

Simulation of Personnel in ARFORGEN to Predict Effects of Structure, Policy, and Demand Changes

Vertical

Manufacturing	Pharmaceutical	Healthcare	Portfolio	Logistics	Financial	Government	Business
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Genre

Case Study	Project Review:	White Paper	Technology Overview
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Client



Army G1, (Major Mark Zais) and West Point (Major David Hughes)



Situation

The restructuring of the U.S. Army's active component to 45 Brigade Combat Teams (BCT) and 13 Combat Aviation Brigades (CAB), along with the adoption of the ARFORGEN (Army Force Generation) process, have fundamentally changed Army force structure across rank and specialty while also transforming the model and cycle by which units are manned. In order to meet manning requirements for the planned force structure in support of potential conflicts worldwide, the Army must continually reassess the manning processes and policies used to achieve these goals.

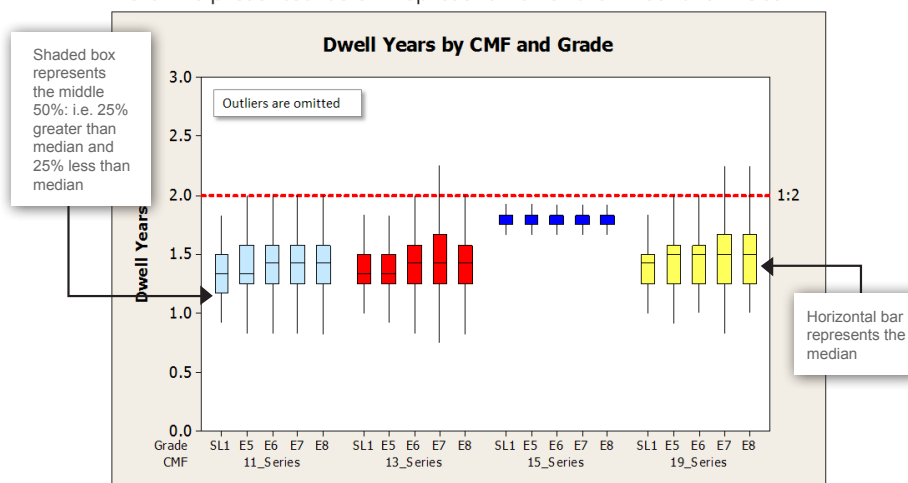
The Army refers to the time a Soldier spends deployed overseas in a combat environment as Boots on the Ground time, or BOG. Conversely, the time a Soldier spends between deployments is known as "dwell." This BOG:Dwell ratio is an important, highly visible statistic, that serves as a leading indicator of recruiting, retention, and morale issues for the Army, its Soldiers, and their families. The Army's goal for the BOG:Dwell ratio is 1:2, or 1 year of BOG followed by 2 years of Dwell. In 2009, the VCSA (Vice Chief of Staff of the Army) designated BOG:Dwell analysis as a priority modeling effort because he recognized how much stress was being placed on the force and wanted to know which type of Soldiers were the most stressed.

The Army G1 and West Point conducted an initial study to develop a methodology to measure stress on the force and determine whether the Army can meet stated BOG:Dwell goals. This initial research, focused on Units, found that unit dwell is not a sufficient model for individual Soldier dwell because individual Soldiers typically do not stay with the same unit throughout their careers. As a result of the findings, the VCSA directed the Army G1 to expand the study to estimate the individual dwell statistics by grade for all specialties, thereby producing a decision support tool that provides predictive capabilities to assess the stress on the force as a result of changes in demand, policy and structure.

Objectives

- Produce a holistic decision support tool that is capable of informing senior leadership and providing predictive capabilities to assess the stress on the force as a result of changes in demand, policy and structure.
- Determine the relationship between unit and individual dwell by grade for a selected Military Occupation Specialty (MOS).
- Provide an ability to forecast BOG:Dwell ratios for any selected additional MOSs over a long-term time horizon.
- Provide the forecasted lead-time necessary to shape the force and make structure changes in time to mitigate stress caused by aforementioned changes.

The CMFs presented below represent BCT and CAB centric MOSs.



These are NOT historical statistics, these are simulated statistics based on a specific ARFORGEN demand scenario.

This graph displays the ratio of BOG:Dwell prior to changes from the model. Divided by series, it is easy to see how the ideal 1:2 ratio for BOG:Dwell was not being met.

Results

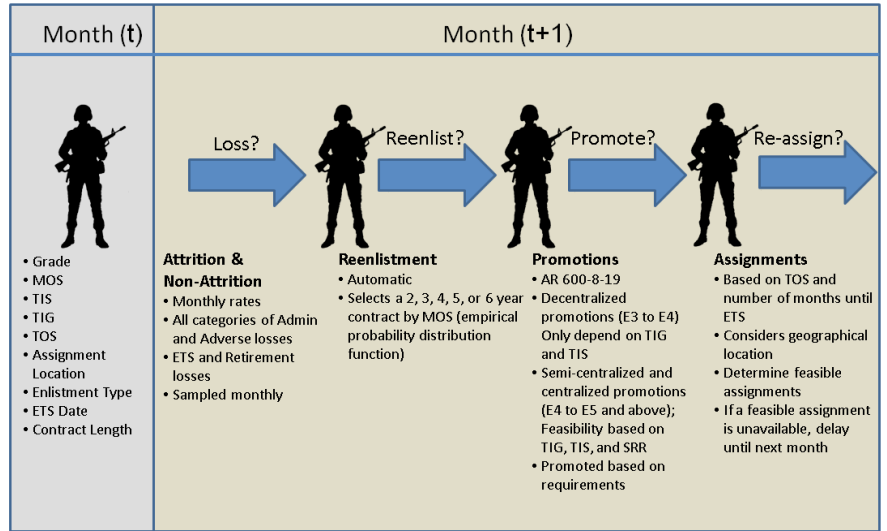
The result of this research is a realistic and useable simulation tool that can assist decision makers in analyzing the future effects of current and proposed demand, structure, and policy changes. As the international environment changes, this tool will allow decision makers to design policy which complies with applicable regulations, law, and procedures and to understand the effect of that Army-level policy on the individual Soldier.

Solution

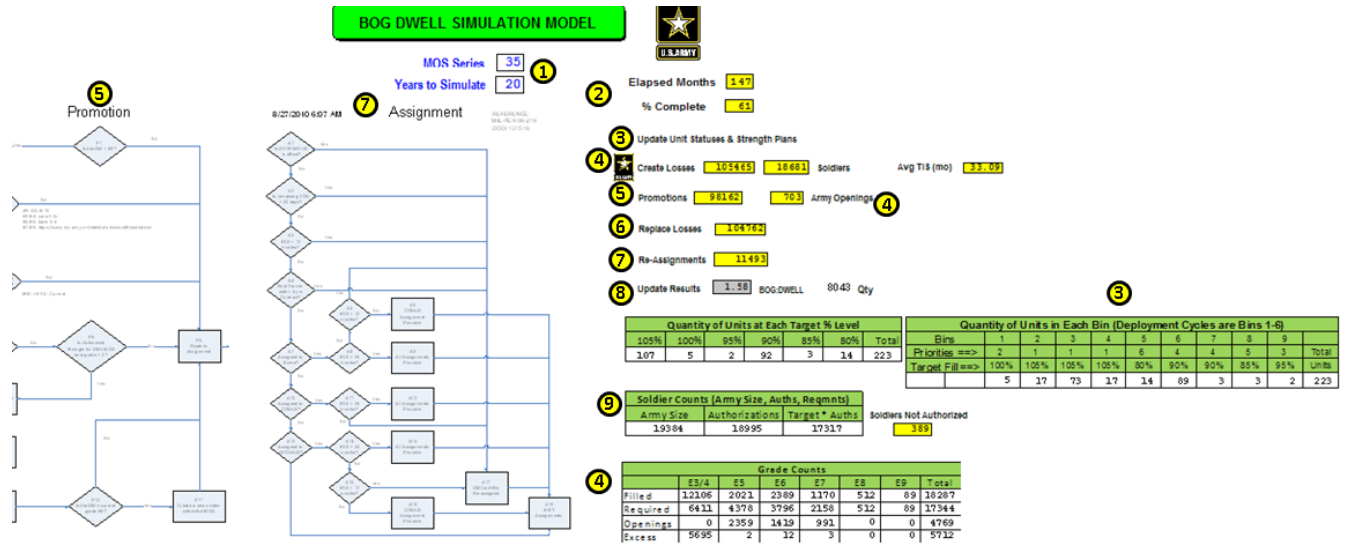
Flow diagrams were created in Process Simulator and merged into the main ProModel simulation. This model eliminated shortcomings of the initial study model by cutting and pasting the schedule from FORSCOM AST output directly into the model without any reformatting required – one of the major reasons this version only takes 30 minutes to run a simulation vs. 27 hours from the initial model.

We generated a simulated Army, assigned and deployed its Soldiers, and replicated their career progression using historic records. A discrete event simulation allows for the interdependencies and variation needed to provide insight into the complex dynamics of a system that cannot be obtained otherwise.

The latest version of the model still calculates unit dwell times based on output from Forces Command's (FORSCOM's) ARFORGEN Synchronization Tool (AST), which is a ProModel based discrete event simulation used by FORSCOM to determine the best sequencing of units into deployment given the available information.



While running the model, it was important to break down the soldiers into their unique characteristics. This leads directly to the research for a personnel tool.



Simulation Structure

A run of the model shows a way to simulate 20 years while also considering multiple variables such as promotions and how many losses need to be filled.