



ALEXA AS A CALL PLATFORM FOR CHILDREN: WHERE DO WE START?

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INTRODUCTION

- Alexa shows interesting potential as a platform for hosting CALL games aimed at children
- **But** what are the methodological and ethical issues in this context?
E.g.:
 - Alexa through Amazon's Echo devices offer a new interaction paradigm. How does this affect the interaction? Will children develop unexpected ways to interact with the device? How do we need to log interaction in order to capture potentially relevant data?
 - Can games of this kind be educational? How would we tell?
 - What issues are there that may concern parents? To what extent are they worried that the child may overuse the device, acquire bad habits, or grow to dislike the L2 due to potential negative interactions?
- Created half a dozen simple language games
- Currently performing the study

WHY ALEXA?

- Implemented various web-based CALL applications under a previous project (callst.unige.ch)
 - Lack of scalability (5–6 simultaneous users)
 - Maintenance cost (especially in human hours)
 - Free recognition by Nuance (but for an academic license/limited capacity)
- Cloud-based solutions are now commonplace
 - Amazon Web Services (AWS) is a 24/7 service for large volumes of users
 - Alleviates the burden of maintenance
 - Free-tier for small deployments
 - Superb far field speech recognition
- New paradigm shift that includes Amazon Echo, Google Home, Apple Home-pod, Harman Kardon, Samsung Bixby, etc.
 - But not only smart speakers. Alexa will be part of TV sets and laptops

AMAZON ECHO: A NEW INTERACTION PARADIGM

[Different features combined together]

- Hands-free – “I can be preoccupied with other tasks on the same time”



- Far field recognition – “I don't need to be close to the device”



- Always on – “I do not need to spend time unlocking or booting the device”



- Shared device – “I can share the device with other members of my family”




GAME DESCRIPTION (EN-FR-DE)

WhichAnimal 

[Alexa] *[Dog's bark sound]*

[User] *It's a dog!*

NumberGame 

[Alexa] *Five minus two.*

[User] *It's three.*

WhichLanguage 

[Alexa] *Bongiorno!*

[User] *It's Italian.*

GAME DESCRIPTION (EN-FR-DE)

LetterGame 

Cities that start with "L".

[Alexa]

Leiden!

[User]

WhichMovie 

Frankly my dear I don't give a damn.

[Alexa]

It's Gone with the Wind.

[User]

WhichPokemon 

It's yellow with two horizontal brown stripes on its back.

[Alexa]

It's Pikachu.

[User]

Content created by children!

DEMO VIDEO

WhichLanguage
Identify the language from the prompt



WhichAnimal
Identify the animal from the sound



NumberGame
Perform the calculation from the given prompt

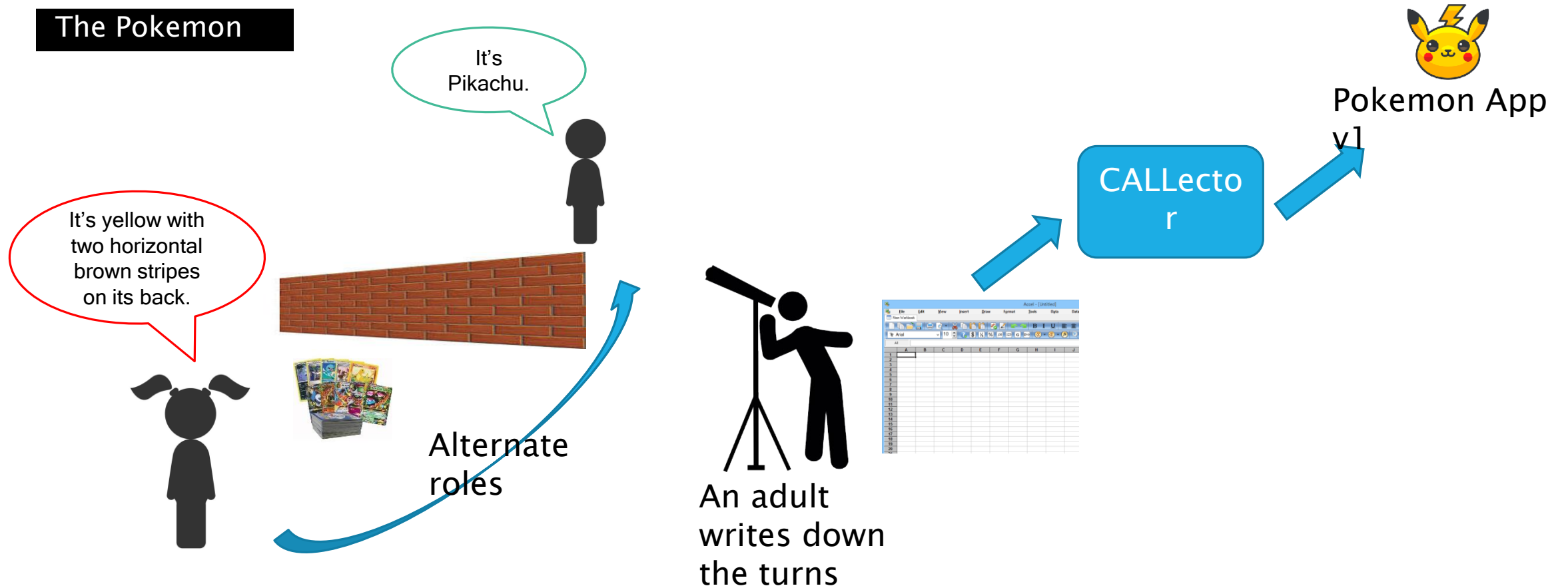


WhichPokemon
Identify the Pokémon from the description



CHILDREN AS CONTENT PRODUCERS

The Pokemon

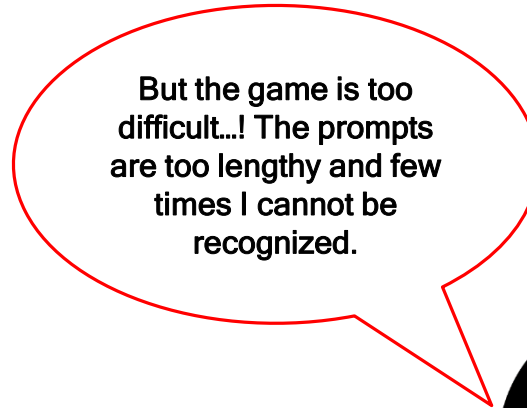


CHILDREN AS CONTENT PRODUCERS

The Pokemon



That is great! I can create my own game in Alexa!



But the game is too difficult...! The prompts are too lengthy and few times I cannot be recognized.




Pokemon App
v2

✓ New prompts

✓ Shorter prompts

ONBOARDING USERS

- Made the applications available to 6 beta testers
 - 6–11 years old children (unfortunately only boys)
- We offered 4  devices for free
- Parents and children could choose among the applications available in the different languages and interact freely
- Prepared few pages of instructions (also helped them onsite to configure the device when needed)
- Evaluation based on a questionnaire and server-side interaction logs
 - Unfortunately no audio recordings from user' input are available

How to run our Alexa language-practice games included: how to change language and install new games, see next page

Commands

Starting a game

Here are phrases for starting the different games:

- Animal game (English): *Alexa, start which animal*
- Language game (English): *Alexa, start language game*
- Movie game (English): *Alexa, start which movie*
- Arithmetic game (English): *Alexa, start number game*
- Letter game (English): *Alexa, start letter game*

- Animal game (French): *Alexa, lancez quel animal*
- Language game (French): *Alexa lancez quelle langue*
- Movie game (French): *Alexa, lancez quel film*
- Arithmetic game (French): *Alexa, lancez jeu de chiffres*

- Animal game (German): *Alexa, starte welches tier*
- Language game (German): *Alexa starte welche sprache*
- Movie game (German): *Alexa, starte welcher film*

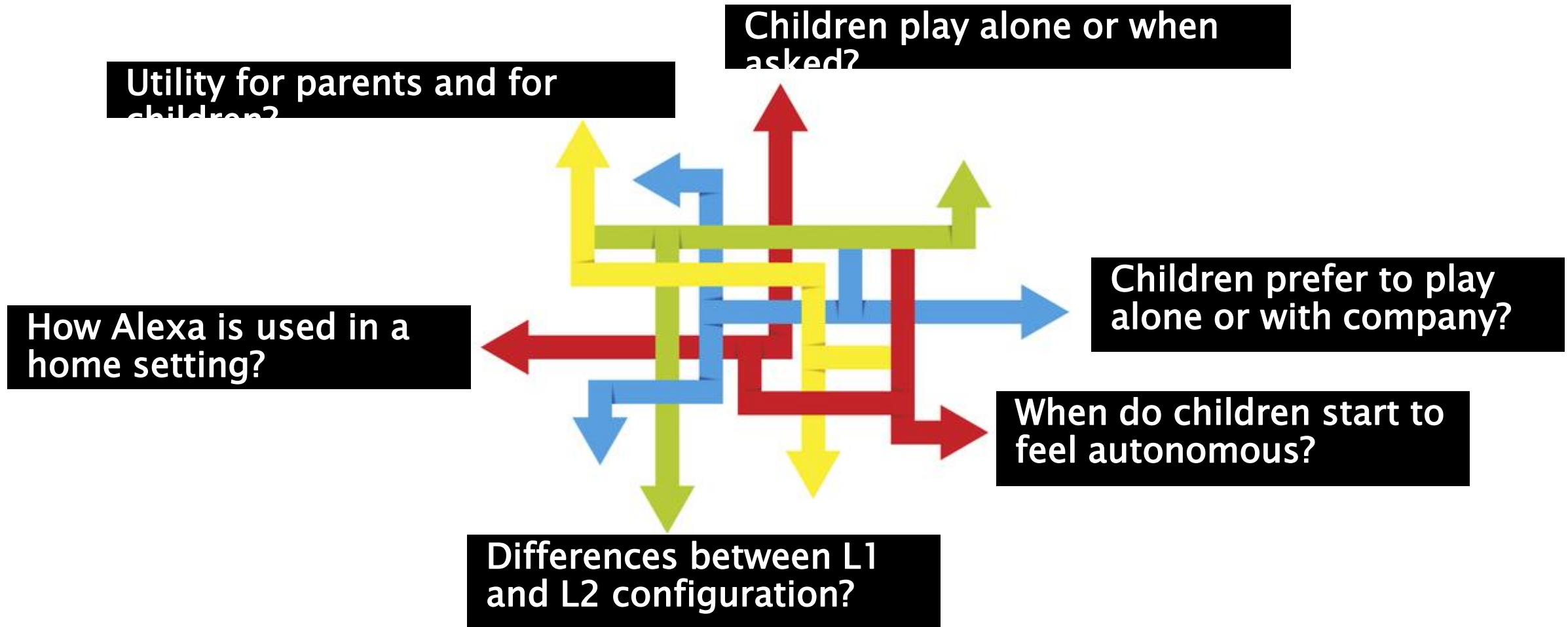
SET & SETTING OF THE STUDY



KEY USABILITY PROBLEMS

- **Barge-in.** Children tend to interrupt the prompt.
 - We introduced a distinctive sound to signify the start of a turn.
- **No-speech-timeout.** The application exits after a few seconds of inactivity.
 - We introduced a “wait” command. Less of a problem when multiple children interact at the same time.
- **Wrong application launch.** Children found it hard to recover from this error and launch the correct application.
- **Simultaneous user input.** More than one child talks to the system on the same time. Not a clear turn taking mechanism.
- **Background input.** People in the same room (besides the players) need to be quiet.
- **Out-of-context interactions.** Children could start posing irrelevant questions to Alexa.

EVALUATION DIRECTIONS



WHAT PARENTS THINK?

1. Was it easy to change the Alexa language?
2. Is the Alexa device always available? If so, in which language?
(L1 / L2 / whatever was used last)
3. How many times did your kids play the game with adults?
 1. Did the kids spontaneously want to do this, or only do it when reminded?
 2. Do they play purposefully/in a focussed way?
4. How many times did your kids play the game with other kids?
 1. Did the kids spontaneously want to do this, or only do it when reminded?
 2. Do they play purposefully/in a focussed way?
5. How many times did your kids play the game on their own?
 1. Did the kids spontaneously want to do this, or only do it when reminded?
 2. Do they play purposefully/in a focussed way?
6. How long did it take the kids to become confident that they could play the games without your help?

Echo in the home setting

Social aspects of the interaction

WHAT PARENTS THINK (CONT.)?

7. How well do you think the kids understand the L1 as spoken by the games?
8. How well do you think the kids understand the L2 as spoken by the games?
9. Do you think these games encourage any particular kind of behaviour in your kids? (e.g. rudeness, loudness, politeness, curiosity, openness, cooperativeness, ...)
10. Did your kids spontaneously express any opinions about the games or about Alexa?
11. Do you think it's basically positive for your kids to spend time playing these games?
12. What did you think was most positive about our games?
13. What did you think was most negative about our games?
14. What other games would you like?

Behavioral aspects of the interaction

WHAT CHILDREN THINK?

1. Which games did you play?
 2. Which games did you like most?
 3. Which games did you like least? [choose at most two]
 4. Do you prefer to play by yourself/with an adult/with a sibling or friend?
 5. What made you very happy during the games?
 6. What made you very mad during the games?
 7. What is the first thing you remember from the games?
 8. How much L2 did you use from the game? (which words?)
 9. What other games do you want us to make/do you want to make yourself?
- Major usability problems.
- Type of games children like the most/least.
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PRELIMINARY RESULTS

- In general the children were motivated by the applications
- Various technical challenges:
 - Difficult to change language of the device. You need to follow certain steps from the Alexa web interface
 - Not all languages are available by default. You need to do a firmware update
 - Not always easy to install our application as a beta tester
- Parents: “Kids play purposefully” but “Alexa is too addictive and kids get angry when they don’t get the question right”
- Children: “What don’t you like?” → “Being wrong!”
- The idea of the Pokémon game came after the test began. Other kids have expressed their wish to implement geography, history and general quiz games

THANK YOU!



“A school for boys and girls” – Jan Steen

Scotland National Galleries