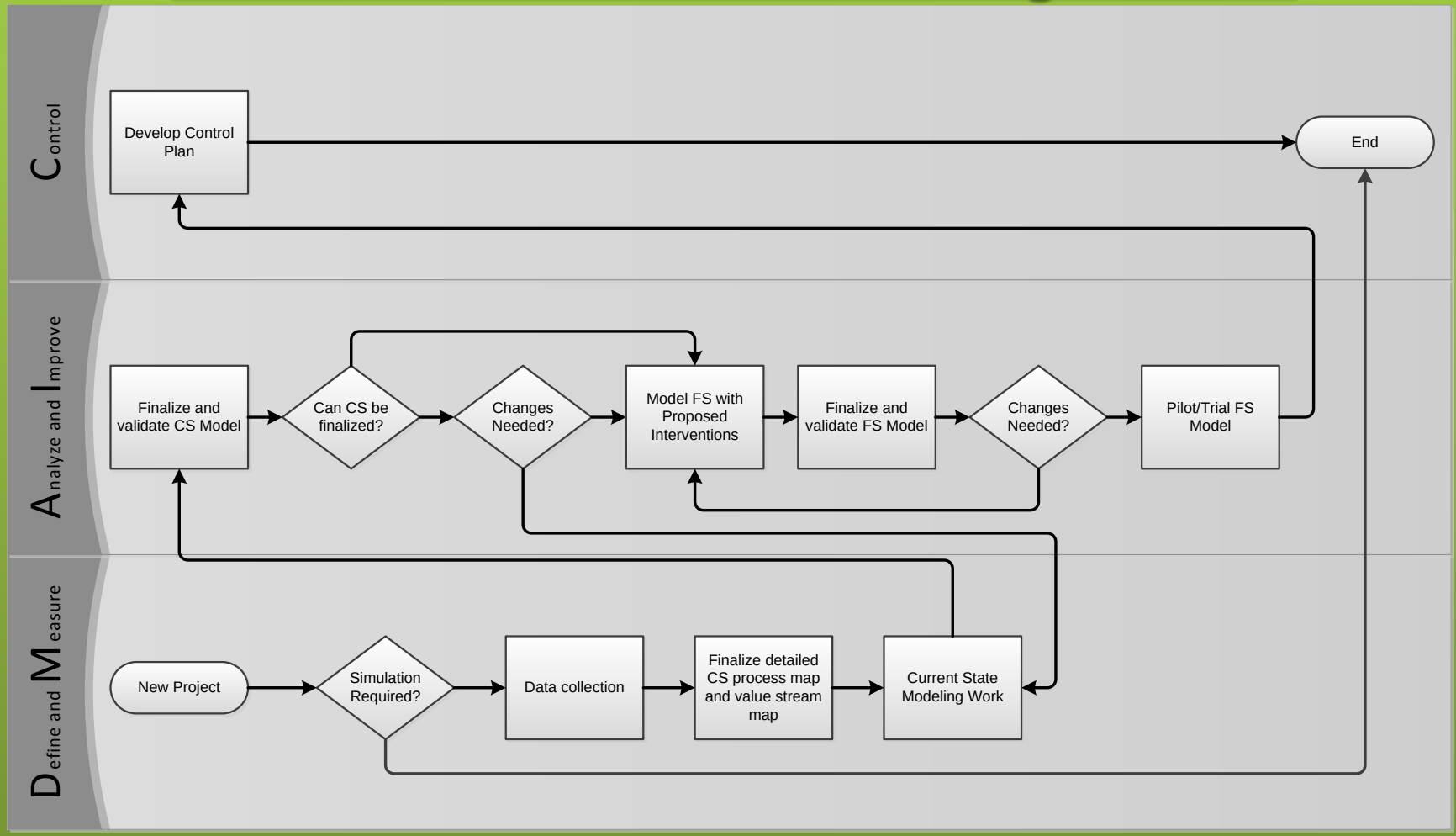


Step Four

Build Standardization and Clarity

Step Four: Build Standardization and Clarity

Standard Process Following DMAIC



Step Four: Build Standardization and Clarity

Standard Definition for DES Use

DES

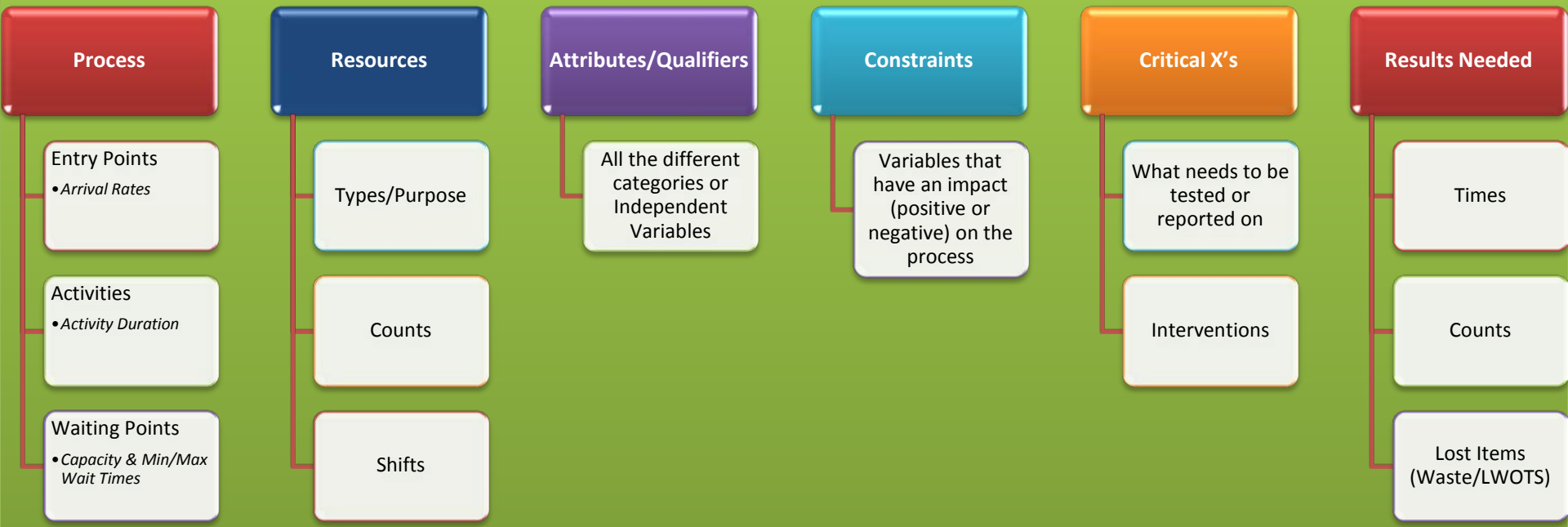
- Full department or system analysis
- Full service lines
- Complex, multi input models
- Utilization of resources
- Dynamic models or analysis

Simple Queueing Analysis

- Specific issue or machine or process
- Singular wait lines or non complex models
- Single procedures
- Static models or analysis

Step Four: Build Standardization and Clarity

Standardization of Inputs and Outputs



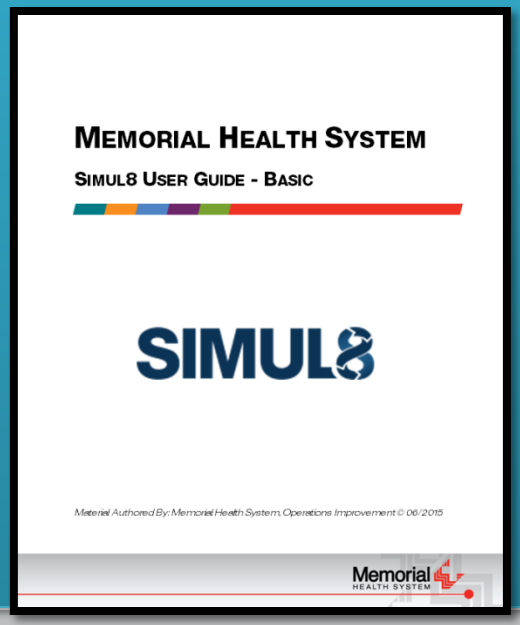
Step Five

Ramp It Up

Step Five: Ramp It Up

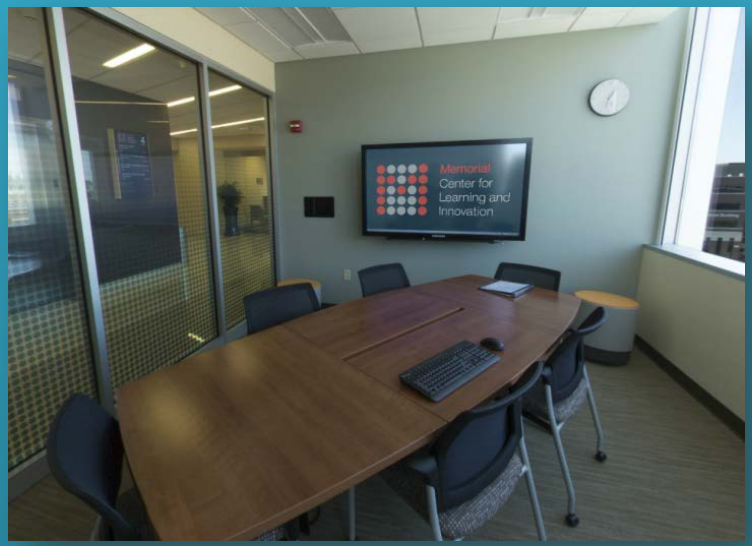
Create a Education System Tailored to Your Organization

Develop Training Materials and Program



Conduct Periodic Education Sessions

- Lessons Learned
- Lab Sessions

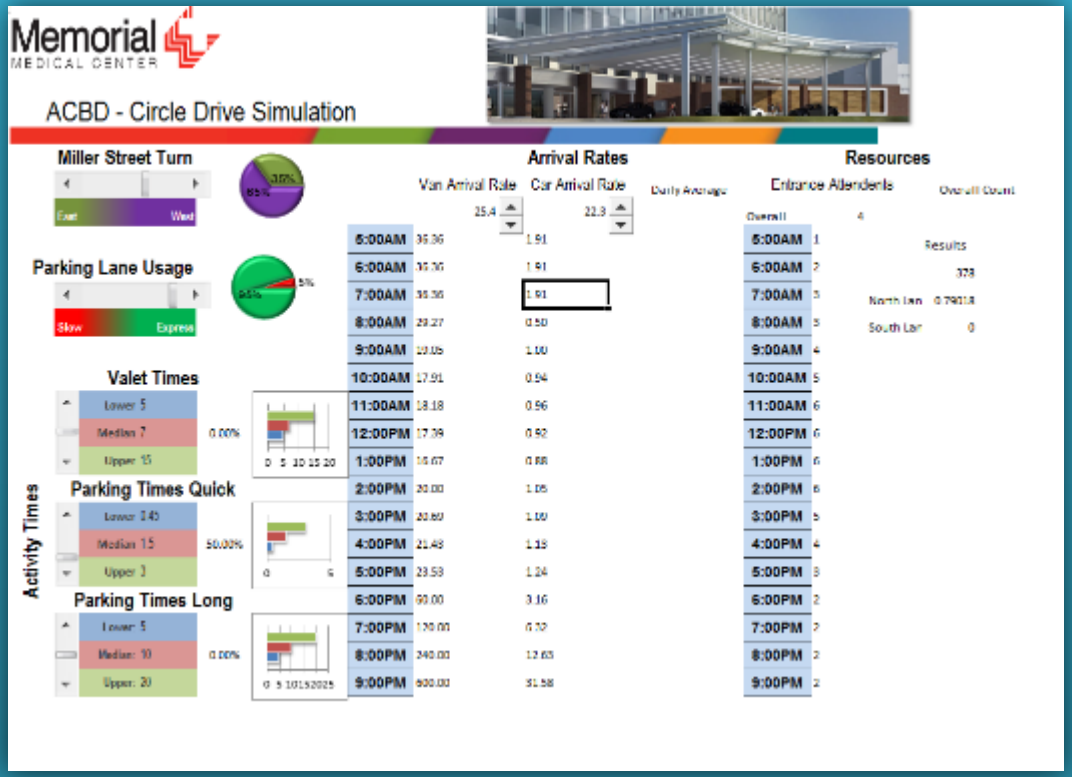


Step Five: Ramp It Up

Improve Technological Access

Add Network License and Citrix Access

Build Dynamic Templates in Excel



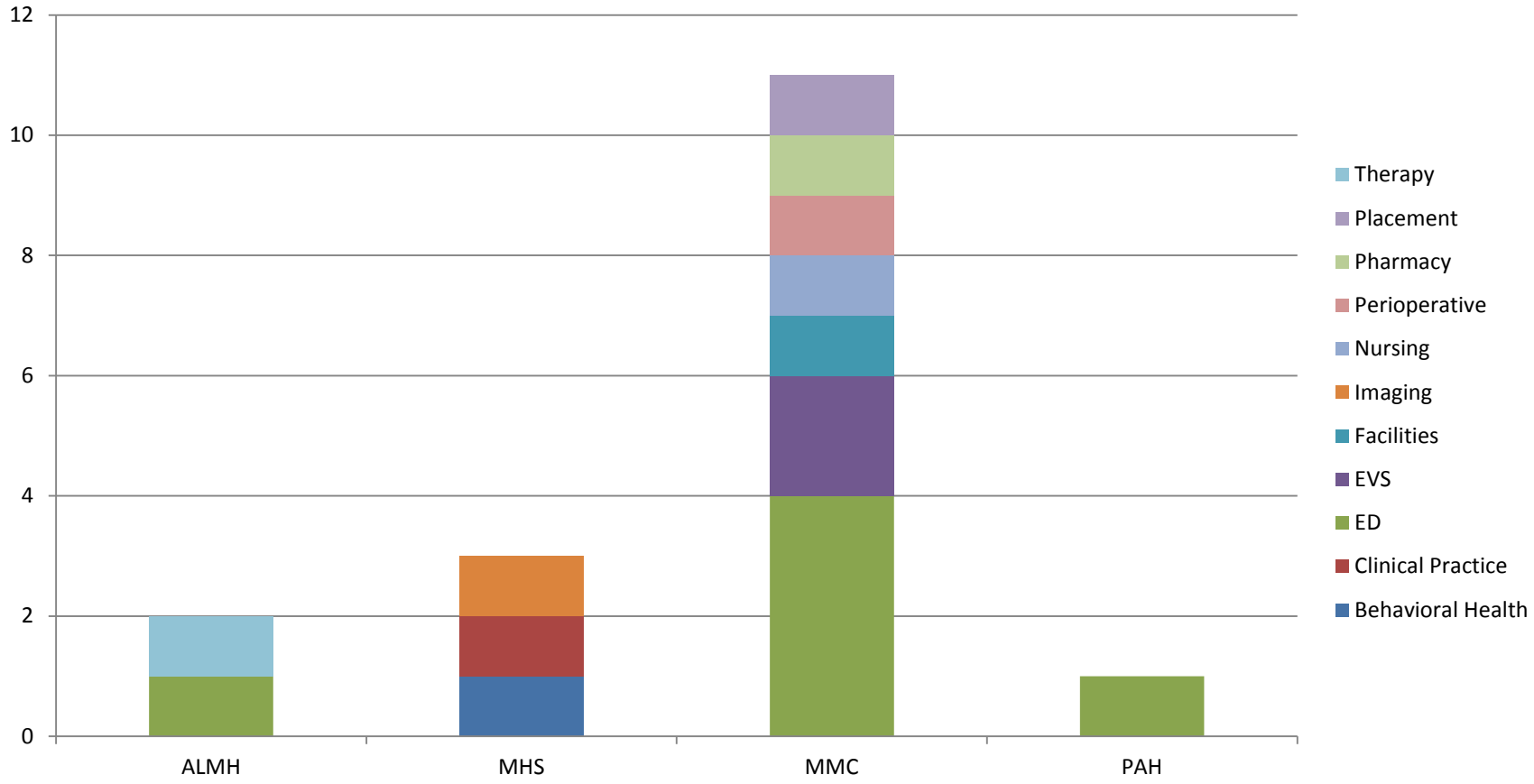
Step Five: Ramp It Up

Encourage use in more diverse situations

Increase use of
Complex Modeling and Programming

Educate Operations Improvement
Personnel

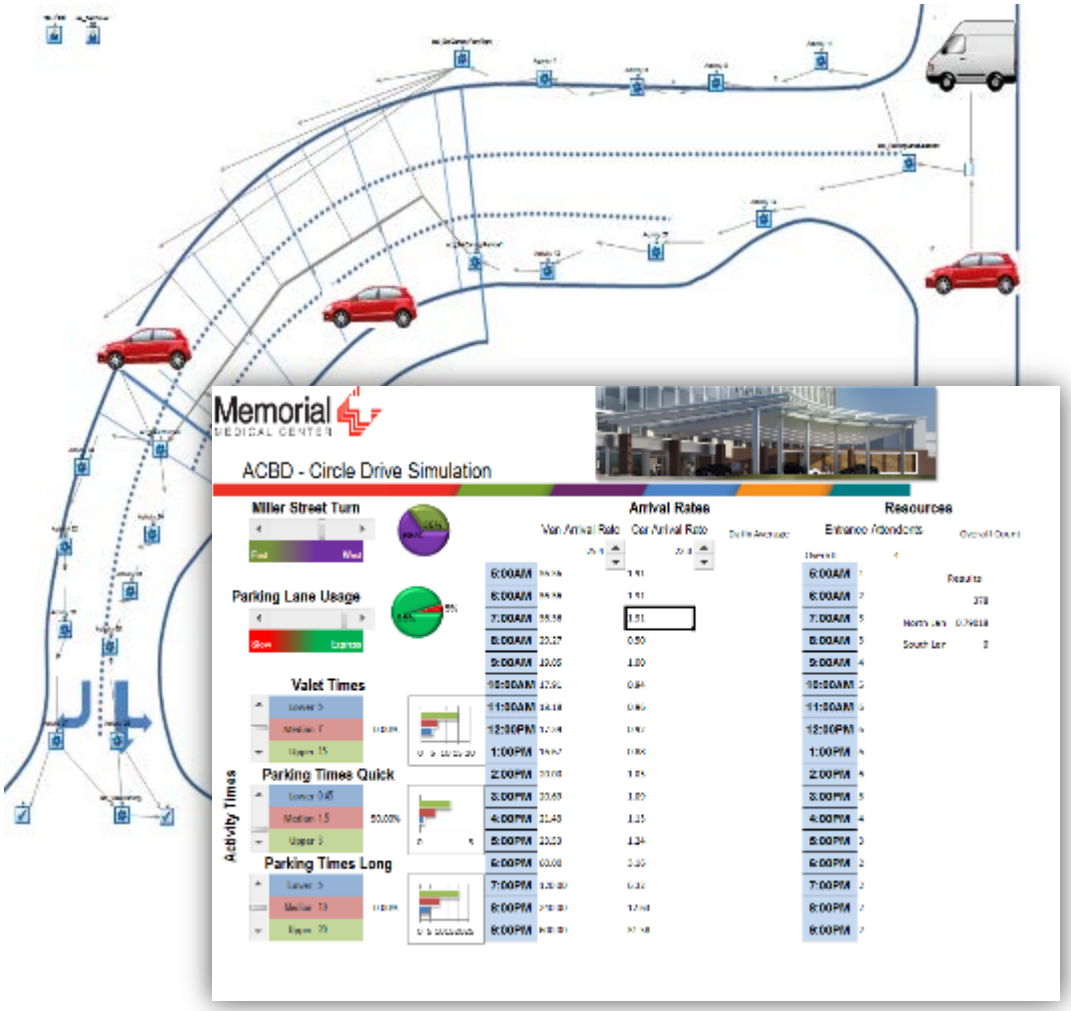
DES Use Histogram



Additional Models

Some Other Ideas for Use

MMC – Medical Center Front Entrance



Scope

- Analysis of vehicle volume through new PCT drive

Innovation

- Use on facility driven project
- Creation of Dynamic User Interface in Excel

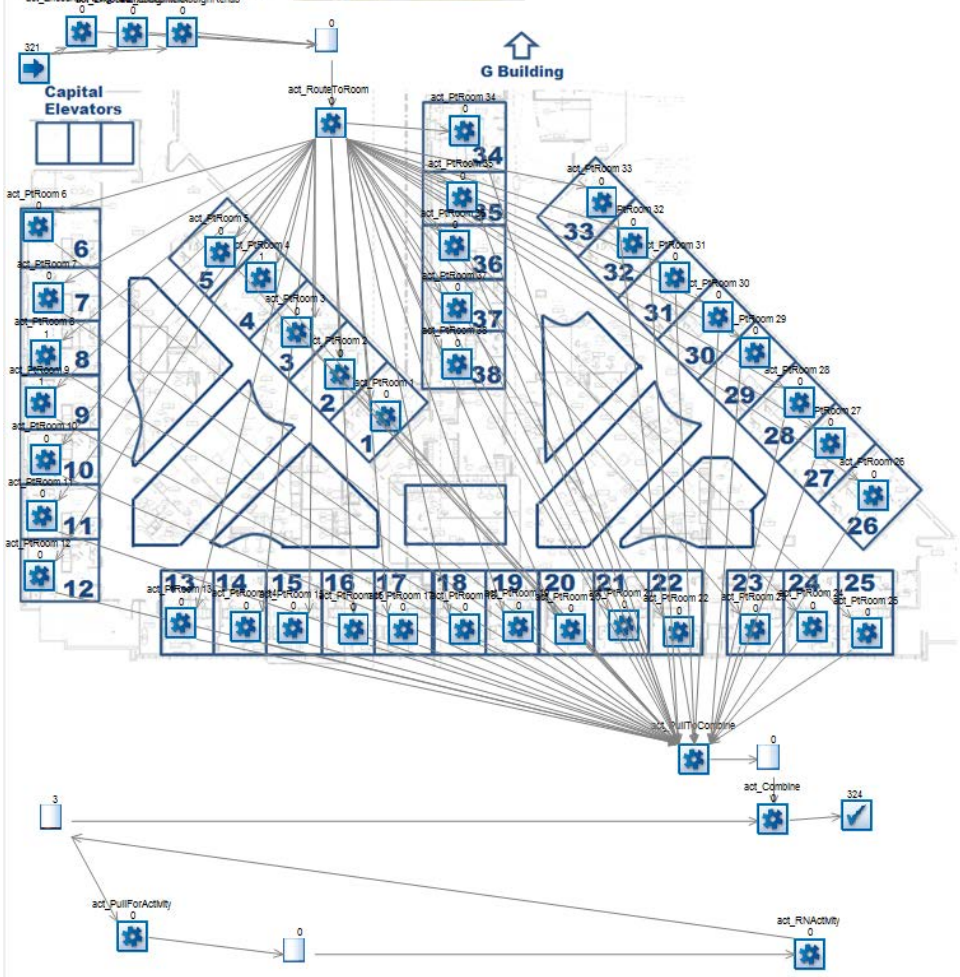
Results

- Predicted no backup on 1st street if >80% of cars park less than 10 minutes, has held true

MMC Patient Care Tower

Memorial MEDICAL CENTER

Patient Care Tower



Scope

- Testing of RN patient assignment

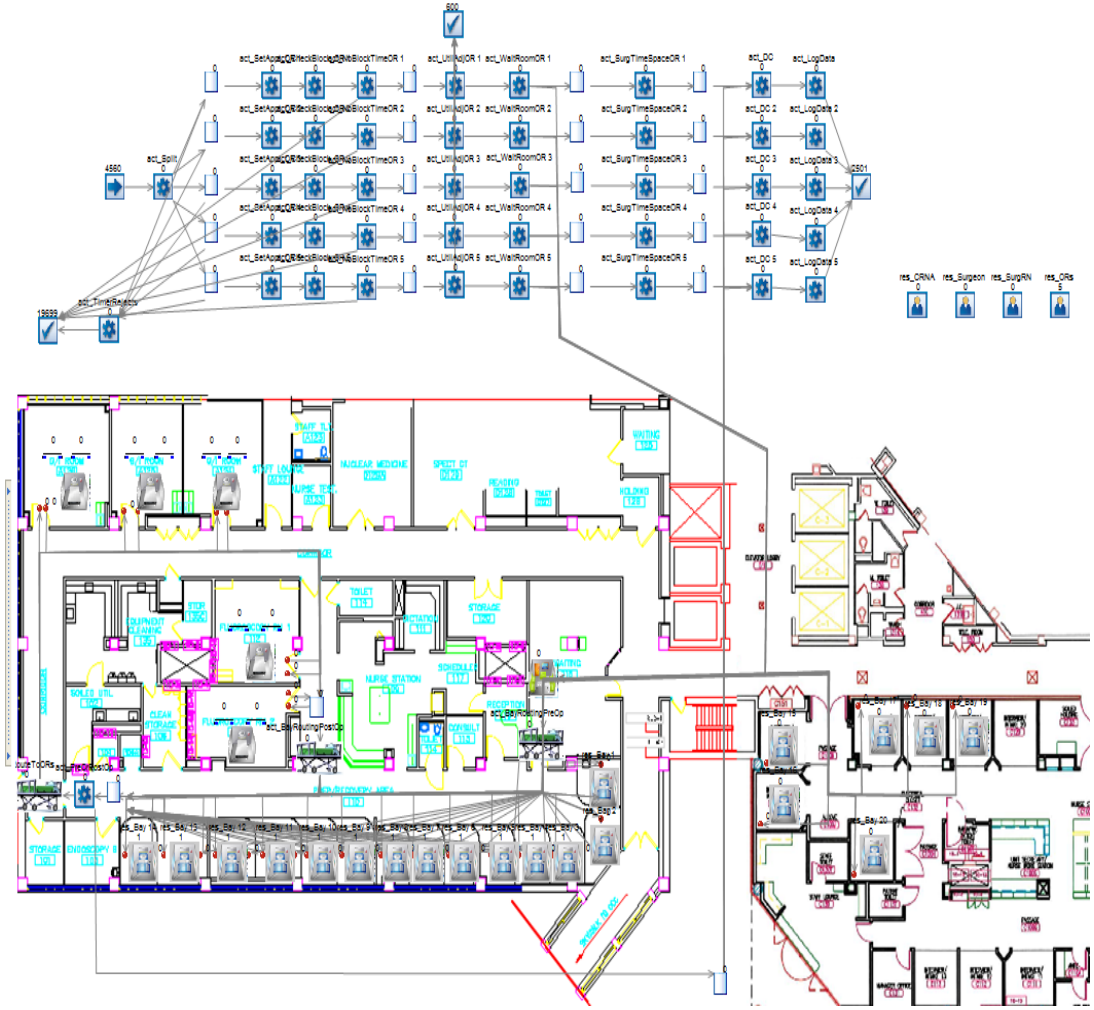
Innovation

- Extensive use of complex back end programming

Results

- Allowed for the development of assignment equity

MMC SPA Block Scheduling



Scope

- Develop Model to Test Block Schedule Change, Gage Impacts

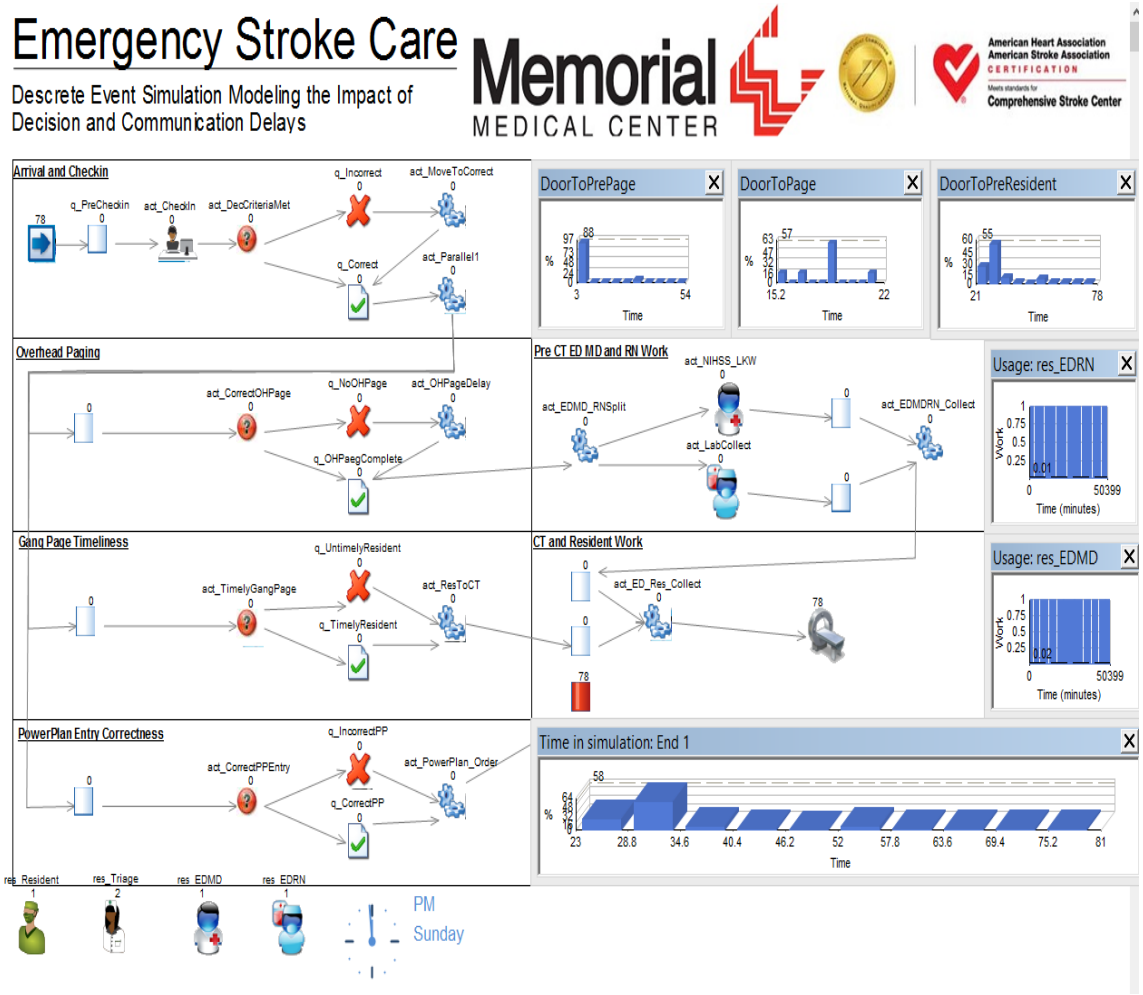
Innovation

- Use of Extensive External Connections Including Excel and Access, Complex Visual Logic

Results

- Used to Identify Process Improvements, Staffing Utilization, Financial Impact of Block Changes

MMC Stroke Communication



Scope

- In conjunction with a Live Simulation, estimate clinical impact of stroke protocol communication improvements

Innovation

- Probability assessment, our first model looking at human factors, estimating clinical impact

Results

- In Progress
- Current state within 1 minute of actual results

SIMUL8 Healthcare

Questions?

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Image: Memorial Center For Learning and Innovation, Inpatient Simulation Center