

# **ARCHITECTURE OF INTELLIGENCE FUSION SYSTEMS - C4I SUPPORT**

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  - **Information sharing architecture.**
- **Our solution:**
  - **C4I architecture to support situational awareness.**
  - **Role of CAX in Intelligence Fusion Systems development.**

# **Introduction: Challenges of Crisis / Emergency management**

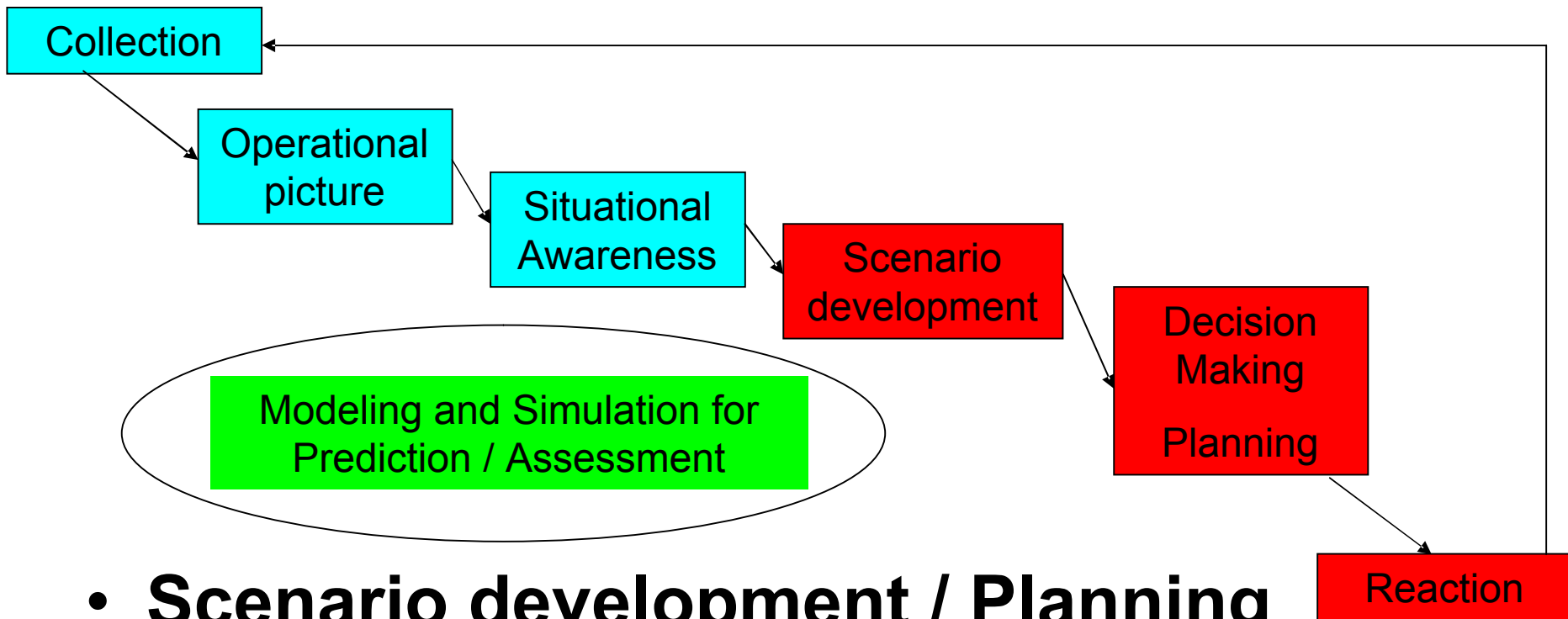
- **Short alert time (some times difficult to predict)**
- **Large scale of covered citizens / critical infrastructure**
- **Civil-military**
- **Interagency**
- **Regional / cross-border**
- **Public-private**
- **Volunteers**

# **Network of SitCens and network enabled rapid reaction / immediate response system**

- **Collection and fusion**
- **Situation awareness**
- **Decision making and planning**
- **Tasking**
- **Control**
- **Collection system configuration management**
- **Reaction system configuration management**

# Architecture of the situation and scenario development

- **Common Recognized Operational Picture for Situational Awareness**

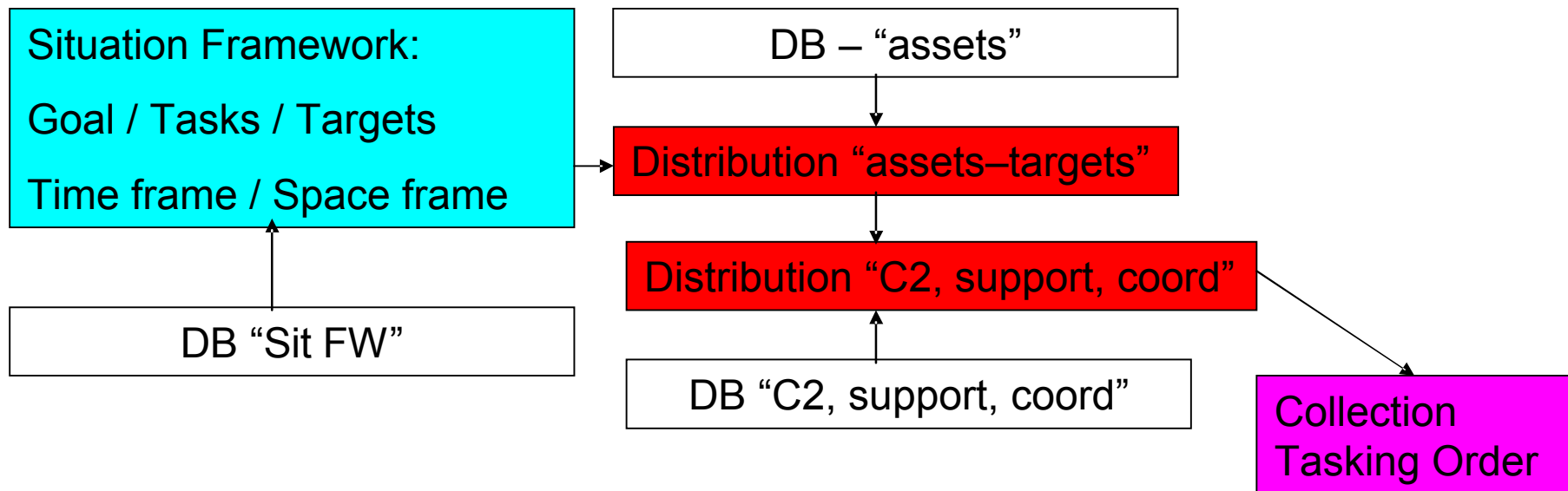


- **Scenario development / Planning**

# Architecture of the collection system, collection planning and tasking

## System of intelligence assets configuration and management

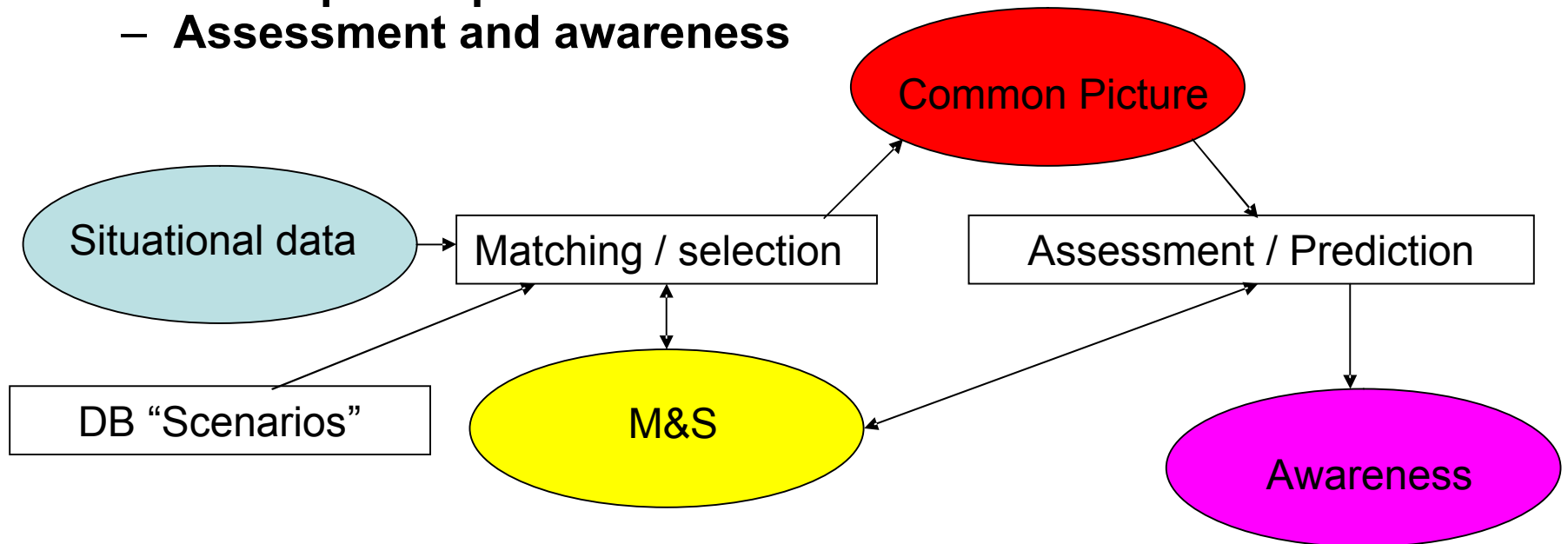
- Mission / tasks => targets
- Time frame / Space frame
- Assets database (capabilities, readiness, position)
- Tasking in time frame / space frame / task- target frame
- C2, support, coordination



# Architecture of the situation assessment system and intelligence fusion

Joint Intelligence Center and data / intelligence fusion –  
Emergency Operations Center

- Scenario frame (from military ops to crisis management ops)
- Matching of scenarios with situation data
- Modelling and simulation for situation / scenario development prediction
- Assessment and awareness



# Information sharing architecture

## Joint Intelligence Center and web-services / knowledge repository management

– Players

– Activities

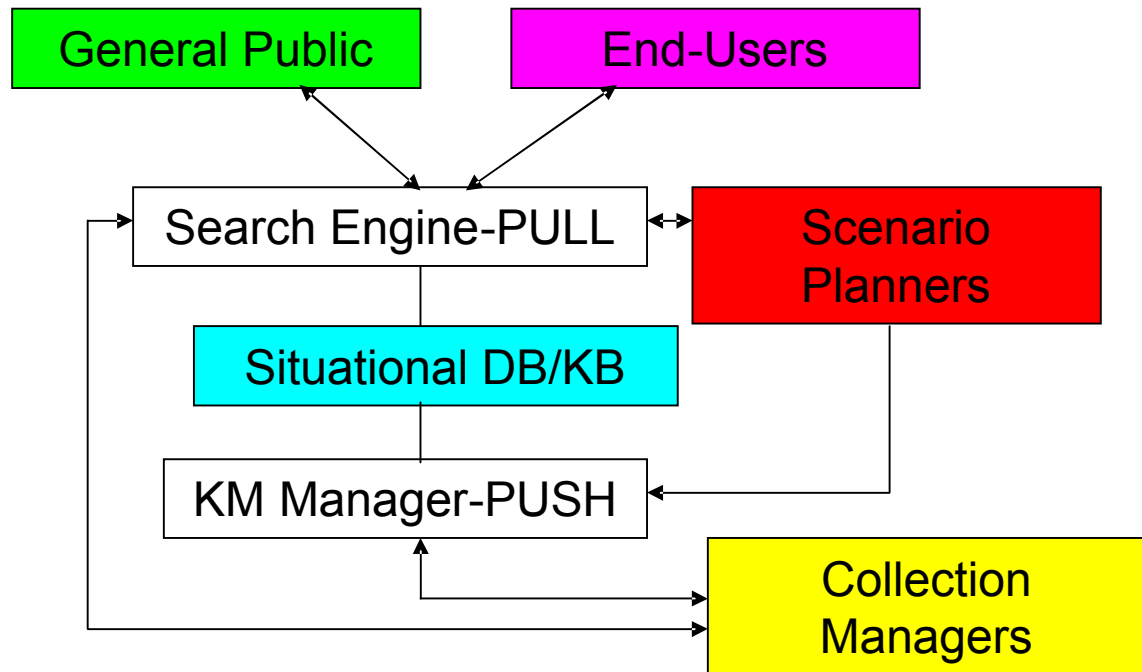
– Locations

– Tools

– Strategies

– Tactics

– Events – link with implemented scenarios





# **Center of Excellence on Operational Analyses: NATO SfP/ EU FWP**

- **Activities to support development of integrated crisis / emergency systems**
  - **Situational awareness and operational planning**
  - **Enterprise architecture governance**
  - **Capabilities planning**
- **Support activities**
  - **Infrastructure management**
  - **Mathematical support tools**
  - **Project management**
  - **Training management**

# **Project base from last 4 years for CoE on OA**

- 1. ASOC project / NSOC project**
- 2. Land forces C4 architecture project**
- 3. Architectural approach to emergency management  
C4 systems planning project / Mobile C2 modules  
project**
- 4. White paper on Civil Security**
- 5. EAG for IEMS project**
- 6. CAX for CM/EM project / CIP Project**
- 7. Set of projects on collection planning, radar data  
fusion, situation assessment, operational planning,  
CAX in the last 20 years**

# **Personnel base for the CoE on OA**

- **More than 40 persons networked around the kernel of 9 persons in the Bulgarian Academy of Sciences**
- **Academician, professors, senior and junior researchers, programmers, PhD students**
- **IPP-BAS in cooperation with IMI, CNSDR, SRI, DSC, AMol, universities and foreign partners**
- **Main goal: CAPACITY BUILDING trough consolidation / transfer / adaptation/ development / integration**

# **Conclusion: Role of CAX in Intelligence Fusion Systems development**

**Focus on CAX as a key tool for:**

- Concept Development and Experimentation**
- Advanced Technology Demonstrations**
- Training**
- Assessment and certification**
- Requirements definition for SW/HW for IFS**
- Situation awareness through intelligence fusion**
- Civil-military, interagency, cross-border coordination through information sharing**

# **Conclusion: Center for CAX on CM/EM in BSCR**

- ***Military DF – Crisis Management  
Situation Synthesis***
- ***Academic support in new NATO  
members / PfP partners to data fusion /  
situational awareness***
- ***Partnership as data fusion platform***
- ***PAP CMEP/CM as environment for  
intelligence fusion***

# CoE on OA

- ***Bulgarian Academy of Sciences – Center for National Security and Defense Research***
  - <http://www.icsr.bas.bg/cnsdr/>
- ***Institute of Parallel Processing***
  - <http://www.bas.bg/clpp/>
- ***C4I Department in IPP***
  - <http://www.gcmarshall.bg/c4i/>
- ***SfP 981149 form NATO “Security through Science”***
  - <http://www.gcmarshall.bg/sfp981149/>