RESILIENT SOCIETY –
NOVEL IT SERVICES FOR CROWD TASKING AND MANAGEMENT IN CRISES AND DISASTER SCENARIOS
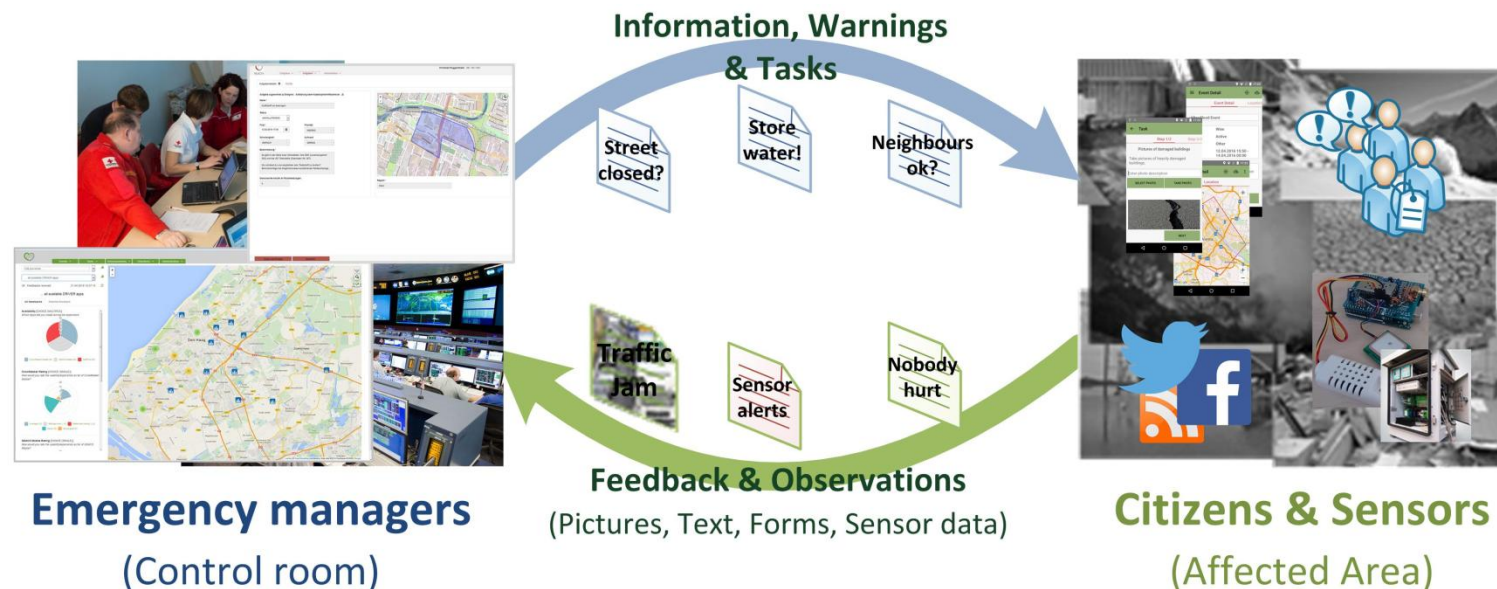
Andrea Nowak, Christoph Ruggenthaler, Daniel Auferbauer

Center for Digital Safety & Security
AIT Austrian Institute of Technology
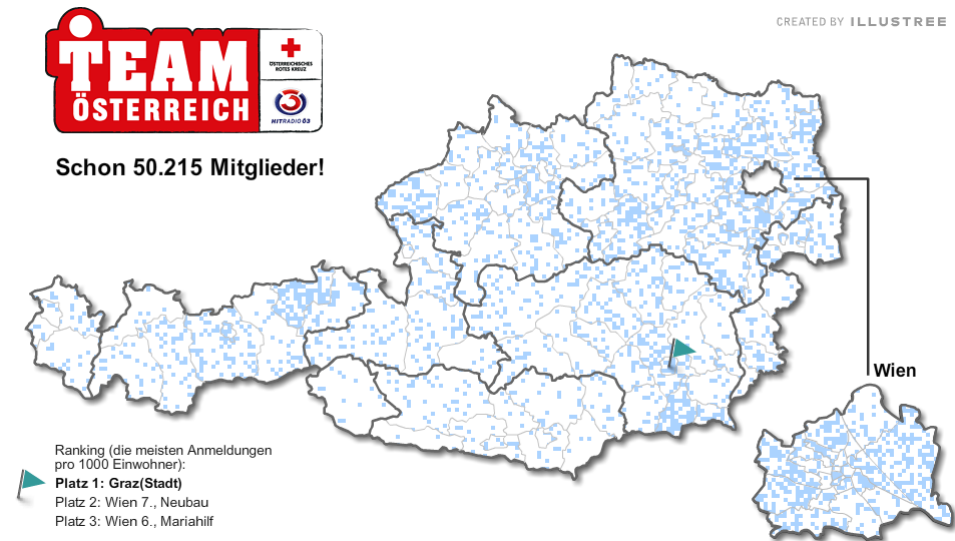
VISION OF AUSTRIAN RED CROSS & AIT

- State-of-the-Art **Technologies to enhance Emergency Management** by
    - **using** the untapped potential of **social and new media** information
    - **approaching local citizen** crowds directly with mobile technologies
    - ensuring **resilient society** by providing **reliable real-time information**
    - utilizing **sensor** data and **observations to enhance operational pictures**

Information, Warnings & Tasks

Street closed? — Store water! — Neighbours ok?

Traffic Jam — Sensor alerts — Nobody hurt

Feedback & Observations
(Pictures, Text, Forms, Sensor data)

Emergency managers
(Control room)

Citizens & Sensors
(Affected Area)

TEAM ÖSTERREICH

About

- Volunteer management effort, conceived in 2007

- Cooperation of Red Cross and nationwide media

- Help in various relief efforts: cleaning up, filling sandbags, re-building, …

- 50k members as of 2017

Schon 50.215 Mitglieder!

Ranking (die meisten Anmeldungen pro 1000 Einwohner):
Platz 1: Graz(Stadt)
Platz 2: Wien 7., Neubau
Platz 3: Wien 6., Mariahilf

Wien

Screenshot of Team Österreich homepage, showing distribution of members
http://application.oe3.fm/teamoesterreich/karte.html

REGISTERED VOLUNTEERS EMPLOYED IN GUIDED GROUPS

Registered, but not specifically trained

Volunteers support the distribution of relief goods to refugees in Austria at the Hungarian border (Sept. 2015)

Pictures: Austrian Red Cross

THE 1ST APPLICATION

CrowdTasker

Research Project: RE-ACTA
Resilience Enhancement by
Advanced Communication for Team Austria

MOTIVATION AND OBJECTIVES

- **Leverage volunteer manpower** in crisis & disaster management phases
  - Integrate pre-registered volunteer crowd in the entire CDM process for
    - **Information sourcing** (collect information from the field, …)
    - **Temporary job execution** (text translation, local alerting, …)
    - **Efficient information sharing** from professionals to population
  - **Select** best suitable **volunteer crowd** for tasks based on
    - **Pre-defined skills** and **knowledge**
    - **Residence** and **GPS** location

- Creation of **Crowdtasking process** and **Proof-of-Concept application**
  - Legal, privacy and liability aspects are examined upfront
  - Specification & design of whole Crowd-Tasking process
  - Unified, efficient communication channel and workflow
    - Able to cope with large amount of volunteer communities

THE IDEA
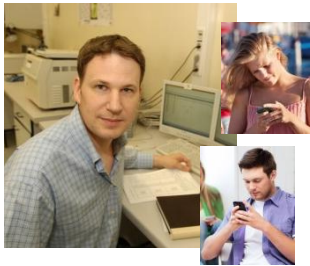
Addressing local volunteers at their current position

Execution of appropriate tasks

Submit feedback and information
Like pictures, multiple choice, free text …
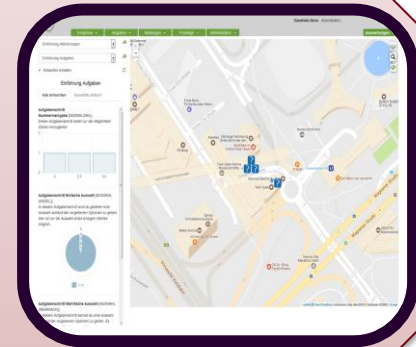
Visualization and assessment of received information from the field
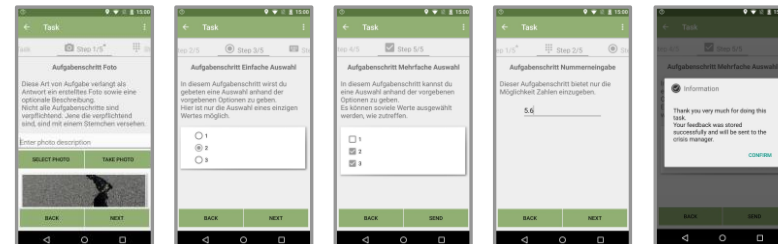
CROWDTASKER IN ACTION

Select preregistered
citizens / volunteers

Create and assign
specific tasks

Visualize & evaluate
received feedback
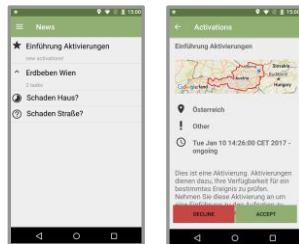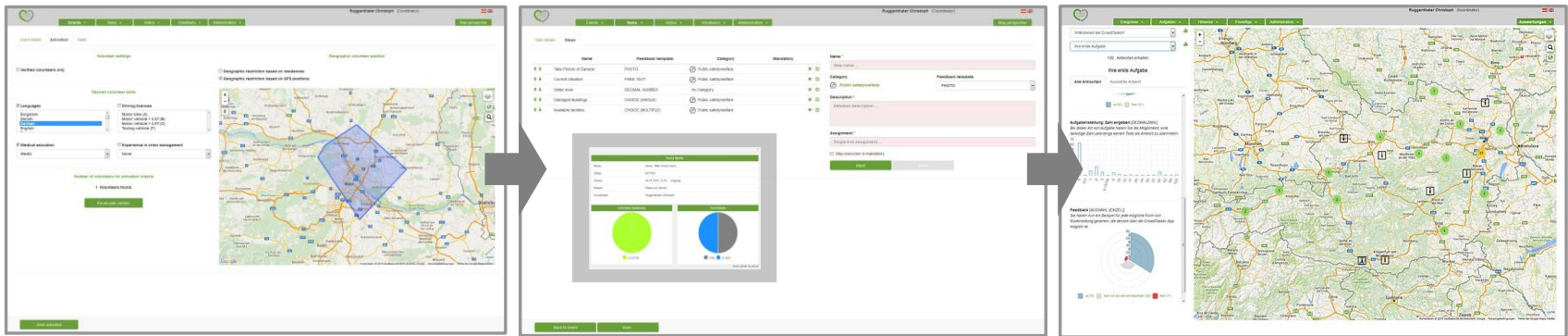
Receive relevant events
and manage requests

Execute received tasks
and report back information

Demo: https://crowdtasker.ait.ac.at

NATIONAL & EUROPEAN DEMONSTRATIONS + TRIALS

- **Earthquake Relief Help**
  - Report local damages
  - Verify power supply

- Vienna, Austria (2015)

Damage Assessment

- **Chemical Accident Trial**
  - Warn people in hazard zones
  - Capture personal health state

- Tel Aviv, Israel (2016)

Warning and **Guidelines**

- **Refugee Supply Demand**
  - Acquire & distribute donations
  - Capture volunteer availability

- Vienna, Austria (2016)

Resource Gathering

- **Imminent Flood Scenario**
  - Assess local water levels
  - Report infrastructure damages

- The Hague, Netherlands (2016)

Situation Awareness

- **Student & Teacher Awareness**
  - Survey emergency plan procedures
  - Check equipment (hose, first aid …)

- Middle Schools, Austria (2017)

Resilience and **Preparedness**

THE 2ND APPLICATION

Young Crowd

Assessment and Evaluation of Austrian Classroom Resilience and Preparedness

MOTIVATION AND OBJECTIVES

- Enhance Resilience and Awareness in Austrian Schools
  - Establish citizen science activities
  - Increase awareness for existing security and safety equipment
    - Teach the handling and importance of functioning devices
      - Status and location of defibrillators
      - Guidelines and emergency exits in case of fires
  - Introduce and execute the crowdtasking approach in schools
    - Evaluate and evaluate the usability and acceptance
    - Capture additional requirements and use cases for this target group

- Promotion and Enhancement of Team Österreich
  - System integration of Team Österreich and CrowdTasker
  - Adapt processes and test the overall system

THE SOLUTION

CrowdTasker
(Teacher)

Team Österreich
(Students & Teacher)

- Volunteer registration for students & teachers
- Organize volunteers into groups (classes) → teacher = coordinator
- Create event per group

- Verify student profiles & publish event activation
- Create and advertise tasks
  - Validate safety equipment
  - Awareness building / raising in emergency situations
  - Citizen Science activities

Mobile Apps
(Students)

- Get to know local security & safety units
  - Extinguisher & defibrillator
  - Emergency exits
- Report and document potential safety issues
- Prepare for emergency

PLANNED PRODUCTIVE ROLLOUT IN 2017

- Go Live after successful system integration
  - Interworking systems and applications
  - Aligned processes and workflows
  - Permission Mapping and Association
    - Federal organizational hierarchy

- Enhancement of Team Österreich volunteer platform
  - Adding mobile apps and crowdtasking to the portfolio
  - Establish central communication & collaboration channel
  - Increase the acceptance and attraction for loosely coupled volunteers

- Cooperation with national radio station and media
  - National coverage for advertisement to interested citizens
  - Promotion of volunteer engagement and Team Österreich platform

Team Österreich

Crowd Tasker

Mobile Apps (Android, iOS)
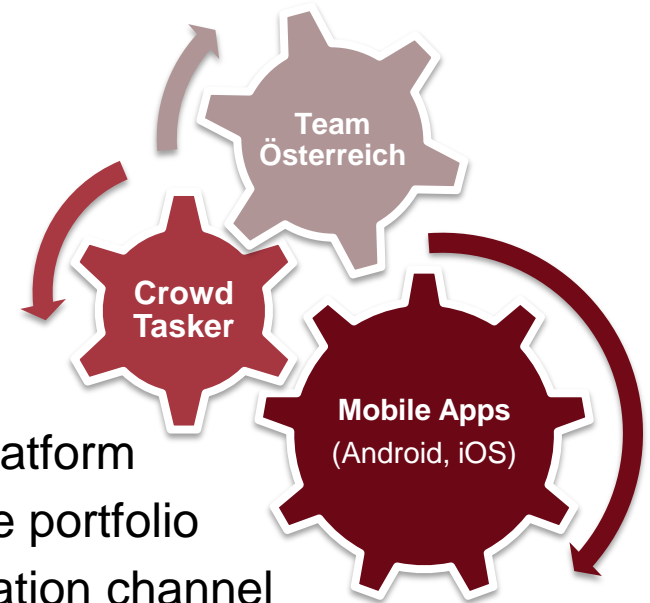
THE 3RD APPLICATION

RECheck

Collection of resilience values within the population through simple surveys

MOTIVATION
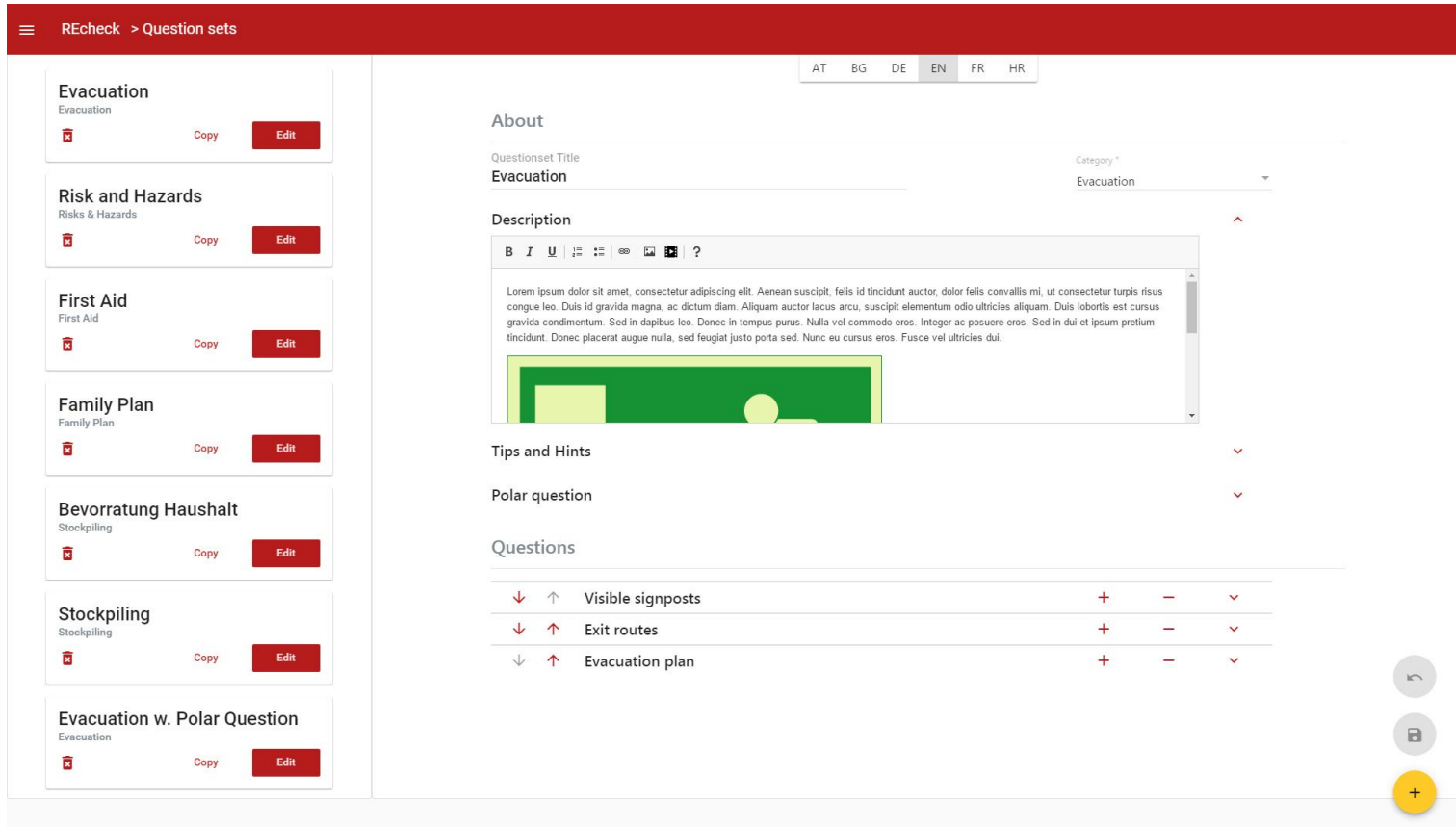
- Social cohesion in the population is constantly declining

- The knowledge of the social environment is of great importance for the resilience

- Households and neighborhoods are currently not recognized as target groups and mostly neglected (focus on individuals & communities)

THE IDEA

- Intuitive, easy-to-use web application for creating modular questionnaires

- Pre-defined modules based on resilience aspects can be quickly combined as needed for local needs

- Enables benchmarking per country and resilience aspect (e.g. "flood preparedness in Austria")

- Visualization of data on an interactive heat map

RECHECK - WEB APPLICATION (1 / 5)

Creating a question set (questionnaire building block)

RECHECK - WEB APPLICATION (2 / 5)

Composing a questionnaire

RECHECK - WEB APPLICATION (3 / 5)

Executing questionnaires (optimized for mobile devices)

RECHECK - WEB APPLICATION (4 / 5)

Certificate for participating in the questionnaire

RECHECK - WEB APPLICATION (5 / 5)

Analysis and visualization of feedback data
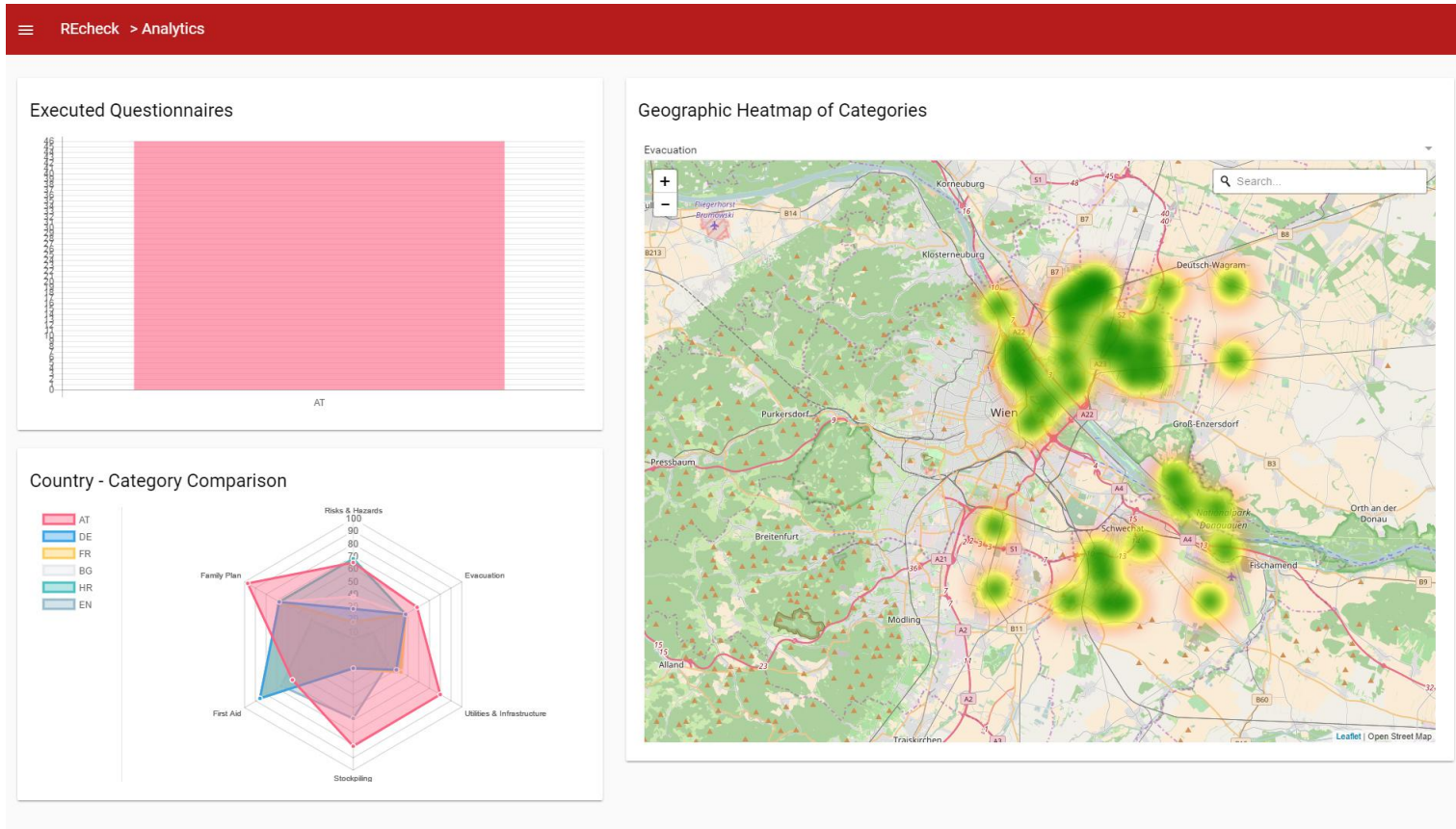
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