Surprise Trips
A UbiComp Platform for Natural Exploration

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We report on a platform that augments the natural experience of exploration in diverse indoor and outdoor environments. The system builds on the theme of surprises in terms of user expectations and finding points of interest. It utilizes physical icons as representations of users' interests and as notification tokens to alert users when they are within proximity of a surprise. To evaluate the concept, we developed mock-ups, a video prototype and conducted a wizard-of-oz user test for a national park in Denmark.

1. Key Concepts

Roaming about an environment, users pick up one or more physical artifacts, which represent areas of interest to them. These "interests" notify users when a surprise is within proximity to their current location and guide them to the exact surprise location.

I. Discovering Surprises within Proximity

- notification via audio, visual, tactile feedback
- varying levels of signaling to guide to exact surprise locations (compass or dowsing rod)
- signaling stops, user needs to identify surprise
- content delivery via fixed devices, the users' mobile phones or the "interests" themselves
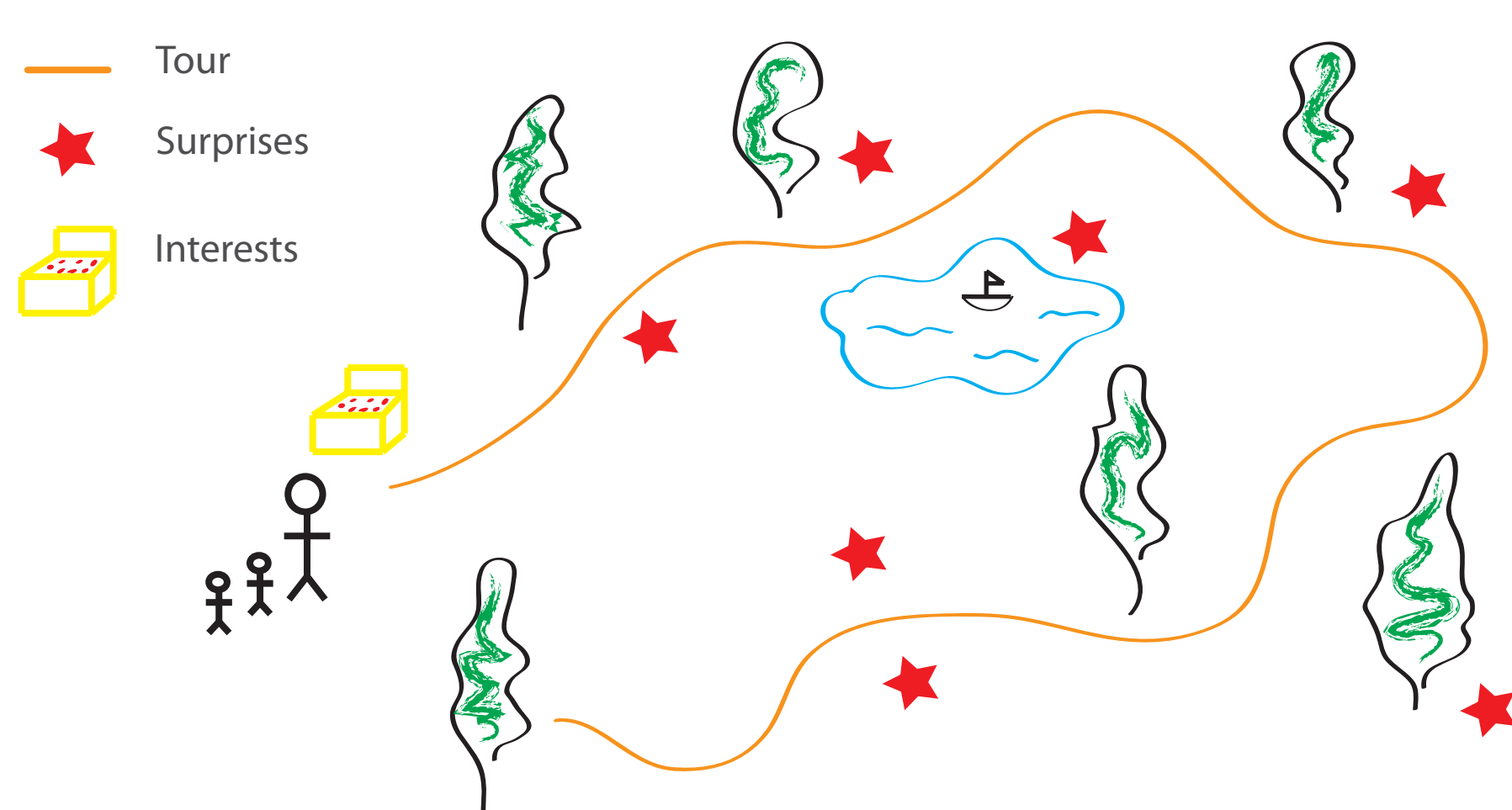- surprises are POIs from professional or user-contributed sources

Figure 1. Conceptual view of the platform deployed in a national park.

II. "Interests": Symbolic Physical Artifacts

- represent categories of interest for the user through their strong symbolic characteristics
- user does neither know the concrete category nor the kinds of surprises awaiting him or her
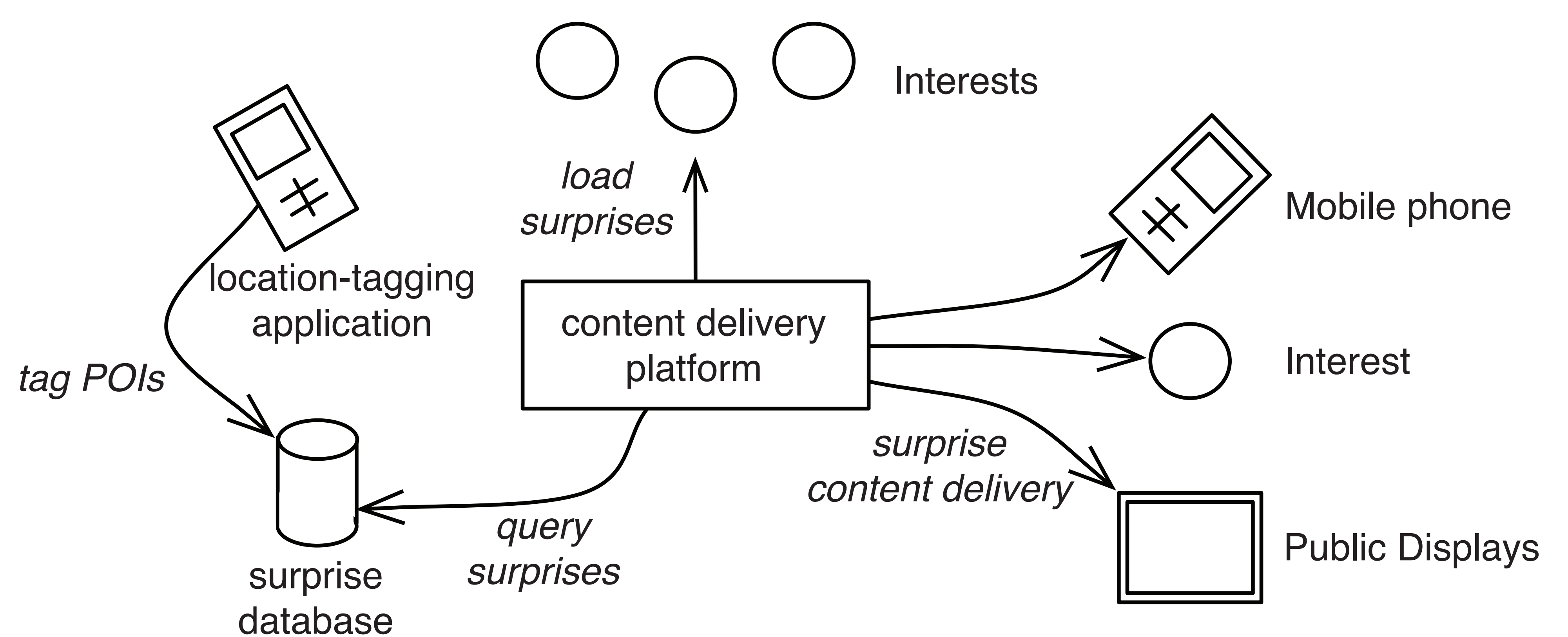

Figure 2. A box of mock-up "interests".

Figure 3. Proposed architecture of the Surprise Trips platform.

2. Architecture

A distributed architecture for location tagging and asynchronous content delivery to "interest" artefacts, mobile phones and situated displays

I. Content Delivery Platform

- initializes "interests" with current surprise snapshot at point of sale (e.g. via Bluetooth)
- may provide additional surprise content via 3G networking to capable devices
- optional location-tagging application for user-contributed surprise locations

II. "Interests" with Embedded Technology

- stuffed animals or solid, cheap, light, small
- GPS, digital compass, actuators for notification (audio, visual, tactile), Bluetooth, controller chip, memory, battery (3G, speaker)

3. Application Domain

Prototypical implementation of the platform for the National Park Mols Bjerge in Denmark with the aim to engage teenagers and families and let them experience nature in a different way. Through various "interests" taken along the tour, users could discover rare flowers and animals, stories and fairy tales, nice scenery, interactive games and multimedia content.

4. Evaluation

Three feedback and evaluation sessions with different user groups (university students and staff, national park stakeholders) using "interest" mock-ups and wizard-of-oz together with a video prototype and storyboard to demonstrate the overall interaction concept.

Concept generally viable, but several problems identified including: involved learning effort, technical limitations (e.g. mobile network coverage in the national park), limited number of potential surprises throughout the park, finding and identifying the surprises at the destination and missing mute button.

Figure 4. Wizard-of-oz evaluation with prospective users from the national park.