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The Journalist in the Machine: The SeQueL to the fourth estate

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Abstract
Following the work of Lev Manovich [MANOVICH, 2002] on the relationship between database and narrative in New Media this paper explores some of the implications of the rise of the database in the New Media era. In particular, the data systems, and their web interfaces, which are becoming part of the fabric of everyday life, may fail, in terms of communication, if no account is taken of narrative. The paper considers some examples and suggests that where there is a central-local dimension to operations then the database should be the concern of the centre whereas the narrative belongs locally.

1 Introduction

Sometimes it seems that half of us spend our lives turning data into stories and the other half providing stories for databases. I might use a computer to analyse some data and produce an academic paper. I might have my car stolen and add data to police records. In all probability these police records will be analysed, converted to a couple of narratives, sloganised by politicians and then, maybe, I'll get a chance to vote on them.

Stories have always been important. The database driven media we have now, through the Internet, market research and the general ubiquity of computers increases the demand for matching narrative. The growth of call centres is evidence of this. I might buy my car insurance directly from the database (through a web site) - but I might prefer to talk to someone who will deal with the database on my behalf.

This paper argues that the ascendancy of the database is shifting the locus of the narrative.

With the railways came national time, national newspapers and - some might argue - national politics. Information and communications technologies bring not only their own technical standards but also new registers of communication and promises of efficiency gains.

We can interact with databases directly without conventional narrative intervening. If I book a flight online the 'storyline' is one supplied by an interface designer in anticipation - not by me in expectation as would be the case if I visited a travel agent. The efficiency gain derives from the reduction of language to a number of choices.

Choices which have a meaning for me - and for the airline. The transaction cost is reduced through the removal of a burdensome communications protocol - talk.

Examples are legion - ‘press 1 for a new sales enquiry, 2 for customer service…’, ‘A burger and fries please. Is that a *meal*?’ - essentially we are having to learn machine ‘narratives’ - or subscribe to interfaces, and communications registers that, for the most part, don’t match the requirement. These machine narratives are of course created by interface designers who, to be fair, are stretching technology.

The issue becomes important when we devise large systems with standard interfaces that suit no one. The efficiency promises of the technology can be thwarted by poor user take up, reticence and even defiance. The main reason is that they ignore the local narrative. If we can put this back in then the potential of New Media to deliver efficiency gains and better communication will be increased.

2 Databases and Devices; People and Stories

Devices communicate by exchanging data. People communicate by exchanging stories. If people communicate through devices - telephone, email, electronic form - then, at some level, a story is converted to data and back again. In the case of a digital telephone conversation the data aspect of the communication is largely unobtrusive. In email communication some subtlety of language is often lost and we see (or saw) the growth of emoticons. If I fill in an electronic form, however, this is usually bound to a database, often with a fixed perspective on the world, and a limited 'language'.

Much of the time this is of little consequence - such an aeroplane is leaving, do I want to be on it or not? - but as web systems develop to provide for richer communication needs, particularly those involving some level of collaborative working, then system designs need to take user narratives very seriously if they are to succeed.

Because it might be possible to complete a tax return online does not, of itself, mean I will not want the help of an accountant in the task of expressing my 'story' in the language of the database.

Because someone in an organisation has developed a web system to handle some function such as work rosters, car parking, room booking, scheduling of any kind, expenditure authorisations etcetera does not mean that it will be used, and if it is used that does not mean it will improve efficiency or release time for more productive communication.

New Media, and electronic data systems in general, have given expression to the database as a foil for the narrative. The ease with which databases can be created and the authority that the information within them can command gives a power to the database and interface designers - the Structured Query Language (SQL - SeQuel) programmers - who marshal the information flows in and out of the database. A power similar in kind to the questionnaire designer who incorporates leading questions.

In the UK General Election of May 2005 an issue has arisen over targets in the National Health Service. Politically, the proportion of people seeing a doctor within 48 hours of requesting an appointment needs to be high. The doctors have targets to meet. One response is not to allow patients to book more than 48 hours ahead. While deprecated - and I think now resolved - this is an illustration of how database thinking can thwart narrative in the hi-tech age.

Databases demand stories and stories demand databases at a range of levels. News reports increasingly draw on database aggregates and more and more databases are being constructed to capture stories. This developing relationship lies at the root of the systems we design and deploy to order our lives in everything from political representation to car parking. In the New Media age the mediation of information flows in both directions lies in the unseen hands of those who create and maintain the data systems that link database and narrative.

This paper notes developments in 'agile computing' and seeks to draw together developments in a number of diverse areas where the nature of the database/narrative linkage is becoming significant and tries to show that a balance between narrative and database perspectives is required to sustain communication and deliver the promise of New Media as it extends into the fabric of our daily lives.

3 Parallels from History

Communication is a two-way process. An understanding of narrative will help us build more effective systems for the gathering of data from people (e-commerce, e-learning) and also for aggregating that data into usable forms. For example, the e-learning site that is built around the uses that students want to make of it (rather than the logic of the underlying data system) is one that captures the student narrative and exploits it to encourage participation. Similarly, if the e-learning site's subsystem for tutors is founded on an understanding of the story from their perspective then engagement is encouraged. The information exchange between the parties might consist of shared access to the same database - the mark for an essay - but the encapsulation of that, for both student and tutor, needs to be done within the framework of different narratives. Neither student nor tutor want to spend time learning an interface. They expect it to be intuitive and that means involving a narrative in the design. To exploit the potential of web data systems in areas ranging from e-commerce to e-democracy it will be necessary to incorporate 'narrative layers'.

In all this there is much we can learn from the established communications industries.

> "In America they say 'sell the sizzle, not the steak.' In Britain they say 'sell the sizzle, not the sausage.' Either way, it means sell the benefits not the features." [FOSTER, 2003]

> "You are all familiar with the small package overnight air delivery services and at least some of their advertising. Think about your own Purchase Logic for these services. Which of the following two messages speaks to you? Which company would you choose?

> 'When it absolutely, positively, has to be there.'
> 'If it doesn't get there on time, you get your money back.'"
> [URBAN, 1985]

This well established distinction between benefits and features parallels that between the narrative and the database. It is a distinction which has not escaped some software developers:

> "Many people write big, functional outlines of all the features they thought up. Then they design each one, and hang it off of a menu item (or web page). When they're done, the program (or web site) has all the functionality they wanted, but it doesn't flow right. People sit down and they don't know what it does, and they don't know how to accomplish what they want. Microsoft's solution to this is something called Activity Based Planning. … The key insight is to figure out the activity that the user is doing, and focus on making it easy to accomplish that activity."
> [SPOLSKY, 2003]

In each of the above cases the same idea is at work - axiomatic in the advertising business, formally stated in marketing terms and relatively new to software design. It is only as software development has advanced that the 'subtleties' of interface design have been addressed. Quite naturally in the history of computer systems the focus shifted from hardware to software before arriving at design. With a new born child we will first be concerned to establish that basic functions are working (vocal chords, hearing) before worrying about 'software' (language), behaviour ('design') and, ultimately, what they have to say.

Whereas evaluating a software application as a tool that is more or less easy to use, well or badly designed, may be adequate for many purposes in the case of a web site the design is part of the communicated content - the message - the story.

Ergonomics[1] has a longer history than software development and web site design - and quite naturally so as it concentrates on the physical - the hardware. The Study of Human Computer Interaction (HCI), has more recent origins[2].

The computer has evolved from a device for calculation into a device for communication. The hardware issues have been largely solved and issues surrounding user interfaces are receiving much attention. The next concern relates to the content that is communicated - the message. Web sites are increasingly database driven - providing different content to different people. At one level this could be in response

[1] According to Letters and Science Computer Resources (http://ls.berkeley.edu/lscr/support/faq/ergo/ergodef.html 12/11/2003) "Ergonomics originated during the Second World War to overcome performance failures due to human error in new high tech defence systems.". The term was first coined by Polish Professor Wojciech Jastrzebowski in 1857 and some might point to its origins in the work of Bernardino Ramazzini (1633-1714).

2 Probably the earliest trace of the origins of HCI lies in the work of Vannevar Bush "As We May Think" Atlantic Monthly, July 1945 but perhaps the launch of the *International Journal of Man-Machine Studies* (IJMMS) in 1968 might be seen as the real start of the area as we know it today.

to a search term entered by a user, at another level it could differ according to the user's country. Beyond that, where users have supplied information to these systems, content may reflect that. There is more to come: systems might track user movements through sites and deliver future content with emphases to match. Advancing web technology moves us away from the position enjoyed by communications researchers in Old Media where the content of the newspaper, TV/radio programme or film is known and the same for everyone exposed to it. Even before we consider the possibilities of the highly adaptive media forms that the web offers us there are variations in client circumstances - bandwidth, screen resolution, operating system, plug-ins - that bring about wide variations in the user experience of the same stimulus.

Add to this the possibilities for two-way communication afforded by the web - from server access logs through purchasing histories to web campaigns - and we can see that new approaches to communications research are required. Approaches which take account of the two-way flow across multiple channels and which also account for the machine processing of data into stories and vice versa.

And that communication is mediated by software and interfaces that link the datastreams to our consciousness, values and judgements. The interesting thing about this mediation, as compared to that done by newspaper editors, journalists and so on, is that it is done 'mechanically' - by algorithms, feeding on data and presenting stories in ways directed by systems architects and designers so that the design becomes part of the story. The mediation is part of the message.

Web data systems - such as you might use to buy a book - can provide a reply to the message, possibly in the form of an order for the book, a 'blog', a web site or a campaign. There are algorithms that convert the datastreams to stories and algorithms that convert stories to datastreams.

We are at the point now where the accumulated wisdom in the fields of advertising, marketing, public relations and journalism, needs to be applied to data systems as they capture the stories, turn them into datastreams and interpret the aggregate.

4 Parallel Activities

Academics, doctors, lawyers, call-centre workers, sales staff, journalists and others operate at the interface between the database - evidence, measurements, statements, records, specifications, photographs - and the narrative - the conclusion, the diagnosis, the advice, the judgement, the implication. Traditionally, the interpretation of data has been the preserve of human beings and the movement has been from data to story.

There are signs that in this new age interpretation may be given to machines and that stories will feed databases. The implications of this may be worth some examination.

At present it is hard to imagine anyone submitting to a machine for a haircut. We observe dogs catching balls - but we do not suppose that they have a grasp of Newton's laws of motion. The theory and the practice both come from experience and involve different narratives.

A story represents a high degree of data compression - achieved largely through the symbolic representation of concepts and values which are stimulated in the receiver. They do not have to be transmitted - simply triggered. Roger Schank's work in this area is instructive:

> "Knowing a great deal about a subject means being able to detect differences that will reflect themselves in differences in indexing. In other words, intelligence depends on clever indexing. Our expert is intelligent about military history. He sees nuances where others would not. He analyzes new stories well enough to be able to relate them to old stories that might not obviously be the same."
> [SCHANK & MORSEN, 1995]

Now consider the experience of an Amazon customer who has bought books for Christmas presents… "You might be interested in…", "Other people who have bought this book also bought…". The mechanical narrative has inadequacies.

None of this is intended to deny the value and utility of rapid database searching in modern life. The rapid growth of the Internet is a testimony to the way easy access to data helps people come to decisions, write academic papers, buy books and find love.

Some of the early promises of computer technology, however, have not been realised because, it turns out, computers are hopeless at narrative. There are cases where the application of overwhelming data-processing power can compensate for this. A computer playing scrabble is likely to beat a human being even though the human may have a larger vocabulary.

The capability of computers to process large datasets has given more people access to tools and methods for the generation of narrative. An obvious example is the analysis of data from scientific experiments - the performance of statistical significance tests, the search for patterns in datasets, the visualization of data structures - where theories (stories) can be tested against evidence and validated (or not) by established rules to yield conclusions - the drug works, there is likely to be oil under this part of the desert.

These approaches are well established. Further, from the flotsam and jetsam left over we try to construct narratives to explain the human condition. The data alone does not do this.

When we seek to devise electronic systems to provide a narrative directly from data the results are often disappointing. Expert systems built on rules painfully extracted from professionals with experience offered the promise of cheap, quick, unbiased, systematic analysis, conclusions and recommendations in a range of areas. Once captured, the knowledge base of leading experts could be deployed everywhere and at all times for the greater good. Further, such systems could be fed by information sources unavailable to the human expert and thus have their power multiplied still further. The computerised doctor of the future, we were told, would be informed by up-to-the-minute data on relevant epidemiological trends. This does not seem to have come about:

> "Recent years have seen an enormous development in Medical Expert Systems, and the systems now available are mature enough for targeted adoption in practice. In order to deliver health-care even more effectively, Expert Systems will be increasingly integrated in Hospital Information Systems (HIS). But thus far the systems have failed to gain widespread acceptance by physicians."
> [FEDERHOFER, 2003]

On the stock markets we have seen computer systems programmed to sell in specific circumstances causing "domino effects". Writing on the Great Depression, Robert J. Samuelson observed:

> "… there are times when the world changes so much and events move so rapidly that even the well-informed do not know how to respond. This is the story of the depression. "
> [SAMUELSON, 1993]

We, remain, however, attracted to idea of the mechanical creation of narrative from data. We clamour for league tables of hospitals and schools - as well as football teams. Sport provides us with large quantities of narrative and the data visualizations offered by the TV companies represent attempts to squeeze out more. Devotees will sometimes listen to the radio commentary while watching an event on TV. This maximises the narrative - with no commentary and a single camera we have little more than data.

Now that things can be counted easily, and formulae applied by machines to generate scores and funding decisions the criteria used (the narratives) become crucial - and they beget more narratives designed to produce compliant data: The hospital patients left in the ambulance because the clock does not start ticking until they enter the hospital; the purchase of well published academics in time for the Research Assessment Exercise and so on.

In human resource terms attentiveness to the narrative can pay real dividends. Think of the factory with conveyor belts and machinery; think of the piece of cardboard taped to the edge of the line at a strategic point - maybe held in place by some bicycle clips. You know it was put there by someone who understands how the thing operates. In some companies that would soon be replaced by a precision engineered and properly attached plate. In others it might be replaced every month or worse - removed as non-standard equipment.

Performance monitoring systems in work situations can be counterproductive when the importance of narrative in human communication is ignored and replaced by formulae and databases unconnected to reality. Take, for example, the system that rewards speedy responses to queries as opposed to complete responses.

Even journalists, it seems, have been infected by the rigours of the database:

> "The new precision journalism is scientific journalism. … It means treating journalism as if it were a science, adopting scientific method, scientific objectivity, and scientific ideals to the entire process of mass communication. If that sounds absurdly pretentious, remember that science itself is restrained

> about its achievements and its possibilities and has its own sanctions against pretension."
> [MEYER, 1991]

Computer Assisted Reporting, however, has a major role to play in converting the mass of data available on the web into narratives that can be understood by human beings. See Houston, Quinn and Lamble.

To an extent it is the appetite for narrative we have as consumers of news that drives the database culture. An education minister facing a voter in the 1979 general election with the line: "I've seen the figures" received the retort: "I've seen the children." We want to see graphs of crime figures going down and modern politicians use data to construct narratives for us.

From my own experience:
One evening I came home from work and saw my wife's car parked outside the house. The pair of us had dinner, she departed for a meeting and I sat down to do some writing. The 'phone rang:
"It’s the police here. Are you the owner of vehicle registration number [my wife's car]?"
"Yes"
"Well, we've all done it sir - filled up with petrol without paying - if you pop back to the garage and pay for the petrol we'll say no more about it."
"I'm sorry, but I'm sure the car was nowhere near there."
"So you deny taking the petrol without paying?"
"Yes."
"In that case, sir, I'll have to register the crime. I'll call you back later with a crime number."
"OK."

I telephone my wife, advise her of the position and she confirms the vehicle's location miles from the scene of the crime. The number plates have been stolen.

The 'phone rings:
"Police here. The crime number is …"
"Actually officer it seems the number plates were stolen."
"Are you reporting a crime?"
"Yes."
"Very good, sir, I'll ring you back with a crime number for that. Where is the car now?"
"At the meeting - with my wife."
"You mean she drove the vehicle without number plates?"
"I suppose she must have done."
"Ahh! Crime number 3! I'll get back to you later with all these crime numbers…"

The pressure for measurement can be enormous.

The Child Support Agency (CSA) in the UK, founded in 1993, is run by central government and aims to:

> "… assess, collect and pay child support maintenance, ensuring that parents who live apart meet their financial responsibilities to their children."
> [CHILD SUPPORT AGENCY, 2005]

According to Computer Weekly:

> "An administrative officer was cited in the report as entering information which the person knew to be false. They were 'extremely concerned that by doing so they were breaking the law but [*were*] determined to get cases moving and knew of no other workaround that could help.'"
> [COLLINS, 2005]

What this illustrates is that the centre is no place for narrative - and the local situation does not welcome the database.

Mature industries recognise this point - and it speeds things up enormously. New industries are often slow to learn the distinction.

Consider money. In the simple case I want to buy something and the vendor wants to sell it. I don't care where the thing came from. The vendor does not care where my money came from. Sold. Simple.

The database of items sold - profits etc - lies with the vendor and the narrative of what I want the thing for lies with me.

On the whole I do not want to know exactly how the thing was made, where it came from, how it got here, who made it, when and at what cost. But I know I want it. I might want it because its 'fair traded' - or for any of a million other reasons. My reasons. I may share these with market researchers, the police - or even psychiatrists - but they are my reasons. Similarly, the vendor may have a wealth of information about the product but not so much on where my money came from - and whilst they might try to find out, this narrative is essentially private.

And economies grow.

Consider electrical power. I want the wall socket to deliver electricity to power devices. Mostly, what happens before the wall socket is the business of the power company and what happens after is my business. And they are very different businesses.

There was a time when you had to rent your telephone from the dial tone provider. Choice was limited, prices were high and the phone company did not know whether it was supplying dialtone or devices. Some defensiveness about what can and cannot be connected to the network is reasonable where the technology is immature but in the end the database - the raw service, the power, the dialtone, the money - will become separate from the narrative - the analysis, the electrical devices, the phone calls, the story.

New Media - the web in particular - quickly developed this separation of powers. I have a web page - the network has protocols. The database is essential to the narrative - the point, though, is the narrative. Not the database.

Railway companies began with obsessions about the network and TRAINS. Now they are more concerned with passenger transport.

At root, service providers work best with clear objectives - supply electricity - as paralytic organisations. This is the nature of the database. Service consumers are by nature ‘politicking’ - considering different devices, life chances, opportunities, threats, directions, plans, schemes, successes and failures. The stuff of narrative.

When the database tries to control the narrative results can be disastrous - and the narrative could not begin to organise a database. The narrative needs the database - and feeds it.

Data systems in organisations that track sales, transactions, deliveries, student marks, bookings, stocks, salaries, employees, customers etc. are an essential part of modern life - but they are not life itself. Life is a narrative and the data systems need to harness the narrative if they are going to work.

5 Practical Steps

5.1 Agile Computing

As the languages used to create web data systems develop, and knowledge of them becomes more widespread, the process of application development can be much more rapid. This allows development to take place closer to users making it easier to incorporate their 'narratives' - requirements, circumstances, preferences, detailed operations - into systems.

> "Manifesto for Agile Software Development
>
> We are uncovering better ways of developing software
> by doing it and helping others do it. Through this work
> we have come to value:
>
> Individuals and interactions over processes and tools
> Working software over comprehensive documentation
> Customer collaboration over contract negotiation
> Responding to change over following a plan
>
> That is, while there is value in the items on
> the right, we value the items on the left more."
> [BECK et al 2001]

In the case of an e-commerce site, for example, the users - buyers - essentially pay for the system as they use it. There is an incentive to keep it responsive to user needs. However, in organisations where commissioning and funding decisions are removed from users the danger is that local narratives will tend to be marginalised as special

cases - or areas requiring detailed user training. In these circumstances it might be worth considering the extent to which the eventual system will achieve its potential.

5.2 Trust, Shared Goals, Impact

Work on web systems as tools for collaborative working in various contexts has shown that success - as measured by participation - increases where levels of trust in the system are high, where users have shared goals and where the system has something to offer the user. See [STACK, 1999] and [SOBOL & ROUX, 2004] for accounts of particular implementations. This is entirely consistent with the idea of incorporating narratives in systems.

5.3 Analysis of User Surf Paths

Given the general communication model of PERSON - DATA…DATA - PERSON adopted in this paper and the broad conversion processes involved between narrative and database there may be scope for using data on usage patterns observed on web systems to capture user narratives and incorporate them in system revisions. The DMASC system represents such an approach - see [SOBOL & STONES, 2002] and [SOBOL & STONES, 2005], also the web site at http://www.dmasc.com. Here the idea is to map user movements through web sites in visualizations which are aimed at revealing user narratives to system designers. There is some evidence to suggest that conventional, statistical usage monitoring can sometimes fail to capture the essence of the user experience. The suggestion is that that improved consumption monitoring and incorporation in the design and redesign process can lead to better systems. See also [SOBOL, STONES and WHITWORTH, 2005].

5.4 Personalization?

Forthcoming work looking at the impact of personalization in web systems - where users are constantly addressed by name and given screens pertinent to their circumstances - will argue that web systems need to respect established communication conventions. Therefore as these change so should the systems - the web may change some conventions. In the same way that many of us now accept the principle of closed circuit television (in return for the security benefits) the convenience afforded by web-site personalization may become accepted, tolerated and even desired. And then assumed. Personalised mailings may once have won elections but are now barely noticed. It may be that interactive systems are currently enjoying a persuasiveness dividend by virtue of their youth, but the fundamental point relating to the give and take involved in the development of trust in a communication relationship remains.

6 Conclusion

The rise of the computer, the web and database systems has enabled systems to be built which service human communication in a wide range of spheres. Often these

systems seek to capture a narrative and turn it into data. Usually the data needs to be converted back to a narrative. In the conversion processes there are parallels with journalism and public relations. As web systems proliferate the database/narrative dimension might be used to account for success and failure - in particular, where narrative is denied a voice, failure may follow.

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