to the level of the architecture of the software and even in a couple of cases to writing the software code. During the discussion, I asked him in various ways why flexibility was so important to him. Repeatedly, he indicated that he was committed to "empowering the user." Toward the end of the conversation, he began to justify flexibility for the user in terms of workplace democracy. Ultimately, flexibility, user empowerment and workplace democracy emerged, to my mind, as values that guided his work – in fact, values of a moral character. He and his team literally built these values into the technology (for a similar point, see Winner, 1986). I mean "literally" in that one could not explain why the application had certain character-istics that it did without reference to those values.

When it was initially ready, the virtual office application was tested by installing it on the computers of a group of administrative staff in the lab. Although the "admins" had been eager to be part of the test, once the application was installed, they made little use of it. In fact, they hardly configured their virtual offices at all, and when they did, their designs were far simpler than what the system was capable of. Whatever else this may have indicated, it meant that the admins took almost no advantage of the flexibility that the project team had worked so hard and passion-ately to put into the design of the system. At this stage, the application looked like a potential failure.

During the test, I talked with some members of the admin staff about the appli-cation. When I asked them about the test and what they had done, or not done, in configuring their virtual offices, they said that they couldn't make much sense out of it and that they felt "abandoned." From their perspective, the project team came in, installed the application and went away. The admin staff had wanted more guidance and help from the design team. In further discussions with the admin staff, it became clear to me that among the things that were valuable to them about their work were feeling included and supported.

This, it seemed to me, was a source of the problem. The virtual office application, as an artifactual system, had the values of the design team built into it. But the design team and the admin staff, as human systems, had different values infrastructures. Flexibility for the user as envisioned by the design team, clashed with the admin staff wanting to feel supported. Consequently, what was intended as democratic empowerment was taken as abandonment. So, the problem encountered in testing the application's initial design was not technological so much as it was axiological. In untangling the problem, reconfiguring the functions of the application alone would not very likely address the situation because the criteria against which it was designed in the first place were not functions but values. Since the problem rested with the clashing values infrastructures of the two interconnected human systems, it is there that criteria for a fix were to be found. It was important, I felt, to deal with the clash of values at the level of the human systems. This, in fact, surfaced when the two groups began to talk with one another about the lackluster test. The admins came to understand that the developers had intended the flexibility to put more power in their hands, even though it ended up being technically more than they were comfortable with. The value that the admin staff placed on being supported in dealing with new workplace technologies, meanwhile, came to the attention of the

project team leader. The design team was then in a better position to plan the next phase of the project to include more follow-through support for the admin staff while still incorporating a good measure of flexibility into the design of the application.

The virtual office application can be seen as a socio-technical system. It was conceived of as a technology to link together members of a social group, who in turn could configure the technology in keeping with their needs and styles. In the terms of the broadened perspective on socio-technical systems presented here, the application was an artifactual system that was designed to afford various functions of the human system that would use it. As an artifactual system, its design could not be explained solely in terms of the technical functions it was to serve, but also required reference to the values of its designers. To be useful, to flourish, the application also needed to be configured by the users in ways that would be stable enough to afford the desired social functions, thus enabling them to flourish as a "virtual" group, and to do so in a sustained and sustainable way. The test failed because the admin group made little use of the application's flexibility. This was due to a mismatch between the values infrastructure of the designers, as built into the application, and that of the users. So both the original design of the application as a technological artifact and its failure to afford the intended social functions were rooted in the axiological dimensions of the two human systems.

4 Conclusion

Our lives are today are suspended within a complex network of systems, and increasingly dependent upon their sustenance and stability. This network contains three kinds of systems, natural, artifactual, and human, that are as distinct as they are interdependent. Artifactual and human systems, from economies to cities to organizations to the latest technologies, are products of human design. They embody, by choice or default, our axiological judgments about what is worth doing and how best to do it. If the systems we make are to afford patterns of human life in any way we ought to find acceptable, and reflect the fact that everything we may make is ultimately dependent upon the flourishing of nature, we must make deliberate values assessment a much more explicit element of how and what we design.

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