

USING THE STRATEGY TO TASK TECHNIQUE TO PRIORITISE TECHNOLOGY OPTIONS

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Abstract. The Strategy to Task Technique (STT) is an approach used to develop low-level, often system-specific, requirements for a system or capability through a process of decomposition. The paper describes the use of STT as an enabling analytical tool to support technology investment decisions. The Strategy to Task technique was used to establish relative priorities for a number of defence system categories. These priorities were then used in a subsequent analysis to evaluate the relative contribution of a number of technology programmes to these defence system categories; the aim was to establish investment priorities for these technology programmes. Two Strategy to Task analyses were completed; one analysis used UK military doctrine material and sources, the other analysis used a UK military task list hierarchy. These analyses produced two independent sets of relative priorities associated with the defence system categories. There was reasonable consistency between these two sets of priorities. Further sensitivity analysis was completed to establish a greater degree of confidence in the outputs. The paper also assesses the method of implementation used and discusses the robustness of the Strategy to Task approach in this application.

INTRODUCTION

The Strategy to Task Technique (STT) is an approach used to develop low-level, often capability or system-specific requirements through a process of decomposition. The technique has several applications and includes assessments of possible system options to meet low level, high-resolution requirements. In this paper an application to help support technology investment decisions is described.

STRATEGY TO TASK OUTLINE

The Strategy to Task technique was originated by the US Air Force and the RAND Corporation and was first widely aired in a paper published in 1989 [1]. It is also described, including a QFD-based worked example, in a paper by Bathe and Smith [2].

The STT process, illustrated in Figure 1, is a structured method for generating more specific lower level tasks from sequential decompositions of higher-level requirements. The highest-level requirements can often be from expressions of national military and/or political goals. The process, therefore, starts from expressions of high-level requirements and cascades through several structured layers to arrive at the lower-level tasks. Authoritative sources, for example Military Doctrine publications, can be used to prompt responses at each subsequent level as to how the previous next higher requirements can be met. The process is then followed until a lowest level appropriate to the specific application is reached.

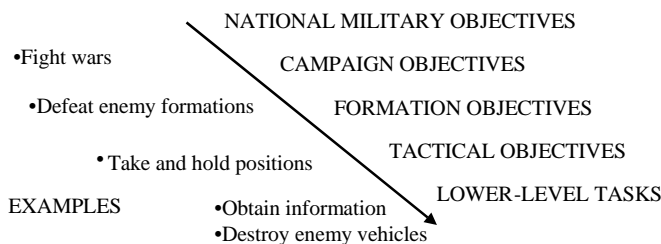


Figure 1. Overview of the STT approach.

As a more detailed example, Figure 2 shows the decomposition process used for an artillery requirements study and which was completed using the Quality

Function Deployment (QFD) technique as the structured cascading mechanism. Figure 2 shows the sources of information used for the study; in this case UK Military Doctrine publications.

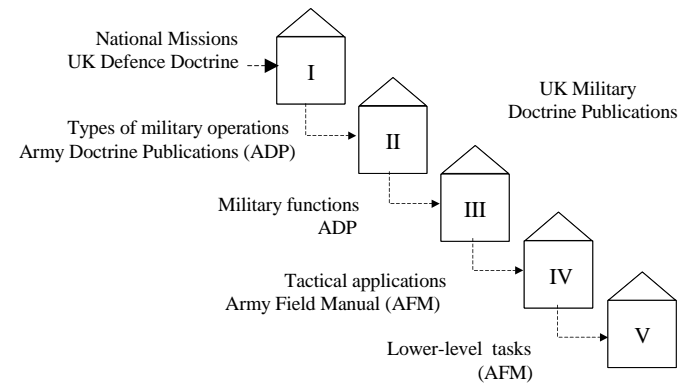


Figure 2. Example STT cascade used for an artillery study.

Figure 2 shows that, in this case, the process was initiated by evaluating the National Missions of the UK Armed Forces. Next level activities were identified from British Army Doctrine Publications (used also for the subsequent next level in the hierarchy) until appropriate functions for the artillery systems under study were reached (these were then developed further from a lower level doctrine publication—the Army Field Manual—until artillery relevant tasks were defined). Each box or ‘house’ in Figure 2 is a Quality Function Deployment (QFD) matrix where a set of requirements (determined either from the initial top-level source for the first matrix of the hierarchy or cascaded down sequentially from the previous level in the hierarchy) is mapped against a set of responses generated from reviews of the source material.

The usual QFD scoring approach is used to link the strengths of responses to requirements; a non-linear scale 0, 1, 3, 9 is found to work well. The QFD approach used in conjunction

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