

Reconstructing Coding Practice - Towards a Methodology for Source- Code

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Abstract

Mutual cooperation between the domains of social research and digital artefact production comprises an important aspect of HCI design projects. Despite this fact, scientific practitioners are confronted by a startling lack of methodologically sound approaches pertaining incorporation of source code into the social research process. The text therefore provides a theoretically founded inquiry into possible reasons and remedies for the situation described.

1 Introduction

1.1 General Approach

Since its inception, the field of HCI has been informed by a set of methodologies “borrowed” from or derived from those of other disciplines. These methodological imports designate both a consistent element of the discipline, while they are part of an accelerating trend: Rather than consolidating itself internally, HCI continues to diversify itself by importing concepts and methods from a growing array of otherwise distinct disciplines and subdisciplines (Rogers, 2012).

This level of diversity is accompanied by an ever growing supply of new concepts and languages. Given this level of heterogeneity, we think it infeasible to establish wholly integrative concepts within HCI project teams. Consequently, the project underlying our discussions aims at providing translations between perspectives, rather than trying to formulate an integrative conceptual corpus. Thus, following Muller (Muller, 1997), we adopted a conceptualisation of HCI as a translational and as a practical endeavour.

Drawing on this concept of translation we employ an approach towards interdisciplinary communication developed by Heidt et. al. (Heidt, Kanellopoulos, Pfeiffer, & Rosenthal, 2013). The goal is to sensitise participants towards the view of others, thus allowing differences to become explicit. We believe this sensitisation can prove to be beneficial and productive on the level of artefact production, be these theoretical or material in nature.

1.2 Project Outline

The discussions communicated unfolded themselves within the aforementioned research context, tasked with developing technologically productive forms of interdisciplinary communication. As a whole, the project concerns itself with the development of translations within interdisciplinary HCI projects. Conducted from the perspective of informatics it emphasises translations to and from source code.

The feasibility of translation-devices is tested within the context of a development project, creating interactive installation to be deployed in museums. Among the prototypes developed are sketches for a mobile-recommender system, a social-media infrastructure as well as a tangible UI installation.

2 Issues Encountered

In order to better facilitate both practices of translation and of production, we highlight some of the methodological shortcomings encountered.

Despite its roots both in cognitive as well as in computer science HCI does not seem to have developed adequate methods for addressing processes of source-code production. Throughout our observations of relevant social research practices, we were confronted with a surprising lack of understanding and a surprising lack of methods addressing the coding process. This is in stark contrast to the high level of intellectual competence displayed throughout other aspects of social research.

During the initial phases of the projects, we came to the understanding that despite their overwhelming interest in the subject area, social scientists seemed to be ill-equipped to deal with processes of source code production. We noted that translations pertaining to the level of code seemed to be substantially harder to accomplish than those to and from physical materialities.

This state of affairs is aggravated by the fact that many modern development styles rely heavily on coding, often bypassing the more formal and more verbal stages of digital production (Boehm & Turner, 2003). There exist remedies to these problems, i.e. in the form of prototyping. However, we believe the potential contributions of social-scientists will be left largely unrealised as long as they remain unable to perform methodological sound reconstructions of coding processes.

In search for a reason for these deficiencies one might again consider the relative disciplinary independence of the methodologies in question. While imported into the field of HCI, they evolved apart from the field of digital production. This seems to constitute both part of their appeal within HCI, as well as rendering them blind to specific forms of digital practice.

Development of suitable methodological tools could inform itself by a discussion of theoretical artefacts created within the fields of informatics and HCI. Subsequently, we discuss a series of conceptual candidates we believe might benefit endeavours tasked with developing adequate methodologies.

3 Theory Candidates

3.1 Concepts

First of all, digital artefacts can be conceptualised in analogy to other material artefacts, leading to the concept of “digital materialities” (Leonardi, 2010). As discussed, informing design processes of physical artefacts seemed to pose no problem for social scientists. While trained for reflection rather than for design, they easily were able to employ their skillsets within the context of a HCI development project.

However, it is our position that adopting the concept of a special type of materiality alone cannot prove to be sufficient. Coding is a practice more complex and exhibiting a more involved set of communicative implications than other design processes.

At least to the computer professionals involved, software construction can be conceptualised as a form of reality construction (Floyd, 1992). In order to do justice to the informatics-side of the process, coding thus has to be acknowledged as a process involving the aspects of negotiation (Curtis & Iscoe, 1990) as well as theory building (Naur, 1985). As far as the community of coders is concerned, it can be viewed as a mode of “world making”.¹

We believe theoretical incentives of this kind provide potential when discussed within the community of the social-sciences. Since many of the works cited emerged from an intensive dialogue of informatics with social and cultural theory, reimporting them should prove to be possible.

3.2 Practice

Practical methodologies allowing for tighter integration and a more direct dialogue of digital design and social theory building processes might be developed by accounting for structural similarities between informatics theory building processes and certain forms of qualitative social research.

While more agile forms of digital production create grave problems for traditional forms of material collection, they also parallel the iterative style of theory development i.e. employed by grounded-theory (Engelmeier, 1994; Glaser & Strauss, 1967).

The importance of this similarity in structure must not be overemphasised for there remain fundamental practical and theoretical differences between both practices of theory building. However, being accustomed to an iterative style of theory development should provide a basis for mutual understanding. Consequently, we believe the discussion of interlocking forms of agile software production and social theory making bears enormous potential.

¹ Whether this mode could be designated as “poetic” in the sense of Warner (Warner, 2002) is left for the reader to be decided at this point. Indeed, further conceptions might liken coding within academic or open-source contexts to other forms of public address. Drawing on more poignant theories of the circulation of speech such as brought forth by Warner would lead to a reformulation of the problem. It would be framed as one of failing to account for the reflexive mode of constitution of the public to be addressed by a particular body of code.

4 Conclusion

We discussed a family of issues encountered while observing interdisciplinary HCI projects within the academic context. Regarding endeavours calling for an unusually high degree of interdisciplinarity, we called into question the feasibility of a common language within project contexts. Instead, we built on conceptions of HCI as a practice of translation. Differences are to be rendered productive on the level of artefact construction, while researchers learn to translate between their disparate disciplinary worlds as well as the world of the users. Despite the roots of HCI within informatics, we found construals of the coding practice to remain insufficient within the HCI domain. We discussed possible reasons for this state of affairs in the context of social research. As a potential remedy, we provided a discussion of theoretical and conceptual elements informing possible future development of more adequate methodologies.

References

- Boehm, B., & Turner, R. (2003). *Balancing agility and discipline: A guide for the perplexed*. Addison-Wesley Professional.
- Curtis, B., & Iscoe, N. (1990). Modeling the Software Design Process. *Empirical Foundations of Information and Software Science V* (pp. 21–27). Springer.
- Engelmeier, G. (1994). *Grounded Theory und Systemanalyse in der Informatik*. In A. Boehm, A. Mengel, & T. Muhr (Eds.), *Texte verstehen: Konzepte, Methoden, Werkzeuge* (pp. 141–158). Konstanz: UVK Univ.-Verlag.
- Floyd, C. (1992). Software Development as Reality Construction. In C. Floyd, H. Züllighoven, R. Budde, & R. Keil-Slawik (Eds.), *Software Development and Reality Construction SE - 10* (pp. 86–100). Springer Berlin Heidelberg. doi:10.1007/978-3-642-76817-0_10
- Glaser, B. G., & Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. (B. Glaser & A. N. Strauss, Eds.) *Observations* (Vol. 1, p. 271). Aldine. doi:10.2307/2575405
- Heidt, M., Kanellopoulos, K., Pfeiffer, L., & Rosenthal, P. (in press). Diverse Ecologies – Interdisciplinary Development for Cultural Education. *INTERACT 2013*.
- Leonardi, P. M. (2010). Digital materiality? How artifacts without matter, matter. *First Monday*, 15(6), 7.
- Muller, M. J. (1997). Translations in HCI: formal representations for work analysis and collaboration. *Proceedings of the ACM SIGCHI Conference on Human factors in computing systems* (pp. 544–545).
- Naur, P. (1985). Programming as theory building. *Microprocessing and microprogramming*, 15(5), 253–261.
- Rogers, Y. (2012). *HCI Theory: Classical, Modern, and Contemporary*. *HCI Theory*. Morgan & Claypool Publishers.
- Warner, M. (2002). Publics and counterpublics. *Public culture*, 14(1), 49–90.

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