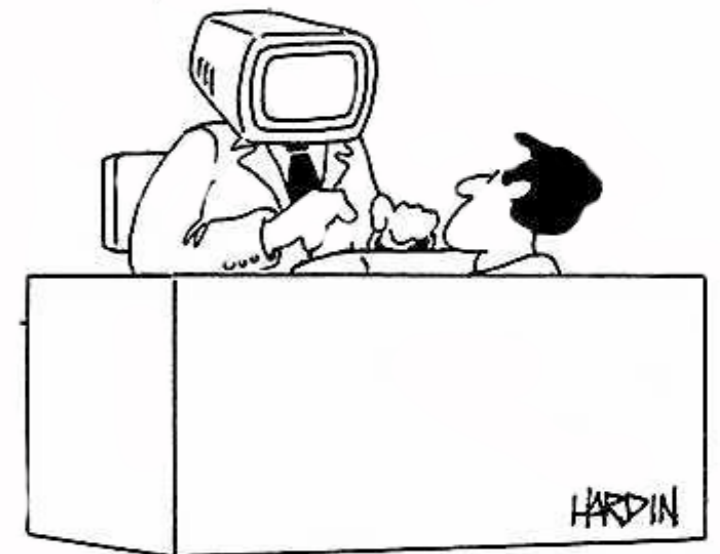


A Context Sensitive Dashboard

For an Adaptive Knowledge Worker Assistant

Ralf Biedert, Sven Schwarz, Thomas Roth-Berghofer



Regarding Your Next Work-Day

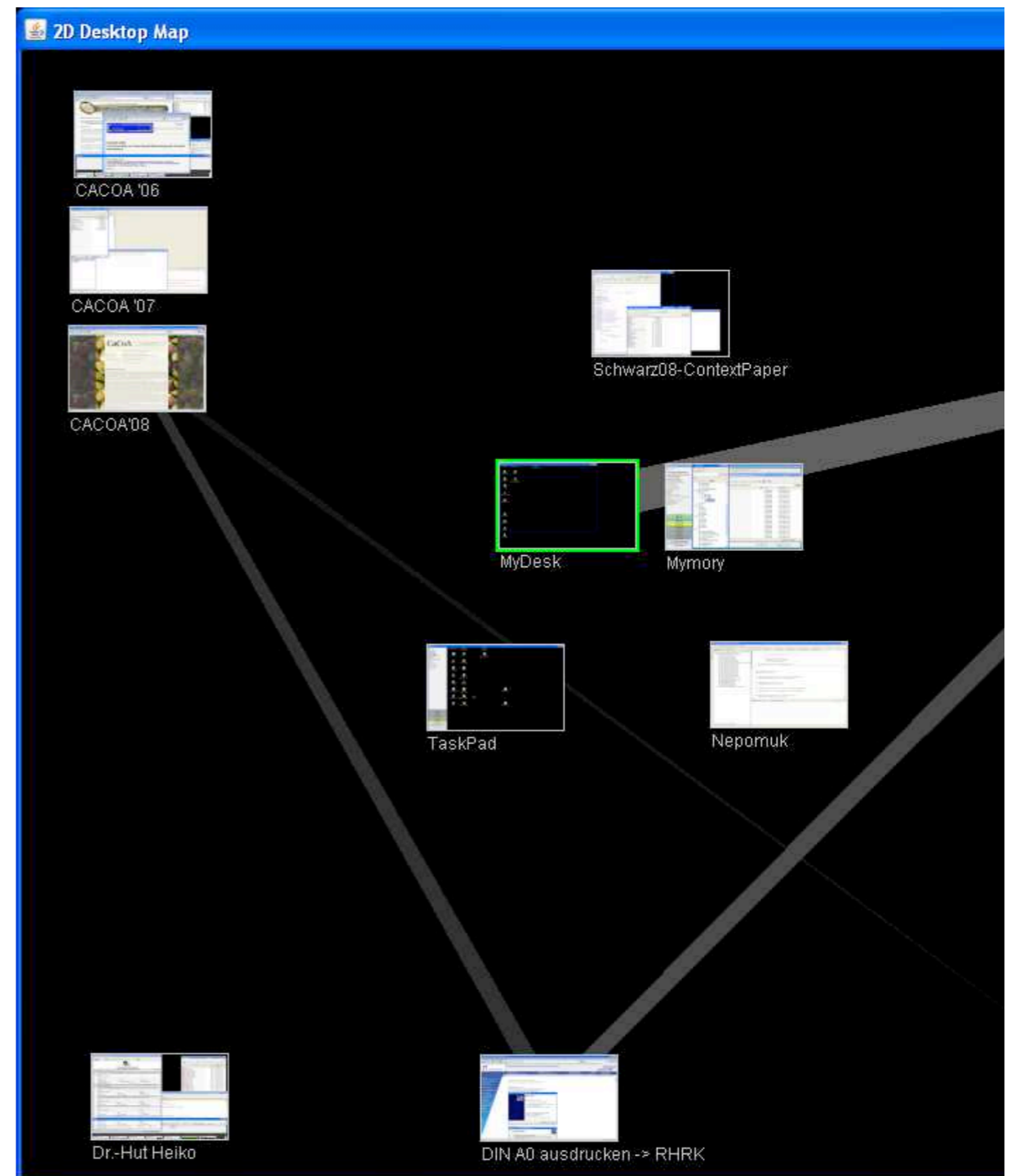
- It is likely that you process several tasks a day
- will interrupt your tasks, interrupt your interrupted tasks, ...
- won't finish all tasks a day
- will do work twice

*Thus, fragmentation of work is a way of life for these information workers. The majority of working spheres are interrupted and people spend about **11 minutes** in a working sphere before switching to another. The irony of the work day is that the longer people spend in a working sphere, (and thus we assume become more involved in it) the more likely it is to be interrupted and the longer is the interrupting event“*

From: No Task Left Behind? Examining the Nature of Fragmented Work. Mark et al.

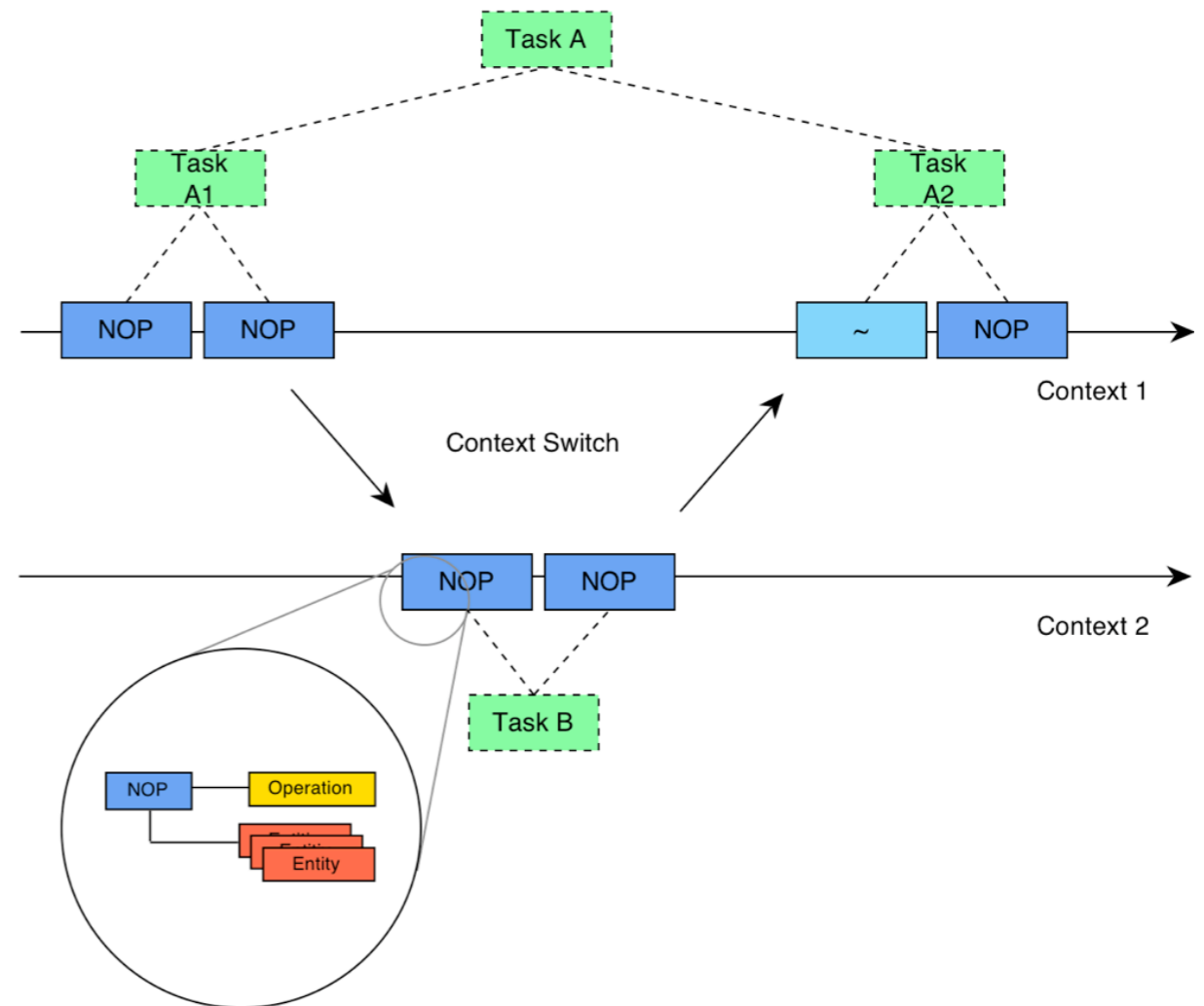
Within MyMory Project at DFKI

- a context sensitive infrastructure and observation plugins were built
- MyDesk provides contexts
- plugins deliver native operations to the user observation hub



So, what *Exactly* is Context?

- glbl. context (explicit)
 - a unique category provided by the user
 - equals his selected task
- current local context (implicit)
 - last observed NOPs



How do NOPs look like?

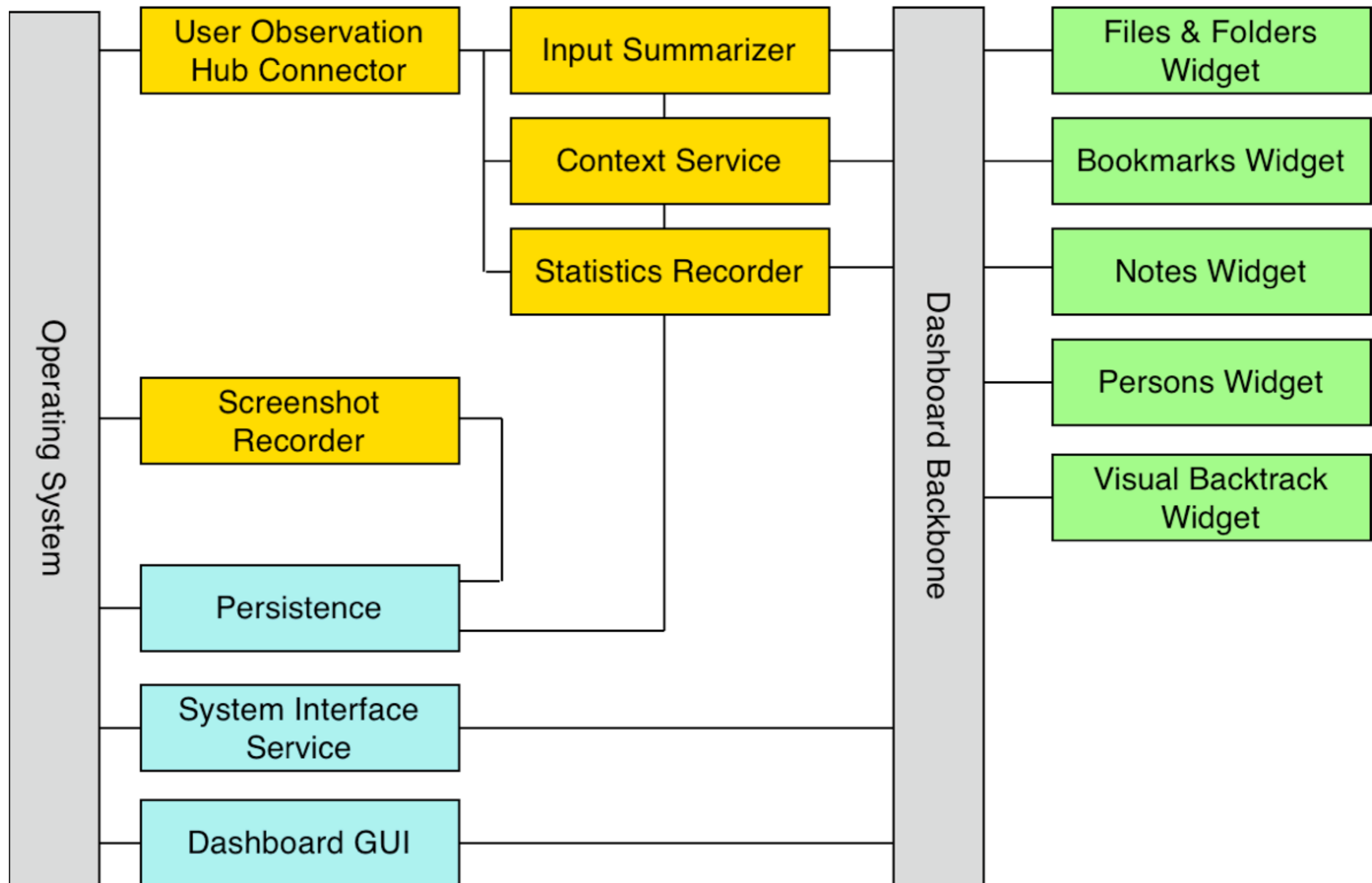
- „Native Operations“
for high-level user
actions
- serialized as RDF
- examples: *send mail,*
open document,
navigate to, ...
- dispatched to
listeners

```
<rdf:RDF
  xmlns:nop="http://ontologies.opendfki.de/repos/ontologies/..."
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  <nop:Application rdf:about="urn:app:Mozilla_Firefox">
    <nop:name>Mozilla Firefox</nop:name>
  </nop:Application>
  <nop:WebpageLoaded rdf:about="urn:nop:1212870387264_2">
    <nop:webUrl>
      <nop:Web rdf:about="http://de.start2.mozilla.com/" />
    </nop:webUrl>
    <nop:timestamp rdf:datatype="http://www.w3.org/2001/XMLSchema#"
      >2008-06-07T22:26:27.264+02:00</nop:timestamp>
    <nop:certainty>1.0</nop:certainty>
    <nop:application rdf:resource="urn:app:Mozilla_Firefox" />
  </nop:WebpageLoaded>
</rdf:RDF>
```

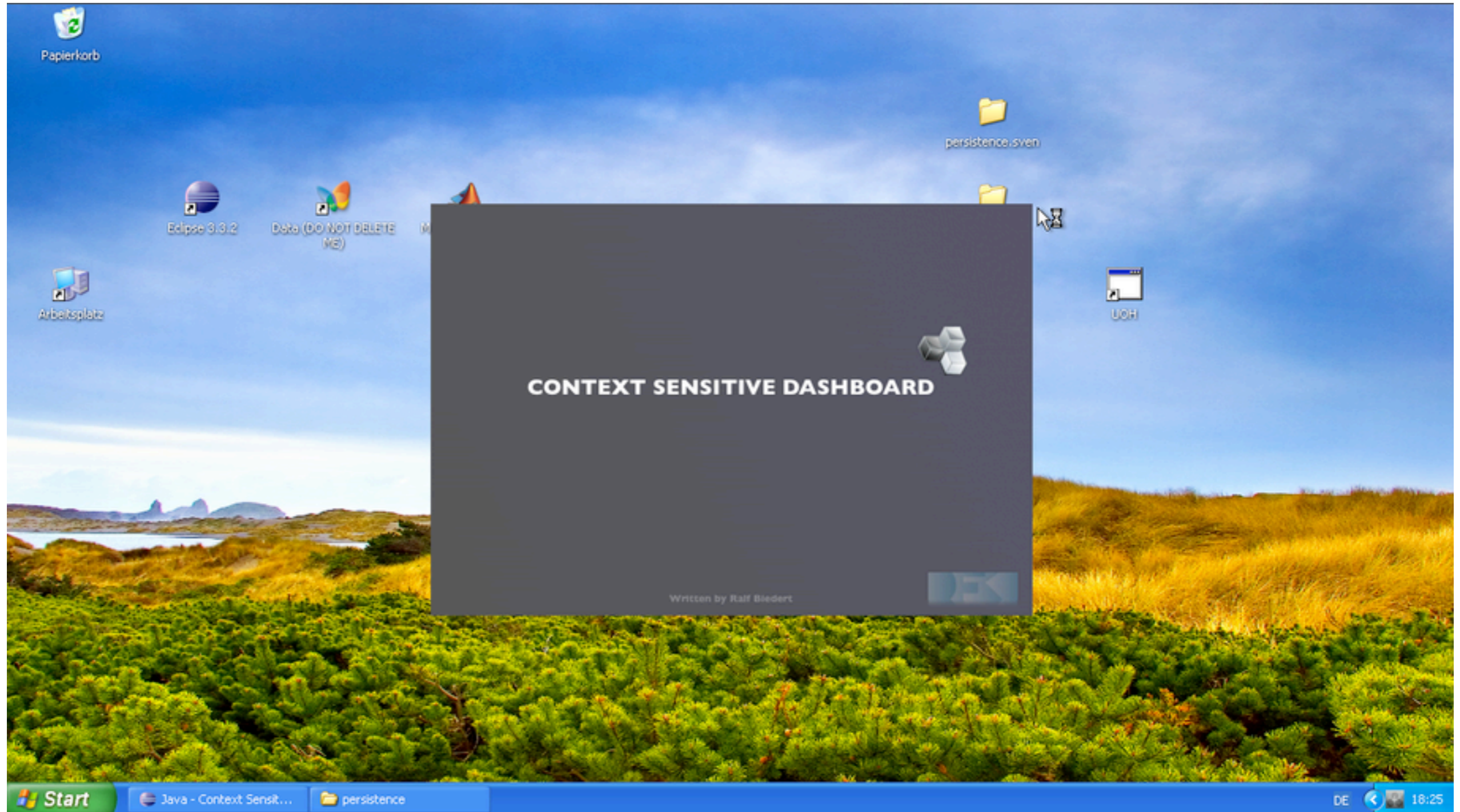
The Context Sensitive Dashboard

- stores users' actions and contexts
- in addition monitors the screen and keyboard
- in order to
 - speed up users work *within* a context (principal idea: benefits must be higher than costs)
 - reduce mental context change times between context (provide retrieval cues)

Technical Architecture

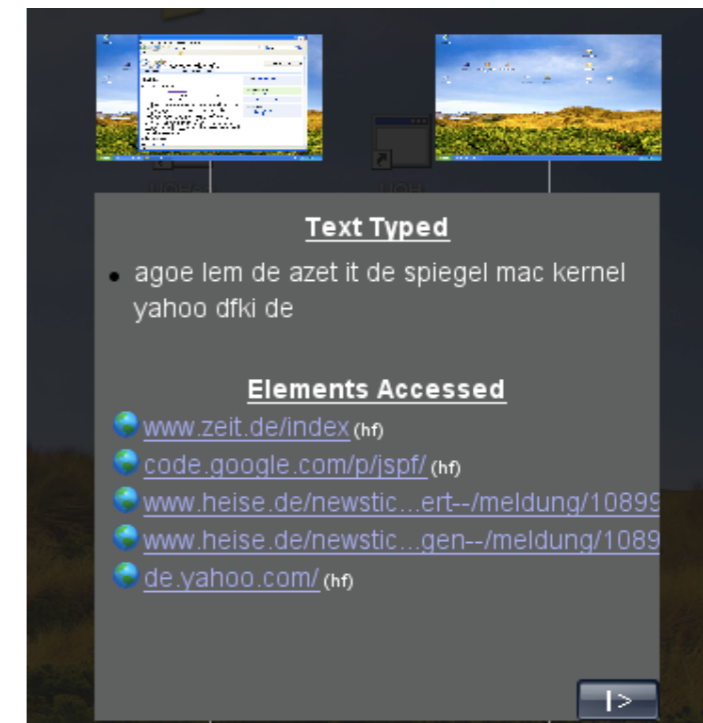


CSD in Action



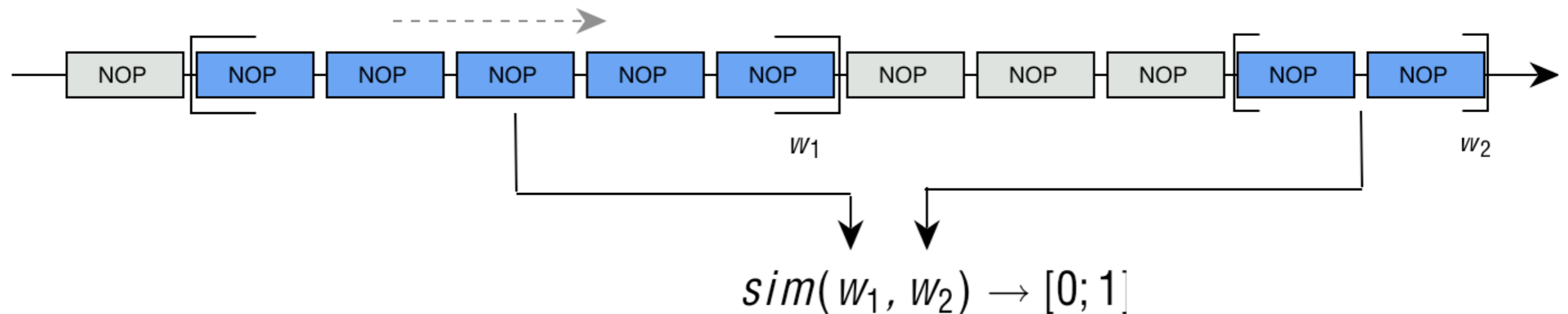
How do we Generate Assistance?

- The user is able to store bookmarks per context (always visible)
- most frequently used items (pC, pCS)
- similar situation (using CBR approach on a sliding window)



What is a *Similar Situation*?

- a *situation* is a window of observed events



- two windows are *similar* if they share *similar* events
- this induces a ranking on all elements

So what are *Similar Events*?

- depends on how pedantic you are. Please compare:

open_page ap.wetter.com/forecast/germany/?sessionID=ZGF0ZT0yMDA4MD

vs.

print_page ap.wetter.com/forecast/germany/?sessionID=ZGF0ZT0yMDA4MD

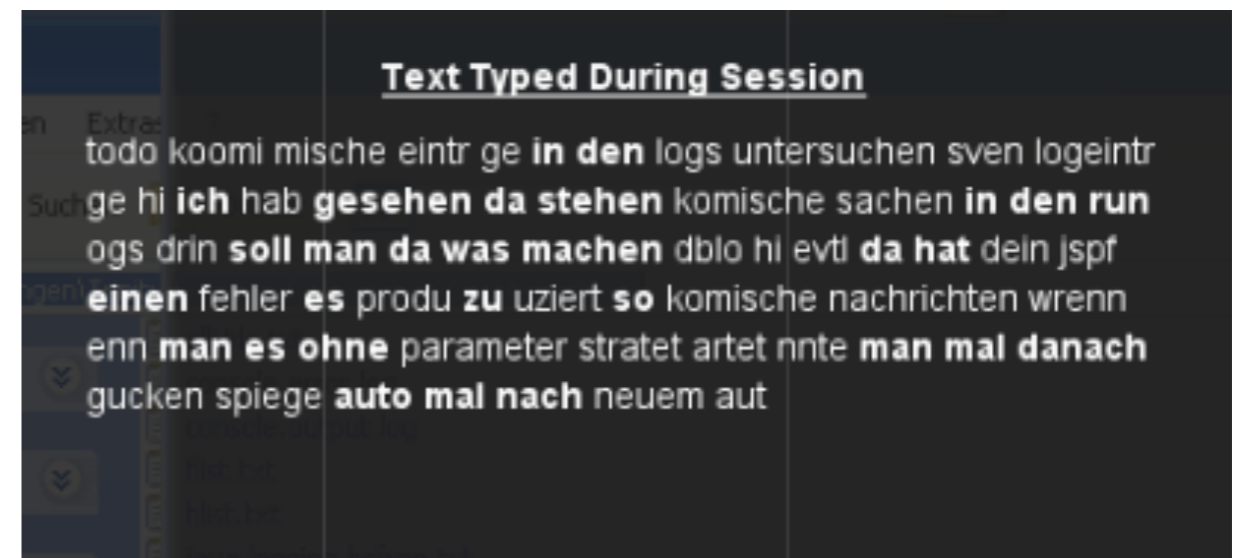
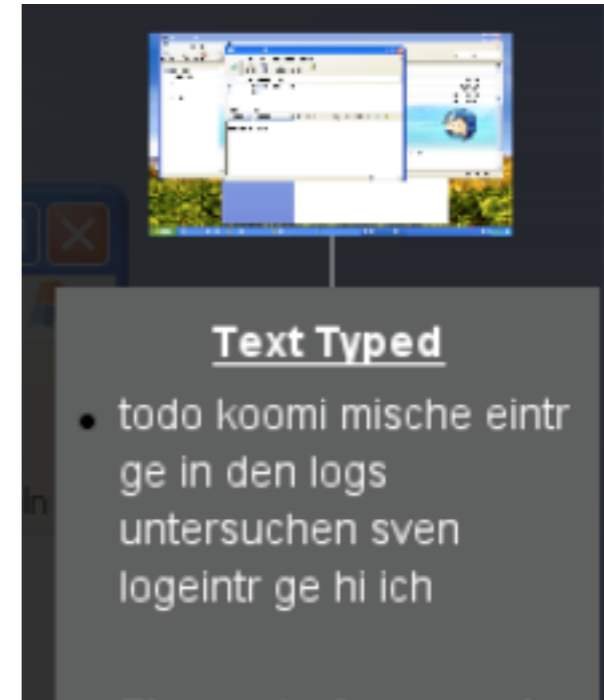
vs.

open_page ap.wetter.com/forecast/germany/?sessionID=**S5LCmKKL3yMVcIWP**

- currently we are ,entity level pedantic‘

Providing Excerpts

- every character is logged
- filter noise
- use top-1000 to filter non-important terms
- find terms with highest frequency
- extract area around

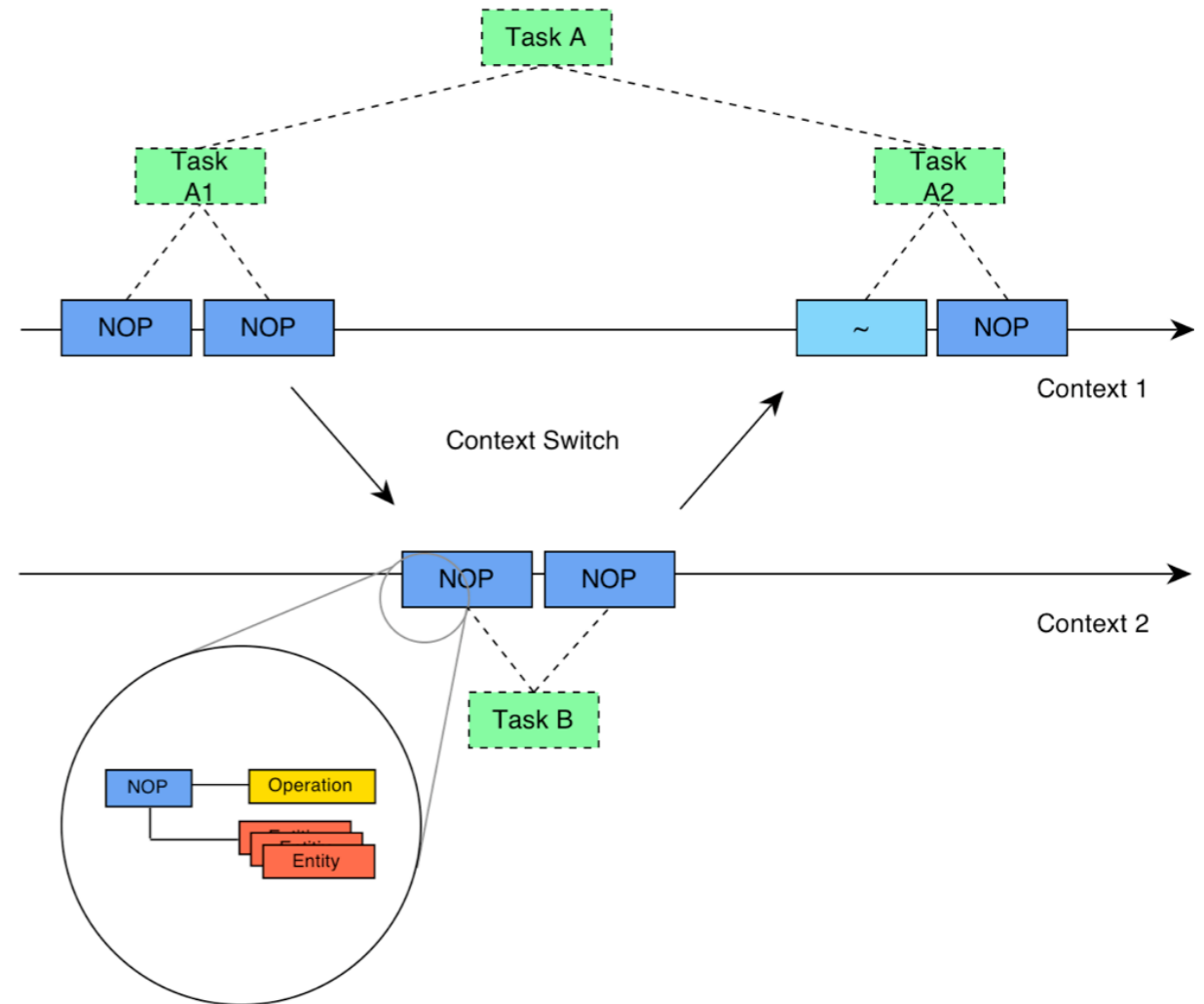


Evaluation Questions

- is there any benefit in employing (global) context to discriminate NOPs and entities?
- does everyone benefit?
- what widgets are useful, what elements should they contain?
- are the costs worth the benefits?
- does the take-me-back help you to remember what you did (last summer)?

Is There a Benefit of a g. Context?

- does it make sense to have a global context?
- wouldn't it be easier to have one giant „bucket“?
- careful: don't replace *entity access problem* with *context access problem!*



Does Everyone Benefit?

- is a hard context switch a „natural“ way of interaction?
- „entity centered context definition“ vs. „action centered context definition“?
- mixed „pierce through“?

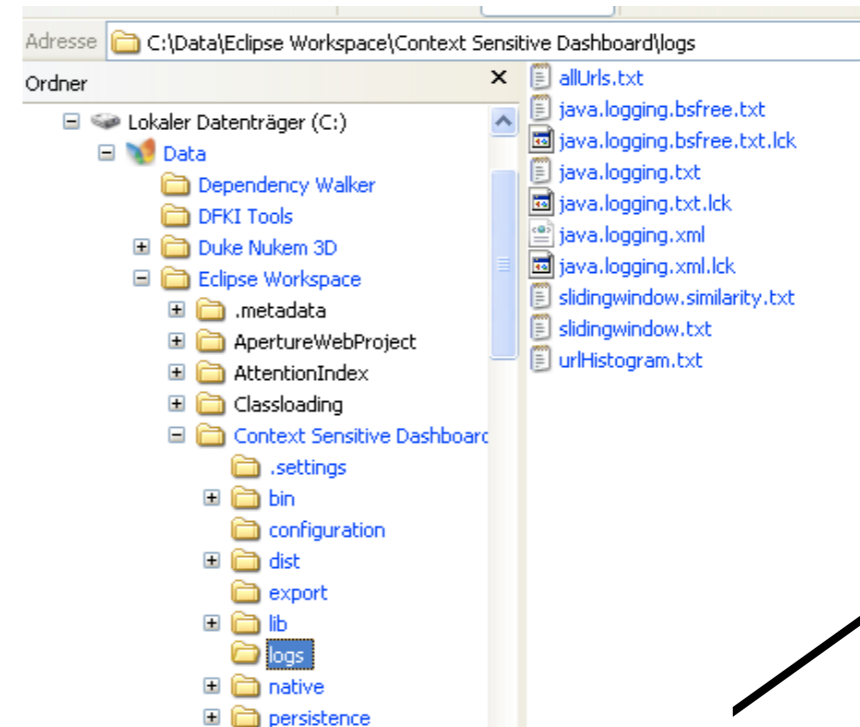
Call Andrew	Call Betty	Call Chris
Mail Andrew	Mail Betty	Mail Chris
Send Andrew	Send Betty	Send Chris

Elements to Select?

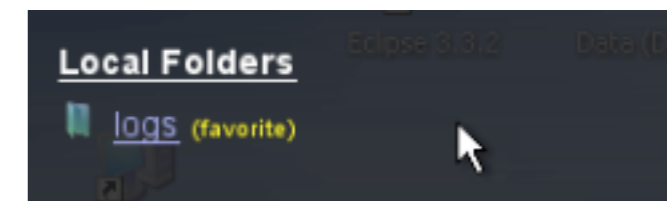
- obvious: listen to users' recommendations about new widgets
- to find out which widgets are used frequently and which are ignored most of the time
- monitor which category of provided elements were used most frequently (favorites, frequency, situation) but take into account the display issues (favorite supersedes frequency supersedes situation)

Do Benefits Outweigh Costs?

- very tough question
- easy part: costs inside dashboard
- difficult part: calculate ,alternative' costs
- frankly, no idea how to do this practically. In theory just watch every step



vs.



So, what will we do?

- offline evaluation of similar-situation algorithm with leave-one-out-cross-validation
- user studies with a number of students „please use it for an hour and tell us what you think“
- *Fragmented Task Coping Test*: one hour, every five minutes (times might change) task will be changed, thus 12 fragments. Pretest: no support. Test: dashboard. Posttest: no support. Compare task throughput.

Thank You!

Questions?