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On Professional Informatical[i] Action

Abstract:

Our patterns of thinking and acting (as "computer professionals") must be out in the open, so as to expose informatical action to criticism by the society as a whole. We are responsible for the provision of knowledge about these patterns. This article criticizes the (defining) use of the trait approach and the functional approach to "profession" in the debate on professionalization in the field of computer science (informatics). An attempt is made to show how informatical action might be better understood by examining the concept of profession in a multidimensional approach, sensitive towards the various perspectives. For this purpose it becomes necessary to examine first of all the various perspectives on the concept "profession" and secondly the debates on professionalization in other disciplines.

Agenda

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"Our head is round so our thinking can change direction." (Francis Picabia)

Preliminary Remarks

This article[ii] criticizes the (defining) use of the trait approach and the functional approach to "profession" in the debate on professionalization in the field of computer science (informatics). An attempt is made to show how informatical action might be better understood by examining the concept of profession in a multidimensional approach, sensitive towards the various perspectives. For this purpose it becomes necessary to examine first of all the various perspectives on the concept "profession" and secondly the debates on professionalization in other disciplines.

Trait approach and functional understanding of "profession"

The debate on professionalization in the field of computer science frequently follows a *trait approach* [indikatorentheoretischer Ansatz] (Cogan, 1953; Greenwood, 1957; Millerson, 1964; Hesse, 1968) or a *functional approach* [funktionalistischer Ansatz] (Parsons, 1939, 1951, 1968; Goode, 1957, 1972) to "profession". Profession is defined as an occupation requiring academic preparation with long specialized schooling and a notable increase of rationality when pursuing action goals. Competencies are limited clearly by the task the client assigned and are oriented towards important individual or collective problems. Personal interests (such as likes or dislikes) are not supposed to have a bearing on professional actions. According to Goode the required high autonomy expresses itself in (a) the right to teach and educate junior staff, (b) the right to exercise professional self-control, and (c) the (autonomous) structuring of professional routine. Also included is a specific ethic, protecting clients with self-incurred obligations by all members of the profession.

Critics from within Computer Science

Schinzel & Kleinn (2001) and others have thoroughly examined the lack of compliance with the traits (which were said to represent the common core of professional occupations) in the field of computer science.

- "Core of the discipline", frequently insisted on for professions: Neither computer science knows, what its "core of the discipline" should be – nor it's clear whether this core can be created at all, exempting perhaps Theoretical Computer Science.

- A clearly defined work area is insisted on for professions: Currently computer science is continuously opening new actuation areas. On the other side, application fields draw nearer towards computer science.

- Extensive autonomy is insisted on for professions: However, IT-Professionals experience strong pressure to comply with schedules in many projects. This haste results in unreliable analyses, products that are prematurely handed over to the customer, incomplete compliance even with legal obligations (among others Hornecker & Bittner, 2000; Ford & Gibbs, 1996).

- Professions require a "long" academic preparation: Nowadays access to jobs in the ICTs does not call for university or college education; no (formal) education may even be required. There is no "knowledge monopoly", and it is debatable whether closing the field is to be desired. Outsiders "crossing over" can be important whenever they introduce their practical knowledge of the application's working environment into projects.

Critics from within Sociology of Professions

The trait approach and the functional approach have been often criticized (among others Johnson, 1972; Waddington, 1996). Some points of criticism are:

- Within the trait approach no underlying selection and structuring principle for the definition of professions are recognizable (cf. Johnson, 1972).

- Due to stricter self- and peer-control, professions are less sensitive to social control and criticism by non-professionals. We should avoid this kind of seclusion for computer science by all means.

- It is hardly feasible to register the complex identities of groups that interact with a multitude of addressees, their sustainers, and society as a whole by lists of attributes (traits).

- Both approaches provide little insight on the activities of professionals and their

corresponding patterns of thinking and acting.

Furthermore the international discussion is made more difficult by the fact that obligations in the USA usually professionalize bottom-up, in German-speaking countries top-down (Koring, 1999: part 6.4). Due to these structural differences it is not viable to simply adopt Anglo-American terms of profession.

A Multidimensional Approach towards the Problem

This criticism becomes even more convincing in my opinion, once traits are used (purely) for definition. The *profession* attribute is then used or becomes pertinent only in case of a sufficient number of verifiable attributes.

This is not an adequate view in the contexts of informatical action. Neither does it contribute to our understanding of informatical action, if we use this as positive attribution. I therefore propose a different view on "profession", one that is multidimensional and open for various perspectives. On the one hand I want to undertake an "expedition"[iii] through existing research, based on articles by Pfadenhauer and Mieg (Mieg & Pfadenhauer, 2003; Pfadenhauer, 2003). On the other hand I would like to demonstrate by means of examples, how the debate on professionalization in pedagogic can be made fruitful for our understanding of professional informatical action.

Sociology of Professions: Anglo-American Approaches

I have already mentioned the *trait approach* and the *functional approach*. It is the main idea of the functional approach that professions take care of central social obligations, as for instance medicine being responsible for the citizens' health. Undertaking a similar task (within an occupational community) is linked to special obligations (considering the public welfare) as well as to special privileges (e.g. autonomy or a higher than average income). It may well be asked whether the profession is a necessary pre-requisite to carrying out this specific service, and, whether all professions are to be considered as fulfilling central social tasks (cf. Mieg, 2003).

Using the *power approach* [machttheoretischer Ansatz] (Johnson, 1967, 1977; Larson, 1977), professions are understood as holding power in the economic and societal area, public welfare being ideology, which conceals the fact that professions define customers' desires and provide the services to fulfill them. The power approach and the functional approach only appear to be controversial:

> "We have always known, from sociological and general literature as well from everyday experience, that professionals and professions act with a dual motive: to provide service and to use their knowledge for economic gain." (Krause, 1996:ix – quoted after Evetts, 2003: 50)

Evetts (2003:50) states, that "the key issue which this dual character raises, both for theories of professions as well as for considerations of aspects of professional performance, is how to maintain this balance."

Focusing on informatical action the *interactional approaches* [interaktionistische Ansätze] and their methodologies may well be very valuable. They concentrate on the professional's relationship with the client, analyzing the interaction between professional and audience (client, society). Professionals claim to know more about certain specifics and especially about what promotes the clients requirements (cf. Hughes, 1965). Upon consideration of the special relationship between client and professional, however the processes of professionalization may easily be forgotten about.

Sociology of Professions: German Approaches

Based on Mieg (2003) three important German approaches shall be briefly described.

Oevermann's *structural approach* [strukturtheoretischer Ansatz] (1978, 1983, revised 1996) is similar to the *functional approach*. It presumes central functions for professions in society. However, only the provision of truth, consent and therapy are considered as central social tasks, crisis-handling as a general function of professional activities being required exclusively in these areas. In order to cope with a problem successfully, scientific as well as hermeneutical and case-specific competencies must be connected in a manner that makes available practical interpretation and strategies for action [realisierte Professionalität]. In addition to this interpretational competence [Vermittlungskompetenz] professionals are required to comprehend the specific logic of interaction pertinent to their profession. Barristers, e.g., need

to understand the logic of court procedures, this being their professional arena. Oevermann's methodology *Objective Hermeneutics*, is used by Hofer (2002) to interpret the consulting component of software development in the conflict between technical problem-solving and vicarious crisis-handling.

Stichweh (e.g. 1992, 1994) explicitly applies Luhmann's *system theory* to professions [systemtheoretischer Ansatz]. He emphasizes the transitional character of professions: "Professions are a mechanism of transition from the society of estates of early modern Europe to a functionally differentiated society of modernity" (1997:95). Society's functional systems experience the formation of performance roles and complementary roles (clients, mandatators). However, we do not find roles for professions in all functional systems. Stichweh states that professionalization takes place

> "wo eine signifikante kulturelle Tradition (ein Wissenszusammenhang), die in der Moderne in der Form der Problemperspektive eines Funktionssystems ausdifferenziert worden ist, in Interaktionssystemen handlungsmäßig und interpretativ durch eine [...] spezialisierte Berufsgruppe für die Bearbeitung von Problemen der Strukturänderung, des Strukturaufbaus und der Identitätserhaltung von Personen eingesetzt wird" (1992:43).

> (where a significant cultural tradition (a context of knowledge), elaborated in modern times in the contour of a functional system's perspective on a problem, is used by a specialized occupational group acting and interpreting within a system of interaction in order to cope with problems of structure, structural change, and the preservation of personal identities – D.B.).

He places the interpretational competence (which is similar to Oevermann's vicarious crisis-handling) in the center of his theory on profession and considers it as the core of the reality of professional action.

Fritz Schütze (1992, 1996, 2000) is a prominent representative of an *interactional approach* [interaktionistischer Ansatz] in the sociology of professions. By means of interactional analysis he intends to reveal "das Paradoxe, das Zerbrechliche, das Fehlerhafte" (the paradoxical, fragile and error-prone quality) of professional action (cf. Schütze, 1996:187). Problems

> "treten immer dann auf, wenn eine Profession nicht mehr systematisch an der (Selbst-)

> Bewußtmachung und der permanenten Berücksichtigung der unaufhebbaren Kernprobleme des professionellen Handelns arbeitet" (Schütze, 1996:187).

> (arise, whenever a profession ceases to consider systematically its (self-)consciousness and permanent deliberation of undissolvable principle problems of professional action – D.B.)

Schütze names several undesirable developments amongst others in this context:

> "gefährliche Vereinfachungstendenzen bei der Anwendung abstrakter Professionskategorien auf Einzelfälle, die Mystifizierungstendenz professionellen Wissens und Handelns, die Tendenzen zum Vergessen der Interaktionsbasis zwischen Professionellem und Klient [...] sowie die Tendenz zur Aushöhlung der Interaktionsreziprozität in der sozialen Beziehung zwischen Professionellem und Klienten [...] durch Verführungen, die mit der Machtposition des Verfahrenswalters [...] gegeben sind" (1996:187).

> (dangerous tendencies to simplify when abstract professional categories are applied to a particular case, a tendency to mystify professional knowledge and action, tendencies to disregard the basis of interaction between professional and client as well as a tendency to undermine the reciprocity of interaction during social relations between professional and client due to the temptations offered by the power position of being in control of the process – D.B.)

Amongst the paradoxicalities of professional action, Schütze counts the prognosis of project development on an insecure empirical basis, the interpretation problem [Vermittlungsproblem], and the choice of the moment for intervention (cf. Schütze 1996:194).

Another approach should be especially pointed out within the interactional approach: the staging approach [inszenierungstheoretischer Ansatz] (amongst others Pfadenhauer, 2003a, 2003b), who considers professional achievement primarily as the presentation of performance. Mieg (2003:36) states, that Goffman's "The presentation of self in everyday life" (1959) is an important basis for this approach. Goffman's distinction between stage and backstage may help in the attempt to examine the detachment in time, space and personnel between requirements analysis (customer involved) and software production (customer not involved)

The Debate on Professionalization in Pedagogics

Two works of Koring (1996, 1999) should demonstrate how the debate on professionalization in pedagogics provide impulses for our discussion on the professionalization in computer science.

Koring's (cf. 1999:part 6.8) understanding of professional pedagogics (as "tackling" with Oevermann's work) is based on two regulating ideas that can be applied to computer science:

- Computer scientists should aim to empower clients to self-acting and autonomy.
- They should aspire to the structure of a maieutic (or Socratic) computer science, e.g. computer science that takes up existing competences productively.

Computer scientists should provide situated arrangements that facilitate self-acting or advance it. The client must be able to deal productively with the (computer-)system-to-be and the cultural changes it will entail – otherwise the computer scientist's task as an "advocate" is not feasible. Acting professionally, the computer scientist structures and accompanies the process in which the clients articulate, for instance, problems and preconditions of their work processes. Computer scientists interpret this newly articulated significance concerning the relation to the subject, person and the design process itself. Those informatical interpretations provide the addressees with a current point of reference within the design process.

Originating from the discussion in General Educational Science, Koring (1996:314ff.) offers an insight into the argument on pedagogical professions within the discussion of educational scientists. Similar questions arise for computer science, once we endeavor to build bridges between computer science and research on professions in order to better understand professional informatical action.

- A profession-related computer science may come somewhat closer to professional contexts of informatical actions by focusing on certain topics, such as a connection between empirics and reflection in computer science, general structures of informatics, a grammar of informatical action (using Koring's arguments).
- The task-oriented variety of a theory of profession (related to computer science)

grapples with the question how far specifics of informatical professionalism have been elaborated up till now (using Hornstein & Lüders' arguments, 1989). At the core lies the hermeneutics of informatical problems, in order to discover a material definition of what informatical professionalism might be.

Closing Remarks

A multidimensional approach towards the "profession" problem with sensitivity for the various perspectives provides (new) impetus for the theoretical discourse in computer science, raising questions[iv] such as:

- How are the orientation towards public welfare and economical actions linked in informatical actions?
- Which structures exist for the interaction between computer scientists and the audience (clients and society)? Which "mechanisms of interaction" dominate? Which way to go towards interactional analyses?
- How complete is our understanding of informatical action in the conflict between technical problem-solving and vicarious crisis-handling?
- How do we, in our role as instructors, "construct" competence in translation and interpretation?
- What is our approach towards the paradoxical, the fragile and erroneous in informatical action?
- How do we reach good quality situational arrangements? What guides us in our informatical action when we have to intervene?

Quite consistent with a General Computer Science (cf. Wille, 1999; Bittner, 2003), I am convinced that our patterns of thinking and acting (as "professionals") must be out in the open, so as to expose informatical action to criticism by the society as a whole. Research on the boundaries between computer science, (sociological) research on professions and pedagogics led us to these fruitful questions and give a fresh impetus to our research on professional informatical action. We should bridge the gap between these disciplines for more findings!

Acknowlegdements

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[i] The unusual term informatical is based on the analogy: mathematics – mathematical, informatics – informatical.

[ii] elaborates on the preliminary work in (Bittner, 2003a) and (Hornecker & Bittner, 2003)

iii This will be a cursory "expedition", as for instance Abbott's approach yet remains unconsidered. Please note publications in the context of the

PROFI project under the direction of Prof. Schinzel, IIG Freiburg.

iv Pursuing these questions we find assistance by the methodical instruments within the respective theories.