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The Role And Worldview of Systems Designers: A Multimethod Study of Information Systems Practitioners in the Public Sector

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The need to integrate the mechanistic logic of computers with the ambiguous nature of living human systems remains fundamental to the successful design and implementation of computer-based information systems. This dialectical tension has been a central theme in MIS research and practice, and has been described in terms of the two-culture problem, the user-analyst relationship and the tension between rationality and emotionality, prompting the call for improved user-analyst communication, increased business knowledge on the part of the designer, user involvement, and mutual understanding. This paper identifies two dialectical and complementary worldviews referred to as design metatheories, both of which are required for effective design practice. Associated with each metatheory are a multitude of attributes, including designer ontology, epistemology, role, value system, and role characteristics. The paper draws upon research in practitioner epistemology, decision-making, and role theory to establish a model linking designer assumptions and designer role. The scientific worldview, characterized as objectivist, reductionist, and mechanistic, is contrasted with its complement, the humanistic worldview, characterized as subjectivist, holistic, and organic. The intellectual foundations of these two metatheories are found in the work of Herbert Simon and C. West Churchman respectively. For each metatheory the model identifies a constellation of internally consistent and mutually reinforcing assumptions, as well as a designer role, value system, and role characteristics.

Drawing upon related research, the paper then derives four hypotheses linking design metatheory with specific role characteristics, including product/service orientation, task/relational orientation, tolerance for ambiguity, and orientation towards hierarchy. These hypotheses were tested, using data from a larger study, involving a 12-month period of participant observation, a 10-month period of semi-structured interviews, and the development of a survey instrument. Administration of the survey was preceded by a brief presentation emphasizing the importance of the study and guaranteeing confidentiality and anonymity. Seventy-eight questionnaires were returned for a response rate of 97.5%, thus precluding the possibility of any significant response bias. The fourteen managers were removed, leaving a core sample of 64 designers. Differences were statistically significant for three of the four hypotheses, with the fourth marginally significant. As hypothesized, scientific designers were more product-oriented, task-oriented, intolerant of

ambiguity, and hierarchically-oriented than their humanistic counterparts. Findings were substantiated through a series of confirmatory interviews with several key informants.

Since the survey data was obtained from a single research site, caution is necessary with respect to generalizability. Subsequent research should (1) validate the model across several organizations, (2) identify and validate further differences between scientific and humanistic designers, and (3) further verify the usefulness of the scientific/humanistic distinction for the practising manager. While the development of an instrument for the assessment of ontological assumptions represents a formidable challenge, there do exist several instruments for obtaining validated and reliable indicators of practitioner values. In addition, role characteristics are highly amenable to measurement, and several reliable and valid measures of task/relational orientation and of tolerance for ambiguity/conflict currently exist.

Many of the classic design predicaments, including a limited conception of the designer role, and an over-emphasis on elaborate and technically sophisticated design techniques, can be traced to an unbalanced emphasis on a rational/scientific perspective. Cultivating conscious awareness of the designer's core assumptions, values, and predisposing characteristics, may be a first step towards addressing this imbalance.

By calling attention to the interlocking set of attributes associated with each perspective, the model allows designers and their clients to recognize their innate predispositions, to make conscious and informed choices regarding their roles in the design process, to diagnose imbalances, and to move fluidly and consciously between perspectives. Resistance to change on the part of both practitioners and clients can be understood and accommodated when recognized as a clash of assumptions, values, and role expectations. All four variable clusters in the model represent potential points of intervention. Implications for the selection, education, socialization, and supervision of designers and for the design of CASE technology are discussed. These metatheories are best viewed as complementary perspectives, as both are required in appropriate balance for effective design. Design strategies which over-value either perspective at the expense of the other are likely to be less powerful and more highly at risk than those which incorporate both. With the prospects of continued increase in both technical complexity and social/political complexity in systems design, the tension between the scientific and humanistic perspectives is likely to become increasingly acute and salient, and the need for techniques, concepts, and research to facilitate integration and synthesis of these perspectives increasingly essential.

Note: A complete version of this paper is available as Working Paper 289, Center for Information Systems Research, MIT, 1996.