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# Working with Digital Records: Developing Tool Support

Experiences from the Nottingham e-Social Science Research Node:

Developing new forms of **Digital Record** for **e-Social Science (DReSS)**

[www.ncess.ac.uk/digitalrecord](http://www.ncess.ac.uk/digitalrecord)

# DReSS

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## ■ The research programme

- Developing new computational resources and tools supporting
  - The assembly of qualitative records of interaction
  - The structuring of qualitative records
  - The coupling of qualitative and quantitative records
- Focus here on providing resources for and assembling “qualitative records”
  - i.e., on the set of materials that the qualitative researcher gathers in the course of his or her inquiries, which become the focus of subsequent analysis
- The nature of our own qualitative research
  - “Ethnographic” studies of technology-in-use  
cf. Graham Button (1992) “The curious case of the vanishing technology”, *Technology in Working Order: Studies of Work, Interaction, and Technology* (ed. Button, G.), pp. 10-28, London: Routledge.
- Despite disciplinary dispute
  - Computing in everyday life and the potential of new resources and tools to support broad study of technology, whatever the analytic persuasion

# New resources and tools for studies of technology in everyday life

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## ■ Digital records

### – 2 basic components

- **External** resources: resources that a qualitative researcher gathers from a setting - e.g., field notes photographs, audio, video, etc., - things which are external to the interactional 'work' of a setting but which document it
- **Internal** resources - that set of computational technologies and digital media that people exploit within their interactions and use to conduct their interactions

### – Digital records go beyond “hypermedia” and current web-based resources and tools

cf. Dicks, B., Mason, B., Coffey, A. and Atkinson, P. (2005) *Qualitative Research and Hypermedia: Ethnography for the Digital Age*, London: Sage.

### – Digital records go beyond existing qualitative software packages, such as Anvil and Atlas

[www.atlasti.com/index.html](http://www.atlasti.com/index.html)

[www.dfki.de/%7Ekipp/anvil/index.html](http://www.dfki.de/%7Ekipp/anvil/index.html)

### – Digital records log or record internal resources and enable the qualitative researcher to **replay system recordings** much as one might a video

### – Furthermore, new tools enable internal resources to be combined and be replayed **side-by-side with external resources** to provide a more comprehensive view of interaction

# Revolution or evolution?

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- A natural extension of the qualitative record
  - Technology and qualitative research
    - Pen and paper
    - Photography
    - Audio
    - Video
    - Digital media (emails, webpages, blogs, etc.)
    - Etc.
  - Digital records extend the range of resources available to qualitative researchers
  - New tools enable qualitative researchers to combine novel resources with the existing bricolage of materials they routinely gather
  - The emphasis on resource and tools is **practical** and **methodological**, rather theoretical and conceptual
  - Digital records and tools for their use represent an evolution of qualitative research practice then

# Working with digital records: practical troubles

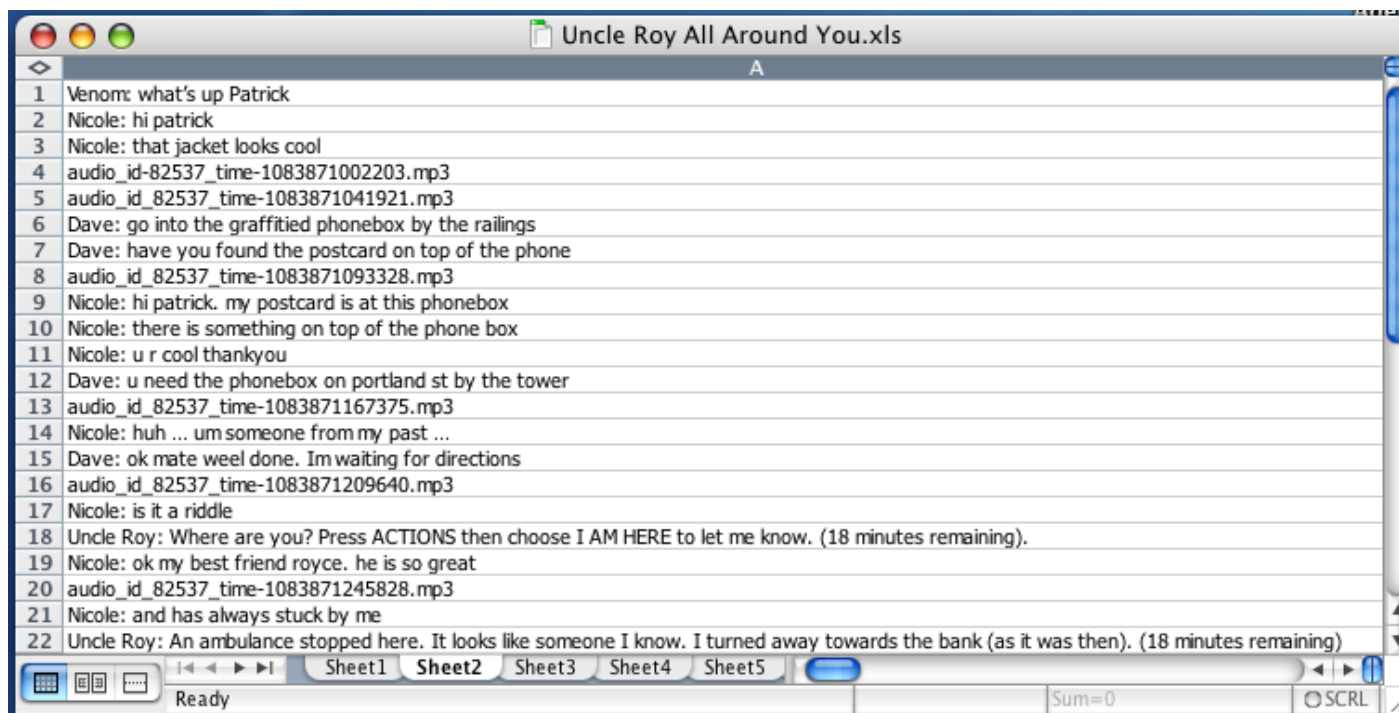
- System recordings are “messy”

	A	B	C	D	E	F	G	H	I	J	K
5478	PRIVATE_CHAT	1.08387E+12	82537	venom_89	what up patrick						
5479	PRIVATE_CHAT	1.08387E+12	18928	ant_49	can you speak now						
5480	MOVEMENT	1.08387E+12	82537	396	0	0					
5481	MOVEMENT	1.08387E+12	18928	462	405	0	0				
5482	ROY	1.08387E+12	18928	<c><n>local</n><t>2</t><m>Cantonese warning. (21 minutes remaining)</m><h>0</h></c>							
5483	MOVEMENT	1.08387E+12	18928	462	405	0	0				
5484	PRIVATE_CHAT	1.08387E+12	82537	Nicole_20	hi patrick						
5485	MOVEMENT	1.08387E+12	18928	452	401	0	0				
5486	ROY	1.08387E+12	18928	<c><n>local</n><t>2</t><m>Strangeness can be comforting when you are in the right mood.							
5487	MOVEMENT	1.08387E+12	18928	452	401	0	0				
5488	PRIVATE_CHAT	1.08387E+12	82537	Nicole_20	that jacket looks cool						
5489	AUDIO	1.08387E+12	82537	audio_id-82537	time-1083871002203.mp3						
5490	MOVEMENT	1.08387E+12	82537	509	438	0	0				
5491	MOVEMENT	1.08387E+12	18928	453	400	0	0				
5492	PRIVATE_CHAT	1.08387E+12	18928	dave_31	record a msg emma I m trying to help you...						
5493	AUDIO	1.08387E+12	82537	audio_id-82537	time-1083871041921.mp3						
5494	AUDIO	1.08387E+12	18928	audio_id-18928	time-1083871046968.mp3						
5495	PRIVATE_CHAT	1.08387E+12	82537	dave_31	go into the graffitied phonebox by the railings						
5496	ROY	1.08387E+12	18928	<c><n>local</n><t>2</t><m>Head for Princess Street. (20 minutes remaining)</m><h>0</h></c>							
5497	MOVEMENT	1.08387E+12	18928	430	429	0	0				
5498	PRIVATE_CHAT	1.08387E+12	82537	dave_31	have you found the postcard ontop of the phone						
5499	MOVEMENT	1.08387E+12	18928	414	444	0	0				
5500	PRIVATE_CHAT	1.08387E+12	18928	Nicole_20	hi emma. this phone box is where my postcard is						
5501	AUDIO	1.08387E+12	82537	audio_id-82537	time-1083871093328.mp3						
5502	PRIVATE_CHAT	1.08387E+12	82537	Nicole_20	hi patrick my postcard is at this phone box						
5503	ROY	1.08387E+12	18928	<c><n>local</n><t>2</t><m>I never use a disguise: no need. (19 minutes remaining)</m><h>0</h></c>							
5504	MOVEMENT	1.08387E+12	18928	398	466	0	0				
5505	ROY	1.08387E+12	18928	<c><n>local</n><t>3</t><m>Go immediately to 20 Dickinson St.</m><h>26</h></c>							
5506	PRIVATE_CHAT	1.08387E+12	82537	Nicole_20	there is something on top of the phone box						
5507	PRIVATE_CHAT	1.08387E+12	82537	Nicole_20	ur cool thank u						
5508	AUDIO	1.08387E+12	18928	audio_id-18928	time-1083871136531.mp3						
5509	MOVEMENT	1.08387E+12	18928	398	466	0	0				
5510	ROY	1.08387E+12	18928	<c><n>local</n><t>2</t><m>Head for the tram lines. (19 minutes remaining)</m><h>0</h></c>							
5511	MOVEMENT	1.08387E+12	18928	398	466	0	0				
5512	PRIVATE_CHAT	1.08387E+12	82537	dave_31	u need the phonebox on portland st by the tower						
5513	AUDIO	1.08387E+12	82537	audio_id-82537	time-1083871167375.mp3						
5514	MOVEMENT	1.08387E+12	18928	398	466	0	0				
5515	MOVEMENT	1.08387E+12	18928	382	460	0	0				
5516	MOVEMENT	1.08387E+12	18928	351	438	0	0				
5517	AUDIO	1.08387E+12	18928	audio_id-18928	time-1083871175125.mp3						
5518	MOVEMENT	1.08387E+12	18928	363	426	0	0				
5519	ROY	1.08387E+12	18928	<c><n>local</n><t>2</t><m>Gaze up at the top of the concrete tower then tum on your heel.							
5520	MOVEMENT	1.08387E+12	18928	363	426	0	0				
5521	PRIVATE_CHAT	1.08387E+12	82537	TC_40	what is your status						

Log from a mixed reality game: 1000s of entries recorded over days

# Working with digital records: practical troubles

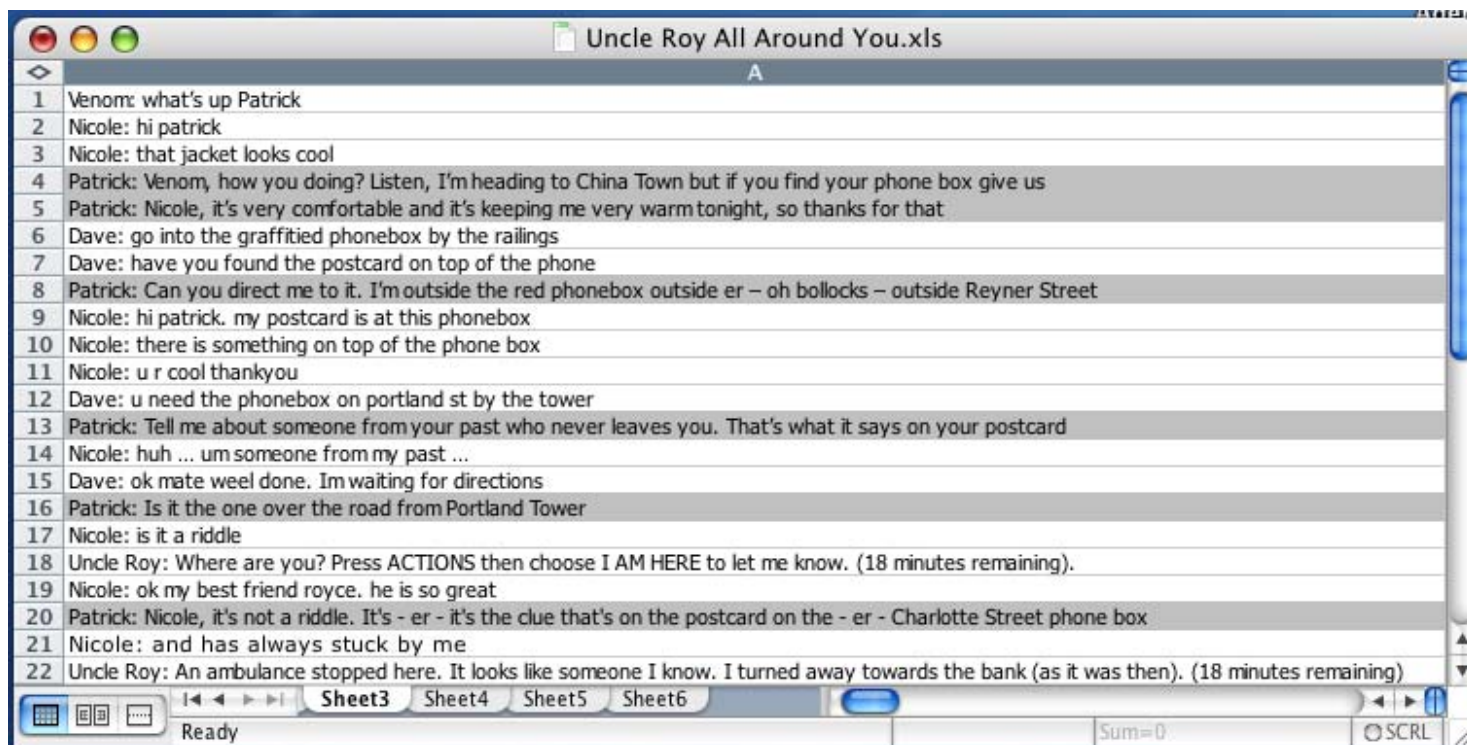
- System recordings need to be “cleaned up” to identify salient features to analysis



Internal interactional threads accompanying video recording

# Working with digital records: practical troubles

- Internal content needs to be synchronized



Synchronizing content of audio files, etc.

# Working with digital records: practical troubles

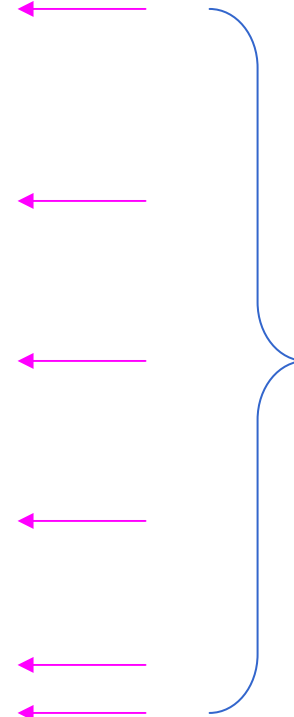
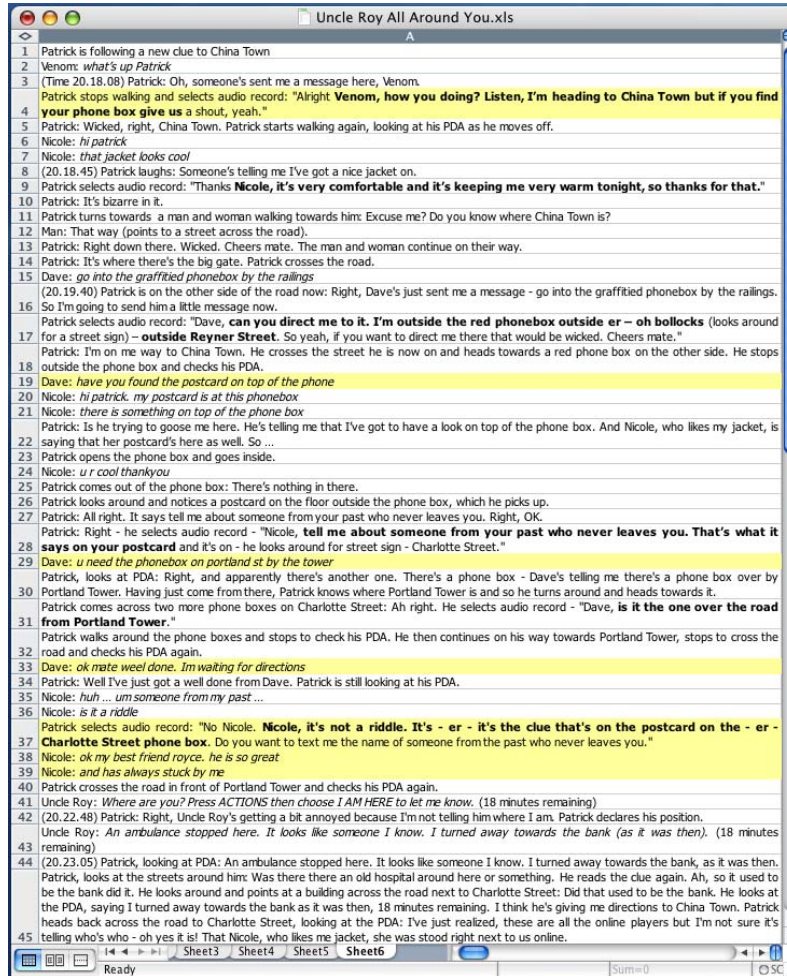
- External content needs to be added

The screenshot shows a spreadsheet application window titled "Uncle Roy All Around You.xls". The spreadsheet contains a transcript of a story, with lines numbered 1 to 45. The text includes dialogue and actions from characters like Patrick, Nicole, and Dave. An audio player window is overlaid on the spreadsheet, showing a video of a man looking at a postcard. The audio player window is titled "Patrick (Finding a Postcard).mpg" and shows a progress bar at 00:01:09. The spreadsheet text includes:

1 Patrick is following a new clue to China Town  
2 Venom: *what's up Patrick*  
3 Nicole: *hi patrick*  
4 Nicole: *that jacket looks cool*  
5 (Time 20.18.08) Patrick: Oh, someone's sent me a message here, Venom.  
6 Patrick stops walking and selects audio record: "Alright **Venom, how you doing? Listen, I'm heading to China Town but if you find your phone box give us a shout, yeah.**"  
7 Patrick: Wicked, right, China Town. Patrick starts walking again, looking at his PDA as he moves off.  
8 (20.18.45) Patrick laughs: Someone's telling me I've got a nice jacket on.  
9 Patrick selects audio record: "Thanks **Nicole, it's very comfortable and it's keeping me very warm tonight, so thanks for that.**"  
10 Patrick: It's bizarre in it.  
11 Patrick turns towards a man and woman walking towards him: Excuse me? Do you know where China Town is?  
12 Man: That way (points to a street across the road).  
13 Patrick: Right down there. Wicked. Cheers mate. The man and woman continue on their way.  
14 Patrick: It's where there's the big gate. Patrick crosses the road.  
15 Dave: *go into the graffiti'd phonebox by the railings*  
(20.19.40) Patrick is on the other side of the road now: Right, Dave's just sent me a message - go into the graffiti'd phonebox by the railings.  
16 So I'm going to send him a little message now.  
17 Dave: *have you found the postcard on top of the phone*  
Patrick selects audio record: "Dave, **can you direct me to it. I'm outside the red phonebox outside er - oh bollocks** (looks around for a street sign) - **outside Reyner Street.** So yeah, if you want to direct me there that would be wicked. Cheers mate."  
18 Patrick: I'm on my way to China Town. He crosses the street he is now on and heads towards a red phone box on the other side. He stops outside the phone box and checks his PDA.  
20 Nicole: *hi patrick: my postcard is at this phonebox*  
21 Nicole: *there is something on top of the phone box*  
Patrick: Is he trying to goose me here. He's telling me that I've got to have a look on top of the phone box. And Nicole, who likes my jacket, is saying that her postcard's here as well. So ...  
22 Patrick opens the phone box and goes inside.  
24 Nicole: *u r cool thank you*  
25 Dave: *u need the phonebox on portland st by the tower*  
26 Patrick comes out of the phone box: There's nothing in there.  
27 Patrick looks around and notices a postcard on the floor outside the phone box, which he picks up.  
28 Patrick: All right. It says tell me about someone from your past who says love you. Right. OK  
Patrick: Right - he selects audio record - "Nicole, **tell me about s on your postcard** and it's on - he looks around for street sign - C Patrick, looks at PDA: Right, and apparently there's another one. Tower. Having just come from there, Patrick knows where Portland  
31 Nicole: *huh ... um someone from my past ...*  
32 Dave: *ok mate weed done. Im walking for directions*  
Patrick comes across two more phone boxes on Charlotte Street  
33 **from Portland Tower."**  
Patrick walks around the phone boxes and stops to check his PD road and checks his PDA again.  
35 Patrick: Well I've just got a well done from Dave. Patrick is still look  
36 Nicole: *is it a riddle*  
37 Uncle Roy: *Where are you? Press ACTIONS then choose I AM HER*  
38 Nicole: *ok my best friend royce. he is so great*  
39 Patrick crosses the road in front of Portland Tower and checks his PDA  
Patrick selects audio record: "No Nicole. **Nicole, it's not a riddle Charlotte Street phone box.** Do you want to text me the name  
41 (20.22.48) Patrick: Right, Uncle Roy's getting a bit annoyed becau  
42 Nicole: *and has always stuck by me*  
43 Uncle Roy: *An ambulance stopped here. It looks like someone I kn*  
44 (20.23.05) Patrick, looking at PDA: An ambulance stopped here. It Patrick, looks at the streets around him: Was there there an old h be the bank did it. He looks around and points at a building across the PDA, saying I turned away towards the bank as it was then, heads back across the road to Charlotte Street, looking at the PDA: I've just realized, these are all the online players but I'm not sure it's telling who's who - oh yes it is! That Nicole, who likes me jacket, she was stood right next to us online.

Contents of video accompanying interlational thread

# Working with digital records: practical troubles



Points of movement

The re-ordered record

# Resolving practical troubles

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- In our case, enables us to understand the “fragmented” character of interaction in emerging ubiquitous computing environments
  - Reconcile differentially distributed interaction
  - E.g., interaction across online environments mediated by text and physical environments mediated by audio
  - Identify the ‘work-practices’ organizing interaction that users themselves exploit to reconcile differentially distributed interaction
  - For example,
    - exploiting local knowledge to make sense of clues and instructions,
    - eliciting clarifications to establish mutually intelligible orientations to the street,
    - identifying candidate objects and locations to coordinate searches, etc.
  - Thus, digital records make visible how users situate and embed future and emerging technologies in action

# Developing tools to support reconciliation

## ■ ReplayTool

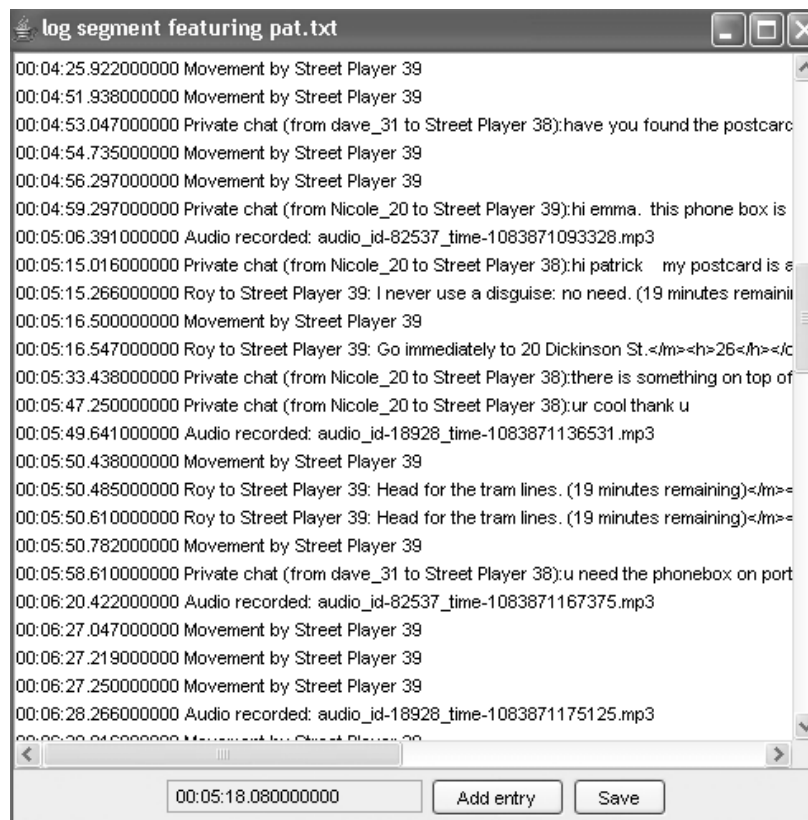
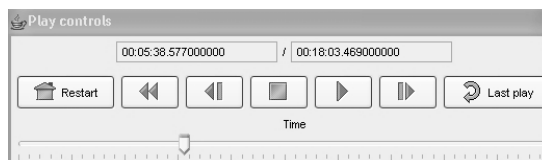
The DataGoggles application interface is shown in four different views:

- Main View:** Displays a welcome message and a list of files associated with the 'roy\_logs' project. The files are categorized into Material, Audio, Video, Text, Photos, and Field Notes. Under Video, there are files like 'DoF.mov' and 'roy\_video.mpg'.
- Data Spread View:** Shows a horizontal bar chart titled 'Data Spread' with 'Event Type' on the y-axis (Private chat, Roy chat, Roy, Audio, Movement) and 'Start time' on the x-axis (15:00 to 20:00). Below the chart are input fields for 'Start time' (14:52:38.984 6/5/2004) and 'End time' (20:25:56.578 6/5/2004), along with 'Query' and 'Save last query' buttons.
- People List View:** Displays a list of people with columns for 'NickName' and 'Role'. The list includes names like 'dananded\_81', 'krista\_32', 'bob\_91', 'peter\_33', 'Street Player 38', 'Street Player 39', 'venom\_89', 'Nicole\_20', and 'dave\_31'.
- Map View:** Shows a street map of a city area with various streets labeled, including 'PRINCESS STREET', 'PORTLAND STREET', 'MACKVILLE STREET', and 'CROFTON STREET'. There are several red dots on the map, likely representing user locations or events.

Selecting salient resources

# Developing tools to support reconciliation

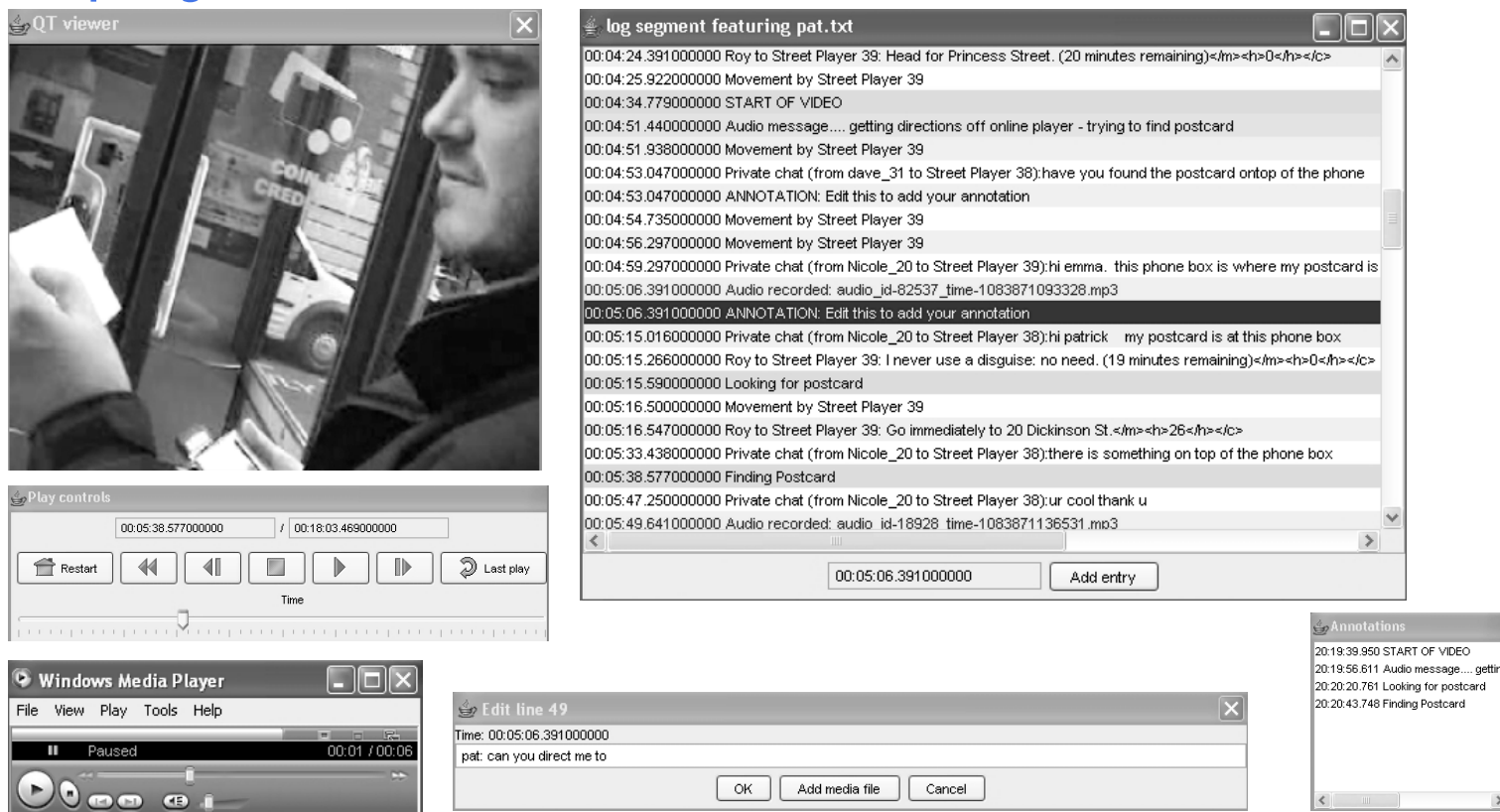
## ■ ReplayTool



Synchronization

# Developing tools to support reconciliation

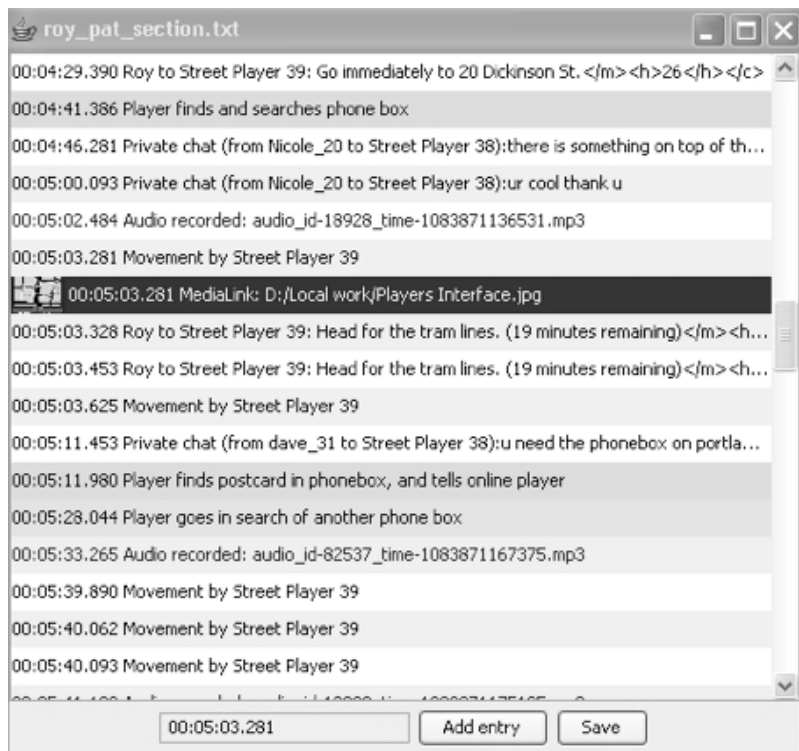
## ■ ReplayTool



Adding internal and external content

# Developing tools to support reconciliation

## ■ ReplayTool



Creating alternate representations of interaction

# Current and future development

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## ■ ReplayTool

- Supporting “structured” forms of analysis
  - Coding mechanisms
  - Production of statistical representations
  - Flexible transitions between qualitative and quantitative data sets
- New forms of data capture
  - Data from sensors (location, motion, light, heat etc.)
  - Primary challenge: developing sensible representations
  - Marrying representations to other resources
- Version 1 of ReplayTool available for public release:  
<https://sourceforge.net/projects/replaytool>
  - Version 2, to include support for coding, within a year