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Implementing Innovation Management Systems Through the Done–Check–Act–Plan Cycle (DCAP)

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Abstract:

This study addresses the need for pedagogical practices supporting learning and implementation of the ISO 56002:2019 Innovation Management System standard (ISO 56002). Adopting an abductive research approach, the study iterated between empirical data and theory to develop DCAP (Do–Check–Act–

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Plan) as an integration of pedagogical and learning dimensions at an individual, team, and organizational level. Using a multiple-case research design, empirical data were collected from organizations engaged in innovation management system development. The findings indicate that DCAP functions as a pedagogical and operational structure that helps people interpret, enact, and expand their learning of the ISO 56002 in practice, and serves as a complement to the PDCA (Plan–Do–Check–Act) approach. The study contributes empirical insight into how learning processes support the enactment of ISO-based Innovation Management frameworks. Limitations and future research are discussed.

Keywords: Innovation Management; Innovation Management System, IMS; ISO 56002:2019; Done-Check-Act-Plan; DCAP; PDCA.

PROBLEM

Research on the ISO 56002:2019 Innovation Management System – Guidance (ISO 56002) shows that it provides a holistic and systematic approach to innovation work (e.g. Cortimiglia et al., 2015; Barboza et al., 2023; Arslan et al., 2024; Demir et al., 2025). However, recent studies call for stronger theoretical frameworks for innovation management systems (IMS) (Karstegl et al., 2025) and for improved pedagogical support to facilitate implementation in practice (Johnsson et al., 2022; Kihlander and Richardsson, 2024). This article explores ways to support and facilitate practical implementation of the ISO 56002.

Further, innovation work is carried out by people, with human needs and expectations related to e.g. development, protection, recognition (ISO 56002:2019), and related work needs such as making progress in meaningful work, creativity and work orientations (Amabile and Pratt, 2016), as well as needs related to positive emotions and the broadening of the thought-action repertoire (Fredrickson and Branigan, 2005) which motivates further research on the human aspects when implementing the ISO 56002. The ISO 56002 is built on the Plan–Do–Check–Act cycle (PDCA) (ISO 56002:2019), which can add structure to the innovation management (e.g. da Silva, 2021). However, planning requires knowledge (e.g. Rydin, 2007) and the ISO 56002 can appear oversimplified (da Silva, 2021; Tidd, 2021).

Considering the challenges and aspects of the above, this study contributes to both innovation management research and innovation pedagogics, defined as “deliberate interventions in an organizational context that enable the learning and implementation of innovation management practices” (Johnsson et al., 2022), by the Done–Check–Act–Plan cycle (DCAP), aiming to increase learning and understanding of ISO 56002 by positioning DCAP as a supplement to PDCA during its implementation.

CURRENT UNDERSTANDING

To frame our research, three areas were selected: innovation pedagogics, the PDCA in ISO 56002, and individual, collective, and organizational learning. Related to our research, they all address central learning and pedagogical aspects.

Innovation pedagogics

Innovation pedagogics—understood as knowledge of the principles and vocabulary of innovation, as well as its learning actions—is critical to successful innovation management; ultimately, innovation is enacted by people (ISO 56002:2019; Engeström and Sannino, 2010).

Organizations often rely on external consultants or advisors for education and support, reflecting persistent difficulties in adopting and sustaining innovation management practices (e.g. Blackbright, 2019; Lidman et al., 2022). In this context, consultants or advisors can be understood as innovation pedagogues whose role is to create conducive learning conditions and promote learning within client organizations (Johansson, 2017). Innovation pedagogy is not a one-way process; it is multidirectional and relational, unfolding through interactions during the learning process (Ohlsson and Döös, 1999). Although research on external support for innovation exists (e.g. Börjesson et al., 2014; Brix, 2020; Rampa and Agogué, 2021; Johnsson et al., 2023), most studies focus on internal support roles such as innovation coaches, managers, or leaders.

Research on the pedagogical aspects of implementing the ISO 56002 remains limited. A few exceptions include Johnsson et al. (2022), who highlight SMEs' difficulties in understanding the standard's content and terminology, and Kihlander and Richardsson (2024), who examine how IMS implementation can be facilitated in SMEs. Related work by Kihlander et al. (2024) identifies critical factors in designing an IMS. None of these studies, however, addresses the challenges associated with the PDCA.

The PDCA in the ISO 56002

Following Moen and Norman (2010), PDCA emerged from Japanese reinterpretations of Deming's work after his 1950 JUSE seminars, later superseded by Deming's the Plan-Do-*Study*-Act (Shewhart) cycle (PDSA), used for learning, testing and implementation. Within the ISO 56002, the PDCA provides a structured approach in four phases: *Plan*, defines objectives and actions to address opportunities and risks; *Do*, executes planned support and operational activities; *Check*, monitors progress against objectives; and *Act*, takes actions to continually improve IMS performance. PDCA can be applied to the overall IMS and its elements (ISO 56002:2019).

The PDCA approach offers several benefits, including support for learning (Loyd and Gholston, 2016) and for structuring innovation management activities (da Silva, 2021). However, recent research criticizes PDCA for being oversimplified and for encouraging a check-box mentality that underutilizes its iterative potential (da Silva, 2021). Further critiques highlight that continuous learning is insufficiently addressed in the ISO standard, which may result in outdated activities and structures and potentially hamper innovation (Kihlander et al., 2024).

Moreover, PDCA does not fully account for the complexity of operational innovation work, including false starts, iterations between stages, and dead ends; it has also been described as too detailed and complex to be useful for small firms, where unexpected opportunities are difficult to integrate into extensive planning processes (Bolisani and Scarso, 2022). Planning itself requires substantial domain knowledge, as planners must understand the causal relationships between actions and intended impacts (Rydin, 2007). This view is further developed by Davoudi (2015), who conceptualizes planning as a practice of knowing—encompassing knowing what, how, to what end, and doing. In addition, innovation activities may be conducted unknowingly due to unfamiliar

terminology (Kleinknecht, 1987) or because relevant knowledge remains tacit and difficult to articulate (Dooley et al., 2013; Esterhuizen et al., 2012).

Individual, collective, and organizational learning

As 'innovation knowledge' and learning are critical to innovation, a thorough understanding of how learning occurs within organizations must go hand in hand with the application of the ISO standard.

Organizational learning, as described by Crossan et al. (1999), unfolds across multiple levels—the individual, group, and organization—and encompasses both the creation of new knowledge and the use of existing knowledge. It is, in other words, a dynamic process characterized by feed-forward and feed-back flows, through which learning moves between individual intuition, collective interpretation and integration at group level, and ultimately toward institutionalization at the organizational level.

Collective learning can be understood through structural dimensions such as alone–common, private–public, and specific–general. Learning emerges as individual experiences move from private sensemaking toward shared articulation and are embedded in collective tasks, norms, and rules that shape organizational practices and structures (Granberg et al., 2021).

Individual learning is commonly explained through Kolb's experiential learning theory, where learning unfolds through concrete experience, reflective observation, abstract conceptualization, and active experimentation within learning spaces, and where individuals' learning styles evolve through ongoing interaction with the environment (Kolb and Kolb, 2005), highlighting the importance of designed learning environments shaping human development (Kolb and Fry, 1975).

Reflective learning as an embedded learning mechanism

Drawing on Antonsen et al. (2011), theories of learning and change in organizations emphasize reflection as central to improving professional practice and service quality. From this perspective, reflective learning can be understood as an interplay between action, reflection on action, and the exploration of new possibilities, embedded in everyday work practice.

From a harmonizing perspective, expansive learning theory highlights collective reflection as a key driver of organizational change, enabling activity systems to evolve through questioning established practices and the joint construction of new meanings (Engeström, 2001; 2015; Engeström and Sannino, 2010). Such learning processes are often operationalized through structured reflective methods, such as debriefing and systematic collective review, which allow teams to learn from real-world events and have been shown to improve performance and collective learning outcomes (Tannenbaum and Cerasoli, 2013).

Extending this view, action learning aligns with this perspective by framing reflection as a process that occurs in and through practice—focused on actions taken—rather than as an individual, purely retrospective activity (Pedler et al., 2005; Olsson et al., 2010). Recent work in critical action learning further broadens this understanding by foregrounding emotional, relational, and power-related dimensions of reflection, thereby broadening reflective learning beyond instrumental evaluation (Hauser et al., 2023).

Action learning as a framework for knowledge-building

Against this background, in this research and context, we understand action learning as a practice-based framework integrating individual and collective learning through reflection on practice (Rohlin, 2012; Tiller and Gedda, 2017).

Drawing on appreciative inquiry as a complementary theoretical lens, inquiry and dialogue within action learning may be conceptualized as a multidimensional knowledge-building process that is simultaneously *scientific*—understood in a socio-rationalist sense as systematic inquiry into experience—and *metaphysical*, oriented toward meaning, emerging futures, and not-yet-known forms of human action. At the same time, this process is both *normative*, in its ethical aspiration to affirm and enhance what social life is and might become, and *pragmatic*, in its generative focus on action, social transformation and innovation (Cooperrider, 2021). This highlights that innovation requires the integration of knowledge management, learning, and creative action, rather than treating knowledge creation as an end in itself (Basadur and Gelade, 2006).

Action learning can thus be understood as a relational framework in which dialogue and inquiry, action, reflection, and value creation are interrelated rather than sequential. It is a process through which practitioners, individually and collectively, learn by acting within their own practice, reflecting on those actions, and using the insights gained to inform and improve subsequent practice (Pedler et al., 2005). A concrete operationalization of this logic in Scandinavia is the method Gjort–Lært–Lurt? (Tiller and Gedda, 2017), translated as *Done – Learned – What's Wise?*, which makes the relationship between action, sensemaking, and reoriented practice explicit and practically applicable in professional contexts.

Making progress in meaningful work

These learning perspectives connect to research on motivation and well-being in innovation work. The progress principle explains how experiences of making progress in meaningful work strongly influence individuals' cognitive and affective states, strengthening motivation, self-efficacy, and persistence in creative and innovative work over time (Amabile and Pratt, 2016). These dynamics relate to fundamental motivational needs at work, such as feeling good, being competent, and appearing competent, which contribute to outcomes perceived as valuable (Blomquist et al., 2018).

Together, this research underscores the importance of learning structures that enable both progress, reflection and affection as conditions for sustained innovation work.

Research gap

As stated in ISO 56002, innovation work is carried out by people, which makes learning central to its implementation. However, research is still needed on how organizations learn to enact ISO 56002 professionally in practice. To address this gap, this study proposes a learning-oriented framework to support the implementation of ISO 56002.

A guiding question formulated and used throughout the research was: How to support individual, collective, and organizational learning and implementation of the ISO 56002?

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RESEARCH DESIGN

Approach

This research adopted an abductive approach, iterating between empirical data and theory to develop DCAP as an integration of pedagogical and learning dimensions. Abduction enables empirical insights and theory to jointly inform design and refinement and is well suited for identifying new variables or relationships (Dubois and Gadde, 2002).

Accordingly, the study alternated between workshops and coaching sessions, theoretical analysis, and iterative refinement of DCAP. The theoretical framework draws on the ISO 56002 as a structural foundation, complemented by organizational, collective and individual learning theories. Together, these perspectives form the structure of DCAP.

Data collection

Following a multiple-case research design (Yin, 2009), empirical data were collected from eight organizations engaged in innovation management development initiatives. The organizations were selected from ongoing projects and professional networks of innovation management practitioners with explicit innovation ambitions. In total, 11 respondents participated, representing innovation managers, SME managers, project managers, and researchers from research institutes (Table 1).

Data were generated through facilitated workshops and coaching sessions, participant observations, fieldnotes, and semi-structured interviews. Data collection and analysis were conducted iteratively alongside the development of the DCAP framework, with workshops and coaching sessions serving as the primary arenas for empirical inquiry. During these sessions, open-ended questions, visual models, and metaphors were used to support participants' understanding of ISO 56002. Participant interactions were observed, interpreted, and documented in PowerPoint slides, which functioned both as analytical notes and as material for subsequent feedback and presentations.

The empirical material was analyzed to identify recurring challenges, learning needs, and interpretative gaps in existing innovation management practices. These insights informed successive revisions of the DCAP's structure and content. In addition, 19 open-ended interviews were conducted, eight of which were follow-up interviews with the same respondents. All interviews were held online and recorded.

Table 1 Respondents

Respondent	*Role*	*Respondent*
A	Firm representative	Mussel firm
B	Firm representative	Seaweed firm
C	Firm representative	Fish product firm
D	Firm representative	Fertilizer firm
E	Innovation- and change advisor, seafood expertise	Science Park
F	Innovation- and change advisor, seafood expertise	Science Park
G	Innovation and process leader, main facilitator	Research institute
H	Innovation and process leader, project manager	Research institute
I	Innovation and process leader, project manager	Research institute
J	Project coordinator	University
K	Innovation- and change advisor	Consultant

FINDINGS

In this chapter, we first present our empirical findings in the form of the DCAP—Done (What's been done), Check (What have we/I learned), Act (What's wise), and Plan (Next steps)—developed through iterative processes. This is followed by a presentation of the DCAP structure and its content.

Empirical findings

The data presented in Table 2, derived from a selected sample of respondents from the organizations in which the innovation management standard was intended to be implemented, indicate that the DCAP structure can support the implementation of ISO 56002 content within organizations. Illustrative quotes are omitted for non-disclosure agreement reasons.

Table 2 Empirical findings

Phase	*Quote*	*Respondent*
Done	"I went back to my colleagues, showing them—using the picture [10 types of innovation]—how we were just focusing on our offerings."	B
	"We have verified that our product does not contain …"	D
	"The meeting today here … spending a few hours in a structured way. It is good! I wouldn't have taken the time for this otherwise!"	D
Check	"We are learning that [B2B] stakeholders want to have a new type of engagement with us."	B
	"The question is now: how to build the quality process within the group (corresponding to the 'innovation process')? And for me to take on that 'quality' role."	C
	"Important stakeholders in the city of [name] have shown interest in new form of engagement with us"	D
Act	"We, then began exploring additional services by identifying new uses for our machines."	B
	"The role of innovation manager was not considered feasible, as [name] and the rest of the management team did not sufficiently understand the role; instead, I will need to take on the hat of Quality Manager. And talk that language [instead of innovation language]."	C
	"To find the equivalent verification for the product, produced by [name] does not contain [name]."	D
	What if… "has become known as an "environmental company" through its environmental work – a case at the School of [name]… ."	D
	What if …"selling more environmental value."	D
	What if …"help our customer with something else": circular flows:"	D
	What if …"The Environmental permit; once is granted, it will enable …. farming."	D
Plan	"We now plan to support [B2B] partners through our …; this is expected to generate approximately … revenue"	B
	"We plan to reassess how we present …. as an exceptional food product from a consumer perspective, in relation to the market and in relation to investor."	D
	"How might we explore opportunities for investment support?"	D

Done–Check–Act–Plan, structure and content

Research on creativity and innovation has shown that a sense of progress in work, learning domain-relevant skills, meaningfulness, affect, and motivation play a critical role in sustaining individual and team creativity over time (Amabile and Pratt, 2016). Against this backdrop, the DCAP:2025 (Figure 1) emerged as a conceptual model designed to support the implementation of the ISO 56002, as illustrated below.

The DCAP can be understood as an entry point to the PDCA; however, while planning requires knowledge (Rydin, 2007; Davoudi, 2015), the DCAP therefore emphasizes the creation of new knowledge through learning: learning from articulating what has been done

(D); reflective learning from completed activities (C); learning by considering what´s wise (A); as well as learning by planning next steps (P).

Related to the implementation of the ISO 56002 the DCAP is understood as a multi-dimensional process to support construction of new knowledge (scientific, metaphysical, normative, and pragmatic), in line with (Cooperrider, 2021). This learning orientation enabling informed planning of future actions (e.g. Tiller and Gedda, 2017) and strengthening the context's "generative capacity" - that is, its "ability to foster dialogue about that which is taken for granted and [its] capacity for generating fresh alternatives for social action" (Cooperrider, 2021).

DCAP comprises four phases, each guided by value-creating questions (Table 3), inquiry and dialogue inspired by appreciative inquiry (Cooperrider, 2021); e.g. Why – what's stopping? analysis (Basadur and Gelade, 2006;) and e.g. What´s wise (Tiller and Gedda, 2017), as illustrated in the following.

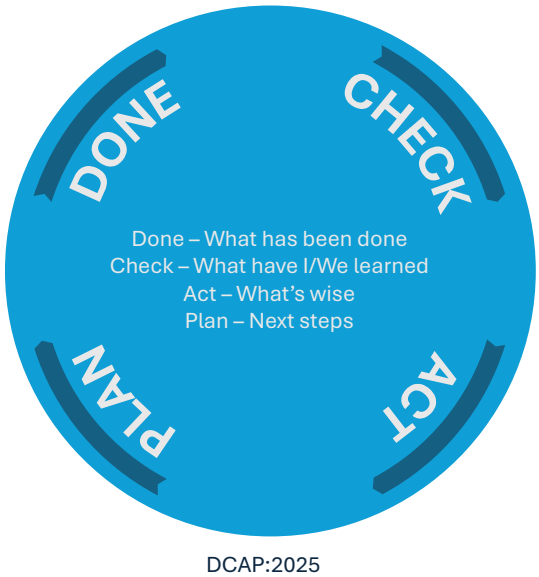

Figure 1 The DCAP:2025

Done – What has been done

Grounded in what has taken place in practice the advisor's work is to: supporting client development and expansive learning (Engeström 2001).

To start focusing on *Done* means making visible and explicit what has been done in order to reveal tacit knowledge (know-how), in accordance with Esterhuizen et al. (2012)—actions taken, decisions made, and interventions carried out —thereby establishing a shared and psychologically safe point of departure, as emphasized by Amabile and Pratt (2016), for collective reflection and further learning, rather than triggering psychological judgment—such as perceptions of not having done enough —or not feeling good, being good and looking good (Blomquist et al., 2018).

Through inquiry and dialogue, a shared factual grounding is established, and anchoring reflection in lived experience rather than in intention or assumption. Given that, tacit knowledge is often so embedded within the individual that its significance may remain unnoticed (Dooley et al, 2013). The key action is therefore the development of new tacit knowledge through in-person sharing (Esterhuizen et al., 2012).

Check - What have I/We learned

The DCAP approach then moves to Check, which historically corresponds to evaluating results, as articulated in the development of the PDCA (Moen and Norman, 2010). In DCAP, Check explicitly emphasizes learning through inquiry and dialogue, supporting experiential learning and its effects at individual, collective, and organizational levels. Reflection on practice enables participants to transform experience into insight that informs subsequent active experimentation (Kolb and Kolb, 2005).

This process aims to eliciting discrete positive emotions, such as e.g. contentment and curiosity, contributing to the broadening of the thought–action repertoire (Fredrickson and Branigan, 2005), as well as support intrinsic motivation, the development of domain-relevant skills, and creativity-relevant processes, thereby fostering progress in organizational innovation (Amabile and Pratt, 2016).

This second step draws also on theories of collective learning that explain how individual sensemaking is articulated, shared, and integrated into collective practices, thereby supporting organizational learning across levels (Granberg et al., 2021; Crossan et al., 1999).

Act - What's wise

Inspired by Tiller and Gedda's (2017) concept of *What's wise*, the third step, has a future action- and innovation-oriented focus, as well as a non-action focus, based on what has been learned. This represents an important dimension when work is characterized by action learning, action research and exploration, as is often the case in innovation processes. The notion of What's wise closely resembles the Norwegian concept of *lurt*, referring to situational judgment about the appropriateness and timing of action—or deliberate non-action.

Building on what has been done and learned along the way, this phase is intended to capture what we wish to invest in going forward (Tiller and Gedda, 2017), and to use accumulated knowledge to generate options, such as alternative opportunities to pursue or possible solutions to investigate (Basadur and Gelade, 2006).

This aligns with the historical development of the PDCA, in which the Act phase addresses questions such as *What changes are to be made?* and *What are we trying to accomplish?* and provides a framework for developing, testing, and implementing changes in work practices to achieve improvement (Moen and Norman, 2010).

Plan – Next steps

In the fourth phase, Plan, participants build on prior insights to plan concrete activities such as changes, tests, and idea development to generate new knowledge for innovation. This phase can also be understood as an entry point into the PDCA.

Here, planning for innovation processes (e.g. Tidd and Bessant, 2024) and related practical activities and methods play a natural role, such as design thinking (e.g. Lewrick et al, 2020).

This phase is also about supporting people involved in carrying out the practical work, by the creation of "high instructional value", that provides answers to the question: "How should I do this?", inspired by Lind and Lisper (1990). This is preferably done through clarification dialogues addressing: What? Why? For Whom? When? Where? How? With which resources? And with whose strengths and talents?

Table 3 DCAP value-creation core questions

Phase	*Inquiry-based questions supporting value creation*
Done	What has been done and what has happened?
	What progress has been made, and what actions were taken?
	What have you or others done to contribute to progress?
Check	What have I / we learned?
	What has been generated from what we have done?
	What enabled these outcomes?
Act	Based on what we have done and learned…
	What is wise? to… do next, stop, strengthen, continue, start—or intentionally not do yet?
	In an ideal world—or desired future state—what would we like to see and experience more of/less of, and why?
	What if …? What if we …?
Plan	What are the next three steps to take, as well as for you and me, us?
	What do you/we need to make planned steps/activities happen?
	How might …? How might we…? Why – what's stopping us?

CONTRIBUTION

Despite this limited case study, this study contributes to the Innovation Management research community. Specifically, it´s responding to calls for further theory and framework development (Karstegl et al., 2025). More precisely, it introduces DCAP as a complement to PDCA, addressing implementation challenges (e.g. da Silva, 2021; Tidd, 2021; Kihlander et al., 2024).

To the ongoing research innovation pedagogics (Johnsson et al, 2022; Kihlander and Richardsson, 2024), this research contribute knowledge on how dialogue and reflection can serve as a tool for advisors supporting its clients understanding and implementing the ISO 56002 standard, and thereby contributing to the research stream of external innovation support (e.g. Börjesson et al., 2014; Brix, 2020; Rampa and Agogué, 2021; Johnsson et al., 2023).

Further, it adds knowledge to research on individual, collective and organizational learning and organizational development theories (e.g. Lind and Lisper; 1990; Crossan et al., 1999; Engeström, 2001; Kolb and Kolb, 2005; Tannenbaum and Cerasoli, 2013; Tiller

and Gedda, 2017; Hauser et al., 2023; Cooperrider, 2021) as they all have served inspiration for developing the DCAP for new settings, i.e. implementing the ISO 56002.

PRACTICAL IMPLICATIONS

DCAP, as suggested in our research, would fit innovation management professionals support its clients implement the ISO 56002, where DCAP can serve as tool to assess and increase the client's awareness, knowledge and motivation of innovation management and the ISO 56002 work in practice. Given the study's limited scope, longitudinal studies of consultants and clients, as well as deeper examination of the facilitator's pedagogical role are suggested.

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