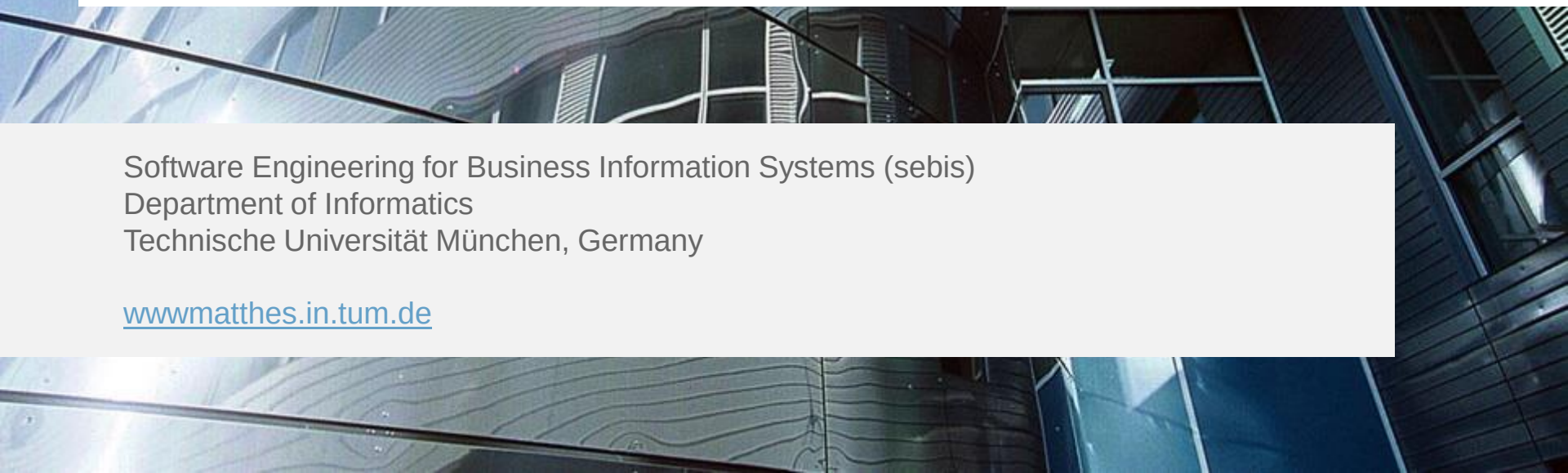
Technische Universität München

sebis

Development of a social extension for real-time communication in CAD software

Markus Müller, 15.06.2015 (Bachelor's Thesis, kick-off presentation)



Software Engineering for Business Information Systems (sebis)
Department of Informatics
Technische Universität München, Germany

wwwmatthes.in.tum.de

Overview

1. **Motivation**
   - Real-world Motivation
   - Research Questions
   - Scientific Motivation
   - Goal

2. **Our Approach**
   - Mayday Button
   - Integrated Chat
   - Screenshot Sending
   - Event Queue

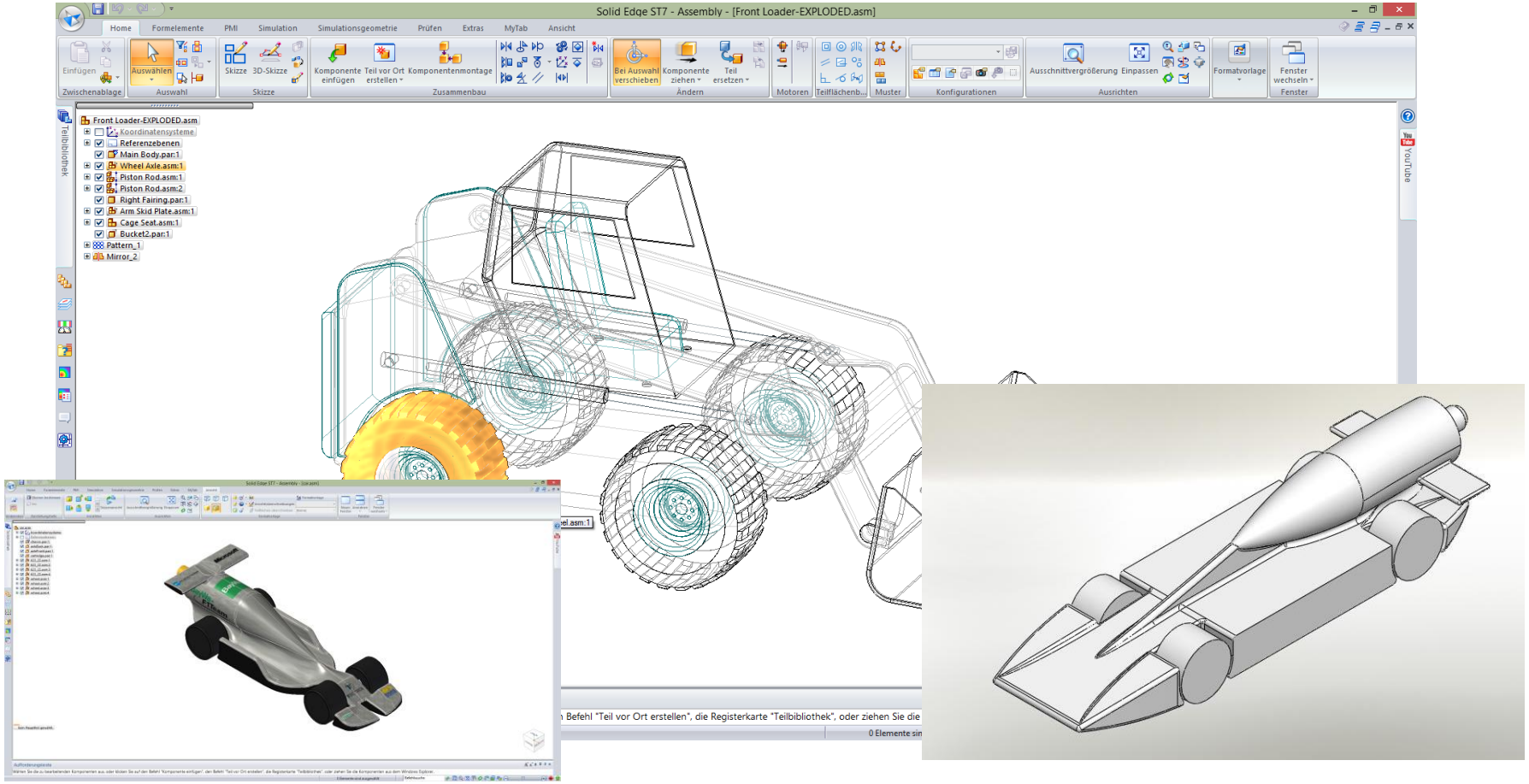
3. **Research Schedule**

Real-world motivation

- Area of investigation: 3D modelling CAD software (CAD = computer aided design)

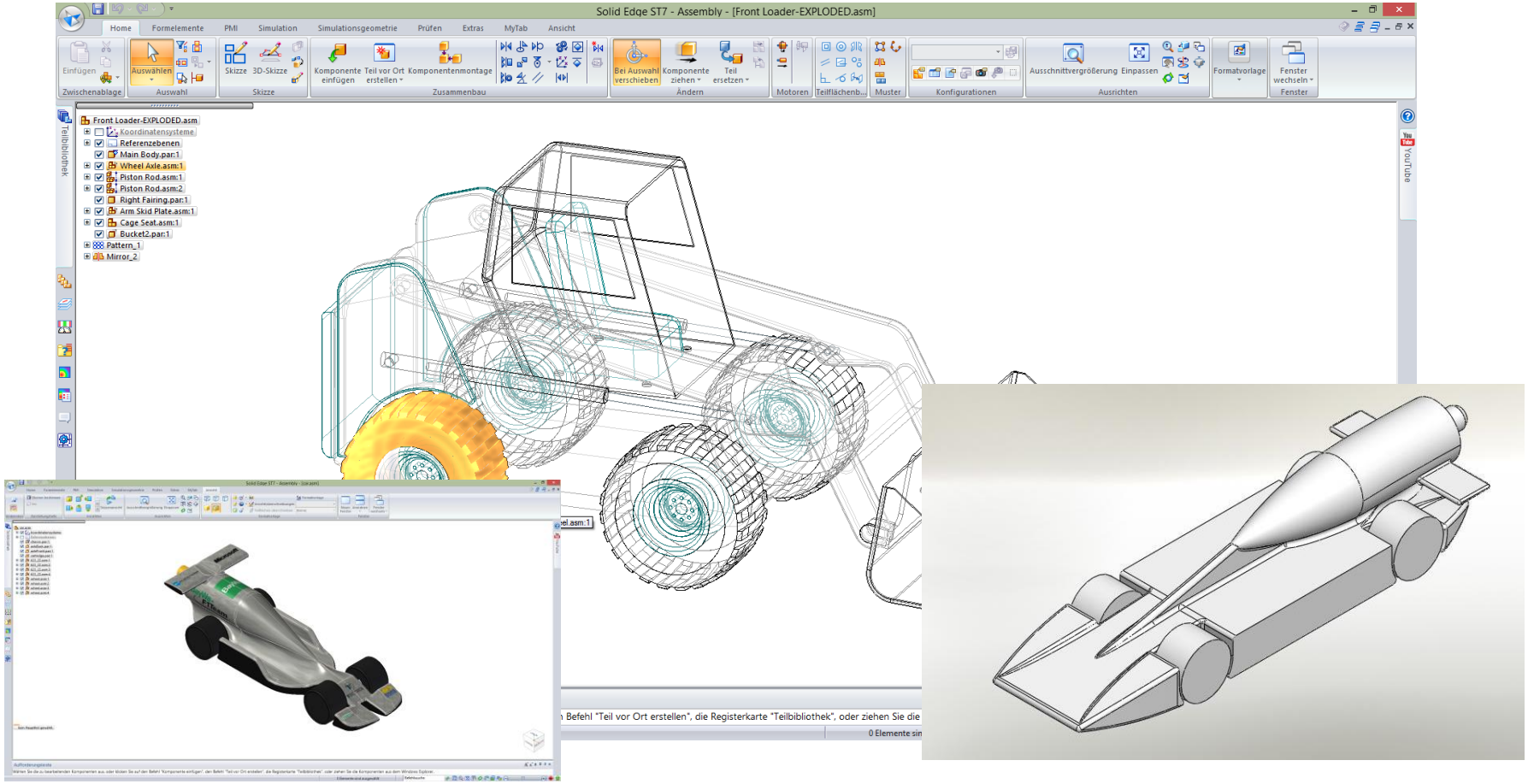
Real-world motivation

- Area of investigation: 3D modelling CAD software (CAD = computer aided design)



Real-world motivation

- Area of investigation: 3D modelling CAD software (CAD = computer aided design)
- In particular: **Siemens Solid Edge**. Cooperation with Siemens



Real-world motivation

During regular work with Solid Edge, problems or difficulties occur

© sebis

Real-world motivation

During regular work with Solid Edge, problems or difficulties occur

What is meant by *problems and difficulties*?

- Program acts unexpectedly
- User does not know how to achieve a certain result
- User looks for an better (mostly: faster) way to achieve a certain result

© sebis

Real-world motivation

During regular work with Solid Edge, problems or difficulties occur

What is meant by *problems and difficulties*?

- Program acts unexpectedly
- User does not know how to achieve a certain result
- User looks for an better (mostly: faster) way to achieve a certain result

Motivation

CAD programs lack possibilities for using the power and knowledge of the **community**

- No **build-in immediate** help for user
- Difficult to explain and remember **sequence of actions** to resolve problem

Our Research Questions

1. How do we help **now** in the workflow?
2. How do we explain a complex sequence of actions?
3. *(How do we recommend something for the future?)*

Scientific Motivation: Research Subjects

Research subjects:

Scientific Motivation: Research Subjects

Research subjects:

- Computer-Supported Cooperative Work (CSCW)
  - "*A system that integrates information processing and communications activities to help individuals work together as a group*." [palmer1994computer]

[palmer1994computer]: James D Palmer and N Fields. Computer supported cooperative work. 1994

Scientific Motivation: Research Subjects

Research subjects:

- Computer-Supported Cooperative Work (CSCW)
  - "*A system that integrates information processing and communications activities to help individuals work together as a group*." [palmer1994computer]
- Social Software
  - "*software that supports group interaction*" [shirky2003social]

[palmer1994computer]: James D Palmer and N Fields. Computer supported cooperative work. 1994
[shirky2003social]: CLAY Shirky. Social software: A new generation of tools. 2003

Scientific Motivation: Research Subjects

Research subjects:

- Computer-Supported Cooperative Work (CSCW)
  - "*A system that integrates information processing and communications activities to help individuals work together as a group*." [palmer1994computer]
- Social Software
  - "*software that supports group interaction*" [shirky2003social]
- Contextual Help
  - "*contextual help allows users to receive help in the actual interface they are interacting with, rather than in another help interface*" [yeh2011creating]

[palmer1994computer]: James D Palmer and N Fields. Computer supported cooperative work. 1994
[shirky2003social]: CLAY Shirky. Social software: A new generation of tools. 2003
[yeh2011creating]: Tom Yeh et al. Creating contextual help for guis using screenshots.2011

Scientific Motivation: Connected Research

Research at this chair:

Scientific Motivation: Connected Research

Research at this chair:

- Robert Gleixner implemented a Q&A system into Solid Edge [Gleixner2015]

[Gleixner2015]: Robert Gleixner. Implementation of collaboration features in cad software. Master's thesis. 2015

Scientific Motivation: Connected Research

Research at this chair:

- Robert Gleixner implemented a Q&A system into Solid Edge [Gleixner2015]

Similar research:

- "*Ask before you search: peer support and community building with ReachOut*" [ribak2002ask]

[Gleixner2015]: Robert Gleixner. Implementation of collaboration features in cad software. Master's thesis. 2015
[ribak2002ask]: Amnon Ribak et al. Ask before you search: peer support and community building with reachout. 2002

Scientific Motivation: Connected Research

Research at this chair:

- Robert Gleixner implemented a Q&A system into Solid Edge [Gleixner2015]

Similar research:

- "*Ask before you search: peer support and community building with ReachOut*" [ribak2002ask]
- "*Photoshop with friends: a synchronous learning community for graphic design*" [kim2012photoshop]

[Gleixner2015]: Robert Gleixner. Implementation of collaboration features in cad software. Master's thesis. 2015
[ribak2002ask]: Amnon Ribak et al. Ask before you search: peer support and community building with reachout. 2002
[kim2012photoshop]: Juho Kim et al. Photoshop with friends: a synchronous learning community for graphic design. 2012

Main goal

Implement a social chat extension for Solid Edge which makes it easy to receive and give help.

Overview

1. **Motivation**
   - Real-world Motivation
   - Research Questions
   - Scientific Motivation
   - Goal

2. **Our Approach**
   - Mayday Button
   - Integrated Chat
   - Screenshot Sending
   - Event Queue

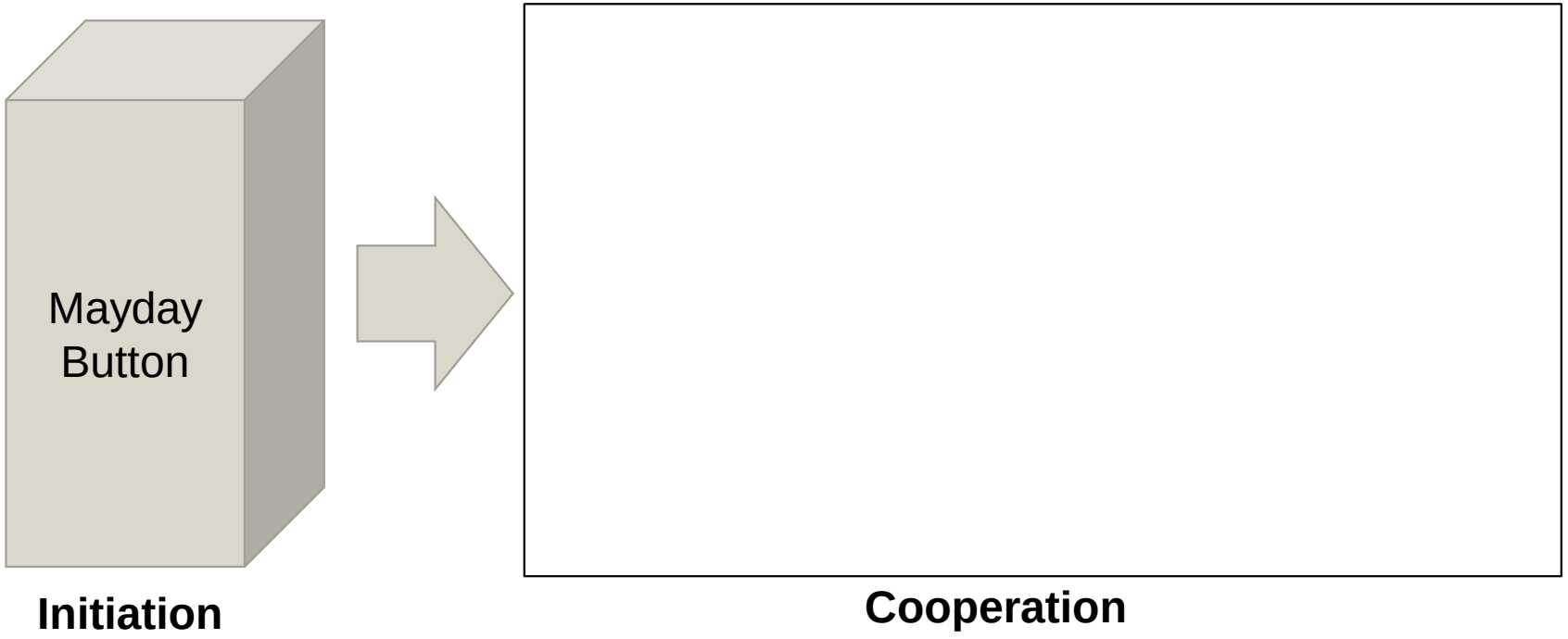
3. **Research Schedule**

Our Approach

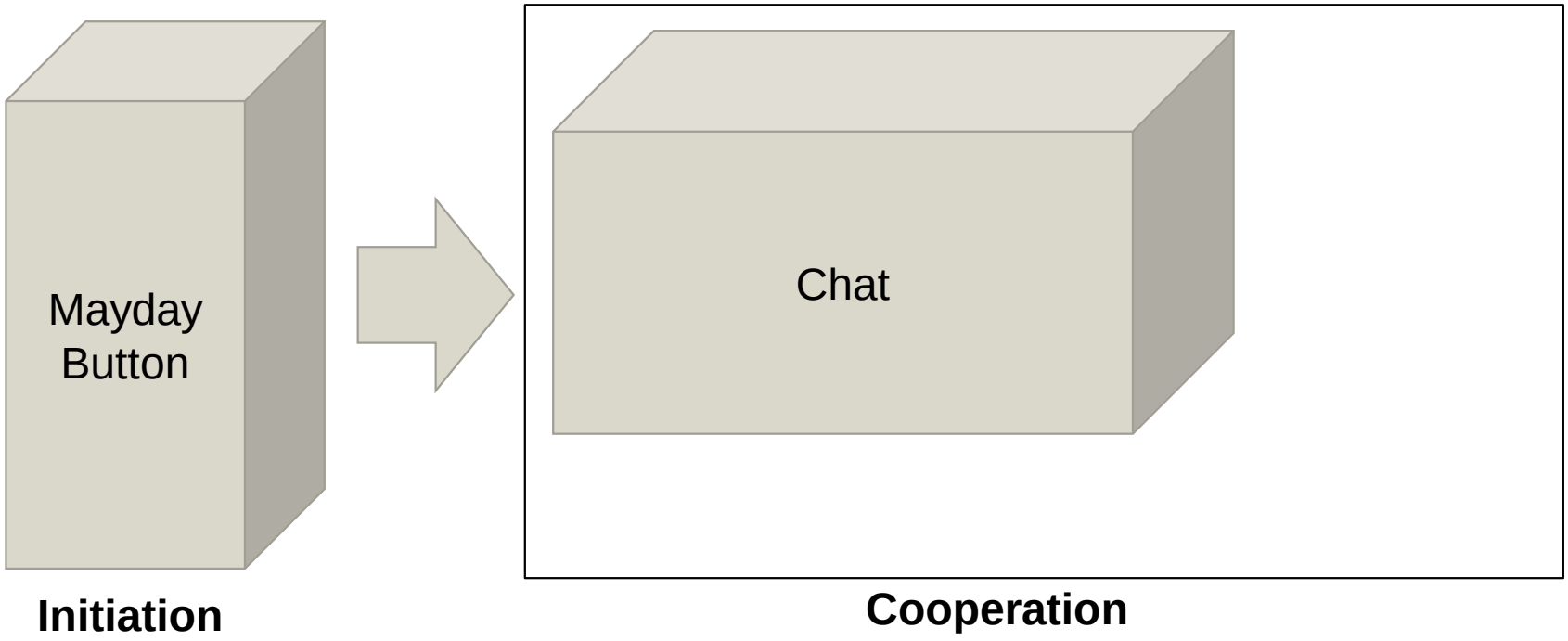
Our Approach

Initiation

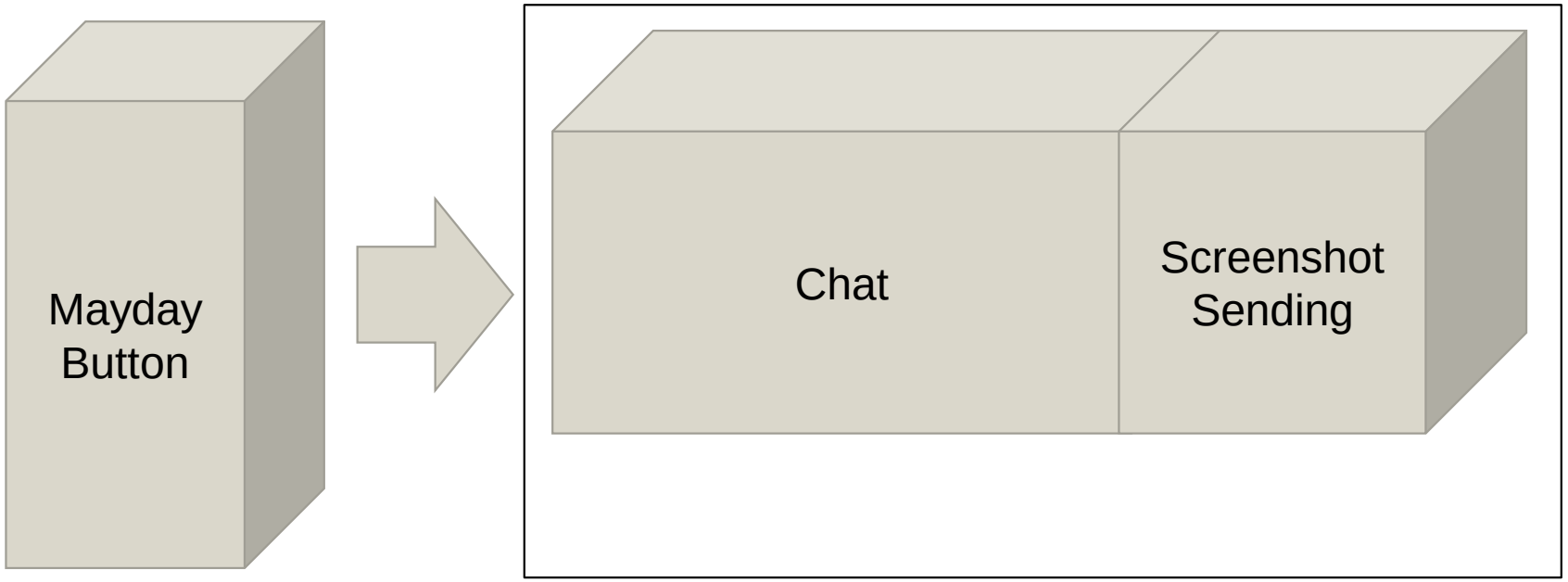
Our Approach



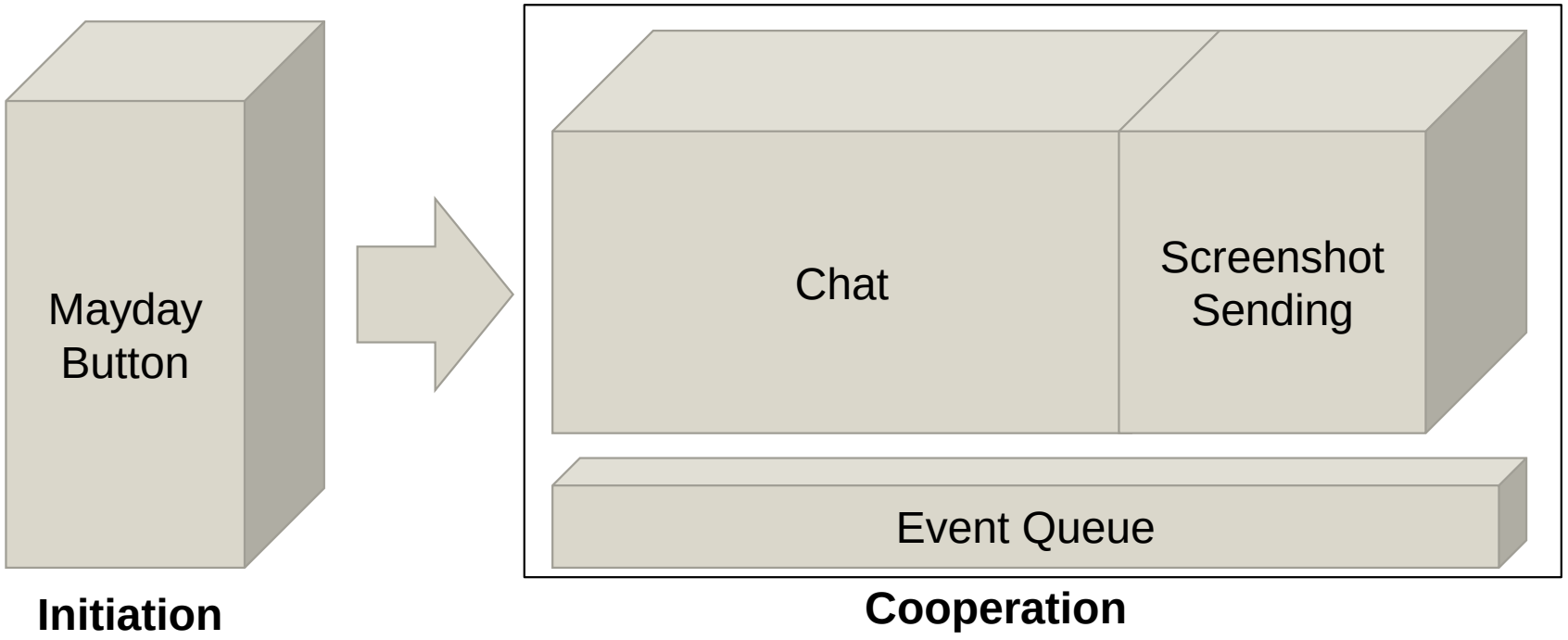
Our Approach



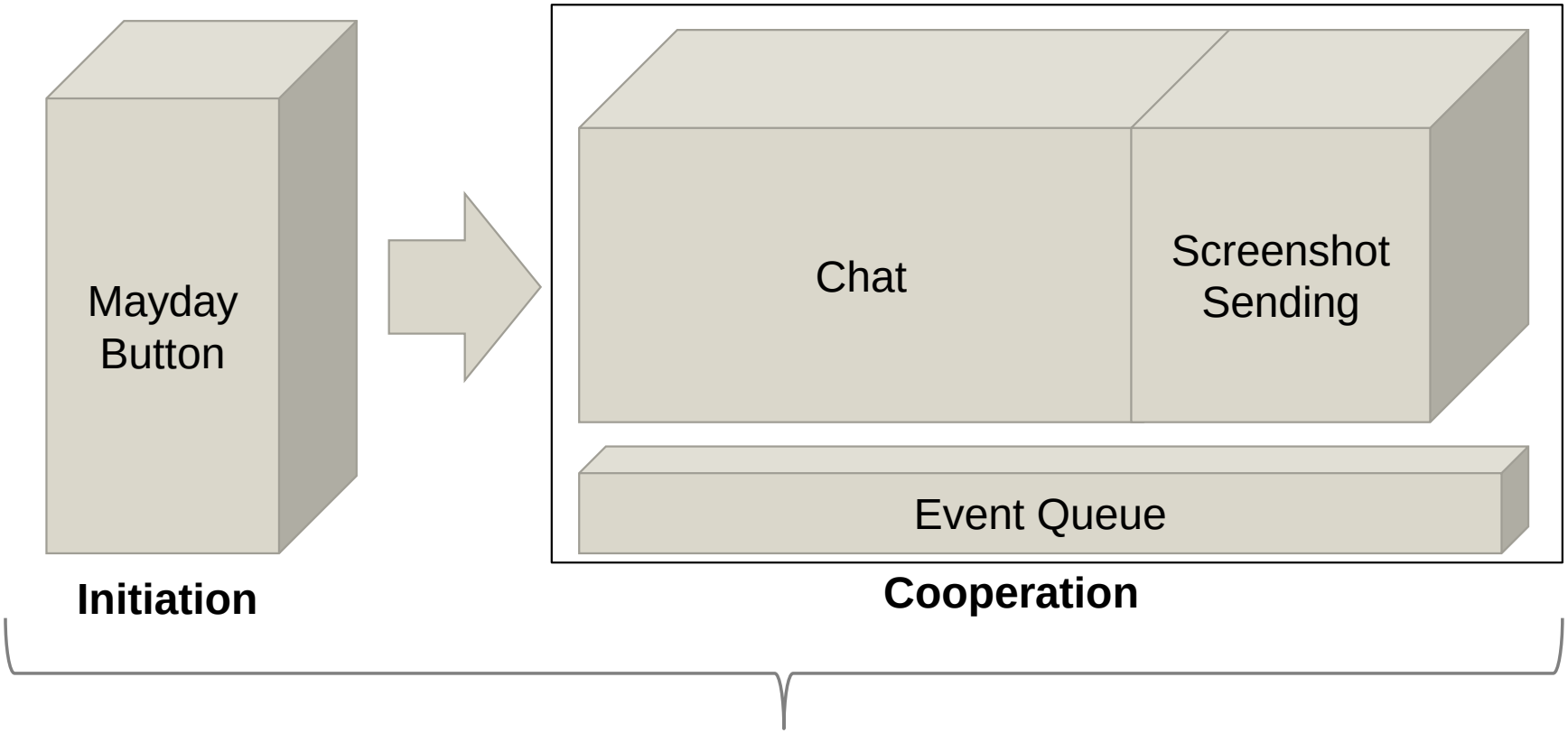
Our Approach



Our Approach



Our Approach



Our Approach

Our Approach

Mayday Button

- **What?** User opens chat with a single action within his application context
- **Why?** Minimized Barriers for initiation of cooperation
- *role model:* Amazon Fire Tablet Mayday Button

Our Approach

Mayday Button

- **What?** User opens chat with a single action within his application context
- **Why?** Minimized Barriers for initiation of cooperation
- *role model:* Amazon Fire Tablet Mayday Button

Chat / Instant Messaging

- **What?** Two users have a synchronous textual conversation (still from within the application context)
- **Why?** Instant Messaging is a flexible and expressive tool for informal communication tasks [nardi2000interaction]

[nardi2000interaction]: Bonnie A Nardi et al. Interaction and outeraction: instant messaging in action. 2000

Our Approach

Mayday Button

- **What?** User opens chat with a single action within his application context
- **Why?** Minimized Barriers for initiation of cooperation
- *role model:* Amazon Fire Tablet Mayday Button

Chat / Instant Messaging

- **What?** Two users have a synchronous textual conversation (still from within the application context)
- **Why?** Instant Messaging is a flexible and expressive tool for informal communication tasks [nardi2000interaction]

Screenshot Sending

- **What?** User can send a momentous shooting of his current application context
- **Why?** Visual means can contain more information than just text [fussell2000coordination]

[nardi2000interaction]: Bonnie A Nardi et al. Interaction and outeraction: instant messaging in action. 2000
[fussell2000coordination]: Susan R Fussell et al. Coordination of communication: Effects of shared visual context on collaborative work. 2000

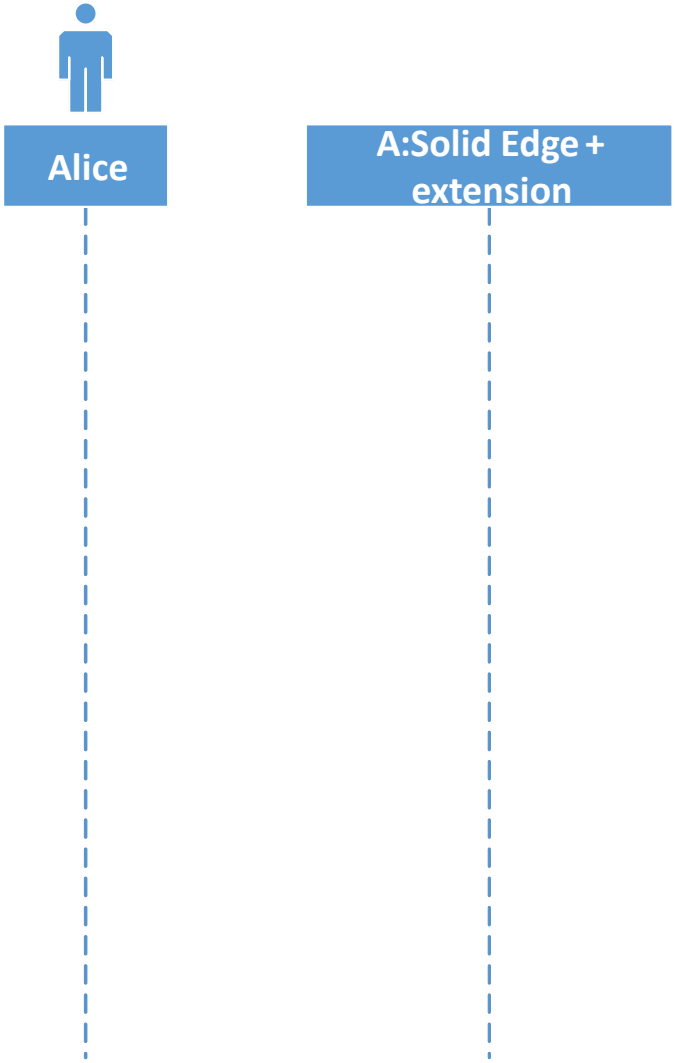
Our Approach

Event Queue

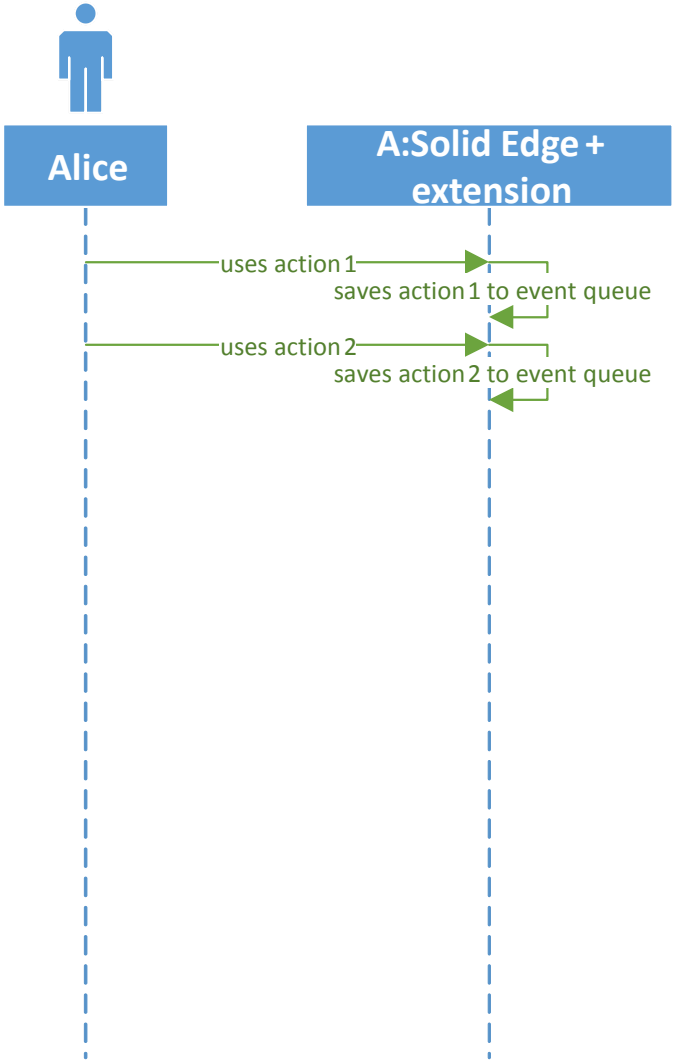
- **What?** The actions of the initiating user are recorded and sent to the conversation partner continuously
- **Why?** Sharing a history of actions is very helpful for both sides [li2010here]

[li2010here]: Ian Li et al. Here's what I did: sharing and reusing web activity with actionshot. 2010

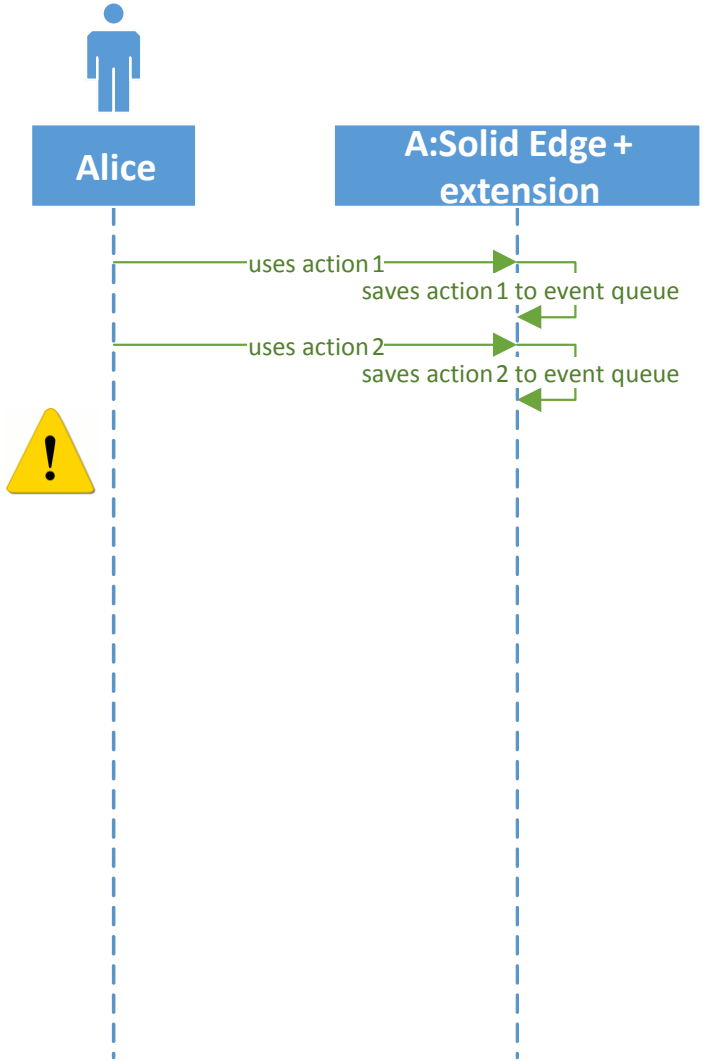
Our Approach: Interaction Diagram



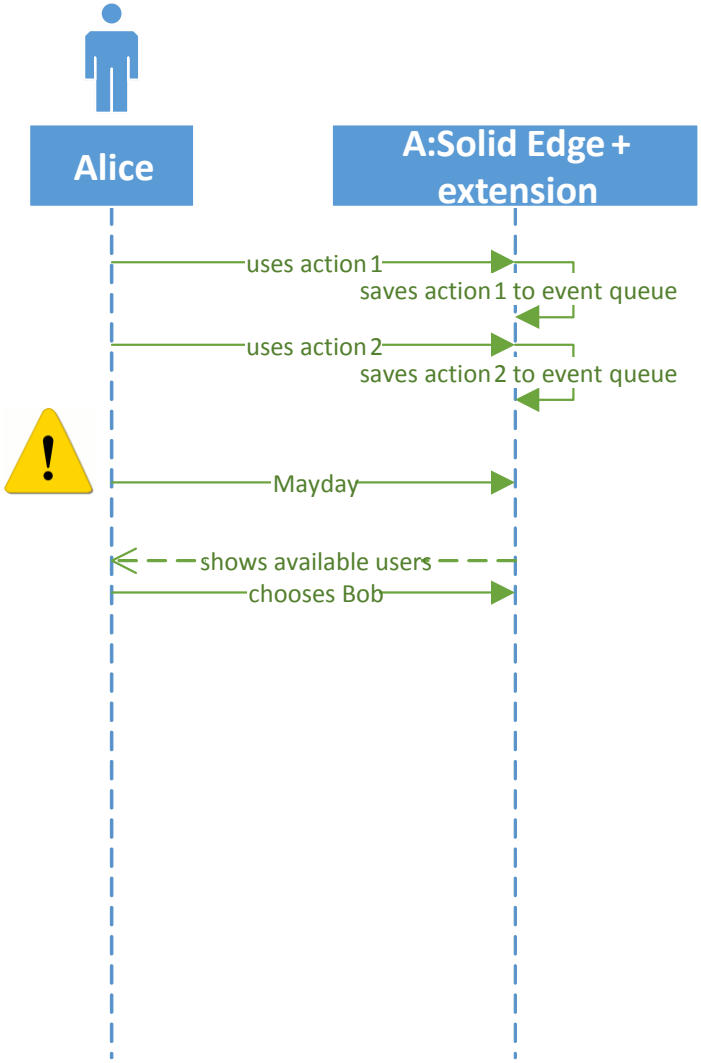
Our Approach: Interaction Diagram



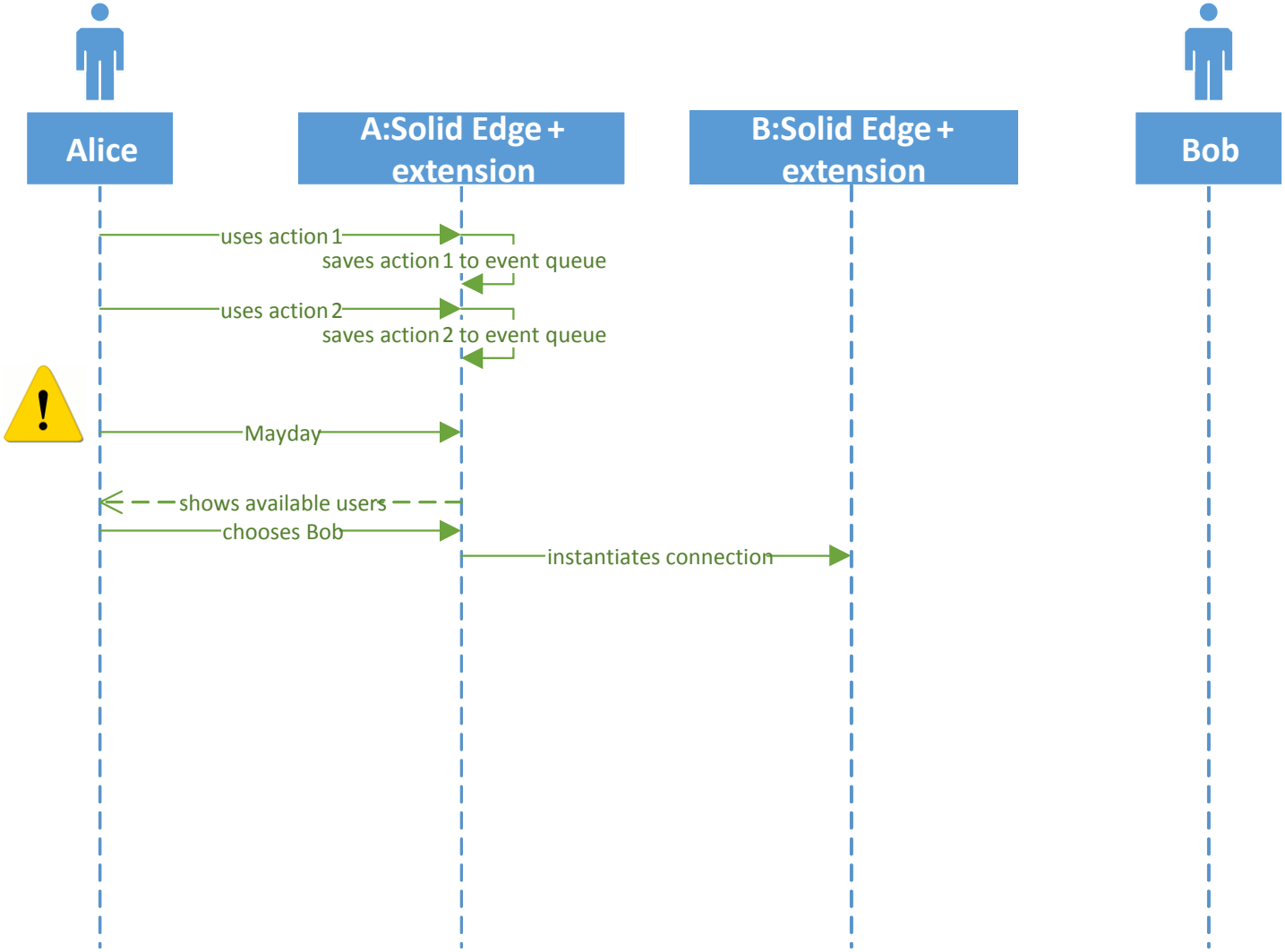
Our Approach: Interaction Diagram



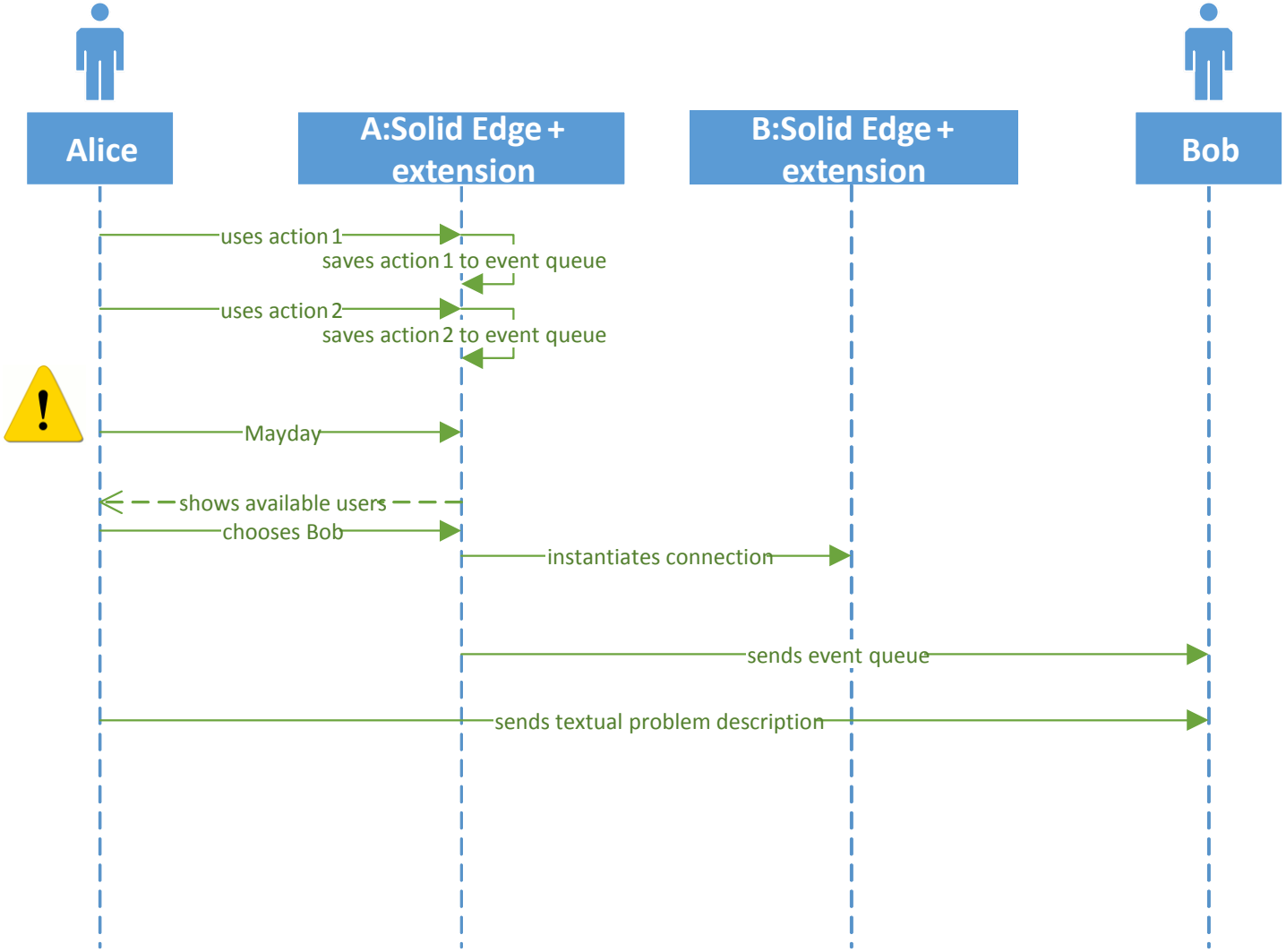
Our Approach: Interaction Diagram



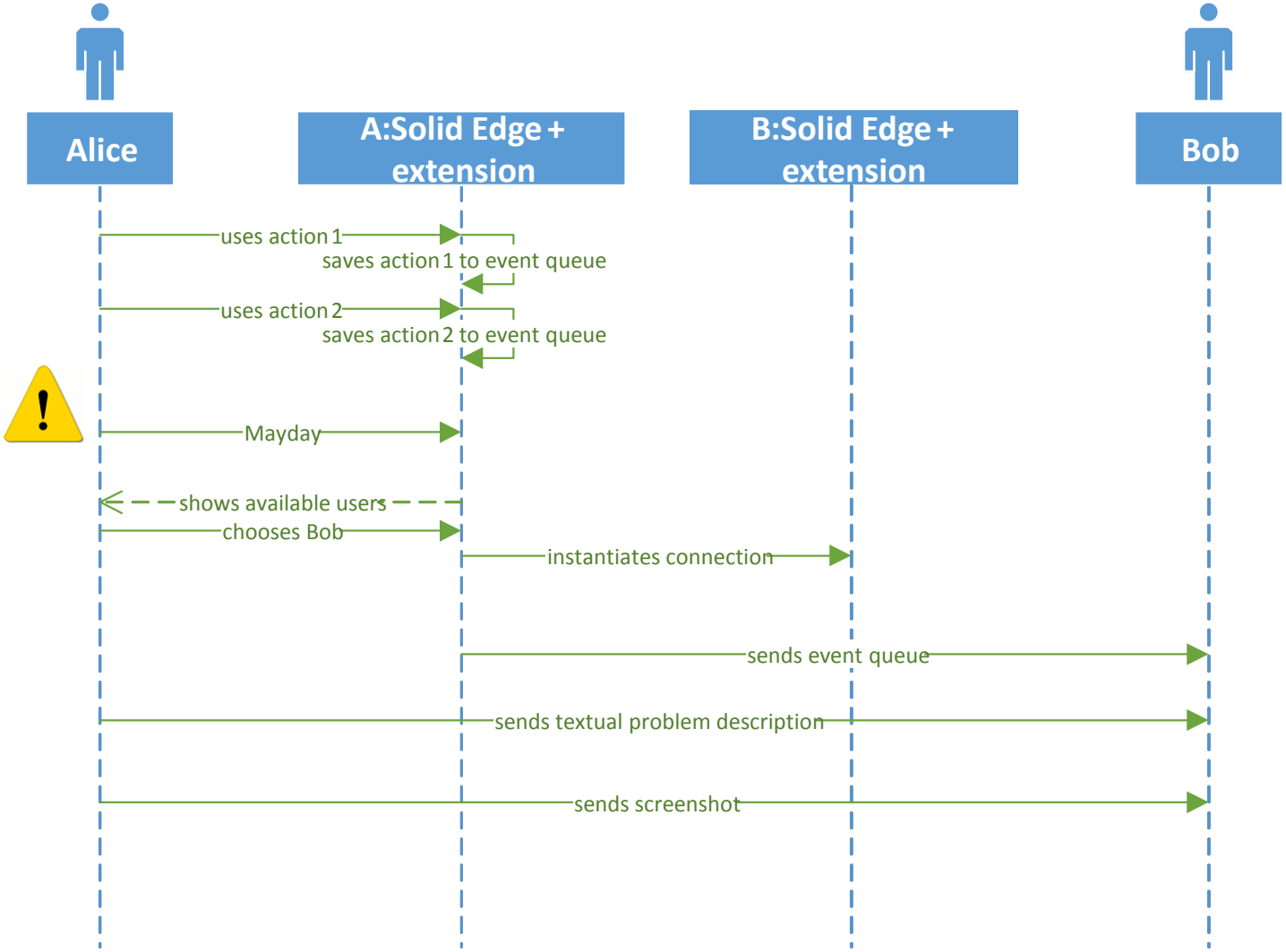
Our Approach: Interaction Diagram



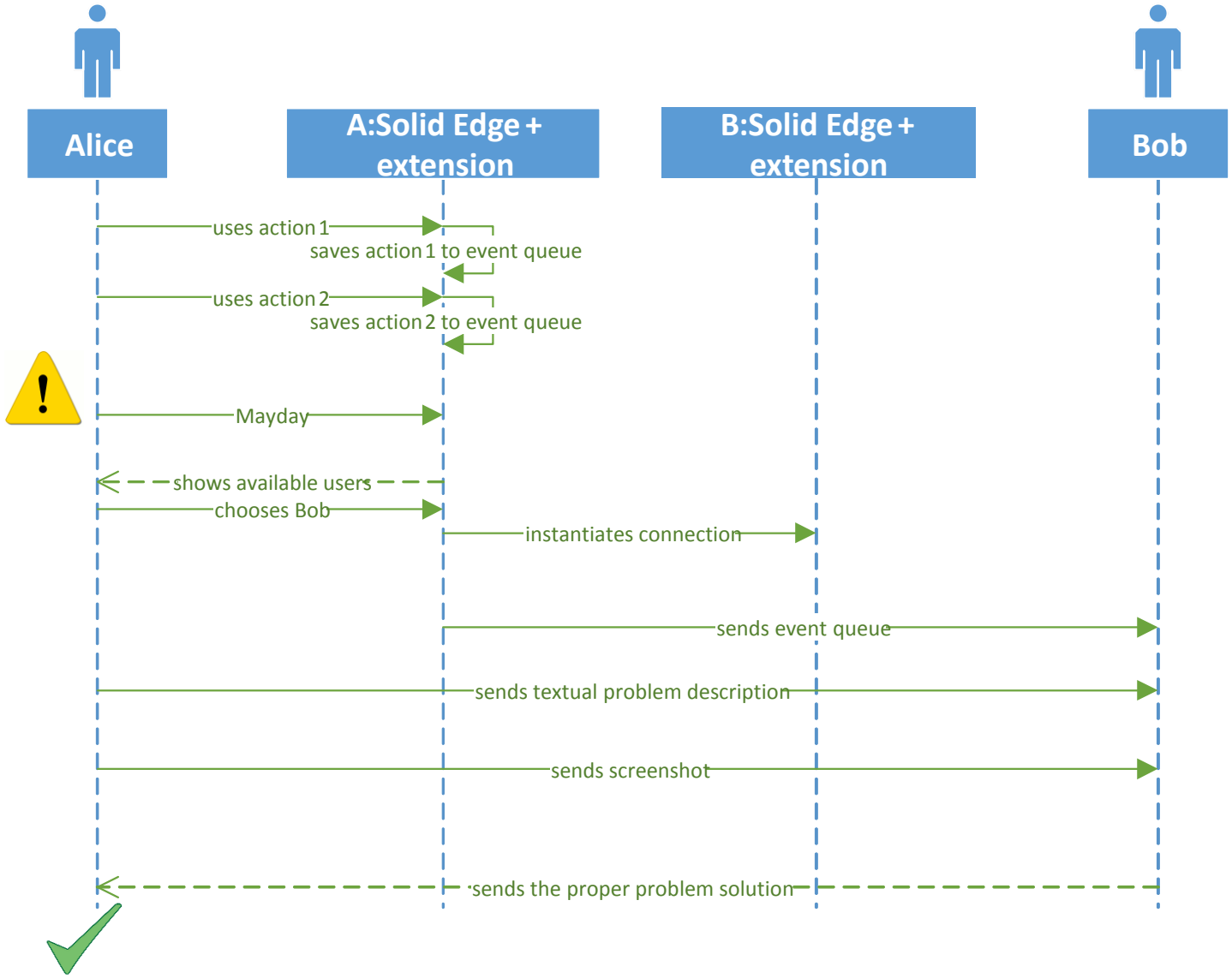
Our Approach: Interaction Diagram



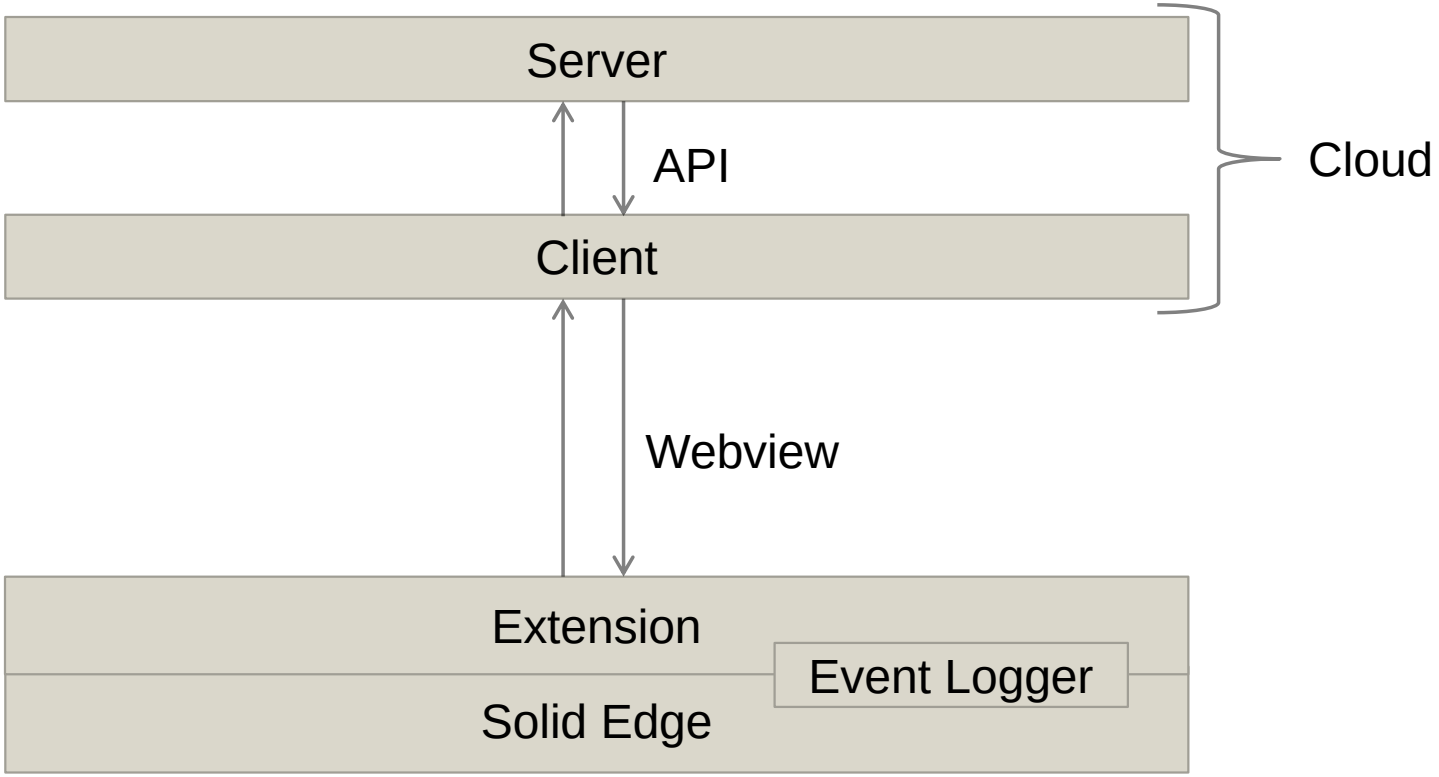
Our Approach: Interaction Diagram



Our Approach: Interaction Diagram



Basic Extension Architecture



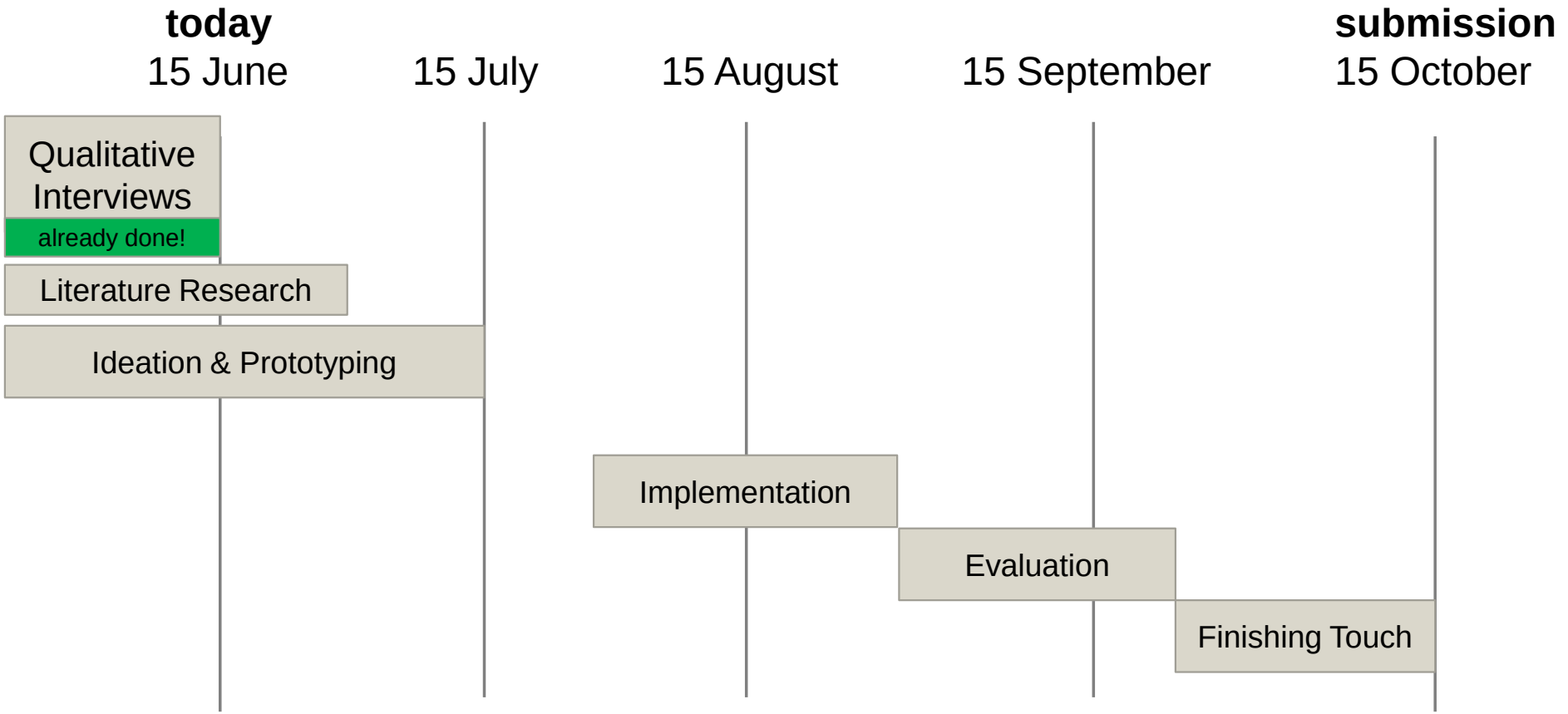
Overview

1. **Motivation**
   - Real-world Motivation
   - Research Questions
   - Scientific Motivation
   - Goal

2. **Our Approach**
   - Mayday Button
   - Integrated Chat
   - Screenshot Sending
   - Event Queue

3. **Research Schedule**

Research Schedule



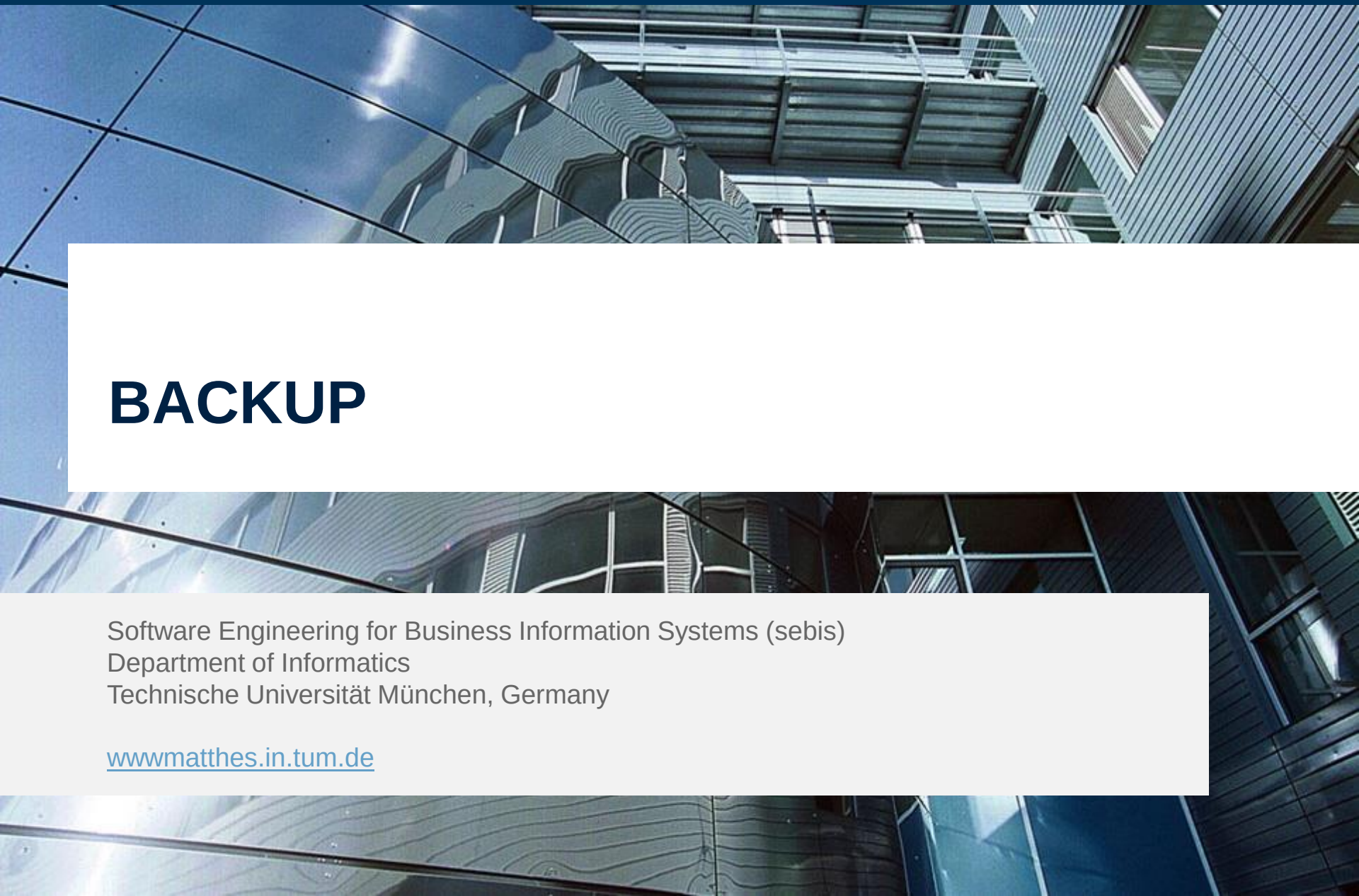
Thank you! Any more questions?

Markus Müller

Technische Universität München
Department of Informatics
Chair of Software Engineering for
Business Information Systems

Boltzmannstraße 3
85748 Garching bei München

sukram.mueller@gmail.com
wwwmatthes.in.tum.de



BACKUP

Software Engineering for Business Information Systems (sebis)
Department of Informatics
Technische Universität München, Germany

wwwmatthes.in.tum.de

Definition: Context

"*Context is any information that can be used to characterise the situation of an entity. An entity is a person, place, or object that is considered relevant to the interaction between a user and an application, including the user and applications themselves.*" [dey2001understanding]

[dey2001understanding]
Dey, A. K.
Understanding and using context
Personal and ubiquitous computing, Springer-Verlag, **2001**, *5*, 4-7

© sebis

Implementation: Technologies to be used

- C# for extension
- Chat will be built with web technologies. We will build a REST API server and a chat client
  - Node.js
  - MongoDB
  - AngularJS
  - Hapi

© sebis