

# Developing actionable knowledge on value crafting: a design science approach

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# Developing actionable knowledge on value crafting: A design science approach



Sjana S. Holloway<sup>\*</sup>, Frans M. van Eijnatten, A.Georges.L. Romme, Eva Demerouti

School of Industrial Engineering, Eindhoven University of Technology, P.O. Box 513, 5600 MB Eindhoven, The Netherlands

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## ABSTRACT

Management scholars are increasingly interested in design science. The design science perspective may help bridge the practice–academia divide by developing actionable knowledge that is grounded in evidence. An eclectic approach to design science in this article serves to develop an intervention tool for crafting work using organizational values, called value crafting. First, several ways to implement the notion of design science are explored. A combination of these design science approaches is subsequently used in a value crafting project in a multinational corporation going through an international merger. In this project, a series of studies serves to iteratively develop an intervention tool for value crafting. Finally, the key contributions of our study to the design science literature are discussed.

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## 1. Introduction

Management scholars are increasingly interested in the notion of design science, especially in the context of the practice–academia divide and the need to develop actionable knowledge that is grounded in evidence (e.g., Bate, 2007; Jelinek, Romme, & Boland, 2008; Hodgkinson & Rousseau, 2009; Rousseau, 2012). Simon (1969/1996) pioneered the notion of organization and management research as a design science (DS). A key purpose of combining “design” and “science” is to produce artifacts in ways that scholars test in practice as well as ground in scientific evidence (Van Aken, 2004).

This article draws on a project in which the authors develop an intervention tool for value crafting (VC). This project uses a DS approach to develop both instrumental and descriptive knowledge (Romme, 2003; Romme & Endenburg, 2006). This approach combines three different perspectives on DS: the regulative and reflective cycle (Van Aken, Berends, & Van der Bij, 2007), realist synthesis of research outcomes (Denyer, Tranfield, & Van Aken, 2008; Pawson, 2002), and C–K theory (Hatchuel & Weil, 2009). This article applies and integrates these perspectives in an iterative approach toward developing a VC intervention tool.

Value crafting provides an interesting opportunity to develop knowledge that is both actionable and research-based. VC draws on organizational values to make short-term and long-term changes in organizational work (Holloway, van Eijnatten, & van Loon, 2011).

Thus, the following key research question is addressed: how can a DS approach be used to develop an intervention tool for value crafting? In this respect, our study contributes to bridging the practice–academia divide by creating an iterative DS approach in which theory guides and informs applied work, and vice versa. Throughout this article, a number of key terms are abbreviated as follows: design science (DS), value crafting (VC), regulative and reflective (R&R) cycle, and contexts–interventions–mechanisms–outcomes (CIMO).

The article is structured as follows. The following section outlines the eclectic approach to DS used in this article. The third section presents the context of the problem and research methods adopted in this article and the three studies that inform the design and development of the VC intervention. The fourth section outlines the results, and the final section discusses implications for future research.

## 2. An eclectic approach to design research

In the design science literature, three perspectives are instrumental in capturing the iteration of academic research and practical relevance. This section outlines these three perspectives.

### 2.1. Regulative and reflective cycle

Organizational design and development activities draw on both instrumental and descriptive knowledge. The so-called regulative and reflective (R&R) cycles facilitate the development of both kinds of knowledge. The regulative cycle was first proposed by Van Strien (1997) to structure the processes by which researchers can solve problems in a systematic way (e.g., design and plan the intervention). The

<sup>\*</sup> Corresponding author.

E-mail addresses: s.s.holloway@tue.nl (S.S. Holloway), F.M.v.Eijnatten@tue.nl (F.M. van Eijnatten), a.g.l.romme@tue.nl (A.G.L. Romme), e.demerouti@tue.nl (E. Demerouti).

reflective cycle serves to facilitate developmental learning throughout and after the project, so that the resulting knowledge can also be applied to “a new project dealing with the same type of problem” (Van Aken et al., 2007: 37).

## 2.2. Research synthesis (CIMO)

Designing effective solutions in the area of work and management to a large extent depends on how well findings arising from different stages of the research and development process are synthesized. Synthesis involves “making a design for a solution for the field problem” (Van Aken, 2007: 73). Pawson (2002 and 2006) proposes a realist synthesis approach that seeks to test theoretical ideas on intervention–outcome relations, to learn how interventions work in various contexts.

Denyer et al. (2008) propose a so-called CIMO format (or logic for realist synthesis). CIMO involves the synthesis of research findings into problematic contexts (C) of interventions (I) that, by activating generative mechanisms (M), are likely to produce certain patterns of outcomes (O). The context includes the environmental setting and characteristics of those who can influence change; aspects such as experience, competency, power, uncertainty, organizational infrastructure and system interdependencies fall into this category (Denyer et al., 2008; Pawson & Tilley, 1997 and 2001; Rousseau, 2001). An intervention is any action made with the intention to accomplish particular outcomes. In general, these contexts affect interventions and their outcomes. Generative mechanisms are the basic theoretical mechanisms that explain why interventions generate particular outcomes; examples of generative mechanisms are intrinsic motivation, escalating commitment, social pressure, and social capital. Outcomes refer to the results or consequences of an intervention in its various aspects, such as in the area of knowledge transfer, knowledge sharing, performance improvement, or low error rates (Denyer et al., 2008).

## 2.3. C–K theory

Knowledge discovery and development processes are highly iterative in nature (Kerssens-Van Drongelen, 2001). In this respect, C–K theory provides a “unified design theory” (Hatchuel & Weil, 2009: 181) that draws on a concept space and a knowledge space. As such, it gives way for creative iterations without sacrificing scientific integrity, providing an approach “where creative thinking and innovation are not external to design theory but are part of its central core” (Hatchuel & Weil, 2003). The knowledge (K) space contains the existing and established knowledge perceived to be valid, whereas the concept (C) space contains ideas and hunches that are either unknown or have not yet been firmly established. Partitioning propositions into these two spaces serves to map the design and specification of solutions: the K–C operator is between the existing and initial concepts; the C–C operator is about restructuring the initial (raw) concept into a more developed one; the C–K and K–K operators involve discovery and deduction processes. These operators serve to make the knowledge development process more transparent (Hatchuel & Weil, 2009).

## 2.4. Integration

In developing a model and intervention tool for crafting work using organizational values, we combined the three perspectives on DS previously outlined. C–K theory provides the overall framework/structure of our research strategy. C–K theory provides a design process plan, and serves to develop and refine the concepts and knowledge used in the VC project. The regulative and reflective cycles were used to design a strategy for value crafting by using distilled knowledge within a field experiment. The CIMO format here serves to synthesize research findings toward a tool, in the form of a testable prototype.

## 3. The value crafting project

The VC project was conducted in a manufacturing corporation, referred to here as the International Production Company (IPC). In 2008, the European Union granted approval for a merger and acquisition process of multiple companies, resulting in IPC. The merger resulted in a substantial increase in the number of subsidiaries and offices, some of which had highly different cultures and values. IPC therefore started developing a common organizational culture across all subsidiaries and offices. A key element of this cultural transformation was a model and tool for VC, to be used in the post-merger integration process. The remainder of this section outlines the research questions and methods adopted in each of the studies contributing to the development of the VC tool (for more details see Holloway, 2014).

### 3.1. First study: crafting work

Work crafting involves four important crafting domains: intentions, behaviors, roles, and values. The need for crafting work arises from the employees' need to: assert control over their jobs; create a positive self-image; fulfill the need for connecting with others; and feel part of an ever changing work environment (Wrzesniewski & Dutton, 2001). The research question in this first study therefore was: How does the crafting of work translate into four domains of development (i.e., intentions, behaviors, roles, and values) in individuals and groups? As such, work crafting pertains to how individuals shape their cultural embeddedness at work, that is, their internalization of rules, norms and values. Crafting work can thus lead to a collaborative work environment “in which employees are able to develop their personal resources through learning processes and by translating already existing resources to other valuable assets” (Kira, van Eijnatten, & Balkin, 2010: 619).

The present study includes collecting data in two control teams and inviting one experimental team to participate in a work crafting intervention. In the latter team, work crafting was implemented with help of a set of hint cards. This set consisted of ten cards, eight of which contained an assignment in the one of the four domains of development (i.e., intentions, behaviors, roles, values) and two cards were left blank. The blank cards were created for participants who wanted to create or share their own ideas. Regarding the other eight cards, each domain was represented in two cards. One of these cards represented an ‘a priori’ assignment, and the other card depicted ‘a posteriori’ assignment. The former assignment would be carried out before engaging in it, and the latter assignment was to be carried out directly afterwards (Baehr, 2006).

We used questionnaires, direct observations, and focus-group interviews to collect data, and all sessions were audio and video recorded. Moreover, the regulative–reflective cycle, CIMO format and C–K theory serve to evaluate the methods used, and create a preliminary VC proposition (Holloway, 2014).

### 3.2. Second study: crafting work using organizational values

VC extends the broader notion of work crafting by focusing on value use, a specific developmental mechanism (i.e., translation and transcendence) in which an organizational value is used to facilitate learning and development in intentions, behaviors, social roles, and organizational culture. The question in this study was: do VC efforts to change work by way of organizational values influence individual and team development?

This study examined two research and development (R&D) teams at different stages of cultural development, drawing on a longitudinal (t1 and t2) as well as cross-sectional research design. VC was implemented in these teams by means of an intervention in which the team members were instructed in VC and then prompted by a facilitator to follow a four-step process. Data were collected by means of

questionnaires (t1, t2), recorded observations (t1, t2), and focus-group interviews (t1). The regulative–reflective cycle, CIMO format, and C–K theory were used to conceptualize and plan the interventions, and to evaluate the methods adopted (Holloway, 2014).

3.3. Third study: spontaneous value crafting

Because the previous two studies involved interventions directed by a facilitator, the present study established whether or not non-directed VC would have a significant influence on individual or team development? In the third study, participants were thus able to value craft whenever or wherever they deemed it appropriate, if at all. Participants were invited to write a diary, to avoid a strong retrospective bias when data are collected weeks or years after the events have actually happened (Bolger, Davis, & Rafaeli, 2003). As such, 71 individuals from IPC subsidiaries in five countries completed a diary over a period of four weeks. We also used the internet to collect additional (e.g. biographical) information about the participants. These methods were embedded in the regulative–reflective cycle and C–K theory, to direct the process toward a VC intervention tool (Holloway, 2014).

4. Results

The studies previously outlined inform the development of a model as well as tool for VC. The iterative nature of this process appears in Fig. 1. The remainder of this section first outlines the results of the studies outlined in the previous section. Subsequently, we describe how these research findings were used to develop a model and intervention tool for VC.

4.1. Main findings of the consecutive studies

This section discusses the key findings arising from each separate study. Holloway (2014) provides additional details.

4.1.1. Findings from first study

This study explores whether or the crafting idea is useful in an actual intervention. The knowledge space includes literature about work design and human resource development. The concept space served to introduce the notion of work crafting and the four domains of development, and to create a (hint card) intervention. The key proposition in this study was: within the context of teams in an international company going through a merger (C), work crafting interventions (I) will trigger the mechanisms of transcendence and translation between the intention, behavior, role and value domains (M) in order to enhance and develop human resources in all these domains (O).

The findings arising from the experimental interventions conducted in this study (also compared with two control groups) suggest that the mechanism of translation is easier to identify in the data than the mechanism of transcendence. We also observed that the intervention brings about outcome changes related to the different domains. A key finding was that crafting work appears to yield its most tangible results when there is group participation and facilitator guidance. With a facilitator guiding the process and providing hint cards, participants were willing and able to craft work (Holloway, 2014).

4.1.2. Findings from second study

In the second study, the R&R cycle helped evaluate plans for redesigning work based on VC and define the design knowledge to be included in the VC intervention. In the knowledge space of this study, the prior literature as well as the domains of intentions, behaviors, roles, and values were extended by adding literature on complexity research. In the concept space, we created a preliminary VC method to craft work by using organizational values in a business context. This intervention contained four steps: (1) picking an organizational value and better understanding it; (2) developing intentions concerning what to do with it; (3) applying it to daily work; and (4) adopting the company value.

The findings from the interventions in two R&D teams in IPC confirmed that all four domains could be used in accomplishing behavioral change. The key CIMO proposition arising from this study was: within the context of teams in an international company going through a merger (C), value crafting interventions (I) trigger the mechanisms of transcendence and translation between intentions, behaviors, roles and values (M), to enhance work performance and satisfaction as well as the adoption of new company values (O). The findings support the conclusion that this CIMO pattern is present in the data to some extent (Holloway, 2014).

4.1.3. Findings from third study

The third study focuses on the evaluation of non-directed VC. In terms of C–K theory, we studied literature about diary studies as well as longitudinal data-collection techniques and pattern analysis in the K-space. Within the C-space, the idea of self-guided crafting and its potential effects were explored. The key proposition here is that within the context of managerial work in an international company going through a merger (C), naturally occurring value crafting (I) will trigger mechanisms of translation and transcendence between intentions, behaviors, roles and values (M), to enhance work performance as well as the adoption of new company values (O).

The diary data collected in this study served to analyze where and when people were using organizational values in their daily work. While there were some indications of crafting values in how participants did their work, these VC efforts were highly undirected. Participants employed unstructured VC strategies, for example triggered by their co-workers and work settings. Therefore, these crafting efforts could not be used in any kind of sustainable practice for making short-term or long-term changes in organizational work and culture. In terms of developing the VC model and intervention tool, the findings in this study reinforce the conclusion arising from

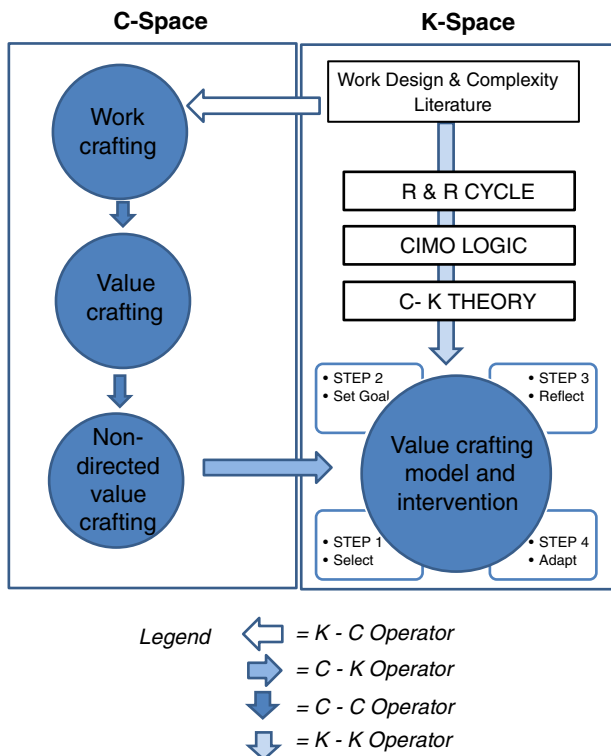


Fig. 1. Overview of the design science approach used in the VC project.

the first study about the importance of deliberately guiding and supporting the VC process (Holloway, 2014).

#### 4.2. Toward a model and prototype

The findings from the three studies contribute to the development of the VC model. In the first study, a hint card intervention was designed and used in which participants picked a domain in which they would like to develop one of the four domains (intentions, behaviors, roles, values). This intervention apparently supported thinking about work (intentions), flexible task building (tasks), mindfulness about how to improve the group process (values), and participative decision making (roles). In the second study, organizational values were used as a means to encourage participative and proactive work in two R&D teams. These teams developed strategies to include organizational values in their team work. The third study involved a non-directed VC process. This study shows some VC was happening, but in a highly undirected manner. The three studies together demonstrate that directed VC is much more effective in accomplishing organizational change than non-directed VC.

#### 4.3. Alpha and beta testing of model and intervention tool

Subsequently, alpha and beta tests of the VC intervention model and tool were conducted. The alpha test was conducted with five different external experts from a variety of specializations and backgrounds. These experts gave useful feedback regarding the validity and usability of the VC model and intervention tool, which was subsequently used to improve the facilitator's manual and the intervention tool for the beta test. The beta test was conducted in another company, an international construction corporation.

The alpha testers (ATs) were asked to fill in a short questionnaire in order to gauge the goals, usability, theoretical soundness, clarity and appropriateness of the VC model and intervention tool. ATs were asked to read the theoretical materials provided, and to complete the questionnaire. The surveys were sent to ATs to assess the information they received about the intervention tool. The feedback from the ATs included the following recommendations: provide more background information to the VC facilitator with respect to the background VC theory; simplify procedures and use more industry-specific language; and focus more on practical activities created by the participants themselves. Most of the recommendations were incorporated in the revised tool.

The beta testing was conducted in two workshops, because of the limited time that staff members of the company involved could make available. Instead of conducting four workshops, each covering one step of the VC intervention model, each workshop thus involved two steps. Participants created scenarios to craft values in the workshops and they were given an assignment to craft values at the end of the first workshop. That VC assignment would be done during the one-week break between the two workshops. The beta test in these workshops resulted in a variety of findings. First, all sessions in the beta test were successful in having the assigned steps executed. Second, with regard to the translation mechanism, we observed clear transitions of a value being translated into a team intention, an intention into behavior, behaviors into a role, and roles into an adopted/adapted value. Finally, because a Gamma test could not be conducted in this project, the evaluation of the intended outcomes (in work performance and perceived satisfaction) was inconclusive.

The overall effectiveness of the alpha and beta tests can now be assessed. The alpha test mostly showed a positive result. The feedback received from the ATs was helpful and was incorporated into the intervention tool. The results of the beta test were mainly positive. However, not all of the changes predicted by the VC model could be observed in this test.

## 5. Discussion and conclusion

The study contributes to the literature on management research methods by developing an eclectic approach to design science. In this respect, the VC project reported in this article draws on three different ways to approach design science: the regulative–reflective cycle, CIMO-based research synthesis, and C–K theory. As such, the study here serves to bring together three distinct discourses on design science, and the work on the VC project also suggests that these different discourses can be effectively combined. The eclectic approach adopted in this article also reflects the pragmatist stance that prevails in design-oriented research (Romme, 2003).

More specifically, the regulative and reflective cycle enables directing the process toward specific (tools for) interventions, while also facilitating developmental learning throughout and after the project, so that the knowledge arising from the project can be applied elsewhere (Van Aken et al., 2007). The CIMO format served as a tool for shaping the intervention strategy and plan in the VC project. Here, CIMO appears to provide a language for knowledge sharing across distinct domains (cf., Nonaka & Von Krogh, 2009). Finally, C–K theory facilitated the cyclical nature of design reasoning in the VC project, thus providing an effective tool for iterating between knowledge and (creation of new) concepts. In this respect, C–K theory enhances both the transparency and replicability of the process of designing a tool for practical inquiry (cf., Worren, Moore, & Elliott, 2002).

However, the VC project was also somewhat limited in its scope. In this respect, the number of teams or participants in each of the studies was rather small. This was partly due to differences between the research and corporate timelines in the field work conducted. That is, the pace at which the industrial partner needed practical solutions was much higher than what we as academics would normally be able to offer. For example, the opportunity to collect more longitudinal data would have reinforced the reliability of the results arising from the third study. Moreover, the conceptual VC model and the prototype of the intervention tool would benefit from additional field testing in other firms and locations. Future work in this area therefore needs to draw on Gamma testing and longitudinal data collection over an extended period of time.

Overall, this article demonstrates that an eclectic approach to design science is highly effective in conceiving and testing intervention tools that are grounded in academic knowledge.

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