When Toys Come to Life: Considering the Internet of Toys from an Animistic Design Perspective

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What is the Internet of Toys (IoToys)?

IoToys are physical toys connected to the internet or digital systems, often incorporating sensors, AI, and interactivity.

Purpose

- Enhance Play
- Encourage Learning
- Connect Devices
- Interactive Response

Features

- Adaptive Play
- Engaging Content
- Social Skills
- Open-ended Interaction

Design Approach

Traditional Research
Problem-solving Logic (certainty-driven)

Aiming to make interactions safe, controlled, and user-friendly.

This Paper
Animistic Design Perspective (uncertainty-driven)

Rather than following rigid structures, these toys encourage spontaneity and allow children to take the lead in interactions.

Animistic Design

Animism—the belief that objects, places, and creatures can have a spirit or personality.

Treats toys as if they have life and agency
Focuses on open-ended, creative play experiences

Key Principles of Animistic Design

- **Agency:** Toys act autonomously
- **Embodiment:** Physical interaction with surroundings
- **Ecology:** Interacting with people, spaces, and data
- **Uncertainty:** Encourages unpredictability and exploration

Connected Toy Concepts

To apply animistic design in practice, the researchers developed three toy concepts:
- Bracelet
- 3D figurine
- Robot

Goal:
Each toy concept was designed to embody the principles of animistic design to varying degrees.
By testing different approaches, the researchers aimed to understand how animistic design affects the play experience and what challenges arise with different types of toys.

Bracelet

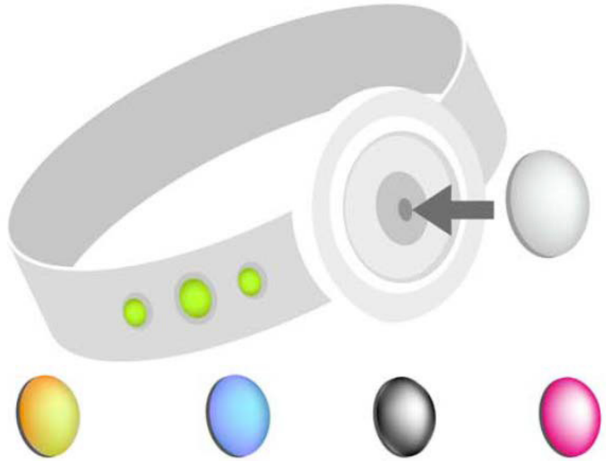

Figure 1. Bracelet concept (ideation concept)

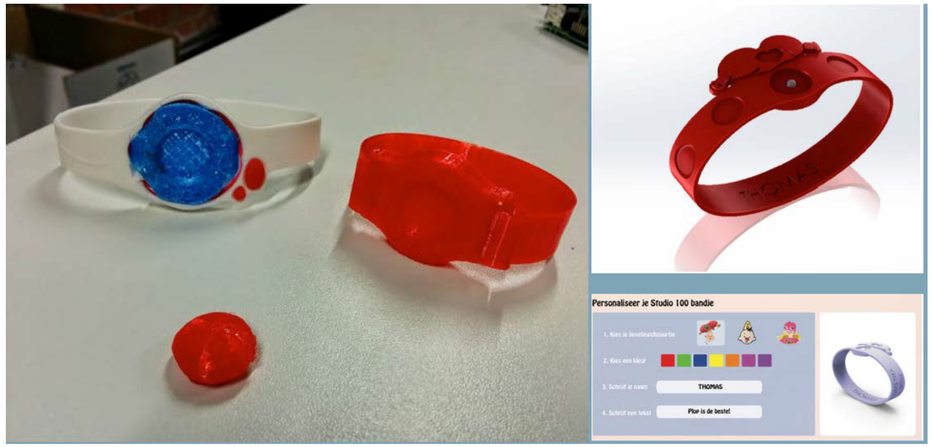

Figure 2. Bracelet concept (Left: product renders; Right: 3D printed prototype © Robby Wauters)

- Customizable Wearable
- Interactive Feedback
- Personal Digital Passport

3D Figurine

Figure 3. 3D Figurine (ideation concept)

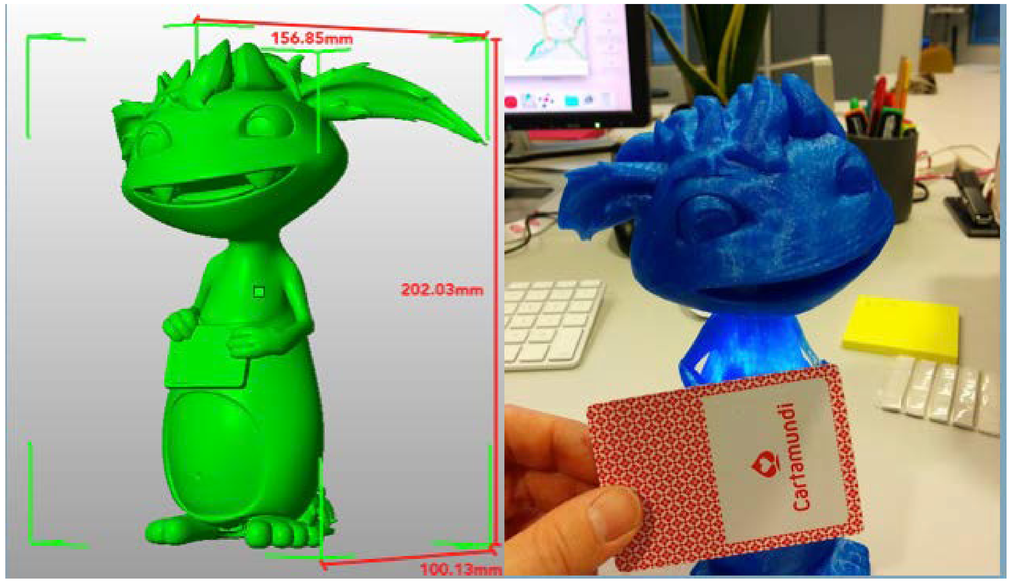

Figure 4. 3D Figurine (Left: product renders; Right: 3D printed prototype © Robby Wauters)

- Hybrid Play Character
- Interactive Game Companion
- Portable and Personal

Robot

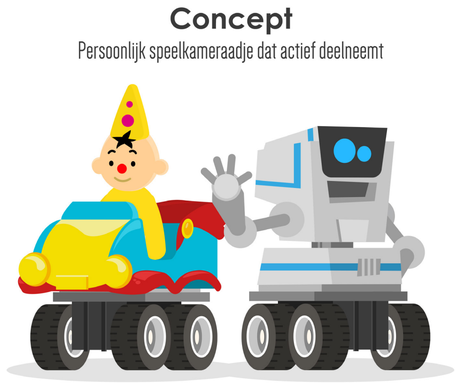

Figure 5. Robot (ideation concept)

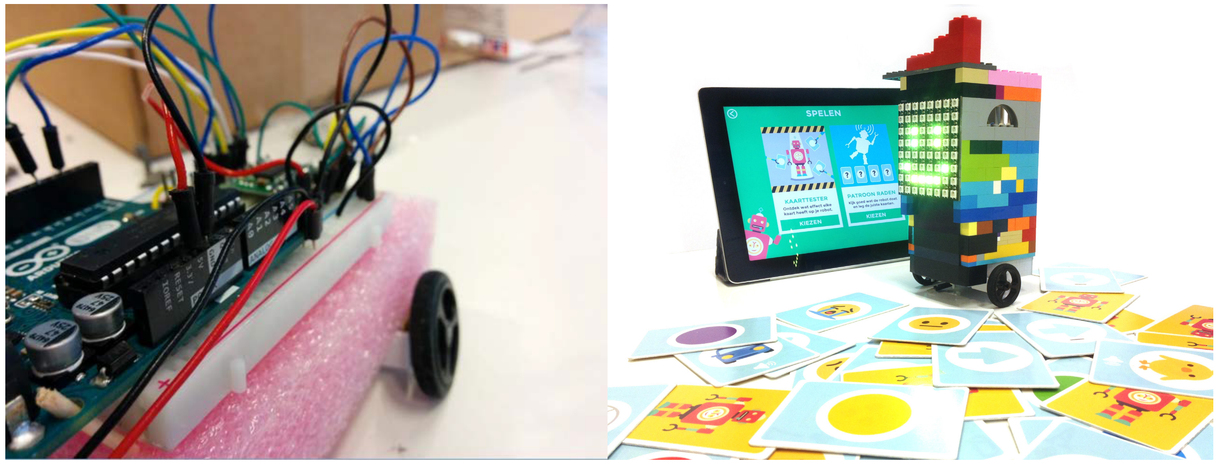

Figure 6. Robot (Left: prototype motor; Right: Lego Brick Robot with LED-lights, © Robby Wauters)

- Programmable Playmate Built with LEGO
- Storytelling and Free Play
- Interactive Board Game Companion

Findings – Design Spectrum

From certainty-driven design (structured) to uncertainty-driven (animistic)
Animistic design fosters creativity and open-ended play

Problem-solving Logic (certainty-driven)

- Domination
- Predefined, Fixed Boundaries
- Dependency
- Predefined Interactions

Animistic Design Perspective (uncertainty-driven)

- Autonomy-supporting
- Fluid, Ambiguous Boundaries
- Independency
- Divergent Interactions

Conclusion: Benefits and Challenges of Animistic Design

Embraces uncertainty and autonomy.
Shifts toys from programmed devices to interactive, responsive “play partners.”

Benefits

- Encourages Creativity
- Supports Independence
- Engagement
- Flexible Interactions

Challenges

- Less Control for Designers
- Privacy and Security Concerns
- Potential for Frustration