Where IT can provide fast activation and effective application of airport contingency procedures
Introduction

- Outline Main issues based on lessons learnt from many events concerning airport contingency/emergency management
- Identify where IT can address such issues
- Identify where Human Factors can be involved
- Propose an effective solution
First who are we:

- Magister Ludi Aviation
- Softsolutions!
Principle elements involved in a contingency event

- Airport
- Event
- People
- Procedures
People

- Within Airport Grounds
  - Airport Authority
  - Police
  - Firemen
  - ATC, Tower
  - Ambulance Service
  - Customs
  - Security Companies
  - Airline Companies

- External to Airport Grounds
  - Hospitals
  - Police
  - Media (TV etc.)
Procedure Lifecycle

**Definition**
Usually defined in the Airport Manual. The perfect definition of a procedure does not ensure its effective application.

**Storage**
At different locations based on scope.

**Activation**
By people involved. It has to be fast and correct.

**Tracking**
Ensuring the effective application of the procedure.

Update → Event → Monitoring
What has the analysis of airport contingency/emergency management revealed?

• Late activation of procedures
• Late communications of relevant information
• Late communications to relevant people
• Information overlapping
• Incorrect application of procedures
• Incorrect storage of information
• Only minimal training to the people involved
Critical Points of Contingency/Emergency Management

- Involvement of a number of different internal and external bodies with possible overlapping authorities and responsibility
- Lack of dedicated software tools that support the paper based procedures
- Difficult to have a diffusion of pertinent information in parallel to the activation and monitoring of procedures
- Effective training to the personnel requires airport’s paralysis
PROTRACK addresses all these issues, providing:

• Fast and correct activation of procedures
• Best communication tools
• Correct dissemination of information
• Continuous tracking of procedures
• Effective training scenarios
Event

PROTRACK activated by any authorised person

Immediate activation of the system in designated stations
Immediate communication to designated people

Gateway

Fax
Voice
SMS
Email

A prototype of a use case is currently under development: please contact MagisterLudi or SoftSolutions!
Communication

Technical Issues

- Definition of flow
  - Where?
- Information exchange
  - What?
- Media/Channels
  - How?
Communication
Human Factor Issues

- Provide an ordered sequence of tasks but avoid too rigid procedures.
- Improve the dissemination of information but implement a dedicated filtering of messages.
- Provide proper training and simulations.
The importance of Human Factors Expertise during the realization of this system

- Ergonomic design facilitates the definition of easy to use, efficient and error precluding human to device interfaces.

- Support the transition of paper based procedures into a system that is practicable and useable.
Based on the previously discussed issues the following four areas of IT are applicable for this problem domain:

- State of the Art Software Engineering Techniques
- Knowledge Management & Networking
- Information Exchange Standards
- Messaging Systems
Messaging Systems

- Messaging systems can handle the concurrent distribution of different message formats to different device types, rapidly and reliably, supporting filtering.
  - Message Bus
    - Transport formats TCP/IP, UDP ..etc).
  - Multiple Message Formats
    - Text, SMS, ASCII, FAX, Audio, Multi-Media).
A General Architecture

System Management Services
- Certificate Management
- Procedure Maintenance
- Procedure Activation

Client Services
- Browser based procedure monitors

System Storage Services
- Knowledge base
- Digital Certificates

System Engine Services
- Message Dispatch Engine
- Procedure Tracking Engine

Message Bus

Gateway

Clients
- Fax
- Voice
- SMS
- Email
Main Software Components

- **Certificate management**
  - Certificate Management for maintaining changes in authority and upholding system security.

- **Procedure Maintenance**
  - Allowing the creation, update and maintenance of stored procedures.

- **Procedure Activation**
  - Supporting the Activation, Tracking & Logging during an emergency situation.

- **Procedure Monitor**
  - A Multi-Platform interface to the Emergency Management system (in read only), provides external and internal entities with information on evolution of the event and possible status of the procedures.

- **Procedure Tracking Engine**
  - Multi-threaded distribution of messages according to stored information
Conclusions 1: What is the advantage of our approach?

- A pragmatic solution that combine state of the art technology and Human Factors issues within the Aviation System
- A systematic, tried and tested design approach for development of a software system
- Open system supporting both networked and other information transmission media.
- Is multi-tasking & secure
- Integrates different software components and information repositories to specifically support paper based procedures
- Supports different end user devices (PC/Laptop/Palmtop/FAX/Phone/GSM)
- Should be compatible with legacy/proprietary systems
- Facilitates training & emergency simulation
Conclusions 2: A Possible Work Path

- **Analysis**
  - User Requirements Specification including:
    - Airport procedures and Information Flow Analysis

- **State of the Art Study**
  - Existing Systems, Software and Procedures
    - Standards developed and in progress
  - *Mature Industrial IT Technologies!*

- **The development of a prototype application**