Using THE HTA TOOL for Agile Mission Planning

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Hierarchical Task Analysis

Make cup of instant coffee

1 Boil water

1.1 Fill kettle

1.1.1 Remove lid

1.1.2 Place under tap

1.1.3 Turn on

1.1.4 Turn off

1.2 Switch kettle on

2 Place ingredients in cup

2.1 Open coffee jar

2.1.1 Extract spoonful of coffee

2.1.2 Place in cup

2.2 Open sugar jar

2.2.1 Extract spoonful of sugar

2.2.2 Place in cup

3 Mix

2.3 Add boiling water
Hierarchical Task Analysis

Advantages:

- Simple concept, easy to learn and use
- Hierarchy allows focus on complex & important tasks
- Used in large variety of domains
- Basis of many other analysis techniques
Hierarchical Task Analysis

Disadvantages:

- Can become large & unwieldy
- Difficult to maintain
- No formal process or appearance
- Analysts and experts need to all be present during its creation
- Low awareness within Armed Forces
THE HTA TOOL

- Growing need for the computerisation of HTA
- HTA tool developed by HFI-DTC (an MoD initiative)
- Several prototypes and user feedback later…
- THE HTA TOOL version 1.0
- Freely available and in use widely & Internationally
- Users include DSTL, RAF, REME TDT, DSTO, DRDC, BAE, Ael (and other acronyms!)
Mission Planning

Decision-making & plans are key military activities
Mission Planning

**Issues:**

- Must be timely and accurate
- Requirement for more agile approach to mission planning (C2 traditionally constrained)
- Whiteboards, spreadsheets and presentations currently used
Mission Planning

Involves breaking down operations into sub-components, which are in turn decomposed, and resources allocated (Hierarchical Task Analysis)

Example: HTA has been used in UAV mission planning (Bryant 2006)
Application of the Tool

Why use THE HTA TOOL?

- Software improves speed & efficiency
- Intuitive - make changes “on the fly”
- Wizards/checkers to help construct
- Extensive plans system
- Automatic updates (numbering & plans)
- Merge, print, export analyses
- And more…
Application of the Tool

BAE Systems are currently using THE HTA TOOL for air mission planning for the Euro-Fighter

Could it be used for mission planning for ground military operations?
Proof of Concept

Trialled THE HTA TOOL as a retrospective mission planning tool

“Armoured Battlegroup in the Quick Attack” scenario
Proof of Concept

THE HTA TOOL - [Quick Attack]

0 Quick Attack
Plan 0: Do 1
Do 2, continue throughout attack
When target found do in order 3-5

1 Advance to Target

2 Find
Plan 2: Do 1 continuously
Do at the same time 2-5

2.1 All units gather data

2.2 Recce platoon gather information on target
Plan 2.2: Do at the same time 1-5

2.2.1 Get info on strengths
2.2.2 Get info on weapons
2.2.3 Get info on fields of fire
2.2.4 Get info on routes into enemy position
2.2.5 Get likely withdraw routes

2.3 Recce advise OC on possible FUPs
Proof of Concept

Example

Companies A and B attack enemy position

Company B expected to make breakthrough, supported by reserve, C

2.2 Company A and B locate FUP
2.3 Company C positioned to support Company B
   Plan 2.3: Do at the same time 1-2
      2.3.1 Set orientation
      2.3.2 Locate reserve ammo supply for Company C
2.4 Confirmatory orders
Company A makes unexpected breakthrough

Hasty re-planning: re-orient C to support A, re-locate ammunitions, notify logistics support

| 2.4 Re-orient Company C in support of Company A |
| Plan 2.4: Do at the same time 1-2 |
| Do 3 |
| 2.4.1 Change orientation |
| 2.4.2 Move ammo supply |
| 2.4.3 Notify logistics support |
Further Development Routes

- Trials on real/simulated missions
- Generate Mission Planning template
- New version of tool?
- Flow chart/time-line based view
- Closer integration between tasks and plans
- Collaborate with other tools & methods
Conclusion

We have shown:

- HTA is suitable for use in Mission Planning
- THE HTA TOOL can be used to create, manage & update Mission Plans

Next step:

- Test the tool on real missions
- Develop THE HTA TOOL to directly support Agile Mission Planning
Questions?

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