

# Systems Maintenance Automated Repair Tasks (SMART)



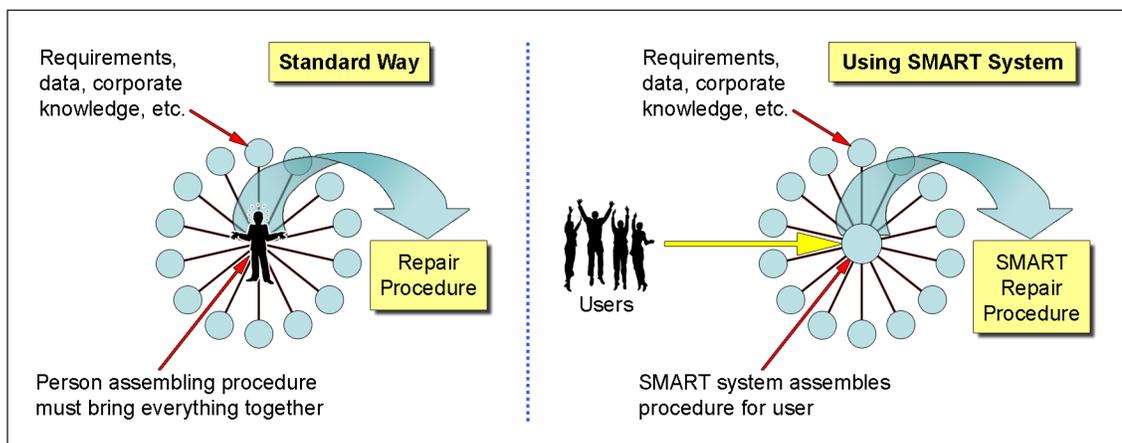
Decision/Data  
Models and  
Analysis

SMART is an interactive decision analysis and refinement software system that uses evaluation criteria for discrepant conditions to automatically provide and populate a document/procedure with predefined steps necessary to repair a discrepancy safely, effectively, and efficiently. SMART can store the tacit (corporate) knowledge merging the hardware specification requirements with the actual “how to” repair methods, sequences, and required equipment, all within a user-friendly interface. Besides helping organizations retain repair knowledge in streamlined procedures and sequences, SMART can also help them in saving processing time and expense, increasing productivity, improving quality, and adhering more closely to safety and other guidelines. Though SMART was developed for Space Shuttle applications, its interface is easily adaptable to any hardware that can be broken down by component, subcomponent, discrepancy, and repair.

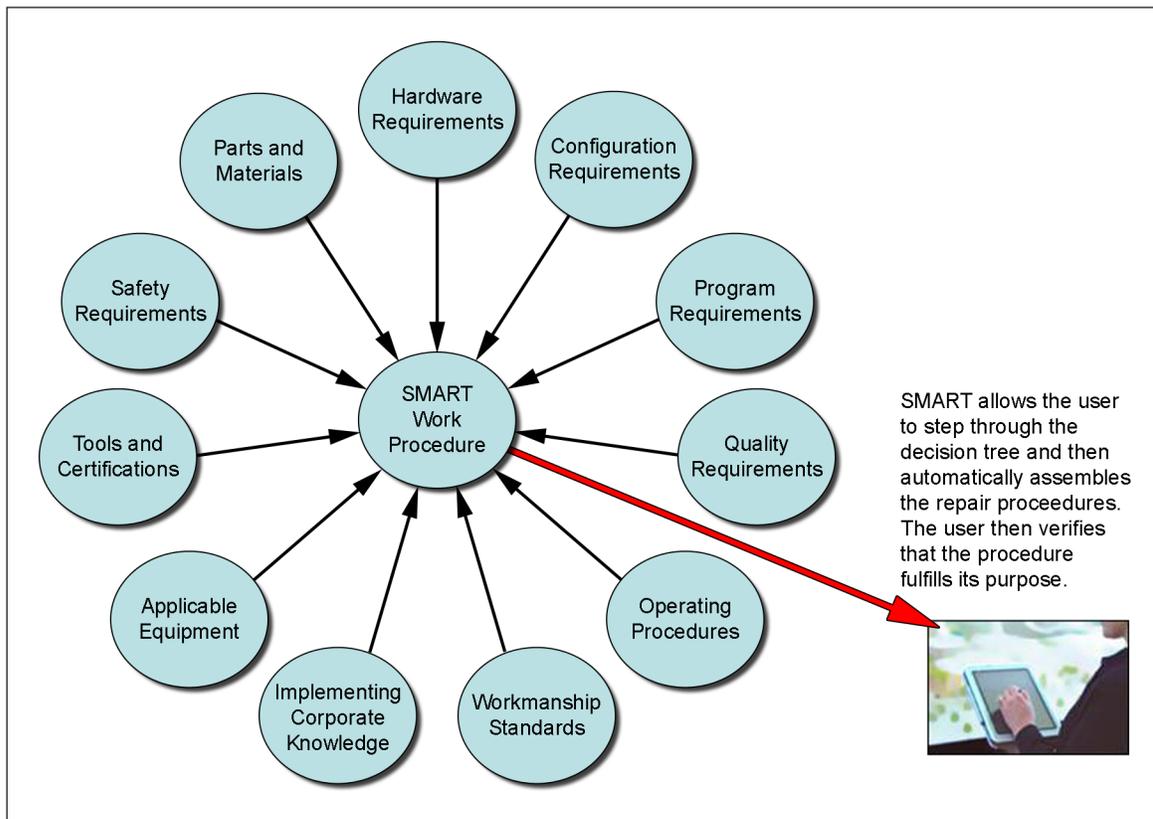
Through SMART’s decision analysis tree, all the permutations among the hardware’s components, subcomponents, possible discrepancies, and corresponding repairs can be identified. SMART’s repair matrix allows the user to define the specific steps and sequences required for any repair identified in the decision tree and to select specific steps from multivariable steps. SMART can interface with external databases and identify information to be inserted into the repair procedure document and will have the ability to automatically select which multivariable step is appropriate.

The user will log onto SMART, then through various levels of the predefined decision tree, identify a hardware discrepancy and refine its description. While navigating through the decision tree, the user can see not only the decision path but the breakdown of the hardware. Backing through decisions or changing a path is extremely easy. After the discrepancy is fully described, SMART will present a set of predefined steps for the user to verify and to tailor or qualify as necessary. The output can be sent to a database for quick retrieval or to a work authoring system in the form of a predefined sequence of steps identifying actions, tools, parts, materials, certifications, and specific requirements.

SMART’s backbone is its ability to create and manipulate interactive decision trees for single-variable and multivariable repair sequences. The user is always presented with the options of the correct hardware configuration and best repair methods. SMART is quick and easy to learn. No special loads are required, and SMART’s security and stability are ensured because the program is Oracle-based and exists on a maintained network server. This reduces the maintenance required for proper functioning and saves time, money, and operational steps. The software itself can be expanded and



Old process versus SMART process.

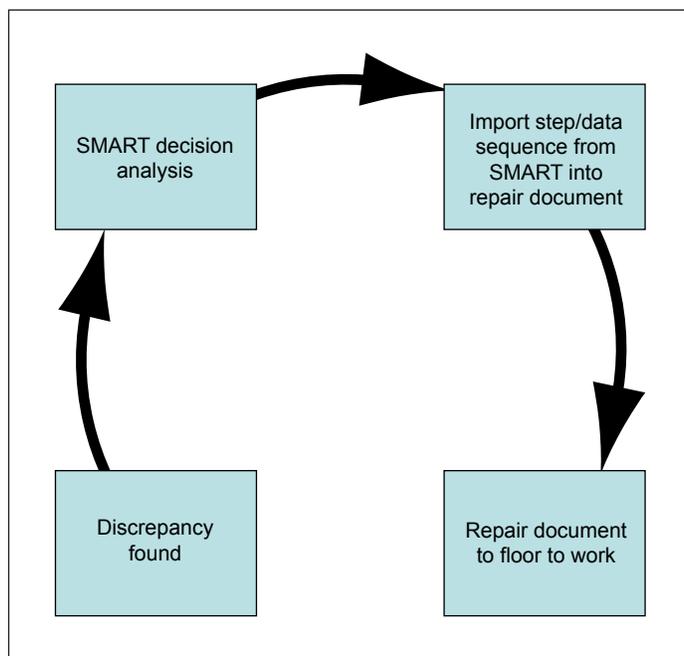


Variables that can be integrated by SMART.

tailored easily. In the scope of its use, SMART has cut process time by about 50 percent, reduced human error, and increased the consistency of hardware evaluation and repair.

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Where SMART fits within the repair process.