Satellite Information as input for ILS-Based Decision Support in Delivery of Health Services

University of Koblenz-Landau
ReGLaN - Health
Research Group Learning and Neurosciences
Gerhard Ackermann
Project Goals

**AIM:** IMPROVED DELIVERY AND OPTIMAL USE OF HEALTH SERVICES IN DISASTER AREAS

**HOW?** RAPID, INTEGRATED IDENTIFICATION AND EVALUATION OF RESOURCES AND CONSTRAINTS

**WITH:** DELIVERY OF AN ILS-BASED DIGITAL DECISION SUPPORT SYSTEM

**TO WHOM?** EMERGENCY SERVICES MANAGERS, DOCTORS, ADMINISTRATION, NURSES (= DECISION MAKERS)
Support Concept: Health Services (1)

Patients & Local Practitioners

Rural
Support Concept: Health Services (1)

Urban

General Hospitals & Clinics

Patients & Local Practitioners

Rural
Support Concept: Health Services (1)

Urban
General Hospitals & Clinics

National / International Specialised Hospitals & Treatment

Rural
Patients & Local Practitioners
Support Concept: Health Services (2)

Rural

Mobile Clinics

Flying Ambulance & Doctor
Support Concept: Health Services (2)

Urban Hospitals

Mobile Clinics

Rural Flying Ambulance & Doctor
Support Concept: Health Services (2)
Problems

- Service requirements can change rapidly.
- Circumstances can change daily.
- The Communities to be served vary greatly.
- Resource availability changes almost continuously.

The Health Services environment is complex and dynamic. There is no single "best" solution.

WE NEED A DECISION SUPPORT SYSTEM THAT CAN CONSISTENTLY HELP TO IDENTIFY THE BEST SOLUTION FOR EACH SET OF CIRCUMSTANCES.
Decision Support Model

FUNCTIONS

Remain the same

Qualified by:

- Requirements
- Constraints
- Priorities
Decision Support Model

FUNCTIONS

- Remain the same
- **Qualified by:**
  - Requirements
  - Constraints
  - Priorities

RESOURCES

- **Qualified by:**
  - Characteristics
  - Capabilities
  - Physical Location
  - Individual
    - Requirements and Constraints
Decision Support Model

**FUNCTIONS**
- Remain the same
- **Qualified by:**
  - Requirements
  - Constraints
  - Priorities

**SOLUTIONS**
- Combinations of resources
- Consolidated characteristics

**RESOURCES**
- **Qualified by:**
  - Characteristics
  - Capabilities
  - Physical Location
  - Individual Requirements and Constraints

Finite Set
Decision Support Model

**FUNCTIONS**

Remain the same

**Qualified by:**
- Requirements
- Constraints
- Priorities

**SOLUTIONS**

- Combinations of resources
- Consolidated characteristics

**RESOURCES**

**Qualified by:**
- Characteristics
- Capabilities
- Physical Location
- Individual Requirements and Constraints

Finite Set

---

Committee on the Peaceful Uses of Outer Space
Scientific and Technical Subcommittee  Forty-sixth session  Vienna, 9-20 February 2009
Decision Support Model

**FUNCTIONS**
Remain the same

**Qualified by:**
- Requirements
- Constraints
- Priorities

**SOLUTIONS**
- Combinations of resources
- Consolidated characteristics

**Finite Set**

**RESOURCES**

**Qualified by:**
- Characteristics
- Capabilities
- Physical Location
- Individual
  Requirements and Constraints

Combine
Decision Support Model

FUNCTIONS
Remain the same

Qualified by:
- Requirements
- Constraints
- Priorities

SOLUTIONS
- Combinations of resources
- Consolidated characteristics

Finite Set

RESOURCES
Qualified by:
- Characteristics
- Capabilities
- Physical Location
- Individual Requirements and Constraints

Evaluate & Select
Combine
Satellite Information on Landslides

Before the Landslide
Satellite Information on Landslides

Before the Landslide

After the Landslide
Satellite Information on Landslides

Before the Landslide

After the Landslide
EXAMPLE

- Landslide
- Primary Supply Route
- Disaster Area

Committee on the Peaceful Uses of Outer Space
Scientific and Technical Subcommittee  Forty-sixth session  Vienna, 9-20 February 2009
Decision Support Model

**FUNCTIONS**
- Remain the same

**Qualified by:**
- Requirements
- Constraints
- Priorities

**SOLUTIONS**
- Combinations of resources
- Consolidated characteristics

**RESOURCES**
- Qualified by:
  - Characteristics
  - Capabilities
  - Physical Location
  - Individual Requirements and Constraints

**Evaluate & Select**

**Combine**
Decision Support Model

**FUNCTIONS**
Remain the same

**Qualified by:**
- Requirements
- Constraints
- Priorities

**SOLUTIONS**
- Combinations of resources
- Consolidated characteristics

**RESOURCES**
**Qualified by:**
- Characteristics
- Capabilities
- Physical Location
- Individual Requirements and Constraints

- Evaluate & Select
- Combine
Decision Support Model

FUNCTIONS
- Remain the same

Qualified by:
- Requirements
- Constraints
- Priorities

SOLUTIONS
- Combinations of resources
- Consolidated characteristics

Finite Set

RESOURCES
- Characteristics
- Capabilities
- Physical Location
- Individual Requirements and Constraints

Combine

Evaluate & Select
Decision Support Model

FUNCTIONS
Remain the same

Qualified by:
• Requirements
• Constraints
• Priorities

SOLUTIONS
• Combinations of resources
• Consolidated characteristics

RESOURCES
Qualified by:
• Characteristics
• Capabilities
• Physical Location
• Individual Requirements and Constraints

Evaluate & Select

Finite Set

Combine
Decision Support Model

FUNCTIONS
Remain the same

Qualified by:
• Requirements
• Constraints
• Priorities

SOLUTIONS
• Combinations of resources
• Consolidated characteristics

 Finite Set

RESOURCES
Qualified by:
• Characteristics
• Capabilities
• Physical Location
• Individual Requirements and Constraints

Evaluate & Select

Combine

A B C D
F G H I
K L M N
EXAMPLE

Landslide

Primary Supply Route

Disaster Area

Port Elizabeth
Conclusion

- "Real-time" satellite information can be used effectively in the Decision Support System.
- Using the satellite information in the Decision Support System increases the benefits that can be derived from the information.
- The Decision Support System can help to make timely, informed decisions regarding the delivery of Health Services to disaster areas.
Conclusion

- "Real-time" satellite information can be used effectively in the Decision Support System.
- Using the satellite information in the Decision Support System increases the benefits that can be derived from the information.
- The Decision Support System can help to make timely, informed decisions regarding the delivery of Health Services to disaster areas.

Thank you for your attention.