AGILE TASK MANAGEMENT IN SAR OPERATIONS

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Investigation / planning / operation roles

- Investigation...performing tasks and giving new info to: Operations
- Operations...create and evaluate tasks to: Planning
- Planning...is getting info and conclusions to: Investigation
Behaviour of search operations

- Working with many searchers
  - Keep track about who is coming, who is on the field, who is waiting for tasks?

- Dynamic change of searchers
  - Lack of number of tasks

- Handling a large number of tasks
  - Managing a list on paper → mess on the paper

- Reevaluation of tasks
  - New list, writing it again on paper?

- Sharing task list between search managers
  - Same list of tasks is needed for 2-3 search managers
Common consequences of overloaded management

1. Lack of available tasks
2. Searchers are waiting in queue
3. Operation leaders apply an ad-hoc techniques!
4. Task management becomes a bottle neck

“Too many” searchers instead of “very powerful”!

Solution is:
Process that can take as many searchers as it is possible without scalability (i.e. big numbers) problems.
Solution invented by Toyota car industry
- KanBan literally means “signboard” or “billboard”
- Uses a card as an information about what has to be produced
- Same principle has been applied to software industry in the last 10 years
Introduction to KanBan board

- Backlog – bin for new tasks:
  - Evaluation
  - Do not execute yet
- Todo – bin for “Ready to perform” tasks
  - Choose for execution
  - Do not evaluate
- In progress – bin of currently executing tasks
- Done – bin of done job
Real world samples
Bridge to the Mountain Rescue Service

- KanBan board is adopted by adding new columns
- KanBan card is adopted to a Rescue Card
- Each card represents a task in SAR mission
<table>
<thead>
<tr>
<th>TASK</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DEPART</td>
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<tr>
<td></td>
<td>START</td>
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<td></td>
<td>FINISH</td>
</tr>
<tr>
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</table>
Briefing with search manager

- Backlog
  - Creek D
  - Segment H
  - Segment I

- Todo [5]
  - Road F
  - Segment A
  - Cliff J
  - River C

- Briefing [1]
  - Cave B
  - Speleo Team

- On the field [5]

- Debriefing [1]

- Done
Fill up Todo with 5 tasks

- Backlog
  - Segment H
  - Segment I

- Todo [5]
  - Road F
  - Segment A
  - Cliff J
  - River C
  - Creek D

- Briefing [1]
  - Cave B
  - Speleo Team

- On the field [5]

- Debriefing [1]

- Done
Speleo team is going to field

- Backlog
  - Segment H
  - Segment I

- Todo [5]
  - Road F
  - Segment A
  - Cliff J
  - River C
  - Creek D

- Briefing [1]
  - Cave B
  - Speleo Team
  - Start: 12:35

- On the field [5]

- Debriefing [1]

- Done
Quad team is going to briefing

**Backlog**
- Segment H
- Segment I

**Todo [5]**
- Segment A
- Cliff J
- River C
- Creek D

**Briefing [1]**
- QUAD Team

**On the field [5]**
- Cave B
- Speleo Team
- **Start:** 12:35

**Debriefing [1]**

**Done**
Fill up Todo with 5 tasks

- Backlog
  - Segment I
- Todo [5]
  - Segment A
  - Cliff J
  - River C
  - Creek D
  - Segment H
- Briefing [1]
  - QUAD Team
  - Road F
- On the field [5]
  - Cave B
  - Speleo Team
  - Start: 12:35
- Debriefing [1]
- Done
QUAD is going to field

- Backlog
  - Segment I
    - Segment A
    - Cliff J
    - River C
    - Creek D
    - Segment H

- Todo [5]

- Briefing [1]
  - Road F
  - QUAD Team Start: 12:44
  - Cave B
  - Speleo Team Start: 12:35

- On the field [5]

- Debriefing [1]

- Done
Search dog 1 briefing

- Backlog
  - Segment I
    - Cliff J
    - River C
    - Creek D
    - Segment H
- Todo [5]
  - Segment A
    - Search dog 1
- Briefing [1]
- On the field [5]
  - Road F
  - QUAD Team
    - Start 12:44
- Debriefing [1]
  - Cave B
  - Speleo Team
    - Start: 12:35
- Done
Fill up Todo with 5 tasks

- Backlog
- Todo [5]
  - Cliff J
  - River C
  - Creek D
  - Segment H
  - Segment I
- Briefing [1]
  - Segment A
  - Search dog 1
- On the field [5]
  - Road F
  - QUAD Team Start: 12:44
- Debriefing [1]
  - Cave B
  - Speleo Team Start: 12:35
- Done
Backlog is empty!

- Backlog!!!
  - Cliff J
  - River C
  - Creek D
  - Segment H
  - Segment I
- Todo [5]
- Briefing [1]
  - Segment A
  - Search dog 1
- On the field [5]
  - Road F
  - QUAD Team
  - Start 12:44
- Debriefing [1]
  - Cave B
  - Speleo Team
  - Start: 12:35
- Done
Search Dog is going to field

Backlog
- Cliff J
- River C
- Creek D
- Segment H
- Segment I

Todo [5]
- Segment A
  - Search dog 1
    - Start: 12:50
- Road F
- QUAD Team
  - Start: 12:44

Briefing [1]

On the field [5]

Debriefing [1]
- Cave B
  - Speleo Team
    - Start: 12:35

Done
New tasks in Backlog

Backlog
- Segment K
- Road L
- Old houses M

Todo [5]
- Cliff J
- River C
- Creek D
- Segment H
- Segment I

Briefing [1]
- Segment A
- Search dog 1
  - Start: 12:50

On the field [5]
- Road F
- QUAD Team
  - Start: 12:44
- Cave B
- Speleo Team
  - Start: 12:35

Debriefing [1]

Done
Rescuers are going to briefing

- Backlog
  - Road L
  - Old houses M
- Todo [5]
  - Creek D
  - Segment H
  - Segment I
  - Segment K
- Briefing [1]
  - Cliff J
  - Rescuers 1
- On the field [5]
  - Segment A
  - Search dog 1
    - Start: 12:50
  - Road F
  - QUAD Team
    - Start: 12:44
  - Cave B
    - Speleo Team
    - Start: 12:35
- Debriefing [1]
- Done
Rescuers are going to field

- Backlog
  - Road L
  - Old houses M

- Todo [5]
  - River C
  - Creek D
  - Segment H
  - Segment I
  - Segment K

- Briefing [1]
  - Cliffs J
    - Rescuers 1 Team
      - Start: 12:55

- On the field [5]
  - Segment A
    - Search dog 1
      - Start: 12:50
  - Road F
    - QUAD Team
      - Start: 12:44
  - Cave B
    - Speleo Team
      - Start: 12:35

- Debriefing [1]

- Done
Raft Team take River C

Backlog
- Old houses M
  - Creek D
  - Segment H
  - Segment I
  - Segment K
  - Road L

Todo [5]
- Segment J

Briefing [1]
- Raft Team

On the field [5]
- Cliff J
- Rescuers 1 Team
  - Start: 12:55
- Segment A
- Search dog 1
  - Start: 12:50
- Road F
- QUAD Team
  - Start: 12:44
- Cave B
- Speleo Team
  - Start: 12:35

Debriefing [1]

Done
Raft Team go to River C, all resources on the field

- Backlog
  - Old houses M
- Todo [5]
  - Creek D
  - Segment H
  - Segment I
  - Segment K
  - Road L
- Briefing [1]
- On the field [5]
  - River C
    - Raft Team
    - Start 13:05
  - Cliff I
    - Rescuers 1 Team
    - Start 12:55
  - Segment A
    - Search dog 1
    - Start 12:50
  - Road F
    - QUAD Team
    - Start 12:44
  - Cave B
    - Speleo Team
    - Start 12:35
- Debriefing [1]
- Done
QUAD is finished, going to Debriefing

Backlog
- Old houses M
  - Creek D
  - Segment H
  - Segment I
  - Segment K
  - Road L

Todo [5]
- Segment I

Briefing [1]
- River C
- Raft Team
  - Start: 13:05
- Cliff J
- Rescuers 1 Team
  - Start: 12:55
- Segment A
  - Search dog 1
  - Start: 12:50
- Cave B
  - Speleo Team
  - Start: 12:35

On the field [5]

Debriefing [1]
- Road F
- QUAD Team
  - Start: 12:44
  - Finish: 13:10

Done
QUAD Team propose: search Road F by search dogs due to bushes
Debriefing done, QUAD is free

- **Backlog**
  - Old houses M
  - Road F Bushes (Search dogs)

- **Todo [5]**
  - Creek D
  - Segment H
  - Segment I
  - Segment K
  - Road L

- **Briefing [1]**
  - River C
  - Raft Team
    - Start: 13:05
  - Cliff J
  - Rescuers 1 Team
    - Start: 12:55

- **On the field [5]**
  - Segment A
  - Search dog 1
    - Start: 12:50
  - Cave B
  - Speleo Team
    - Start: 12:35

- **Debriefing [1]**
  - QUAD Team
    - Start: 12:44
    - Finish: 13:10
    - Information F

- **Done**
  - Road F
QUAD takes Road L

Backlog
Road F Bushes (Search dogs)
- Creek D
- Segment H
- Segment I
- Segment K
- Old houses M

Todo [5]

Briefing [1]
Road L
QUAD Team

On the field [5]
- River C
  - Raft Team
  - Start: 13:05
- Cliff J
  - Rescuers 1 Team
  - Start: 12:55
- Segment A
  - Search dog 1
  - Start: 12:50
- Cave B
  - Speleo Team
  - Start: 12:35

Debriefing [1]

Done
Road F
- QUAD Team
  - Start: 12:44
  - Finish: 13:10
- Information F
QUAD goes to field

**Backlog**
- Road F Bushes (Search dogs)
- Creek D
- Segment H
- Segment I
- Segment K
- Old houses M

**Todo [5]**

**Briefing [1]**

**On the field [5]**
- Road L
  - QUAD Team
    - Start 13:30
- River C
- Raft Team
  - Start 13:05
- Cliff J
- Rescuers 1 Team
  - Start 12:55
- Segment A
- Search dog 1
  - Start 12:50
- Cave B
- Speleo Team
  - Start 12:35

**Debriefing [1]**

**Done**
- Road F
  - QUAD Team
    - Start 12:44
    - Finish 13:10
  - Information F
New resource arrives (Search dog 2)

- Backlog
  - Road F Bushes (Search dogs)
  - Creek D
  - Segment H
  - Segment I
  - Segment K
  - Old houses M

- Todo [6]

- Briefing [1]

- On the field [6]
  - Road L
  - QUAD Team
    - Start 13:30
  - River C
  - Raft Team
    - Start 13:05
  - Cliff J
  - Rescuers 1 Team
    - Start 12:55
  - Segment A
  - Search dog 1
    - Start 12:50
  - Cave B
  - Spelaeo Team
    - Start 12:35

- Debriefing [1]

- Done
  - Road F
    - QUAD Team
      - Start 12:44
      - Finish 13:10
    - Information F
Filling Todo bin with 6 tasks

Backlog!!!
Todo [6]
- Creek D
- Segment H
- Segment I
- Segment K
- Old houses M
- Road F Bushes (Search dogs)

Briefing [1]

On the field [6]
- Road L
- QUAD Team
  - Start: 13:30
- River C
- Raft Team
  - Start: 13:05
- Cliff J
- Rescuers 1 Team
  - Start: 12:55
- Segment A
- Search dog 1
  - Start: 12:50
- Cave B
- Speleo Team
  - Start: 12:35

Debriefing [1]

Done
- Road F
- QUAD Team
  - Start: 12:44
  - Finish: 13:10
- Information F
...after some time, a lot of job has been done...

...and a lot is still working on...
Reported found subject!
结论

- 视觉化给所有成员：
  - 规划
  - 进行中
  - 完成的工作
- 能力选择任务
- 能力接受和评估新任务。
- 可调整以改变搜索者的数量。
- 使得两个任务的分离：任务创建，任务执行
- 优先级任务 ➜ 最佳资源利用
- 无可用任务的缺失是可见的
- 文档？
KanBan rescue card

<table>
<thead>
<tr>
<th>TASK</th>
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<tbody>
<tr>
<td>Road F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DEPART: 13:30</td>
</tr>
<tr>
<td></td>
<td>START: 13:44</td>
</tr>
<tr>
<td></td>
<td>FINISH: 16:03</td>
</tr>
<tr>
<td></td>
<td>ARRIVAL: 16:30</td>
</tr>
</tbody>
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</tr>
</thead>
<tbody>
<tr>
<td>QUAD A</td>
<td>50%</td>
<td>Searched road only. Bushes, send dog there...</td>
</tr>
</tbody>
</table>

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Thank you for your attention!