

HYPER-LINKED COMMUNICATIONS

WebRTC enabled asynchronous collaboration

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OVERVIEW

1. Introduction
2. Related Work
3. Proposed Architecture
4. Methodology
5. Conclusions

INTRODUCTION

INTRODUCTION

1. Introduction

1.1 Context

1.2 Problem Statement

1.3 Thesis Goals

2. Related Work

3. Proposed Architecture

4. Methodology

5. Conclusions

Written communication could never replace face to face communication.

“No computer in our lifetimes will ever rival a human voice’s capacity to conveying rich and complex social and emotional meaning”

— Geddes, Martin

Today, we can achieve more.

Real-time communication applications can make a difference on business, education and health sectors.

An application that provides a way to remember our past communications would be a strong tool.

PROBLEM STATEMENT: USE CASE

A teacher record and streams an interactive class, some students participate in real-time others may participate later.

The teacher adds information to its class (create tags, add links, overlay images ...).

Students can answer to quizzes.

THESIS GOALS

Development of an application that applies the hypermedia concepts.

Record and playback interactive video.

Use only standard technologies like JavaScript, WebRTC, HTML5 and CSS3.

RELATED WORK

RELATED WORK

1. Introduction

2. Related Work

2.1 Early days of the Internet

2.2 Real-Time communications

2.3 Signaling

2.4 Hypermedia

2.5 Collaboration & Time manipulation

3. Proposed Architecture

4. Methodology

5. Conclusions

EARLY DAYS OF THE INTERNET

- IPv4 Address Exhaustion
- Network Address Translation
- Client-Server model
- STUN + TURN = ICE



WebRTC (Web Real-Time Communications)

- MediaStream
- DataChannel
- RTCPeerConnection



SIGNALING: MEET AND GET TO KNOW

- Own Implementation
- SIP
- XMPP
- SigOFly

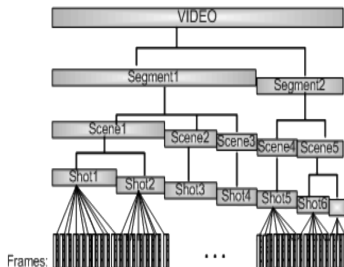
HYPERMEDIA: MORE THAN WORDS, MORE THAN IMAGES

- **Concepts:** HyperText & HyperMedia & HyperCommunications
- **Implementations:** HyperCafe & HyperHitchcock



HYPERMEDIA: MORE THAN WORDS, MORE THAN IMAGES

- **Languages:** HyVAL & SMIL
- **WebBrowser:** Ambulant & SmilingWeb & SVG



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WEB-BROWSER PLUG-INS



ADOBE® FLASH



Microsoft®
Silverlight™

EXTENDING COLLABORATION TOOLS WITH TIME MANIPULATION

- Streaming and Recording
- Media Types
- Recording and Streaming Interactive Media
- Collaborative Environment

PROPOSED ARCHITECTURE

RELATED WORK

1. Introduction

2. Related Work

3. Proposed Architecture

3.1 Modules

3.2 Implementation Proposal

4. Methodology

5. Conclusions

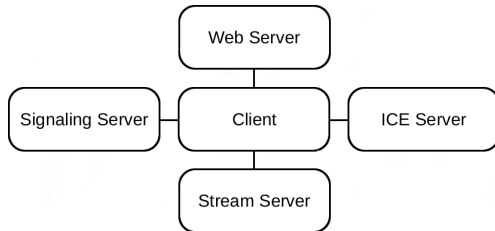
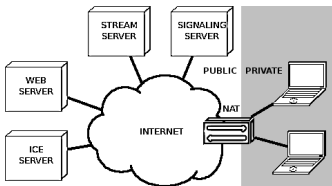


Figure: System Modules

IMPLEMENTATION PROPOSAL



- **ICE Server:** restund
- **Signaling Server:** Ejabberd
- **Web Server:** Play Framework
- **Stream Server:** Jitsi VideoBridge

Figure: System Infrastructure

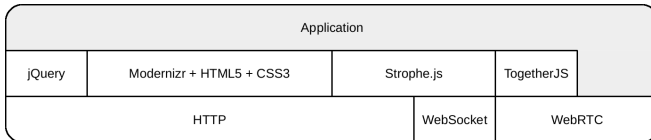


Figure: App Architecture

WIREFRAME

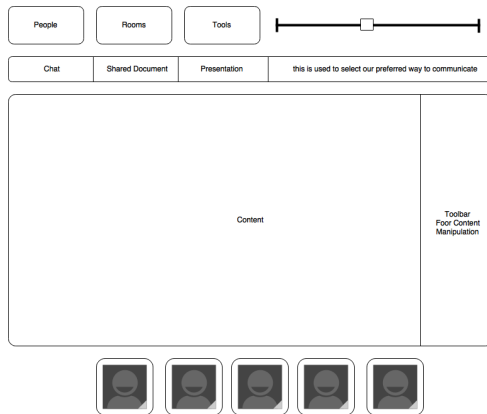


Figure: Application wireframe

METHODOLOGY

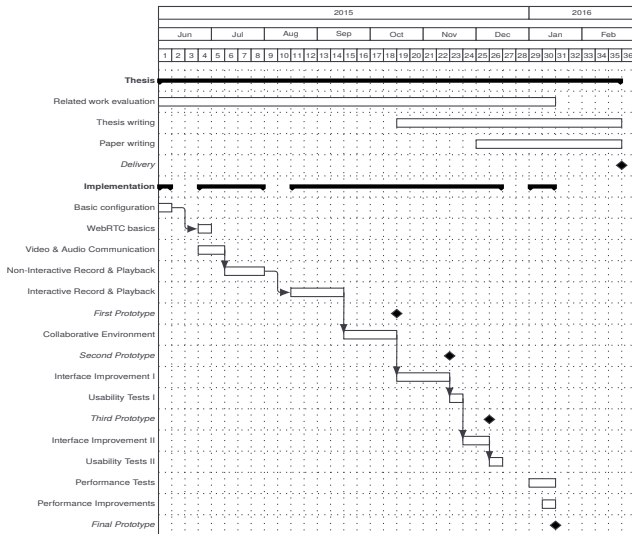
RELATED WORK

1. Introduction
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3. Proposed Architecture
4. Methodology
 - 4.1 Evaluation
 - 4.2 Planned Schedule
5. Conclusions

Qualitative and quantitative evaluation.

- Unit tests.
- Tests with users.
- Benchmarks.

PLANNED SCHEDULE



CONCLUSIONS

RELATED WORK

1. Introduction
2. Related Work
3. Proposed Architecture
4. Methodology
- 5. Conclusions**

CONCLUSIONS

- New usage scenarios for communication and collaboration applications.
- Enrich communications using hypermedia concepts. Record, playback and collaboration features.
- Prototype implementation and testing.

Questions?