31.7.01/NOB/i3 Research Village Contribution

i3net

The dilemma of scientific communities

It is a common view of science and engineering that what they do is simply to deliver research results and products. Sometimes the results and products are marvellous or useful, sometimes we are scared by scientific discovery, and sometimes science and engineering merely seem to us to generate funny, useless, or blatantly irrelevant findings and gadgets. We know, of course, that science is also highly competitive just as competition and getting-there-first is key to company life. However, we are much less used to thinking of science and engineering as deeply social activities. Yet the social, the community, forms the basis of virtually all scientific and technical progress.

The early computer scientists soon found themselves involved in a battle for recognition with the mathematicians. The latter, representing an established science, regarded computer science as an undisciplined intruder on their turf without any clear foundations in the science of mathematics and with no significant claim to originality. Recognition finally came, of course, through demonstrable technical and societal impact, and in the 1980s, theoretical computer science was the place to be if you wanted to be treated as king of the future. Now it was the researchers from artificial intelligence who were treated as dubious intruders by the theoretical computer scientists. Today, theoretical computer science has lost its leading role completely and the artificial intelligence movement is a thing of the past as well.

What happened was that software engineering took over. Software engineering is the discipline of building software which is efficient, transparent, dependable and reusable. It's not a deep science, perhaps, but it is indispensable for building quality IT artefacts of any kind. At the same time, the methodological rather than visionary nature of software engineering prevents it from exerting any strong integral influence on the field of information technologies. IT science and engineering remains an archipelago, composed of sub-communities without any strong contact with one another. The rocks and isles of the archipelago are well known, such as the computer graphics community, the computer speech community, the computer vision community, the computer-supported collaborative work community, the telecom engineering community, etc.

Those communities are *communities*, just like isolated mountain villages, everybody knowing everybody else but knowing precious little of the world outside. This scientific-technical landscape has become underproductive in today's IT world. What we need is convergence of expertise and visions to build systems that people need rather than isolated development of components. But communities are as difficult to get rid of as they are difficult to build. They are held together, and perpetuated, sometimes far beyond the times of need, by personal ties, professional societies, scientific journals, shared conferences and workshops, mutual visits, a deep human need for safety and security, and so on. Once created, a scientific community is as die-hard as any other community. A scientific community always starts with a worthwhile basic discovery, paradigm, or long-term research challenge. But once built, the community takes on a life of its own. Yet we need them, because it is the close ties among people which drives the research along.

i3net is a guinea pig

Among its bewildering tangle of sub-agencies, the European Community's Research Agency for IT called Information Society Technologies (IST) includes a relatively small component called Future and Emerging Technologies (FET). It is FET's mission to look far beyond the present, towards new IT developments which might become the leading paradigms in ten or twenty years. At the same time, FET acts as an EU laboratory for exploring new IT research support mechanisms. In 1995, those goals made FET launch what was called a "proactive research initiative" in Intelligent Information Interfaces (i3) for ordinary people. Four years previously, FET had introduced another innovation, the European Networks of Excellence each consisting of a large fraction of the European inhabitants of some IT science and engineering archipelago isle. The new idea was to combine the network mechanism with a significant number of collaborating IT research projects having a common focus, in order to create an amount of synergy of research effort which could not be achieved through the traditional approach of funding multitudes of non-overlapping, non-collaborating, relatively short-term research projects.

Launched in 1996, i3net, the European Network for Intelligent Information Interfaces, became the first guinea pig implementing those ideas. The network's mission was to demonstrate the increased efficiency of cross-project collaboration compared to the isolated three-year project model used by most national research councils across the world. So, by contrast with the traditional network of excellence which has no built-in relationship with ongoing research projects, in 1997 i3net was tasked with supporting thirteen long-term research projects in computing for local and virtual communities of ordinary people. Twelve additional projects joined in 1998, researching experimental school environments for the 4-8 years old. Seventeen projects on the disappearing computer were gently introduced into the i3 community in 2001.

What happened

What happened was very much like in a basic research project setting out to look at something that has never been investigated before. You end up doing unanticipated things. Equipped with articulate plans to support research in thirteen-growing-to-twenty-five research projects by means of extensive external communication, internal communication, technical collaboration, methodological collaboration, technology transfer, and more, we found ourselves building a new community of researchers, designers, and others with the common purpose of developing artefacts which could meet future needs of ordinary people. Industrial design is traditionally strong in Europe, but the archipelago model has effectively prevented broad cross-talk among designers and technologists. Human-computer interaction (HCI) research is among Europe's strengths as well, but it is only recently that the soft do-good HCI community focusing on users and their needs has begun to become inextricably involved with hard-core technology developers.

We all met twice a year, at least, all 300+ of us. Methodologies for working with users were thoroughly scrutinised. Everybody who was not an industrial designer (like myself) marvelled at the designers' approach to new technology: its hardware orientation, its visionary needs persuasion, its software-innovation-be-damned-what-counts-is-if-it-helps-people thrust. We all faced the tremendous complexity of putting together non-standard technologies for building future systems. As time went by and the technology matured, our joint exhibitions at the i3 community's annual exhibition events and elsewhere proved to everybody that this was one fine approach to IT innovation. Radical interdisciplinarity, or even post-disciplinarity, was achieved in the community being formed, and some community members fell in love with one another.

At the same time, our role as guinea pigs forced us to innovate the ways in which everything was done. We became enemies of frozen long-term plans and roles. Our governing body, the i3 coordinating group (CG), became elected once a year at the General Assembly. The coordinating centre of i3net was kept small. Outsourcing to professionals became a key approach. No task was allocated to anyone for long, thus avoiding that performance failure might seriously damage the community as a whole. No new plan lived for long, being always overtaken by developments and prompt responses by the CG. Inevitably, failures were made by going for what turned out to be, temporarily, at least, impossible to accomplish. For instance, we did not, as a community, manage to do as much synergetic technology development as we wanted to. We believe that this reflects a global challenge to achieving critical mass in advanced systems development, which can only be overcome through more, rather than less, cross-project integration.

What did not change but rather became clearer and more entrenched with time, however, was that the i3 community is a community of, and for, design, technology and people. The community is for convergence of creative content, design and technology. It is for massively interconnecting the obsolete archipelago of IT sub-communities. It is focused on systems for all people. It essentially draws its directions from gleaning how people could live in the future. It is concerned about technology direction, not because of any inclination towards prohibition but because it knows that directions might be changed if we put our minds to them.

The future

Nothing indicates that a community for uniting design, technology and people is becoming obsolete in today's rough IT world. On the contrary: it is certainly not a matter of design or planning that the i3 community's focus on computing for communities, counter-archipelago catalyst philosophy, post-disciplinarity, future-gleaning ethos, and flexible mechanisms of operation now appear to have deeply influenced the EU's 6th Framework Programme 2002-2005 with its focus on 'ambient intelligence'. Rather, we consider this fact a tribute to the i3 community's efforts to invent the future on behalf of all. If true, the i3 community may soon outgrow all current visions of how the Information Society will, or could, develop in the future.

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