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INTERACTION DESIGN, MASS COMMUNICATION AND THE CHALLENGE OF DISTRIBUTED EXPERTISE

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Interaction Design, Mass Communication and the Challenge of Distributed Expertise ¹

Abstract

The paper considers some implications of the rise of design as a master-metaphor of the information age. It compares the terms ‘interaction design’ and ‘mass communication’, suggesting that both can be seen as a contradiction in terms, inappropriately preserving an industrial-age division between producers and consumers. With the shift from mass media to interactive media, semiotic and political power seems to be shifting too – from media producers to designers. This paper argues that it is important for the new discipline of ‘interactive design’ not to fall into habits of thought inherited from the ‘mass’ industrial era. Instead, it argues for the significance, for designers and producers alike, of what I call ‘distributed expertise’ – including social network markets, DIY-culture, user-led innovation, consumer co-created content, and the use of Web 2.0 affordances for social, scientific, and creative purposes as well as for entertainment. It considers the importance of the growth of ‘distributed expertise’ as part of a new paradigm in the growth of knowledge, which has ‘evolved’ through a number of phases, from ‘abstraction’, to ‘representation’, to ‘productivity’. In the context of technologically mediated popular participation in the growth of knowledge and social relationships, the paper argues that design and media-production professions need to cross rather than to maintain the gap between experts and everyone else, enabling all the agents in the system to navigate the shift into the paradigm of mass productivity.

Design Status

With the rise of computer communication, an entire professional group – I won’t go so far as to use the word ‘class’ (Florida 2002) – has arisen around the interface between computers and humans, and between computers and organisations. These occupations have successfully shaken off the humble designation of the ‘technician’ (from the IT department) to aspire to higher status under the banner of ‘design’ (from the art school).

¹ An earlier version of this paper was given as a keynote address, ‘Interaction Design: a Contradiction in Terms? The Challenge of Distributed Expertise’, to the Australasian Symposium on Interaction Design (ASID) held by the Australasian Cooperative Research Centre for Interaction Design (ACID). Queensland University of Technology, October 2008.

It is in this context that we can observe the rise of ‘interaction design’, an apparently neutral descriptor for an area of specialist expertise. The innovation encapsulated in this name is that it associates human/computer interaction with aesthetic rather than scientific disciplines, shifting the field of study from its background in engineering, computer and cognitive science towards a future in the arts and design. Some insiders see this shift as a rift, causing the ‘discipline’ of interaction design to develop in two different directions at once:

Jonas Löwgren explains Interaction Design as a discipline going in two directions: One interpretation is to view Interaction Design as an extension of HCI [Human-Computer Interaction]. Another interpretation is to view Interaction Design as a design discipline, with more in common with architecture than with engineering and behavioral sciences (www.interaction-design.org/encyclopedia/interaction_design.html).

However, the same journey has been taken by other previously technical professions in the past, notably design itself (Sudjic 2008) as well as architecture. Thus ‘interaction design’ is by no means alone in rebranding *as art*, a direction whose pull seems irresistible.

Indeed, the status hierarchy of our times puts ‘the designer’ (as opposed to technicians or even engineers) on a pedestal. The abstract idea of ‘design’ is used to organise large investments, involving both pecuniary (economic) and symbolic (cultural) values.

‘Designer’ now applies to myriad occupations distributed throughout the economy. It is the default descriptor of the information age, just as the ‘engineer’ was the master-metaphor

for the industrial era. So profoundly has our age invested in the concept of design, in fact, that it is also the latest euphemism for the entity previously known as God. The existence of a deity is claimed to be demonstrated by evidence of '*intelligent design*' in nature (Dawkins 1986). Indeed, while many of us are sceptical about the religious godhead, nevertheless we remain 'creationists' in relation to design. We attribute fabulous powers to designers, including the godlike ability to 'create'.

Division of Creative Labour

What is at stake in the professionalisation of human and cultural values in the service of business? The professionalisation of 'interaction design' is a problem not because it is commercial, or because it is too variable a field to define, but because its 'capture' by professional experts in the service of firms reproduces an existing and more fundamental divide – that between *producers* and *consumers*. In this model, inherited from the heyday of industrial capitalism going back to the nineteenth century, designers are on the production side; the value they add is to *do something to consumers*. Here then is the nub of the problem I want to identify: 'interaction design' *abstracts* both 'design' and 'interaction' from the everyday domain, and relocates them within expert systems from which most humans are excluded. Consumers only appear as the end-point of a production process in which they play no creative or even active role. In this model, 'interaction' describes not relations among humans but how a technological system (created by experts) 'interacts' with 'users'. 'Design' is not seen as a human attribute but as a certificated

business practice. It takes what is abundant – ‘embedded behaviour in human environments’, as the Wikipedia entry puts it (‘Design’, fn 11) – and makes it a scarce resource for profit.

Now of course such specialisation based on ordinary practices is commonplace. The ‘knowledge economy’ works by taking tacit knowledge (e.g. cookery) and making it explicit (the recipe), replicable (published) and entrepreneurial (celebrity chefs) (Leadbeater 2000). Such a process is generally beneficial. A human attribute is improved, and returned to ordinary people as a professional service. The problem arises only when this division of labour between producers (the expert system within business) and consumers (seen as passive, out-of-the-loop and manipulable) is taken to extremes; when the tension between economic values (design as a creative service for sale) and cultural values (interaction as a dialogic mode of communication, practiced by everyone) are not reconciled.

In the industrial economy, this tension was not seen as a problem by creative, engineering, scientific or technical specialists – in a ‘mass’ society there was an incentive for ‘workers by brain’ to get as far away from the common mass as possible. To be ‘abstracted’ from the industrial workforce was a proper aspiration, because ‘white-collar’ social and economic status was thereby improved. At the same time, craft-based artisans were absorbed into a working class predominantly made up of unskilled labourers and factory hands, and their

status declined. Instead of a gradient along which different degrees of specialisation could be plotted among a population that was essentially engaged in the same enterprise – industrious productivity using individual creative talents – there emerged instead an arrow of causation. Producers *caused* transformations (of materials, meanings), of which consumers were the *effects*. It was only at this point that consumers came to be understood in terms of *behaviour*, for that was taken to be evidence of the extent to which causation by producers and marketers had taken effect. Thus, producers came to be associated with organisational action, purpose, and scientific causation; while consumers came to be associated with individual behaviour, ‘distraction’ and irrational caprice.

However, such a division is not so easy to justify in the knowledge economy, or in the context of creative innovation. For although trained expertise is clearly vital, equally important is the role of users and consumer co-creators (OECD 2007), many of whom will bring their own expertise to a problem which is solved collaboratively rather than competitively. This is the process of ‘mass creativity’ that Charles Leadbeater (2008) has dubbed ‘we-think’, and J.C. Herz calls ‘harnessing the hive’ (2005). It means that the human dimension of the growth of knowledge, of creativity, of design, and of interaction can’t be left entirely to the experts. With the emergence of the ‘new economy,’ neither can innovation itself.

The professionals have been slow to admit the implications of this paradigm shift.

The tension between producers and consumers is made more complex by *technologies* that are at once the product of scientific expertise, and universally available for just anyone to use. But professional self-preservation seems to dictate that designers continue to stand between users and technologies. Thus we can observe a continuing assumption that *interaction design* is the expertise needed to facilitate users' interactions with technology, and to see 'users' as synonymous with consumers.

Here for instance is how the term itself is defined on the Wikipedia: 'Interaction Design (IxD) is the discipline of defining the behavior of products and systems that a user can interact with.' Here's another definition, from a website dedicated to the discipline:

'Interaction Design' refers to the shaping of interactive products and services with a specific focus on their use' (www.interaction-design.org/encyclopedia/interaction_design.html).

And another, closer to (my) home:

ACID is the Australasian Cooperative Research Centre for Interaction Design. We find better ways for people to interact with each other using communication technologies. Our expertise lies in helping people participate in the digital world. ACID conducts deep and substantial research in interaction design and user experience design (www.interactiondesign.com.au/index.php?option=com_content&task=view&id=12&Itemid=65).

Seemingly, it is all simple and clear. Interaction design is a commercial service profession, 'helping people participate' in their interactions with computers, and thence with each other, for a fee.

Contradictions in Terms?

But when I take a closer look at the two words in the phrase 'interaction design', I can't help thinking that they look uncomfortable together. Is this a case of Heisenberg's uncertainty principle: you can have design, or you can have interaction, but you can't have both at once? My uncertainty stems from my own disciplinary background. The argument I want to make is that design is facing the same challenges now as television has done throughout the broadcast era. Or, to put it another way, here we go again.

In my field of media, communication and cultural studies, the relations between various two-term oppositions have for many years been a focus of analysis, and sometimes a bone of contention:

Producer	/	Consumer
Supply	/	Demand
Expert	/	Amateur
Provider	/	Client
Corporation	/	Customer
Organisation	/	Individual
Causal Action	/	Behavioural Effect
Television	/	Audience

Is this the tacit mental model that generates a new opposition?

Designer / User

Here is where the alarm bells begin to ring. Does the definition of interaction design, which originated in computer science, unwittingly reproduce *mass communication theory*?

This is where the notion of a ‘contradiction in terms’ comes in. It alludes to one of the founding texts of contemporary communication studies; a paper by the sociologist Philip Elliot (1972), called ‘Mass communications – a contradiction in terms?’ Elliott was drawing attention to the disparity between *face to face* communication and *mass* media. ‘Interaction design’ (the term) similarly reproduces a disparity between experts working in corporate or professional organizations (on the one hand) and consumers, creating content in social networks (on the other). Sometimes this disparity can amount to disparagement, as each ‘side’ harbours suspicions about the other. A well-known contemporary critic of the ‘cult of the amateur’, for instance, is Andrew Keen (2007):

We are teetering on the edge of catastrophe. Blogs, wikis and social networking are, indeed, assaulting our economy, our culture and our values. Web 2.0 is pushing us back into the Dark Ages. That's a big deal. It's a message that needs to be shouted from every available soapbox – even from a loathsome blog like this. It deserves to be broadcast in the most electric of oranges. (andrewkeen.typepad.com/the_great_seduction/2006/10/my_book_now_not.html)

Keen is extreme, but he is not alone; his polemic has struck a chord among many commentators (often those closely identified with legacy media technologies like newspapers). The more specialised the creative sector of the economy, the more militant

the occupations within it seem to be about *maintaining* the distance between themselves and the punters. Thus, technical or craft skills keep large-scale media production crews or product designers in specialist firms, isolated from their customers, while human-contact professions like marketing and performance spread more easily into other firms, across the economy (Cunningham 2008).

Throughout the broadcast era, these two tribes – producers and consumers – saw very little of each other. Experts designed and made things; consumers used them up and threw them away (Whiteley 1997). Very rarely did the twain meet, much less ‘interact,’ because from the point of view of the experts, interactivity was a design functionality in the product (not the user), while for consumers interactivity was what they did with each other (not the product). This lack of communication between producers and consumers is what led Elliott to question the *communicative* credentials of *mass* media. How could consuming an industrial product be seen as communication? In the ‘mass’ era, ‘communication’ was essentially one-way – *from* powerful and central organisations, *to* a feminised, suburban, domestic family audience. There was clearly a yawning gap between them in terms of ownership of the means of production, power, influence and opinion-formation.

The *research field* of mass communication was captured by this asymmetry – it became the study of how corporate and state ownership and control of mass media resulted in manipulated populations, who were persuaded by commercial and political campaigns to

hold opinions, make decisions, and perform actions that they would otherwise not have chosen, which were not (according to the critics) in their interests as citizens or in terms of their 'real' class, gender, sexual or ethnic interests.

Abstraction and Representation

Semiotic representation is a fundamental driver of language, being the means by which humans make signs (like words or images) stand for something else (like meanings or ideas). Meanwhile the political kind of representation is a means by which we make *someone* (a politician) stand for *someone else* (indeed, lots of someones); that's the essence of kingship as well as representative democracy.

- Semiotic representation – symbolic values (meanings)
- Political representation – democratic values (decisions)

When successfully conjoined in relations of mutual cordiality, such representation can of course produce spectacular results. On the semiotic side, Shakespeare 'represented' his culture; on the political side, democratising polities can make decisions that improve the lives of all. These two kinds of representation were industrialised – massively scaled up and marketised – during the same period, beginning in nineteenth-century Europe; the period we call modernity. In both cases, industrialisation accelerated the abstraction and specialisation of the function of representation itself. The extension of markets and franchises produced an ever-widening asymmetry between those whose meanings or

choices were represented (the populace) and those who were active agents in making both meanings and decisions.

However, the improvements brought about by the regime of representation were not without cost. Design cannot exist as a domain of specialist expertise without abstraction. Activities, processes and artefacts that are part of everyone's daily life and labour must be abstracted from the domestic context, and also the manual part of fabrication must be abstracted from the mental part. Only then can design emerge as a separate field. This is a long-term historical process with its roots in ancient divisions of labour (e.g. by gender and social hierarchy), but it was not until the beginning of modernity that abstraction took on industrial proportions. The factory system scaled up specialisation and the division of labour, and required a radical separation of design from manufacture. Perhaps this is why the Design Institute of Australia (the 'representative' industry body) is still insistent that designers are a class apart:

A designer plans things for manufacture or construction. The difference between a designer and a craftsman or artist is that designers usually develop things that have requirements set by others and will ultimately be produced by others. www.dia.org.au/content.cfm?id=186

The fruits of the design-led manufacturing process were so good, and so cheap, and so plentiful, that they supplanted artisanal fabrication among the population at large. It was at this point – the point at which aesthetics (culture) met commerce (economy) in the

commodification of design – that design itself became ‘representative’. It was undertaken by increasingly high-prestige specialists on behalf of whole populations, whose choices were ‘represented’ by those of designers (Sudjic 2008). The asymmetry between specialists and everyone else grew to extreme proportions, because as people (now ‘markets’) enjoyed the use of ever more sophisticated designs, so their own skill-set was reduced. As society’s creative horizons widened, the scope for self-made creative innovation among the general population narrowed.

Before industrial urbanisation and the factory system, ordinary people had produced for themselves many of the necessities for sustaining life, home and culture. Then along came Adam Smith and his pin factory (Smith 1776: 1.1); and a new understanding of the productivity of the division of labour. The industrial process of abstraction and specialisation reached into the household. Production turned to consumption as ‘housewives’ were encouraged, by price, quality – and design – to abandon DIY and head for the [super]market. Previously ‘productive’ aspects of domestic life like growing food, cooking, sewing and home-making, and also cultural pursuits, were replaced by the cash nexus and shifted across to consumption. Thus semiotic productivity was ‘abstracted’ from people’s everyday life even as they enjoyed the expansion of its products.

This characteristic of industrial society is shared by popular culture, which also became ‘representative’ as opposed to artisanal during industrialisation. This was when ‘folk’

culture transformed into 'pop' culture. Storytelling, singing and the like were abstracted from the household and sold back in the form of media. Both design and media massively increased the amount of visual 'representation' in general circulation, from designs on pots to illustrations in media. But *self-representation* declined, as the population at large produced for themselves fewer and fewer of the meanings and decisions in which they lived.

The professionalisation of design *converted* the 'masses' into 'passive' consumers and audiences, or so it has seemed for many critics. Nevertheless, people were not passive. They had to learn new skills. For instance, if you stop making clothes, cooking food, singing songs, and start buying fashion, eating out and listening to recordings, you need to learn how to choose among *symbolic and status-based* alternatives within social network markets (Potts et al 2008), and this is where the popular media came into their own. As cultural subsistence (sing-it-yourself) declined and the cultural market economy grew, the media became the forum in which symbolic values were established and exchanged – ideas, products, and designs competed for popular attention (Lanham 2006). People began to represent their own identities via such choices, including the spectacular subcultures of the 1960s and after (Hebdige 1979), fanship (Hills 2002), and the competitive music-and-movie playlists on contemporary social networking sites (Burgess & Green 2009).

Down the Tube?

The modern mass media are based on *representation*, semiotic and political. They ‘abstract’ individual humans (stars and celebrities), both real and imaginary (in news and drama), from the anonymous throng and make them *stand for* everyone else in society, both symbolically and democratically. Because broadcast television in particular reached an almost universal audience, at least in developed countries, it was easy to believe that everyone was ‘spoken for’ on TV. *Everyone was represented*—ordinary life and everyday choices were the real ‘subject’ of mass media—but simultaneously *no one spoke for themselves*. Everything was realist but nothing was real.

On the plus side, television’s domestic setting, live immediacy, leisure-time availability, casual continuity, operational simplicity (two knobs) and the human scale of its screen, suited to faces and dialogue, were all appropriate for the context in which it thrived best: private life and family-building in conditions of expanding consumer affluence and the suburban experience. On screen, broadcast television excelled at head-to-head dramatic conflict, both fictional and factual, in drama, comedy, news, sport and kids’ shows. While encouraging people to stay at home, it taught neighbourly comportment and experiential and national togetherness, and it continuously brought new information and experience to all sections of the public. It could also coordinate population-wide (sometimes planet-wide) attention to, and emotional investment in, periods of excitement and high uncertainty, as during sporting finals, end-of-season cliff-hangers, elections and political crises, and moments of wonder or terror, like the moon landings, 9/11, the Asian tsunami or the

inauguration of President Obama. It was the bellwether of change for a population living through change.

This model of democratic inclusion is typical of broadcasting: not to identify separately but to enfold narratively; not to speak *for* but to speak *to*. TV wants to encompass its audience and entertain them, but it doesn't want them to do very much in return, except watch.

And because of this, 'representative' television remains a problem. The high capital cost of production and highly regulated distribution networks resulted in that extreme division of labour between corporate expertise and lay audiences. For their part, because they didn't appear to be doing anything very much and were 'de-skilled' compared with producer occupations, audiences always seemed to be at the mercy of powerful persuaders, commercial marketing, political manipulation, and jackass behaviour. The model was not so much communication as contagion.

So 'Network' television came to 'represent' the universalisation of corporate will, encapsulated in advertising that reduced audiences to consumers, agency to behaviour, and modernity to an endless pipeline of products, carried from manufacturers and retailers to waiting, willing, wanting housewives, whose job it was to buy the things that were advertised, serve them up to the family (slouched on the couch watching TV), then clean up the house and the bodies in it using more TV-advertised products. Broadcast television perfected its role as the purveyor of what was needed to sustain domestic life by reducing it

to a flow of consumption—products came into the house, went through the alimentary system and then safely out again, chased by cleansing agents from toothpaste to Toilet Duck. No wonder they called it the Tube.

Towards Direct Consumer Productivity

Broadcast television clearly had its limits as a system of representation. These limits will be experienced by any expert system where a small professional group ‘represents’ everyone else. The same applies to interaction design, if it retains a distinction between designers and users that is modelled on the industrial producer/consumer divide. Without meaning to do any harm, such a model nevertheless continues the industrial tradition of expert control, hanging on to a provider mentality, retaining the distance between producer and consumer, confining agency to the producer, and reducing consumers and audiences to the status of an ‘effect’ of actions over which they have no control.

Such legacy thinking applies to many areas of professional practice, across the creative disciplines, from architecture and art to media production, software development and writing. This is because social institutions such as professions change more slowly than technologies. As a result, new systems and possibilities may already be in full flower while existing institutions continue to do – and to do well – what they have been doing all along.

Here, then, is where the wrecking ball of innovation may hit the established edifice of industrial representation. With the widespread accessibility and uptake of Web 2.0, consumption need no longer be seen as *behaviour*, to be manipulated by experts and denounced by critics, but as *action*, a new phase of productivity and DIY creative potential, but now *distributed* across whole populations and not confined to ‘abstracted’ professionals and experts (Hartley 2008: 28). The process of ‘creative destruction’ of industrial-era representational systems has indeed been set in train by the internet. It is not felt immediately or evenly by all those who will be affected by it, whether they be the TV industry, political representatives – or interactive designers. But the wrecking ball is already swinging. TV-screens are transforming into monitors and computer terminals. Television is migrating out of the house, into the street, heading downtown. It is miniaturised and mobile. Television began as ‘one-to-many’ broadcasting, but is developing into a global network – like a phone system – with many possible content providers and viewing platforms. In other words it is playing catch-up with the internet. Already it is downloadable. You can customise your viewing schedule and create your own shows. With YouTube and other video-sharing sites you can ‘Broadcast Yourself.’ And so television is falling forward into participatory culture (Jenkins 2006; McCarthy 2009), converging with consumer co-created content and distributed production whether the established players like it or not.

The question for the future is this: Can TV combine the ‘do it yourself’ and ‘do it with

others' (DIY/DIWO) attributes of the Internet with the broadcasting pleasures of the couch? Can you *self-represent* and be an informed citizen, a creative consumer, and a truly networked communicator – all at once? Can television be created directly ‘*by the people*’ rather than by representatives, and still tell compelling stories?

The greatest challenge to broadcast television comes as the regime of representation gives way to a new model of ‘mass’ communication – one based on the *direct productivity* and action of the agents previously known as consumers. Here is where both semiotic and political innovation is most intense and most urgent. Existing players are experimenting with new business models, programming formats, advertising strategies, not to mention cost-cutting and down-sizing. Meanwhile independent players – both individuals and enterprises, both non-market consumer-co-creators and ambitious entrepreneurs – are coming up with new uses for television, broadcast and otherwise, based not on expert provision to passive consumers (or even ‘interactive’ users), but on social networks (Potts et al 2008).

Productivity Design

Design can no longer be seen as the preserve of designers. Creativity is made up of the activities and productivity of the millions who interact in the social networks that are now dispersed throughout the community. With the growing ubiquity of digital media ‘consumers’ (both individually and aggregated) are becoming a source of innovation, often

more dynamic than firms. The social network 'swarm' outperforms the IP-protected 'lab,' and at twice the speed (Herz 2005).

If it is true that we are evolving from an era of *representation* to one of *productivity*, from expert provision to 'distributed expertise,' what does this mean for interaction design? The question goes beyond whether it should invest in a technical or an aesthetic future. Instead, the important question is whether it should switch allegiance from the producer to the consumer, from supply to demand, from expertise to participation. The principal value proposition in the field of interaction design is to recognise the shift from representation to productivity, and the value of population-wide agency and participation in digital creative innovation. Research is needed, not so much on how to *provide* services to a consumer, but how to identify ways that community-wide creativity can be propagated, improved, and integrated, via markets as well as public agencies and institutions, with the growth of knowledge.

Web 2.0 applications build upon ubiquitous computational power and connectivity to enable user-created content. This poses an increasing challenge to established players, including large corporations. Interaction is more decisive than design, but it is the interaction among people and agencies in complex networks, not the interaction of users (consumers) with technologies (proprietary applications), that we must understand. The internet is a creative community based on productive agents in social networks, some of

global scale. But this did not develop directly from expert designers 'providing' consumers with marketised solutions. The rapid growth of the online economy is based on innovations that originated outside of the market economy, from the internet itself (security), to the worldwide web (academic) to current achievements of 'we-think' like the Wikipedia and Open Source (social networking). Thus it is important to develop a research program that is not solely focused on firms, and not dedicated to the proposition that experts provide solutions for clients. The model must be to assist the development of creative productivity among communities of interest wherever they may be found, for their own purposes. It is from participatory culture itself that the most important changes will emerge. Commercialisation of applications and the marketisation of internet services are second-stage processes of adoption and retention, where markets are coordinating mechanisms, not the 'generative edge' of creative innovation itself (Zittrain 2007).

The real importance of consumer-created content and participatory culture is that they require new ways of thinking about both creativity and innovation in the growth of knowledge. Neither design nor innovation is any longer the exclusive preserve of specialist experts. The industrial model of an IP-protected expert pipeline, controlling value-adds along a value-chain and concentrating expertise inside the firm (the IKEA model of consumer-participation, if you like), is also under challenge. Now, innovation and profitability both require a collaborative interface with users, who may be other firms, but who also include 'consumers' (the word no longer makes any sense) in general.

Practical Applications

To investigate human values and public good as well as economic benefits, we must include the development of *new models of enterprise* based on *participatory culture* and *consumer productivity*, and new approaches to innovation policy. Such research must:

- encompass human and cultural factors as well as science and technology;
- integrate ‘consumers’ and producers as co-creative agents;
- include pre-market and non-market enterprises;
- be evolutionary, based on open complex systems and networks;
- be driven by all the agents in the system;
- shift from a representative to a productive model of expertise;
- reduce the asymmetry between producers and consumers.

How can interaction designers take seriously the challenge of ubiquitous creativity and innovation, and how can they coordinate, adopt, retain and marketise the innovations enabled by consumer-created content, user-led innovation and crowd-sourced knowledge?

The research agenda needs to be expanded from the ‘industrial’ or ‘representative’ question (‘what can producers do to consumers?’) to the ‘productivity’ question. Research must:

- encompass human and cultural factors as well as science and technology;
- integrate ‘consumers’ and producers as co-creative agents;
- include pre-market and non-market enterprises;

- be evolutionary, based on open complex systems and networks;
- shift from a representative to a productive model of expertise;
- reduce the asymmetry between producers and consumers.

Research is required to identify appropriate professional services for three interlinked contexts:

- *Creative professionals*, enterprises and managers;
- National and international *R&D networks*;
- Business models and processes for new enterprise formation and *corporate/community uptake*.

The development of distributed expertise can be boosted rather than resisted by promoting the development of entrepreneurial users and consumers:

- Extending creative and digital literacy;
- Consumer co-creation and start-up enterprise formation;
- Distributed network structure and collaborative work, open to both producers and consumers.

While remaining professional (individual) and commercial (organised in firms), interaction design can commit to 'open' innovation, on the principle that knowledge shared is knowledge gained. This requires a new approach to copyright, intellectual property and

digital rights management; for instance along the lines of the Creative Commons movement. Such approaches suggest a new kind of relationship among agents in a system, going far beyond the binary opposition between producers and consumers. Here, the relations are among *agents* and *enterprises* in a complex *networked system* (or interlocking systems). For instance, the stakeholders in *productivity design* would include:

- *SMEs and sole traders*, including ‘amateurs’, ‘fans’, ‘subcultures’, community organizations, individual consumers and consumers as crowds (creative development);
- *access corporations* (e.g. Cisco, Intel and telcos, to explore demand pressures and user-led expansion of networks);
- *content corporations* (to develop formats for participatory media and community-relations for participatory content, e.g. in games);
- *marketing agencies* (human and collaborative aspects of products and services);
- *designers*, artists and other creative professionals (design of collaborative and demand-led services);
- *legal and regulatory agencies* (seeking to modernise IP law, content regulations, privacy and defamation legislation in an era of open complex participatory networks);
- *cultural institutions* (digital communities of users and co-curators – libraries, galleries, museums, archives);
- *educational providers* (propagating digital creativity);

- *property developers* (interface with existing and new communities to develop urban stories as well as structures);
- *health agencies* (patient experience and feedback, user-led therapies; self-help communities, health communication).

Among the challenges for evolving professions with technical, aesthetic and social components will be that expertise itself will no longer be a scarce resource for direct commercial exploitation, but a participatory attribute of popular culture. It will be available for multi-agent networked use both within and beyond commercial institutions like the firm or the market. If the era of semiotic and political representation is indeed giving way to a new paradigm based on mass creativity, consumer productivity and distributed expertise, then the design professions, and those of the 'mass' media, will need to understand the cultural and creative dynamics of user-experience. The days of the consumer as an effect of the agency of others are over. And the days of godlike design are over too. We need to understand the spontaneous emergence of order in complex systems, not to look for the hand of an external, causal intelligence. Design is part of popular culture, and interactive design, like popular media entertainment, will need to adapt to its demands.

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