USE OF ANALYTIC HIERARCHY PROCESS MODELING IN THE MILITARY DECISION MAKING PROCESS FOR COURSE OF ACTION EVALUATION AND UNIT COHESION

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This article is intended to illustrate how an Analytic Hierarchy Process (AHP) model may be used by military commanders to better integrate staff, understand higher command's mission and intent more clearly, and decide more objectively than other methods used between various courses of action (COA). Additionally, I suggest that AHP modeling minimizes the influence that distracters have on decision-making. I propose that AHP lends itself to the creation of a learning system such that as one gathers additional data or reference points, the model becomes more accurate and reactive. This paper illustrates a way whereby the Army may integrate AHP modeling into its decision-making process to reap greater results from its training through the integration of a knowledge based system (KBS). The intent of this paper is to stimulate interest in AHP usage coupled with KBS for long-term training, learning and COA evaluation.

Figure 1 is a sample mission analysis model that may be used during the military decision making process (MDMP). The model includes as the goal successful completion of the mission that is issued during the operations order and the subordinate specified and implied tasks. The most likely, the next most likely and the most dangerous courses of action are indicated as the various alternatives in the AHP model. Figure 2 is a sample model evaluation criteria model for the generation of priorities during the MDMP. The evaluation criteria are taken from Field Manual 101-5, *Staff Organization and Operations*.

Figure 1: Sample Mission Analysis Model

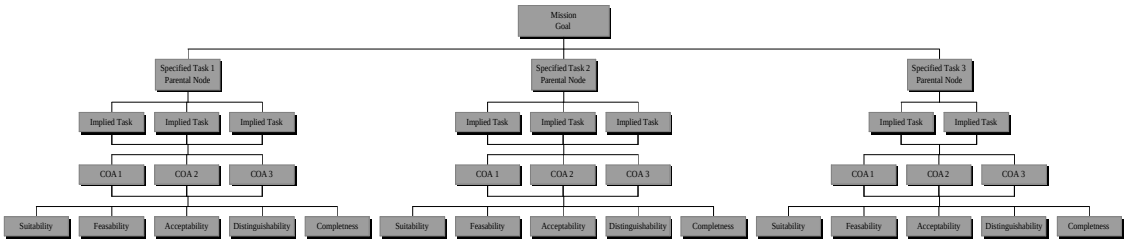

Figure 1: Sample Mission Analysis Model

Figure 2: Sample AHP model evaluation criteria for MDMP

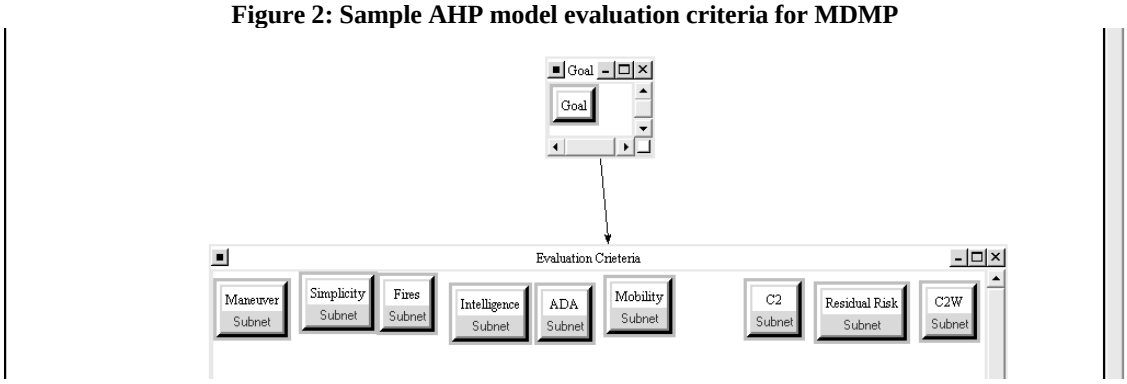

Table 1 and table 2 are the resultant priority generations from the completion of the pairwise comparisons for the sample model for the MDMP. The result of the synthesis is that overall priority is to COA 1. However, the important implication of the model is the combined use of a knowledge based system with AHP throughout the MDMP.

Table 1: Parent Node Criteria Evaluation

FACTORS	Man	Simp	Fires	Intel	ADA	Mob	CSS	C2	Risk	C2W	Priority Vector
Maneuver	1.00	1.00	1.33	0.33	0.33	0.33	0.33	0.33	0.67	0.33	0.20
Simplicity	1.00	1.00	1.33	0.33	0.33	0.33	0.33	0.33	0.67	0.33	0.16
Fires	0.75	0.75	1.00	0.25	0.25	0.25	0.25	0.25	0.50	0.25	0.21
Intelligence	3.00	3.00	4.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	0.05
ADA	3.00	3.00	4.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	0.05
Mobility	3.00	3.00	4.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	0.05
CSS	3.00	3.00	4.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	0.05
C2	3.00	3.00	4.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	0.05
Risk	1.50	1.50	2.00	0.50	0.50	0.50	0.50	0.50	1.00	0.50	0.11
C2W	3.00	3.00	4.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	0.05

Table 2: Distributive and Ideal Priorities for MDMP

Distributive Mode											
	Man	Simp	Fires	Intel	ADA	Mob	CSS	C2	Risk	C2W	Overall Priority
COA 1	0.01	0.01	0.01	0.03	0.07	0.03	0.04	0.07	0.04	0.04	0.38
COA 2	0.01	0.02	0.02	0.03	0.03	0.03	0.07	0.04	0.02	0.07	0.33
COA 3	0.02	0.01	0.01	0.07	0.03	0.07	0.02	0.02	0.01	0.02	0.29

	Ideal Mode										
COA 1	0.50	0.50	0.50	0.47	1.00	0.47	0.50	1.00	1.00	0.50	1.00
COA 2	0.33	1.00	1.00	0.50	0.50	0.50	1.00	0.50	0.50	1.00	0.88
COA 2	1.00	0.33	0.33	1.00	0.33	1.00	0.33	0.33	0.33	0.33	0.78

References

Headquarters, Department of the Army, FM 101-5, *Staff Organization and Operations*, Washington, DC, 31 May 1997.

Saaty, Thomas L. *Decision Making with Dependence and Feedback: The Analytic Network Process*, 2nd Edition, p. 15. RWS Publications: Pittsburgh, 2001.