

Scenario-based Multimedia Manual Authoring and Presentation System and its Application to Tsunami Evacuation Manual for Phuket

Hideaki Shimada¹, Muneo Kitajima¹, Bodin Jaidee², Namnueng Mitsamarn²,
Sirilak Junnatas², and Wantanee Phantachat²

¹National Institute of Advanced Industrial Science and Technology (AIST), Japan.

²National Electronics and Computer Technology Center (NECTEC), Thailand.

Introduction

People can make appropriate decisions in case of disaster if they have knowledge regarding behavioral procedures in order to decide what to do to survive. We will report in this presentation the following issues: 1) the development of an easy-to-understand disaster evacuation manual for people in Urakawa town including persons with disabilities to help them acquire knowledge needed for self-made decisions, 2) SMMAPS – Scenario-based Multimedia Manual Authoring and Presentation System – that provides a basis for creating psychologically valid easy-to-understand procedural manuals^[1], and 3) creation of a version of SMMAPS manual for Phuket, including tsunami evacuation scenarios with local scenes and narrations with the collaboration of NECTEC, Thailand, and AIST, Japan..

Development of Disaster Evacuation Manual for Urakawa by AIST

AIST created a disaster evacuation manual for Urakawa town, Hokkaido, Japan. The intended learners of the manual are the people at Urakawa Bethel House, located in Hokkaido. Urakawa is a town of approximately 16,000 residents, including the community of persons with cognitive or intellectual disabilities and is an earthquake-prone area. The number of scenarios represented in the manual was four, each of which represented a route for escaping from tsunami starting from their work places or group homes to designated escape places. The instruction texts associated with each scene were basically a transformation of the then-available disaster evacuation manual of the area.

The manual is written in SMIL, Synchronized Multimedia Integration Language, for attaining full accessibility. A screenshot is provided in Figure 1.

In order to facilitate learning, the scenes were presented by using photos of various places in Urakawa



Figure 1. Screenshot of the Urakawa manual, with pictures retouched by CG, a visual cue (yellow rectangle on the picture), closed captioning, map of Urakawa town, sign language, and narration. The manual is available on the Web (http://unit.aist.go.jp/humanbiomed/projects/aist_rehab_joint/english/).

town that could be easily recognized by the learners along with a realistic disaster image retouched by CG, sign language, and a narrative explanation. In addition, visual cues were added to some scenes to guide the learners' attention to an important part of the pictures/images (see [2]). The use of local scenes, realistic disaster scenes, etc. as media for preparedness learning manual is our decision based on psychological considerations which will be further described below.

The manual was distributed to the citizens of Urakawa town. The reaction was favorable; the people were deeply engaged by the manual's scenarios and appreciated the scenes as possible solutions.

Scenario and Multimedia: Key Concepts to Facilitate Preparedness Learning

The Urakawa manual was created by SMMAPS (Senario-based Multimedia Manual Authoring and Presentation System), developed as a procedure learning system, including preparedness learning for disaster.

In order to ensure successful evacuation, people have to achieve *encoding*, which means they can acquire information as knowledge, and *retrieval*, which means they can recover encoded information adequately depending on conditions. For successful encoding and retrieval, SMMAPS incorporates two key concepts: scenario and multimedia.

Scenario is defined as a series of important scenes. At the learning sessions, scenario can help the learners to create stronger and more elaborated memory trace for necessary steps to take in each scene. In addition, scenario can enhance recall at the time when the learned steps must be applied by providing multiple retrieval cues in the context of specific scenario.

Multimedia includes photos, CG images, sign language, gesture, visual cues, texts, narration, sound, etc. They can strengthen memory trace by providing qualitatively rich representation of scenes. In addition, they can enhance recall by providing multiple retrieval cues by making representations of the manual contents accessible to the learners.

Flexibility: A Key Concept for Accessibility

Manuals may be used by various people and for various situations. Their contents must satisfy the accessibility requirements. Considering the breadth of potential disastrous situations, which differ among locations, and the variety of special needs, the range of necessary manual contents is staggering.

Figure 2 depicts the outline of SMMAPS. SMMAPS manipulates the manual contents at three levels: *materials*, *scenes*, and *scenarios*. A manual is provided by scenario and scene authoring, which enables the manual creator to adjust the manual contents such that the learner can properly understand the behavioral procedure that the manual contents describe.

The materials include pictures and images, closed captions, sign language, and narration, and are used to define scenes. Individual elements are preserved in the material database. A scene consists of materials, and represents a rule, such as "Don't forget to put out your fire when an earthquake occurs." Scenes are preserved in the scene database. A scenario is a sequence of scenes that represents a procedure, with a theme such as "What should you do when an earthquake occurs in your town?"

The architecture of SMMAPS is highly modular, so that we can create manuals as comprehensible scenarios that meet individual needs by flexibly combining scenes and materials. A manual could be created by integrating the contents in the database when the usage situation is defined in terms of a specific person with a specific accessibility requirement and a specific disastrous situation, to provide better understanding of the behavioral procedure.

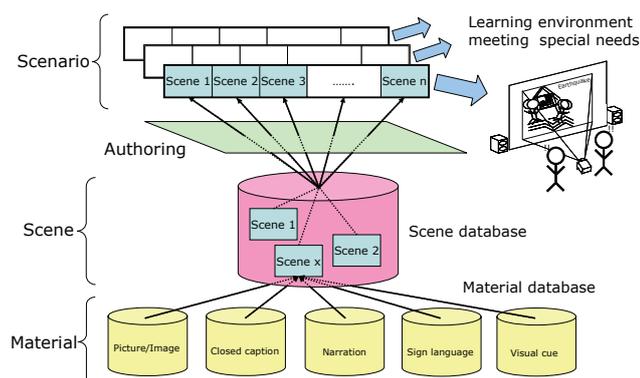


Figure 2 Outline of SMMAPS.

Tsunami Evacuation Manual for Phuket

In this presentation, we will demonstrate a manual for tsunami evacuation in Phuket, jointly by AIST and NECTEC. The manual is created by using the Urakawa manual as template. The flexibility allows us to create manuals easily by editing scenes and scenarios of the Urakawa manual.

The procedure of creating Phuket manual is as follows: 1) developing an evacuation scenario, 2) Taking pictures as materials, 3) authoring scenes in the scenario with captions (Japanese, English, and Thai), Thai narration, and visual cues.

Further Research

In order to enhance SMMAPS jointly, we are going to do the following things.

- International accumulation of using SMMAPS manuals
- Developing authoring tool that allows us to create SMMAPS manuals easily.

Acknowledgements

This work was supported by “Assistive technologies to ensure safe and comfortable lifestyles of persons with disabilities,” Special Coordination Funds for Promoting Science and Technology, 2004, from the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan.

References

- [1] Shimada, H. & Kitajima, M. (2006). SMMAPS: Scenario-based multimedia manual authoring and presentation system and its application to a disaster evacuation manual for special needs. *Proceedings of CHI2006 Conference on Human Factors in Computing Systems*, 1313-1318.
- [2] Masakura, Y., Nagai, M., & Kumada, T. (2006). Effective visual cue for guiding people’s attention to important information based on subjective and behavioral measures. *Proceedings of the First International Workshop on Kansei*, 125-128.