

# Software Developers as Users

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Semiotic Investigations in Human-Centered  
Software Development

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*To software designers, developers and users*

# Preface

This book is the result of many years of discussions, thoughts, questioning, trials, errors, improvement, retrials, persistency, doubts, encouragement, challenges, and progress toward a deeper understanding of what is implied by Semiotic Engineering's view that software designers, developers, and users are brought together by computer-mediated human communication processes whenever people interact with digital technologies. For the first time since we started our research in Semiotic Engineering in the early 1990s, we can present “the big picture” of our vision.

The content of the four chapters connects recent research results from PhD theses by Juliana, Luiz, and Rafael, all three of them jointly supervised by Clarisse and Renato. Juliana and Luiz used Semiotic Engineering to investigate, respectively, modeling and programming activities carried out in software development. Rafael combined knowledge about capture and access technology and ubiquitous computing to create the conceptual architecture of a support tool for interpretive scientific research in general and Semiotic Engineering research in particular. Renato has a long and successful history as a researcher and developer in component-based software engineering and distributed systems, among others. Clarisse is the founder and leader of the *Semiotic Engineering Research Group* at the Department of Informatics of the Pontifical Catholic University of Rio de Janeiro, and she was the one who had the idea to write this book, in March of 2015, when Juliana, Luiz, and Rafael were ready to defend their theses.

The heart of the book is the *SigniFYI Suite*, a set of Semiotic Engineering tools to investigate meanings inscribed in software. The suite has five components. Three of them come from those PhD theses. The other two, a foundational concept and a metacommunication inspection method, have been incorporated to help interested researchers, professional practitioners, educators, or students trace connections between users' experiences and decisions made during software design and development.

The suite is introduced in Chap. 2 with a “technical short story,” that is, a piece of fiction (based on true facts experienced by the authors at different times and circumstances). The characters in the narrative and the plot that involves them come back in Chap. 3, in the detailed presentation and illustration of all five component

**Fig. 1** Chung Fu, the Inner Truth hexagram in the I Ching



tools. Following the semiotic theory at their origin, concepts and methods in *SigniFYI* are all to be used in the context of *interpretive* inquiry, which is fitting for exploring meanings encoded (by people) in computer programs.

Near the conclusion of this book looking back at the shape that *SigniFYI* had taken, one of the authors – a long-time learner of oriental traditions – commented that the proposed suite of tools reminded her of one of the I Ching hexagrams, coincidentally (or not) called “the Inner Truth.” I Ching hexagrams are images or metaphors that evoke ancient Taoist wisdom, and this particular hexagram (see Fig. 1), number 61 in the sequence of 64 hexagrams, corresponds to the image of wind over a lake according to Richard Wilhelm’s translation,<sup>1</sup> the association between the hexagram 61 and the components of the *SigniFYI Suite* sprang from the commentary on the image: “The wind blows over the lake and stirs the surface of the water. Thus visible effects of the invisible manifest themselves.” Indeed, since they are *invisible*, the study of “meanings” can only be achieved through their *effects*. So, in a way, *SigniFYI* provides the *surface of the lake* and the forces that make the invisible *winds* of meaning manifest their presence. The semiotic concepts and methods of *SigniFYI* components provide the keys with which we can analyze the shapes that the winds will draw on the water.

As the writing began to unfold, the authors engaged in a greatly exciting intellectual adventure whose final achievement has only been possible with the help and inspiration generously offered by many of their colleagues, students, reviewers, editors, and, most of all, their families and friends. Alan Blackwell, Alessandro Garcia, Arndt von Staa, Bruno Chagas, Carla Leitão, Eduardo Tolmasquim, Ingrid Monteiro, João Bastos, Liam Bannon, Luciana Salgado, and Tayana Conte have attended seminars or commented on manuscripts while the content of the book was “under construction.” The students enrolled in one of PUC-Rio’s graduate courses in 2015 have also provided valuable feedback, which helped produce the final version of the book that readers now has in their hands. The authors are deeply indebted to these people’s incentive, support, and contributions.

<sup>1</sup> Wilhelm, R. & Baynes, C. F. *I Ching or Book of Change: The Richard Wilhelm Translation Rendered Into English* by Cary F. Baynes. Routledge & Kegan Paul, 1951.

Working with Springer has been a pleasure. The authors thank Beverley Ford for welcoming their initial book proposal and for asking anonymous reviewers to evaluate it and help improve it. Beverley is an expert in combining highly professional objective advice with great kindness and warmth. Her constant support from beginning to end of this book project has been literally “vital” in times when circumstances challenged the authors’ trust in their ability to finish the project successfully. The authors also thank James Robinson for helping them prepare the digital manuscript and giving it the fine-looking format that characterizes Springer’s electronic and printed publications.

The research behind this work has been financed by various Brazilian research-funding agencies. The authors thus thank CNPq (Ministry of Science, Technology and Innovation), CAPES (Ministry of Education), and FAPERJ (Rio de Janeiro’s State funding agency). They also thank the supportive intellectual environment and infrastructure provided to them by the Department of Informatics at PUC-Rio, the Tecgraf Institute, and IBM Research at Rio de Janeiro.

Last but not least, this book is dedicated to all software designers, developers, and users because, in the course of their research, the authors have learned to appreciate how much these groups have to say to one another. If they don’t know it, or they can’t do it, it is possibly because they lack the appropriate means for it. This book is thus a modest first step in the direction of bringing people together through computer technology design, development, and use. Such is the authors’ vision of what human-centered computing is all about.

Rio de Janeiro, Brazil  
April, 2016

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