Round-Trip Sketches
Supporting the Lifecycle of Sketches from Analog to Digital and Back

Sebastian Baltes
@s_baltes

Universität Trier

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Round-Trip Sketches: Supporting the Lifecycle of Software Development Sketches from Analog to Digital and Back

Sebastian Baltes, Fabrice Hollerich, and Stephan Diehl
Department of Computer Science
University of Trier
Trier, Germany
Email: research@sbaltes.com, diehl@uni-trier.de

I. INTRODUCTION
Sketches and diagrams play an important role in related activities [1], [2], [3]. An engineer sketches to clarify old ideas and develop new ones [4]. In mechanical design sketches, not only document final designs, but also provide designers with a memory system to help them form ideas, think, and communicate concepts to colleagues [5]. Besides being an external representation of memory and means for communication [6], [7], they serve as documentation [8]. The ambiguity in sketches is a source of creativity [9] and they support problem solving and understanding [10]. In engineering, contextual experiments have shown that the possibility to sketch has a positive effect on the quality of the solution [8]. Software developers use sketches and diagrams to understand, to design, and to communicate different aspects of software systems [11], [12], [13], [14]. Most software engineering sketches do not follow formal conventions like the Unified Modeling Language (UML), but have an informal, ad hoc nature [12], [13], [15], [11], [14], [16].

Media used for sketch creation include not only whiteboards and paper, but also software tools like Photoshop and PowerPoint [13], [12], [17], [16], [14]. Often, sketches are revised [14] and pass through transitions from analog to digital media [13], because digital sketches can more easily be copied, organized, and shared [18]. Even if a digital version of a sketch is stored, analog sketches may be kept as a memory aid [17]. Here, recent information is often needed to understand informal
Sketches and Diagrams in SE Practice

Existing Studies
- purpose, media, formality, etc.

Exploratory Field Study
- 3 companies
- 13 developers
- 47 sketches

11 Dimensions
- Revision
- Lifespan
- Effort
- Purpose
- Contributors
- Context
- Relation to Source Code
- Archiving
- Medium
- Formality
- UML-Elements

Online Survey
- 394 participants

FSE 2014

Baltes and Diehl
Sketches and Diagrams in Practice
sketches.sbaltes.com

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Survey Results

Revision

- whiteboard (40%)
- paper (18%)
- analog (58%)

54%

Media

transitions between media are common

- computer (39%)
- digital (40%)
- tablet (<1%)

77%

Baltes and Diehl
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Revision

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  transitions between media are common
- analog (58 %)

Media

- computer (39 %)
- tablet (<1 %)
  digital (40 %)

Revision

77 %

Archiving

- archived (38 %)
- not archived (62 %)

- archived (94 %)
- not archived (6 %)
Walny et al.  
Follow that sketch: Lifecycles of diagrams and sketches in software development  
VISSOFT 2011
Tool support?
“Create your way”
“Even in the digital age, paper is still very much a modern reality. [...] Whatever your approach to paper may be, Evernote’s powerful **paperless features** let you handle it all with grace.”
“Livescribe smartpens bring your words and ideas into your digital world.” ...and back to paper?

“Livescribe smartpens only work with Livescribe dot paper.”
Our Motivation

• Many people still use (and prefer?) analog media
• Why force them to use a different (paperless) workflow?

Our goal: Do not treat analog sketches as subordinate artifacts but support different analog-digital workflows
Round-Trip Sketching
Concept

analog

digital

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Prototype
Overview

October 2015

September 2015

August 2015
Linkview
Metaview

14.11.2015
11.10.2015
05.10.2015
01.10.2015
08.09.2015
07.09.2015
25.08.2015

Title: Aufbau der GUI
Author: Fabrice Hollerich
Date: 25.08.2015

Versions

Add Metadata

add anchor remove anchor

Save Delete
User Study
ONE DOES NOT SIMPLY REPLACE PAPER

Questions?

livelysketches.sbaltes.com

@s_baltes

research@sbaltes.com