National Aeronautics and Space Administration

Information Technology and Software

Space Utilization Optimization Tool

Robust software system for real-time visualization, modeling, and evaluation of facility management

NASA's Langley Research Center has developed a space allocation and planning software system to allow for more effective and efficient facility usage. It also provides a customizable strategy for organizing personnel and project teams to maximize productivity and synergies among employees. Cost-reduction solutions are suggested based on organizational input constraints related to the facility. The program uses a standard web browser to allow for visualization of entire organization down to individual rooms. The planning tool is based on algorithms that were developed using ArcGIS software and Visual Basic codes, which enable evaluation of different space management scenarios in real time.

BENEFITS

- Determines over-crowding and/or underutilization of laboratory space, office space, or common rooms
- Objectively incorporates personnel work-team synergies and best practices for employee productivity
- Combines space rule constraints with efficiency metrics to determine an annual cost-savings output
- Retrieves and evaluates data from multiple, dynamic data sources
- Compares and optimizes different planning scenarios
- Performs real-time analysis
- Allow access over a standard web browser

APPLICATIONS

- Optimizing, coordinating and/or preparing large, complex facilities - Federal (e.g., Air Force, Navy, GSA, etc.) and corporate facilities
- Technical and laboratory space - Universities and other research organizations
- Corporate office space - multi-national or multi-building corporations

technology solution

THE TECHNOLOGY

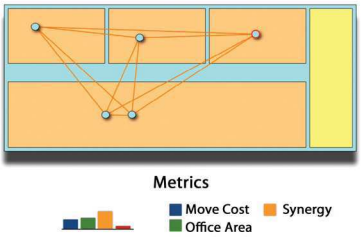
NASA's robust and highly flexible software package was developed in response to an internal need for more efficient and effective facilities management. Available software did not allow for the customization needed in a large, robust organization. Likewise, a GIS visualization technique in concert with optimization techniques was designed. The software developed provides visual representation of not only physical space but also of color-coded employee teams through a web-based portal.

The software has the capability of retrieving data from multiple, dynamic data sources and automatically resolves any consistency issues. Rules for mapping the source data have been defined by an XML model, so the user can access the program via any web browser. The system will model the desired space and display it according to user-generated constraints and metrics for the spaces. This visualization can be expanded to the entire organization or detailed down to the room level. Constraint and metric inputs might include, but are not limited to, the following:

-- Constraints: Personnel resource requirements, space compatibility
-- Metrics: Move costs, synergies among employees

Finally, the software identifies fragmented personnel organizations and inadequate space utilization, and suggests where there might be opportunities for efficiencies. This allows the user to evaluate and compare different scenarios with cost savings (annual efficiencies) tracking. Inevitably the software will be able to suggest solutions that are optimal for that facility.

Screen shot of NASA's Space Utilization Tool



Space Utilization Tool metrics visualization

PUBLICATIONS

Patent Pending

More Information

National Aeronautics and Space Administration

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