

Reading *Microserfs*: a story about research & development as a search for identity

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Abstract: In this paper I explore the question: What is R&D *about*, on a deeper level than creating innovative products or services? Based on my reading of Coupland’s novel *Microserfs*, a story of people creating innovative software, I argue that doing R&D can be understood as a search for identity. When people explore and develop innovative products or services, they are also exploring and developing who they are, what they do and why they do that – they’re reinventing themselves. Furthermore, I argue that how one relates to one’s body and one’s dreams is part of that search, and how that is problematic within a high-tech organisation, because there the body seems not to exist, and only certain dreams are allowed. I associate my reading with a debate about the relation between people and technology, and with my study of R&D as participant observer.

Introduction

This paper is part of my study of R&D as a participant observer [19]. The story goes that organisations try to innovate, in order to create new products and increase revenues. This story is especially dominant in the high-tech sector, where organisations do research and development (R&D) as an organised attempt to innovate. The story goes that organisations try to innovate because towards economic goals (increase revenues, increase market share!) or technological goals (more functions, more megabytes!). In this context of *excess* – the conference’s theme – I’d like to tell a story about an alternative way to look at R&D. In this paper I explore the idea that doing R&D can be understood as a search for identity. When people explore and develop innovative products or services, they are also exploring and developing who they are, what they do and why they do that – implicitly or explicitly, they’re reinventing themselves.

With this paper I aim to contribute to a debate about the relation between people and technology – or sometimes called: the debate of people *versus* technology. In this debate three positions can be distinguished (simplifying for the sake of argument):

1. A positive position towards technology, or: Let’s develop as much technology as possible, it’s man’s purpose to develop and use technology.
2. A critical position towards technology, or: People are – or: *should be* – more important than technology, let’s put some limits on technology.
3. A social constructivist position of the “co-construction of users and technologies”, which goes “beyond technological determinist views of technology [bullet 1, MS] and essentialist views of users’ identities [bullet 2, MS]” [15:p.4], or: people influence technologies, and technologies influence people.

I’ve been working for ten years in R&D in the telecom sector, and I’ve become increasingly critical about telecom technology. Sometimes I ask myself: Now that so many people use mobile phones, email, messaging, etc., has communication and understanding between people improved? Not always, I think. And what is my role in this, working in R&D? I feel attracted to the second position, a *humanistic* position, which wants to put limits on technology. But in my daily work I work with e.g. engineers, scientists, developers, or marketers who seem to be

working from the first position – they’re often eager to create and apply technology. And, to complete the list, my study of R&D is within the domain of organisation studies or science and technology studies, in which the default position is the third position. So, what’s my position?

Question

In January 1993 I bought an issue of *WIRED*, and it was a pre-publication of the first chapter of Douglas Coupland’s novel *Microserfs* [4]. I really liked that story, I was intrigued by it, because it was about technology, *and* it was about people. Around the same time, and for roughly the same reason why I liked the story, I decided to pursue to work in R&D in the telecom sector. (Or is this like looking back and constructing an identity for myself?)

Microserfs is a story of how Dan and his co-workers/friends Karen, Susan, Michael, Todd, Bug and Abe quit their jobs at Microsoft, travel to Silicon Valley and start-up R&D company, *Oop!*, which creates digital, virtual Lego. In the beginning of the story, Dan, the main character tells about a visit to a friend at Nintendo and a discussion with some people who work there:

All of us got into this big discussion about what sort of software dogs would design if they could. Marty suggested territory-marking programs with piss simulators and lick interfaces. Antonella thought of BoneFinder. Harold thought of a doghouse remodeling CAD system. All very carto-graphic/high sensory: lots of visuals.

Then, of course, the subject of catware came up. Antonella suggested a personal secretary program that tells the world, “No, I do not wish to be petted. Oh, and hold all my calls.” My suggestion was for a program that sleeps all the time.

Anyway, it’s a good thing we’re human. We design business spreadsheets, paint programs, and word processing equipment. So that tells you where we’re at as a species. What is the search for the next great compelling application but a *search for the human identity*? [4:p14-15, italics added – MS]

The idea that doing R&D can be understood as a search for identity struck me, and I make that reading of *Microserfs* central in this paper. The idea appeals to me, because it draws attention to searching and identity, concepts typically associated with being human – and not to technology.

This paper is also an exploration of possible themes for my study of R&D. Most studies of R&D deal with technological or economical aspects, or with attempts to manage and control creative processes – the *human side* is often neglected. That is peculiar, if you think, like I do, about innovation as something which *people* do [2]. A recent study identifies organisational culture, employees’ experience with innovation, character of the R&D team, and management style – the *human side* of R&D – as related to successful innovation, whereas factors like financial spending on R&D, innovativeness of the product or organisational structure are less related to success [16]. I’m eager to explore alternative ways of understanding what R&D is about, on a deeper level than developing innovative products or services

The paper’s research question aims to combine a curiosity about the relation between people and technology, a curiosity about the *human side* of R&D, and an eagerness to explore alternative ways to understand what R&D is *about*. The research question then reads: “If we look at people doing R&D, and if we focus at typical human activities, what do we see, and what does that tell about what R&D is *about*?”

Approach

I work in an R&D lab, and plan to study several practices of myself and my colleagues, in order to learn about doing R&D as a participant observer [19]. This is an *involved* role and style [5:pp.43-44]: I am part of what I study. In this role and style I’ve found it difficult to combine this level of involvement – needed to have access to what I study – with a level of distance – needed to be able to analyse and theorize. Wouldn’t it be nice if I had an insider’s account of someone else of situations which I want to study? A *thick description* of R&D in which I am not

involved myself? It is in this context that I propose to read *Microserfs* as ethnography about people doing R&D.

There have been participant observations and ethnographies of R&D. Bruno Latour and Steve Woolgar studied “laboratory life” [12], Gideon Kunda studied “engineering culture” [11], Tracy Kidder wrote about the creation of a computer [10], and Steve Woolgar studied usability trials of computers [22]. I read their texts and found these interesting. But these are *their* analyses and interpretations, and I’d like to have a text to analyse and interpret myself. Enter *Microserfs*.

I realize that *Microserfs* is positioned as “a work of fiction” [4:p.iv], but I agree with Matthew Higgins that “the scientific method used in the study of organizations is not the only form of knowledge that can be utilized” [7:p.7]. Also, one can argue that all texts, including “scientific” ones, contain some dose of the author’s subjectivity. What I find attractive of *Microserfs*, and what distinguishes it from ethnographies, is its style of *heightened naturalism*. In it, reality is exaggerated: what is usually hardly visible is brought to surface and is highlighted. *Microserfs* contains only few accounts of what researchers and developers *do*, unlike regular ethnographies [10, 11, 12] which do contain detailed accounts. What *Microserfs* does bring to the foreground is what R&D is *about* on a deeper level: Stephan Dalton (*Vox*) states that from the story “emerges a yearning for spiritual depth and permanence in a world of random misfortune and economic turbulence” [4:back].

With this choice to read *Microserfs* as ethnography, questions about validity enter the scene. How to handle these depends on the choice for a specific approach or philosophy of science – e.g. a positivist, a relativist or a constructionist approach. I choose a (social) constructionist perspective, and the validity question then reads: “Does the study clearly gain access to the experiences of those in the research setting?” [5:p.53]. There is evidence that Coupland did fieldwork before writing: he acknowledges twelve people [4:p.v] of whom several are insiders in the high-tech world, and some claim to have been interviewed by him [3]. Furthermore, Peter Martin (*Financial Times*) praises the book’s “endlessly detailed description of the present, which captures a mood and a moment with unrivalled deftness” [4:p.ii], and Rom Lappin (*Scotsman*) praises Coupland’s “unrivalled reportage accuracy, his feel for motivations and obsessions of a social group” [4:p.ii]. And Philip Greenspun, who can be considered peer of the novel’s characters, as a teacher in electrical engineering and computer science at MIT, says:

After reading Tracy Kidder's acclaimed *Soul of a New Machine*, I thought to myself “here's a guy who spent 12 hours/day with engineers for an entire year and learned nothing about engineering, nothing about what matters to engineers, and nothing about the hearts and minds of engineers”. After reading *Microserfs*, I thought “here's a guy who seems to have spent a week with engineers and effortlessly absorbed everything that is important about engineering culture, everything that matters about working at a big company, and everything that matters about working at a start-up”. [6]

Microserfs passes this validity check, so I can start reading it as material which I can use as a student of organisation. Note that I will be quoting extensively, that’s mainly because I like Coupland’s – or rather: *Dan’s* – language.

Microserfs

Microserfs is written as if it’s Dan’s diary – or, following my reading it as ethnography: it *is* Dan’s diary, it’s his account of his and his friends’ lives. This is how Dan introduces himself, and how he articulates the reason why he writes his diary:

I am danielu@microsoft. If my life was a game of *Jeopardy!* my seven dream categories would be:

- Tandy products
- Trash TV of the late ‘70s and early ‘80s
- The history of Apple

- Career anxieties
- Tabloids
- Plant life of the Pacific Northwest
- Jell-O 1-2-3

I am a tester – a bug checker in Building Seven. I worked my way up the ladder from Product Support Services (PSS) where I spent six months in phone purgatory in 1991 helping little old ladies format their Christmas mailing lists on Microsoft Works.

Like most Microsoft employees, I consider myself too well adjusted to be working here, even though I am 26 and my universe consists of home, Microsoft, and Costco. [4:p.3]

Lately, I've been unable to sleep. That's why I've begun writing this journal late at night, to try to see the patterns in my life. From this I hope to establish what my problem is – and then, hopefully, solve it. I'm trying to feel more well adjusted than I really am, which is, I guess, the human condition. My life is lived day to day, one line of bug free code at a time. [4:p.4]

Dan identifies himself as somebody using email and working at Microsoft. Also, Dan seems to be fond of lists – he introduces the other persons with similar lists – and, throughout his diary there are over forty lists, e.g. of the contents of Microsoft's campus: "38% Kentucky bluegrass, 19% human beings, 003% Bill, 8% Douglas and balsam fir, 7% Western red cedar, 5% hemlock and 23% other". Furthermore, Dan considers himself a workaholic and wants to solve that. Later on, he says: "I'm trying to debug myself" [4:p.177]. I associate his list-making and problem-solving style with an engineering style – which is not unfamiliar to me, having received an engineering education: I like making lists, I like inventing and proposing solutions.

Dan lives together with his co-workers/friends:

- with Susan, a "real coding machine", who takes an "intellectual pride in putting out a good product – and making money" [4:p.9];
- with Abe, the introvert, in-house millionaire – "How to have millions of dollars and not let it affect your life in any way" [4:p.10];
- with Todd, brought up by "psychotically religious parents" and now a fanatical bodybuilder – "Your body is your temple" [4:p.11];
- with Bug, "The World's Most Bitter Man" [4:p.12] who's 31 already and feels senior and works hard, but is not recognized for that, and frustrated by that;
- and with Michael, "probably the closest I'll ever come to knowing someone who lives in a mystical state" [4:p.13].

Identity

I will explore the argument that people who do R&D, implicitly or explicitly, reinvent themselves. This is especially true for the early phases of innovation, the *fuzzy front-end*, in which people deal with ideas, and not yet with materials – many operational practicalities are outside the process. And dealing with ideas is implicitly or explicitly related to one's view on people and on the world. The company *Oop!*, which Dan and the others start-up, after they quit their jobs at Microsoft, is an example of an "R&D company" [4:p.117].

A little further down the street lives Karen, who also works at Microsoft. Their offices are next to each other, but they never talked – until they accidentally meet in the woods on the campus. They fall in love and become lovers. These are Dan's diary entries of their first encounters:

She said that we, as humans, bear the burden of having to be every animal in the world rolled into one.

She said that we really have no identity of our own.

She said, "What is human behaviour, except trying to prove that we're not animals?"

She said, “I think we have strayed so far away from our animal origins that we are bent on creating a new, supra-animal identity.”

She said, “What are computers but the EveryAnimalMachine?” [4:p.17]

She then said to me:, “Dan, I have a question about identity for you. Here it is: What is the one thing more than any other thing that makes one person different from another person?”

I got all ready to blurt out an answer but then nothing came out of my mouth.

The question seemed so obvious to start with, but when I thought about it, I realized how difficult it is – and sort of depressing, because there’s really not very much that distinguishes anyone from anyone else. I mean, what makes one mallard duck different from another mallard duck? What makes one grizzly bear different from any other grizzly bear? Identity is so tenuous – based on so little, when you really consider it.

“Their personality?” I lamely replied. “Their, uh, soul?”

“Maybe, I think I’m beginning to believe the soul theory, myself. [4:p.32]

This is the start of a continuous dialogue between Dan and Karen which runs throughout the story, and which is central to Dan’s search for identity, and to the story in general – a dialogue about identity, and, related to that, meaning and purpose of their work of creating software.

Dan, Todd, Susan, Bug, Michael and Abe are exploring and developing their identities – and they do that very differently – of course, because it’s about identities:

- Susan and Abe *work* passionately in order to create identities for themselves – interestingly, they’re the only two with Microsoft stocks and money;
- Todd fanatically manipulates his *body*, because that’s the one thing of his identity which he can manipulate;
- Michael’s obsessed by his *dreams* of creating software, and using technology is part of his search for identity;
- Dan and Karen explore their bodies and they discuss identity, meaning and purpose at length – often Karen invites Dan for this search;
- Bug nicely re-invents himself, he discovers he’s gay and learns to deal with that, and helps the others with their search for identity as well.

In this paper I will not go into theories about identity, but I can briefly mention that some scholars distinguish between human, social and personal identities. In the paper you may notice that Karen and Michael are concerned mainly with the *human* identity, that Todd and Bug are searching to get away from their *social* identities into *personal* identities, that Susan and Abe are busy with her *social* identity, and that Karen invites Dan to explore his *personal* identity.

Dan and the others also playfully explore and discuss their identities, e.g. when they invent titles for their business cards, e.g. Bug “Information Leafblower”, Todd “Personal Trainer”, Karla “Who can turn the world on with a smile?”, Susan “Her name is Rio”, Dan “Crew Chief” and Michael “You’re soaking in it” [4:p.173], or when Susan thinks-up Star Trek characters for all of them [4:p.262].

In the next sections I will explore the themes of work, body and dreams as different ways to search for identity in relation to doing R&D.

Work

Dan and the others often talk about “having a life”, and for them work life and private life are intertwined to such extent, that when they search for identities, they do so in their work as well as in their private lives. Or maybe they don’t have private lives, because all their life is work. Or the other way around: maybe they don’t have work lives, because their work is their life. Maybe they are living the “guiding values in hacker life”, passion, freedom, social worth, openness, activity, caring and creativity [8:p.139-141]: working hard out of a passion and experiencing freedom in your work while working hard.

Anyway, searching for identity, or experiencing being an creative individual is hard within high-tech organisations. Maybe that's because of a repressive organisational culture, even – or: *especially?* – if the organisation is known as creative [11], or because of problematic relations between creative people and marketing or management. Here are some of Dan's notes:

I think everyone hates and dreads Marketing's meeting because of how these meetings alter your personality. At meetings you have to explain what you've accomplished, so naturally you fluff up your work a bit, like pillows on a coach. You end up becoming this perky, gung-ho version of yourself that you know is just revolting. [4:p.25]

My only problem with Shaw [his manager] is that he became a manager and stopped coding. Being a manager is all hand-holding and paperwork – not creative at all. Respect is based on how much of a techie you are and how much coding you do. [4:p.33]

It seems like searching for identity is difficult within *all* high-tech organisations: within Microsoft, or within Intel, but also within Apple, and even within *Oop!*:

[About people at Intel:] They're like Borgs," says Susan, "They have one mind. [...] You get the feeling there's a sub-audible tape playing, that says, *resistance is futile ... you WILL assimilate ...*" And then Susan got thoughtful and said, "The more I think about it, it's actually like Microsoft. In fact all huge tech firms are like Microsoft. [4:p.136]

Dan used to believe that Apple is different from all other organisations, but when he talks with an ex-Apple worker, he finds out that "*Apple is Microsoft!!!*" [4:p.121]. They make a list of Microsoft vs. Apple, and all items are similar or the same, e.g.: both have an "eerie, *Logan's Run*-like atmosphere", and people have "wacky titles on business cards" in both [4:p.121-2]. And working at *Oop!* turns out to be similar to working at Microsoft, even the leader/tyrant role of Bill at Microsoft finds an equivalent in Michael: "Michael is now Bill!" [4:p.248].

Working passionately as a search for identity is especially the case for Susan and Abe, who loose themselves in their work. But do they create an identity in loosing themselves, or do they loose their identity in the way they work?

Abe stays at Microsoft, and only joins the others several months after the start-up. During that period, Dan and Abe email often and intimately. Dan thinks that their "e-mail correspondence has given us an intimacy that face-to-face contact never would have. Irony!" [4:p.210]. Here's what Abe says about "having a life":

I suppose there's nothing wrong with my not having a life. So many people no longer have lives that you raeally have to wonder if some new mode of existence is being created which is going to become so huge that it is no longer on the moral scale – simply the way people ARE. Myaby thinking you're supposed to "have a life" is a stupid way of buying into an untenable 1950s narrative of what life is *supposed* to be. [4: pp. 185-6]

The moment Abe joins the others at *Oop!*, feels like he's found an identity for himself. Here's when Abe enters *Oop!*'s office:

He scanned the room further, seemingly unfazed by its colorful shock value, and pulled a plump-looking Costco bag out from underneath his armpit. "Oh, hell, Michael... I brought you some cheese slices to help us through the all-nighters. Now, please tell me, just where is *my* space going to be?" [4:p.313]

Susan also works with a passion. Interestingly, she seizes all kind of work-related occasions as chances to reinvent herself. Here's her account of why she moved to Microsoft:

[Susan:] I wanted to go to a place where loyalty wasn't an issue. *Ha!* I wanted to not have a life because life back East sucked big time. So I made the choice to come up here – we all made the choice to come here. Nobody was holding a carbine up to our temples. So us crabbing about our zero-life factor isn't up for debate really. Yet do you remember, Dan – do you remember ever *having* a life? Ever? What is a life? I think I once had one – or at least dreamed of having one – and now with going to *Oop!*, I kind of feel like I have a hope of life again. [4:p.92]

When Susan's Microsoft shares are converted into cash, she throws a party, and this is for her another occasion to try to reinvent herself:

Susan quit the day after she vested and began “running with the wolves” – or so she announced to all of us the morning after her Vest Fest. She unveiled her new image [...]

Susan's previous image – Patagonia-wearing Northwest good girl – had been shed away for a radicalized look: bent shades, striped Fortrel too-tight top, Angela Bowie hairdo, dirty suede vest, flares, and Adidas. [4:p.62]

Later on, when working at *Oop!*, Susan tries again to reinvent herself again when she starts the feminist-coders movement, *Chyx* – that gives her the opportunity to invent a special members-only bracelet and a special handshake, and gives her media coverage on CNN.

Can we say whether Abe or Susan are successful in their search for identity – or whether you can say such a thing at all? I don't know, but it looks like their work and their search for identity are intimately related. Concerning the search for identity within high-tech organisations, I think the *Microserfs* story is similar to Kunda's story of “engineering culture”. In Kunda's story “self and organization” are played out against each other – individuality and creativity are subdued and even destroyed within the high-tech organisation which he studied [11].

Body

In this section I to draw attention to how people relate to their body, and explore how that is key to exploring or developing an identity, and how that is problematic in the high-tech sector, because there the body seems not to exist. Here are some of Dan's observations about his body:

I don't even do many sports anymore and my relationship with my body as gone all weird. I used to play soccer three times a week and now I feel like a boss in charge of an underachiever. I feel like my body is a station wagon in which I drive my brain around, like a suburban mother taking the kids to hockey practice. [4:p.4]

Soon after they become lovers, Karen teaches Dan shiatsu, and they have daily sessions of massage. They even develop a thesis of how your body stores memories, and they experience shiatsu as a way of taking care – or rather: *caring* – for those memories. Dan mentions his shiatsu experiences, to Abe in an email, and his idea of “the weird relationship people in tech firms can have with their bodies” [4:p.198]. Here's Abe's reply:

I know what you mean about bodies. At Microsoft you pretend bodies don't exist... BRAINS are what matter. You're right, at Microsoft bodies get down played to near invisibility with unsensual Tommy Hilfiger geekwear, or are genericized with items from the GAP so that employees morph themselves into those international symbols for MAN and WOMAN you see at airports. [4: p. 198]

Later on, Dan and the others observe that all of them are wearing Gap's clothes, and that they use these as a way of not-having bodies or identities:

It turned out that *three* of us visited the Gap independently of each other today, and when we found out, we got spooked, and we analyzed the Gap, trying to make ourselves feel better about our vague mood of consumer fictimization. [4:p.268]

I shouted "*Gap check!*" and everyone in the office had to guiltily 'fess up the number of Gap garments currently being worn. Karla, the only Gap-free soul, for the remainder of the day wore the smug, victorious grin of one who has escaped the hungry jaw of bar-code industrialisation" [4:p.270]

The exception is Todd: he certainly *has* a relation to his body, he's an extreme case, he's a fanatical bodybuilder. So when Dan wants to ask a question about the body, Todd's the one he's turning to:

I asked Todd, "Shit, Todd – what is it exactly you want your body to *do* for you? What is it your body's not doing for you now that it's going to do for you at some future date?" Not really Todd's sort of question.

[Todd:] "I think I want to have sex using a new body which allows me to not have to remember my ultrareligious family." Todd mulled this over. We looked around the apartment, strewn with hex dumbbells and rubber flooring mats. "My body was just something I could believe in because there was nothing else around." [4:p.244]

Not only Todd, but all of them struggle or struggled with their bodies:

- Karla suffered from anorexia – "I went through a phase where I wanted to be a machine" [4:p.72];
- Susan's continuously trying to be sexually attractive to men;
- Michael believes he's is ugly – "*Look* at me, Daniel – how could anyone be in love with *me?*" [4:p.324];
- Dan's experiencing a weird and frustrating relationship to his body;
- Bug's discovering his homosexuality when they move to Silicon Valley to start-up *Oop!* – he has to create a new identity, and learn to dress better.

Dreams

In this section I draw attention to how people relate to their dreams, and explore how that relates to exploring or developing an identity, and how that is problematic in organisations in which only certain dreams are allowed.

Michael is extreme concerning the relation to dreams. He lives in a dream world of software code, "he lives to assemble elegant streams of code instructions" [4:p.13]. He creates software for digital, virtual Lego with which he wants to build digital, virtual dream worlds. Dan and Karen decide to join Michael's dream, and his start-up *Oop!* because

you *do* get a chance to be "One-Point-Oh." To be the *first* to do the *first* version of something. [...] I get this little feeling that we can all of us speed up the dream, dream in color, dream in volume, and dream together down south We can, and *will*, fabricate the waking dream. [4:p.89]

Michael dreams about getting "to the *the other side*" – this is his reply to Dan's question what he wants for his 25th birthday next week:

>Bi rthday

I want one of those keys you win in video games, that allows you to blast through walls and reach the next level – to get to *the other side*. [4: p. 149]

Michael points out that thinking in terms of generations, in terms of progress is typical human:

“Bears, for example, certainly don’t have generations. Mom and Dad bears don’t expect their offspring to eat different kinds of berries and hibernate in a different beat. The belief that tomorrow is a different place from today is certainly a unique hallmark to our species. [4:p.242]

Karen also dreams, she dreams about what it means to be human. This is what she says to Todd when he’s asking questions about the purpose of developing software:

“Todd: you exist not only as a member of a family or a company or a country, but as a member of a *species* – you are human. You are part of *humanity*. Our species currently has major problems and we’re trying to dream our way out of these problems and we’re using computers to do it. [...] What you perceive of as a vacuum is an earthly paradise – the freedom to, quite literally, line-by-line, prevent humanity from going nonlinear.” [4:pp.60-61]

Such dreams about progress can be traced back to Francis Bacon’s idea of progress through science and technology [1]. This idea is echoed in the obsession with *new*. At a tradeshow Dan observes how “everybody keeps on asking, “*Have you seen anything new? Have you seen anything new?*” It’s like the mantra of the CES [trade show]” [4:p.356].

But the idea of progress doesn’t only refer to the future. Many utopian dreams refer also to the past. In a way, progress can be understood as nostalgia. This is obvious in the way that Dan and the others create their digital, virtual Lego as an attempt to re-experience childhood:

When I was young, if I built a house out of Lego, the house had to be all in one color . I used to play Lego with Ian Ball who lived up the street, back in Bellingham. He used to make his house out of whatever color brick he happened to grab. Can you imagine the sort of code someone like that could write?” [4:p.76]

So what they say about and do with Lego, is what they say about and do with software, is the same. Abe even argues that Lego and computers are, philosophically speaking, the same:

“First, Lego is ontologically not unlike computers. This is to say that a computer by itself is, well... nothing. [...] Second, Lego is ‘binary’ – a yes/no structure; that is to say, the little nobblies atop any given Lego block are either connected to another unit of Lego or they are not. Analog relationships do not exist. [...] Third, Lego anticipates a future of pixilated ideas. It is digital.” [4:82]

Developing technology can thus be understood as a weird mix of progress and nostalgia. Furthermore, based also on my experience of R&D work, it looks like high-tech organisations stimulate especially these utopian dreams, it looks like only these dreams are allowed. And these dreams are used instrumentally. Dan and the others seem eager, or disciplined, to follow someone else’s dreams, either Bill’s, or Michael’s. Michael leverages their dreams and creativity, e.g. when he makes each of them design an *Oop!* starter module, resulting in weird combinations of their own dreams and Michael’s dream: Todd’s designing a Muscle man, Susan a dancing skeleton, Karla a vegetable factory, and Dan a space station [4:p.241].

Conclusion

Based on my reading of *Microserfs*, a story about people doing R&D, I asked the question what R&D is *about*. I found the following answers:

- Doing R&D is about searching for identity, when people explore and develop innovative products or services, they are also exploring and developing who they are, what they do and why they do that – they’re reinventing themselves;

- How one relates to one's body and to one's dreams are key elements of such a search for identity;
- And searching for identity is problematic within high-tech organisations, especially because there the body seems not to exist, and only certain, utopian, dreams are allowed.

This raises some new questions: If R&D is about searching for identity, and if that is hard within a high-tech organisation, than what does that mean for the organisation of R&D within a high-tech organisation? Can we organize R&D? And if so, how can we organize it? There's lots of literature concerning such questions, and lots of recommendations to stimulate creativity and autonomy, e.g. by organizing – or rather: *not*-organizing – skunk works, autonomous teams and the like. Are these ways to give people the opportunity to both explore and develop innovative products or services *and* to explore and develop their identities?

People and technology

What does searching for identity, and struggling with bodies and dreams have to do with creating software or technology? In my reading of *Microserfs* I drew attention to what *people* do, to typical human activities like searching for identity, meaning and purpose, having bodies and having dreams – rather than focusing on software or technology.

In order to join the debate about people and technology, I will first turn to Lewis Mumford, who wrote extensively about technology (or *technics*, the word he uses). Mumford is associated with the first, humanistic position. The idea of R&D as a search for identity is compatible to Mumford's thesis that man is primarily a *symbol*-maker, rather than the dominant idea of man as a *tool*-maker. Mumford interprets findings from historians, anthropologists and sociologists who studied early man and, based on that, argues that

man is pre-eminently a mind-making, self-mastering, and self-designing animal; and the primary locus of all his activities lies first in his own organism, and in the social organization through which it finds fuller expression. Until man had made something of himself he could make little of the world around him.

In this process of self-discovery and self-transformation, tools, in the narrow sense, served well as subsidiary instruments, but not as the main operative agent in man's development; for technics has never till our own age dissociated itself from the larger cultural whole in which man, as man, has always functioned. [14:p.9]

Mumford goes on to explain where our distorted view on man, as a tool-maker, comes from:

Modern man had formed a curiously distorted picture of himself, by interpreting his early history in terms of his present interest in making machines and conquering nature. And then in turn he has justified his present concerns by calling his prehistoric self a tool-making animal, and assuming that the material instruments of production dominated all his other activities. As long as the paleoanthropologist regarded material objects – mainly bones and stones – as the only scientifically admissible evidence of early man's activities, nothing could be done to alter this stereotype. [14:p.14]

If the only clue to Shakespeare's achievement as a dramatist were his cradle, an Elizabethan mug, his lower jaw, and a few rotted planks from the Globe Theatre, one could not even dimly imagine the subject matter of his plays, still less guess in one's wildest moments what poet he was. [14:p.23]

Interestingly, Mumford theorizes explicitly about body and dreams, how people learned to use and control their bodies and their dreams, and learned to use shared symbols, language and rituals, and how that cultural framework is – or: *should be* – the basis for creating technology:

[Early man] possessed at the beginning one primary, all-purpose tool, more important than any later assemblage: his own mind-activated *body* [italics added – MS], every part of it, including those members that made clubs, hand-axes or wooden spears. [...]

Through man's overdeveloped and incessantly active brain, he had more mental energy to tap than he needed for survival at a purely animal level; and he was accordingly under the necessity of canalizing that energy, not just into food-getting and sexual reproduction, but into modes of living that would convert this energy more directly and constructively into appropriate cultural – that is, symbolic, forms. Only by creating cultural outlets could he tap and control and fully utilize his own nature. [14:pp.6-7]

All through history, man has been both instructed and frightened by his *dreams* [italics added – MS]. And he had good reason for both reactions: his inner world must often have been far more threatening and far less comprehensible than his outer world, as indeed it still is; and his first task was not to shape tools for controlling the environment, but to shape instruments even more powerful and compelling in order to control himself, above all, his unconsciousness. The invention and perfection of these instruments – rituals, symbols, words, images, standard modes of behavior (mores) – was [...] the principal occupation of early man, more necessary to survival than tool-making, and far more essential to his later development. [14:p.51]

Mumford argues for putting limitations on technology for the sake of humanity. From a similar position, Langdon Winner, a contemporary philosopher of technology, observes that in the currently dominant school of science and technology studies – a social constructivist position – there is “an almost total disregard for the social consequences of technical choice [... for what technology] means for people's sense of self, for the texture of human communities, for qualities of everyday living, and for the broader distribution of power in society” [21:p.368]. He advocates to put limits on technology [20], and to turn to Mumford: “With Mumford, there is always an underlying hope that the abstract, mechanic obsession of the modern age would be replaced by a more humane, organic sense of technical possibilities.” [21:p.375]

I may explore – not in this paper, but in future studies – whether or how Mumford's or Winner's humanistic position, laden with ethics and politics, may be combined with a social constructivist position. I may start such exploration with Steve Woolgar's 'semiotic approach': his idea that researchers and developers “configure the user” [22]: they create products and services, and, in doing that, they make assumptions about the world and about what people (should) do. I will then take into account that “configuration is a one-way process: designers, in turn, are configured, by both users and their own organisations” [13]. Maybe Mumford's and Woolgar's theses can be thought of as distant cousins: they both draw attention to how creating and using of technology can be thought of as symbolic activities – as seeking and creating meaning.

My study

I guess my study of R&D is also a search for identity. I am trying to position myself as someone who's critical about technology, who trying to make a difference. My study of R&D is a mix of doing R&D and observing R&D. And there's my engineering style, my eagerness to invent solutions – sometimes without proper diagnosis. I will *research* how people do R&D and try to *develop* alternative ways of doing R&D – can I call that re-R&D, is that a nice identity?

And what about struggling with body and with dreams? If I let loose my eagerness to invent, I can think of two ways to involve my and my colleagues' body and dreams in doing R&D:

- Researchers or developers sometimes apply empathic design or participatory design methods [17], they study how people/end-users use products or services in the field, or conduct workshops in which people/end-users participate in developing or evaluating innovations. I propose that in such settings, researchers or developers can *engage their bodies* more, e.g. through 'shadowing', following someone through his/her daily life, or through 'body storming', enacting scenes which they observed [9]. This would result in a better diagnosis

because it is done from an person's, embodied perspective, and the resulting ideas would be more realistic in the sense that they would better fit people's daily, embodied lives;

- Researchers or developers sometimes construct *storylines*, these are fictional narratives which illustrate how people/end-users may use the product or service they are developing or evaluating in their daily lives, and steer the development of a product or service. Storylines are like dreams that may happen. *And* they are often full of ideologies about people and the world, [18]. I propose that when they use storylines, that they try to *control their dreams*, to critically reflect on their dreams and ideologies, and, if they feel uneasy with what they find, to think of alternatives. Then, the storylines, and resulting products or services, would be based on a better “understanding of the place of technology in human affairs” [21:p.364].

In such a scheme, researchers or developers would engage their bodies and control their dreams (the humanist, second position), which would function as a counterbalance to the *technology push* (dominant, first position). It sounds like setting limits on technology, like Mumford or Winner advocate, but my scheme directly aims to influence what researchers or developers do: how they do R&D. I guess that's my way of trying to help myself and others to explore and to develop identities in doing R&D in a certain way.

Talking about limits seems opposite to the conference's theme of excess. But I *am* talking about excess when I talk about the possibilities that people have to explore and develop identities, to seek and create meaning, to experiencing their bodies and dreams. Researchers and developers are curious people, and I hope that they are curious also to find out who they are, what they are doing, and why they are doing that. Or, like Dan puts it:

How do we ever know what beauty lies inside of people, and the strange ways this world works to lure that beauty outward? [4:p.220]

Let's give Bug, often quiet, and an example of nicely reinventing himself, the last words:

“I used to care about how other people thought I led my life. [...] It starts out young – you try not to be different just to survive – you try to be just like everyone else – anonymity becomes reflexive – and then one day you wake up and you've *become* all those other people – the *others* – the something you aren't. And you wonder if you can ever be what it is you really *are*. [...] Anyway, I never talk about myself, and you guys never ask, and I've always respected that. But there comes a time when you either speak or forfeit what comes next.” [4:pp.291-2]

Let's listen some more to Bug:

“I was so busy geeking out that I never had to examine my feelings about anything. I jumped into one of those little cartoon holes they use in old Merry Melodies, and I just came out the other side, and the other side is *here*. Didn't you ever wonder where the other side was?” [4:pp.317-8]

Bug's also talking about “the other side”, like Michael, but Bug states that the “the other side is *here*”, I take that as a hint that Bug's happy with the here and now, and I guess he's close to finding a nice identity for himself. Bug's not only articulating his own search for identity, but also stimulates the others to continue their search for identity:

“We're like those seeds you used to plant on top of sterile goop in Petri dishes in third grade, waiting to sprout or explode. Susan's exploding. Todd's going to explode. Karla's germinating gently. Michael's altering too. It's like we're all seeds just waiting to grow into trees or orchids or houseplants. You never know. It was too sterile up north. I didn't sprout. Aren't you curious to know what you really are, Dan?” [4:pp.193-4]

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