Mission Oriented C²

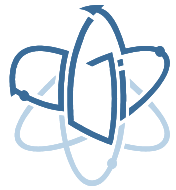## Command and Control Systems as Knowledge Systems

Point of Contact
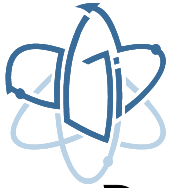
Presented by:

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- Israeli Defense Forces/C4I Branch/C4I Technology Division/Office of the CTO
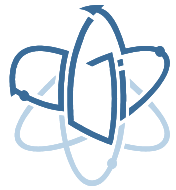
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Agenda

- Information-overflow problem

- Information-oriented C^2 systems

- Mission-oriented C^2 systems:

  - Definition

  - Mission as a shared awareness framework

  - Characteristics of a mission-oriented C2 system

- Summary

Information-Overflow Problem

- Information age leading technologies:
  - IP – Domestic expenses on communication rose up to 5 times in 30 years (OECD, 2001)
  - HTTP – Internet traffic increased 100,000,000 since 1983 (ISC)
  - RFID – 14 billion (tagged & connected) physical entities expected by 2010 (Forrester Research, 2002)
- Large quantities of easily available information leads to information overflow
- The need to cope with the problem of information overflow has created a new products market – Knowledge Services

Information-Overflow Problem
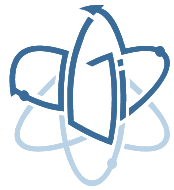
- Knowledge is a model of reality, based on the information known about that reality
- The knowledge consumer uses the model to control and manipulate reality
  - Consumer sites on the Internet – gather product information, present it to the potential consumers, and help them carry out the purchase
  - Health advise – provides health information for a specific set of symptoms
- The knowledge service provides context for the information
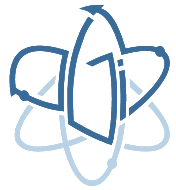
Information-Oriented C² Systems
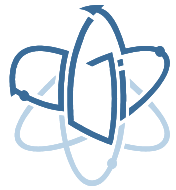
- Infostructure will ensure unbounded availability of information to all forces in the battlespace

- Command and control systems built today focus on the information they manage

- Information Oriented C² Systems:
    - Functionality includes data storing and maintenance of its integrity and coherence
    - Graphical interface and human engineering – all follow the data structure of the system

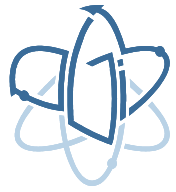# Information-Oriented C² Systems – Example

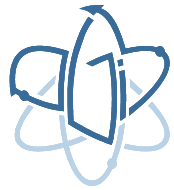Objectives

Targets

Forces
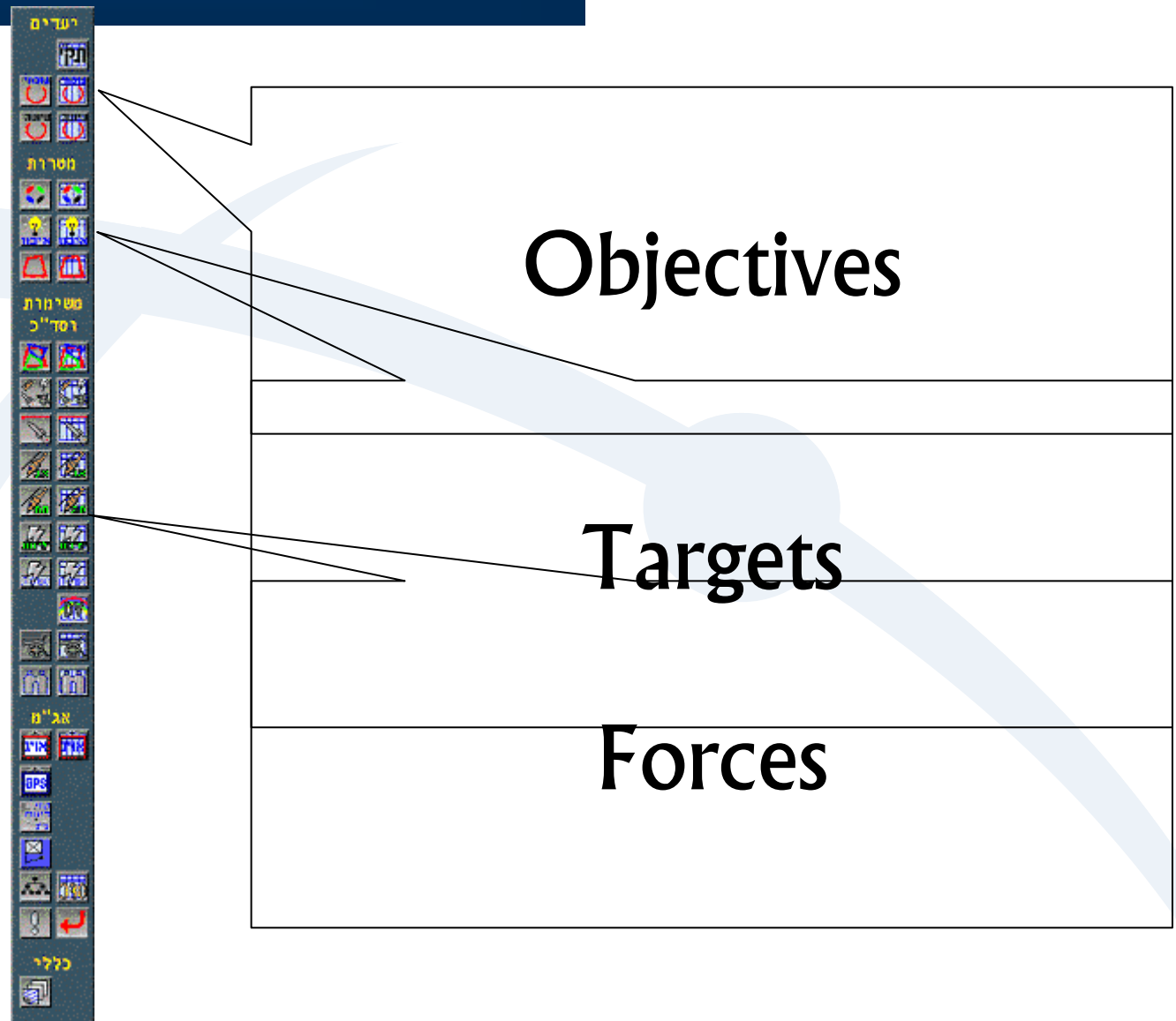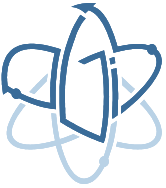
Information-Oriented C² Systems

- Information-oriented systems are tools to manage data
- The knowledge of how to use these tools to achieve the user's goal – lies within the user

Mission-Oriented C² Systems

- **Definition:**
  - A mission is the context of a certain operational process
  - The context represents the knowledge known about that operational process

- **Mission as a knowledge service, answers the questions of:**
  - What decisions and actions are expected to be taken by the user
  - What information should be presented in order to help achieve the mission and in what context should this information be presented

- **The mission enables the user to build a knowledge model:**
  - Reflects reality
  - Means to manipulate that reality

Mission-Oriented C² Systems

Mission-Oriented C² Systems

Mission-Oriented C² Systems

- A mission-oriented system contains the operational knowledge – as a collection of missions

- Each mission presents to the user the information needed to accomplish the mission

Mission-Oriented C² Systems
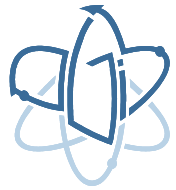
- The mission as a shared awareness framework:
  - A mission can be shared by many users
  - A common mission picture is built jointly all through the mission's phases and is updated constantly by the users
  - Participants see their part of the common picture
  - Participants can view the picture seen by the other users to better understand their view of the mission

Mission-Oriented C² Systems
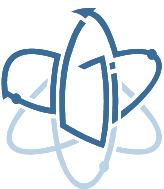
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Mission-Oriented C² Systems
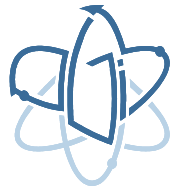
- A mission oriented C2 system will provide a framework in which distributed forces around the battlespace could build a common situation picture

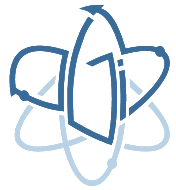- On its basis, the forces will manage reality in a synchronized fashion

Mission-Oriented C² Systems

- Characteristics of a mission-oriented C² system:
  - Composed from a set of services:
    - Collection of services working together to satisfy the user's needs
    - Plug & play
  - Embodies operational knowledge
    - Formulization of operational knowledge
    - Uninterrupted information flow
  - Infostructure-based:
    - Hiding information resources
    - Hiding information consumers

Summary
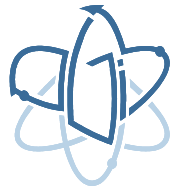
- A mission oriented system contains the operational knowledge as a collection of missions:
  - Each mission presents to the user whatever information is required to accomplish the mission
- Accomplishing a mission is an integrated effort by a group of operational users:
  - A framework in which distributed forces around the battlespace could build a common situation picture
  - Allowing forces to act in a synchronized fashion in order to complete their mission
- Creating self-synchronizing forces:
  - Acting to complete the mission, based on shared awareness achieved between them