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Interventions from within – The case of Action Research in the innovation ecosystem Open Arenas

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Abstract

Insider Action Research conducted within innovation ecosystems (IES) generates a qualitatively distinct set of methodological and ethical challenges that cannot be derived from single-organization or network-level action research alone. When the system being researched is simultaneously the system on which the researcher's own organization depends for funding, legitimacy, and survival, a condition we term "double embeddedness" arises that transforms the foundational action research questions of "action for whom?" and "knowledge in whose interest?" from methodological concerns into existential ones. Drawing on a longitudinal reflective account of Project Open Arenas (POA), a government-commissioned action research initiative embedded in the western Swedish automotive IES during 2004–2005, this paper develops four propositions: (1) temporal boundaries may extend beyond the formal research project, requiring explicit temporal contracting; (2) multi-level embeddedness creates potentially competing organizational and system-level loyalties; (3) glocal dynamics – transnational actors redefining system boundaries mid-process – can override local intervention logic in ways current frameworks do not prepare the researcher for; and (4) IES-level action research may become entangled with system-level changes that have unforeseen consequences for the researcher's own organization. Two structural responses are proposed: an interdisciplinary research team configured to hold the insider/outsider tension productively, and a dynamic contracting process built to survive systemic disruption. Together, these propositions and responses point toward a more explicitly systemic and multi-level conception of the insider researcher's role than the current literature provides.

1. Introduction

Action research is founded on participation in the situations it seeks both to understand and to influence. This creates a productive but demanding tension: the researcher is not positioned outside the system under study but participates in the relationships, interpretations, and actions through which that system develops. The methodological implications of this position have been extensively discussed in relation to insider research within single organizations (Coghlan & Brannick, 2005), and to some extent in multi-organizational and network settings (Johnsen & Normann, 2004; Rasmussen, 2004). Much less attention has been given to what happens when insider action research is conducted at the level of an innovation ecosystem (IES): an open, multi-level configuration of interdependent organizations, institutions, activities, and relationships whose boundaries and direction are continuously changing.

Granstrand and Holgersson (2020) define an innovation ecosystem as "the evolving set of actors, activities, and artifacts, and the institutions and relations, including complementary and substitute relations that are important for the innovative performance of an actor or a population of actors." The innovation ecosystem concept builds on a longer tradition of research on national and regional systems of innovation (Lundvall 2010; Miettinen 2002; Nilsson & Uhlin 2002; Isaksen 1999; Carlsson et al. 2004), which established that innovation processes are shaped by interactions among a spatially and institutionally defined set of actors rather than by individual organizations in isolation. The innovation ecosystem concept extends this systemic perspective by foregrounding more dynamic, evolving, and

less formally bounded actor configurations than the systems-of-innovation literature typically assumes. This emphasis on evolution and interdependence is important for action research. An IES is not simply a larger version of an organization. It has no single locus of control, its boundaries are partly contested, and actors participate simultaneously at organizational, regional, national, and transnational levels. For the purposes of this paper, we therefore approach the IES as exhibiting characteristics associated with complex adaptive systems: multiple interdependent actors, emergent patterns of interaction, shifting boundaries, and outcomes that cannot be inferred straightforwardly from the intentions of individual participants (Checkland, 1989; Midgley, 2000).

These characteristics alter the conditions of insider action research. In a single organization, the researcher's insider position is typically understood primarily through organizational membership. In multi-organizational settings, the problem becomes more complicated because interests, loyalties, and power relations are distributed across several participating organizations (Johnsen & Normann, 2004; Rasmussen, 2004). At IES level, however, the researcher may be embedded simultaneously in several interdependent systems. The researchers' home organizations may themselves depend on the ecosystem being studied for resources, legitimacy, collaboration, and long-term survival, while the researchers are at the same time expected to analyse and potentially influence the development of that ecosystem.

We use double embeddedness as the central analytical concept of this paper. It refers to the condition in which the insider researcher is embedded in a home organization that is itself embedded in the wider innovation ecosystem being researched and influenced. As illustrated in Figure 1, this nested relationship operates within a broader multi-level context in which influences and consequences may propagate across organizational, ecosystem, and transnational levels.

Double embeddedness is not presented as one challenge among several. Rather, it is the underlying condition from which the four methodological and ethical challenges examined in this paper arise.

The insider researcher is embedded in a home organization that is itself embedded in the wider system being researched and influenced. This changes the familiar questions of insider action research. “Action for whom?” and “knowledge in whose interest?” are no longer only questions about methodological integrity or organizational politics. They can become questions about competing loyalties, institutional consequences, and even the survival conditions of the researcher's own organization. Insiderness therefore cannot be treated simply as a binary distinction between being inside or outside a system. It becomes a multi-level and potentially shifting relationship.

A further difficulty arises because the boundaries of an IES cannot be assumed to remain stable during an action research process. Regional innovation processes are increasingly shaped by decisions made by national governments, multinational corporations, investors, and other actors located outside the immediate arena of intervention. Such actors may redefine the problem, redistribute resources, or change the effective boundaries of the system while the action research process is under way. What initially appears to be a regional intervention may therefore become part of a national or transnational

process over which neither researchers nor local stakeholders exercise significant control. The issue is consequently not only how researchers act within a complex system, but how an action research process can retain coherence when the relevant system itself is being reconstituted.

The empirical setting for examining these questions is Project Open Arenas (POA), a government-commissioned action research initiative conducted during 2004–2005 in the western Swedish automotive innovation system. The research team followed two regional innovation arenas, Lindholmen in Gothenburg and Innovatum in Trollhättan, while simultaneously interacting with actors involved in their development. The team consisted of researchers from universities and an industrial research institute, all of which were themselves actors in the regional innovation system. At the same time, the research was commissioned through a national policy initiative, giving the team a simultaneous insider and outsider position.

During the project, this already complex arrangement was disrupted by developments beyond the regional system. General Motors, then the owner of Saab Automobile, initiated a competition between its European manufacturing operations concerning the location of future vehicle production. The decision threatened the Trollhättan plant and rapidly shifted the regional innovation process onto the national political agenda. Swedish national actors mobilized resources and infrastructure initiatives in response. For the action research team, the intervention altered both the system being studied and the relevance of the originally planned research activities. Workshops intended to stimulate regional development became less appropriate as regional actors were absorbed into a much larger crisis-driven process.

The POA case is historical, but the methodological questions it raises have become more rather than less relevant. Regional innovation ecosystems are now routinely exposed to decisions and disruptions originating outside their geographical and institutional boundaries. The subsequent collapse of Saab Automobile, the recent difficulties of Northvolt in the Swedish battery sector, and the broader restructuring associated with electrification illustrate how regional innovation processes remain strongly dependent on transnational actors and rapidly changing technological and economic conditions. The purpose of revisiting POA is therefore not to provide a current description of the western Swedish automotive IES, but to use a longitudinal reflective case to examine methodological conditions that have become increasingly salient for system-level action research.

We identify four interrelated challenges arising from double embeddedness. They concern different dimensions of the same underlying condition rather than independent problems: temporal ambiguity (P1), multi-level loyalty conflicts (P2), glocal disruption (P3), and existential consequences for the researcher's own organization (P4). The empirical sections that follow develop these four propositions before we consider two structural responses for working with them.

First, we argue that the temporal boundaries of such research are particularly susceptible to temporal ambiguity. Researchers and other participants enter formal action research projects carrying histories, relationships, knowledge, and commitments that pre-date the project and often continue after its formal

conclusion. This creates a need for what we term temporal contracting: explicit attention to how pre-existing and continuing relationships form part of the inquiry.

Second, we argue that multi-level embeddedness creates potentially competing loyalties across organizational and ecosystem levels. The central methodological question is therefore not simply whether the researcher is an insider or outsider, but to which system and at which level the researcher owes responsibility when interests conflict.

Third, we show how transnational actors can redefine system boundaries and override the logic of locally designed interventions. We use the term glocal resilience to describe the methodological capacity of an action research process to reorient when global-local dynamics substantially alter the system within which the research was originally designed.

Fourth, we examine a less discussed consequence of insider action research at ecosystem level: the possibility that the researcher's own analysis and intervention may contribute to changes that adversely affect the researcher's home organization. The ethical challenge is therefore not only that organizational loyalty may bias research, but also that system-level research may influence the conditions on which the researcher's colleagues and organization depend.

These four propositions arise from a common underlying condition. In IES-level action research, researchers are not merely studying a complex system from within; they and their organizations are among the actors whose relationships constitute that system. The research process can consequently neither be separated cleanly from the dynamics it investigates nor fully protected from changes occurring at other system levels.

We argue that two structural responses are particularly important under these conditions. The first is an interdisciplinary and multi-organizational research team capable of maintaining productive differences in perspective and of creating an internal space for recurrent reflection on roles, loyalties, and interpretations. The second is dynamic contracting: the continuous renegotiation of roles, system boundaries, expectations, and intervention strategies as both the inquiry and the wider system evolve. Neither response removes the dilemmas of double embeddedness. Rather, they provide ways of working with those dilemmas explicitly and reflexively.

The contribution of the paper is therefore to extend the discussion of insider action research from organizational and network settings toward a more explicitly systemic and multi-level conception of the researcher's position. By examining how temporal ambiguity, conflicting loyalties, shifting system boundaries, and institutional consequences interact in practice, the paper seeks to contribute to both action research methodology and systemic practice in complex, open, and globally connected settings.

The paper proceeds as follows. Section 2 reviews the literature on insider action research and research in large-scale systems and identifies the limitations of existing accounts for IES-level inquiry. Section 3 introduces Project Open Arenas, its research design, and the retrospective analytical process used in this

paper. Section 4 develops the four propositions from the empirical material. Section 5 examines the interdisciplinary research team and dynamic contracting as structural responses to double embeddedness. The final section discusses the theoretical and practical implications and identifies directions for further research.

2. Action Research and its Practitioners

The central problem this paper addresses – how insider action research functions when the system under study is an IES rather than a bounded organization – requires us to establish what the existing literature offers and where it falls short. Action research can be understood as a strategy for intervening in systems while simultaneously generating knowledge about them. In the present case, the system of interest is an innovation ecosystem (IES). We use action research as an umbrella term encompassing several related approaches, including Action Science (Argyris et al., 1985), Appreciative Inquiry (Srivastva & Cooperrider, 1987), Clinical Inquiry (Normann, 1982), and Developmental Action Inquiry (Torbert, 1999). Action research is broadly defined by Reason and Bradbury as “a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes” (Reason and Bradbury 2005, p. 1). Action research is grounded in processes of inquiry in which practical engagement and knowledge generation are intertwined. Bradbury (2015, p. 7) identifies several core principles and characteristics of action research:

Principles	**Characteristics**
The self is relational	Participative, Democratic, Knowledge in action
Systems seek wholeness	Emergent, Developmental
The primacy of the practical	Practical issues concerning our flourishing

The following characteristics are particularly relevant to the present study:

· an understanding of social reality as dynamic and continually evolving;

· an orientation toward practical consequences;

· an emphasis on democratic and participatory processes;

· recognition of multiple forms of knowledge; and

· an iterative mode of inquiry in which understanding, action, and reflection continually inform one another.

An action researcher may occupy either an insider or an outsider position. Insider action researchers conduct research within their own organizations, whereas outsider researchers enter organizations of which they are not members. In practice, however, this distinction is not always clear and may shift over

time. Louis and Bartunek (1992) touch on the subject of practical knowledge when they write about team research where insider (practitioners) and outsiders (researchers) interact. Louis and Bartunek suggest that the research team as a whole should take responsibility for the study; that the team should include diverse perspectives on the research issue; that insiders should contribute throughout the research process; and that insiders and outsiders should collaborate on democratic terms.

A core team consists of researchers (outsiders) and practitioners (insiders) working closely together. In such teams, outsiders may temporarily move “inside” to facilitate or observe, while insiders may move “outside” to reflect or engage in training. de Guerre (2002) describes the core team as “positioned on the boundary of the system-in-environments”. The other constellations: inside-insiders (e.g. “data generators”) and outside outsiders (e.g. “uncontaminated” or non-related scholars) do not belong to the core team.

Much of the insider–outsider literature distinguishes practitioners and researchers primarily on the basis of organizational membership (Adler and Adler 1987). For Louis and Bartunek (1992), the research team provides a means of combining insider and outsider perspectives while preserving distinct roles and mutual respect. When researchers use their own organizations as the arena of inquiry, however, they simultaneously occupy the roles of researcher and practitioner (Coghlan and Brannick 2005). Such role duality raises important political and ethical issues. The political dimensions of insider action research may expose researchers to considerable risk, particularly when more powerful actors seek to use the research process strategically. Pettigrew (2003) and Johnsen and Normann (2004) describe politically related problems in multi-organizational action research, where the risk of power struggles may be amplified. Pettigrew (2003, pp. 383–384), for example, describes a situation in which other partners held separate meetings to develop their own model of the future and excluded the researcher because of the power associated with his home organization. Johnsen and Normann (2004) refer to a situation where the researchers became perceived as strategic actors instead of learning facilitators.

2.1. Action Research in Large-Scale Systems

Rasmussen (2004) examines the implications of scaling action research from individual organizations to networks of organizations in the Nordic countries. He argues that such scaling changes the research strategy fundamentally. In network settings, neither the actors responsible for initiating change nor the direction of change can necessarily be specified in advance, making detailed planning difficult. Rasmussen’s view is that the direct and intensive interaction with co-inquirers which was a characteristic of action research in the traditional setting must be replaced by more second-hand knowledge and the creation of special events such as workshops and conferences. With many different parties involved, the change perspective must be created as a dialogue process and is not given beforehand. Scaling up also means the development of more formal structures, which can create tendencies to bureaucratization. Rasmussen emphasizes the importance of communication to all parties and argues for ‘go slow’ phases of projects, i.e. providing the participants with time to reflect and learn from each other. Scaling action

research to the network level also creates the challenge of avoiding identification with the interests of any single participating organization, particularly because power relations may be less visible than in conventional organizational settings. He argues for the importance of clear communication and dissemination of both goals, activities, and results during the process. This includes making clear that it is legitimate to have different interests. To guide the collaboration process, Rasmussen argues for the need to create “meta-rules”. Finally, Rasmussen points out that there is a need to work simultaneously on both short-term and long-term perspectives, which calls for the use of alternative methodology, e.g. scenario-building and social and technical experiments.

There are few studies (e.g. Gozzoli and Frascaroli 2012; Johnsen and Normann 2004; Lyngsnes 2016; Rasmussen 2004) that deal with action research in a system of numerous organizations. Most research studies of insider action research are focused on change processes in a single organization, and on the insider’s own organization. Although the ‘traditional’ insider researcher also has to deal with issues on different levels, the insider action researcher working at IES level encounters an even more complex situation. However, there are parallels between issues on intra- and inter-organization levels. A study of an IES also includes intra-organizational issues naturally. Hence, findings based on single organization interventions can still be of value when examining the experiences gained from action research on IES level. Yet the accumulated literature – from Louis and Bartunek’s (1992) insider/outsider team framework through Coghlan and Brannick’s (2005) single-organization account to Rasmussen’s (2004) network-level analysis – shares a common limitation: it treats the boundaries of the system under study as relatively stable, the researcher’s organizational membership as the primary axis of insiderness, and the ethical risks of insider action research as flowing primarily from co-optation or power imbalance within the system. None of these assumptions hold when the unit of intervention is an IES. The following section explains why.

At system level, action researchers work with practitioners within processes whose boundaries, objectives, and outcomes cannot necessarily be specified in advance. Roles may therefore remain ambiguous and open to different interpretations, increasing the risk of misunderstandings among participants.

The growing importance of IES-level action research was already anticipated in our own earlier empirical work. The first POA report (Alänge et al. 2005, p. 40) concluded that “the need for insider interactive research is likely to increase, and the traditional descriptive activities for university researchers, on more than an arms-length distance from the subjects under study, will probably play a lesser role in future research of this type. The reason for this is the size, complexity and dynamics of the current type of mobilization, in which everyone (and especially interactive researchers) need to learn also the insider interaction perspective. Regional advantage will depend upon the magnitude and speed of such learning, and therefore the arenas will probably not benefit sufficiently from researchers not actively involved in these learning processes themselves.” Two decades on, this prediction has proved accurate – and the methodological challenges that follow from it remain undertheorized. The present paper is a direct response to that gap.

2.2. Innovation Ecosystems as Complex Adaptive Systems

The IES context in which this action research was conducted is not merely large – it is systemically complex in ways that have direct methodological implications. Drawing on systems thinking (Checkland 1989; Midgley 2000), an IES can be understood as a complex adaptive system: a loosely coupled network of interdependent actors whose interactions produce emergent properties that cannot be predicted from the properties of individual components. Unlike the relatively bounded systems addressed in single-organization action research, an IES has no fixed boundaries, no single locus of control, and no stable equilibrium. Interventions in such a system are not discrete events with predictable outcomes – they are perturbations that propagate across levels and time horizons in non-linear ways.

This systemic complexity has two consequences for insider action research that have not been fully theorized. First, the concept of 'system boundary' – central to all action research design – becomes inherently contested. In soft systems methodology (Checkland 1989), defining the boundary of the system of interest is a core methodological act; in an IES, however, that boundary is not available for the researcher to set because the IES itself is continuously re-constituted by actor interactions, including the actions of global players operating well beyond regional or national reach. Second, because the IES is a wicked problem arena (Rittel and Webber 1973) – a domain where problems are not definable in advance, solutions are not testable before implementation, and every intervention changes the system being intervened in – the familiar action research cycle of plan-act-observe-reflect must be understood not as a linear iteration but as an ongoing, boundary-crossing, multi-actor sensemaking process. Systemic practice and action research are therefore not merely compatible in this context; they are mutually required. This systemic framing is supported by recent work in this journal: Ngongoni et al. (2022) demonstrate how IES emergence can be understood through the lens of change attractors in complex adaptive systems, a perspective that aligns directly with our analysis of how the POA ecosystem was destabilized and partially reconstituted by the General Motors intervention. This systemic framing directly informs the four propositions developed in the following sections: contested boundaries generate temporal ambiguity (P1); multiple levels of actor membership generate loyalty conflicts (P2); non-linear propagation of interventions across levels generates glocal vulnerability (P3); and the researcher's constitutive participation in the system generates the risk of unforeseen consequences for their own organization (P4).

3. The Case of Open Arenas

Project Open Arenas (POA) is used in this paper as an illustrative historical case – a vehicle for surfacing and theorizing methodological challenges that are general in character, not as a current account of the western Swedish automotive IES. The empirical material was generated during 2004–2005, at a formative moment in Swedish IES policy when action research was first embedded in regional IES at

scale. The distance of two decades, rather than being a weakness, affords a degree of analytical clarity: the consequences of the team's choices – including those that were unforeseen at the time – have played out fully and can be assessed in retrospect. Longitudinal distance is an established methodological asset in qualitative case research: Klinga et al. (2018), in a 20-year case study of integrated health and social care, demonstrate that retrospective analysis reveals the dynamics of sustainable change with a clarity unavailable to contemporaneous observation. The conditions documented here – glocal disruption, multi-level loyalty conflicts, temporal ambiguity, and existential risk to the researcher's own organization – have become more rather than less relevant as IES-level action research has grown as a practice and as global disruptions (from industry restructuring to digital transformation) have increasingly penetrated regional IES.

The project combined a formal sequence of data collection and national reporting with a recurrent process of team reflection and stakeholder interaction. Interviews with key actors at the two arenas and in the wider actor network were conducted between September 2004 and February 2005. The research team met weekly, interacted regularly with regional process leaders, and participated in national meetings with the other Visanu research teams. This recurring rhythm provided opportunities to compare emerging interpretations, reconsider the research approach, and relate local developments to the wider national programme.

The original project plan included workshops intended to stimulate and facilitate the development of the two regional arenas. During the project, however, General Motors initiated a competition concerning future production among its European manufacturing plants, threatening the Saab Automobile plant in Trollhättan. The resulting national and regional mobilization fundamentally altered the context in which POA was operating. The research team therefore decided not to proceed with the planned workshops and instead shifted towards monitoring the emerging process, participating in existing forums, and engaging in informal dialogue with relevant actors (Alänge et al., 2005). This adaptation later became important to our analysis of how system-level disruption can alter both the boundaries of an action research process and the role of the researchers within it.

A note on reflexivity and positionality is warranted. All five members of the POA team were simultaneously participants in the action research process and, two decades later, contributors to its theoretical account: the three team members not listed as authors (Mats Lundqvist, Hans Fogelberg, and Stefan Thorpenberg) provided substantive feedback on the propositions and empirical interpretations developed here but did not take authorship responsibility for the theoretical framing and final manuscript. This dual positioning – participant and retrospective analyst – is itself an expression of the double embeddedness the paper theorizes: the researchers cannot step fully outside the system they are analysing because they remain, in various ways, constituted by it.

3.1. Retrospective Analytical Process

The analysis presented in this paper developed across two temporally distinct but connected phases. The first was the original POA inquiry conducted during 2004–2005. The empirical material consisted of semi-structured interviews with actors at different system levels, informal interactions with participants in the innovation ecosystem, project documents and meeting records, and the research team's recurrent reflections on the intervention process. Individual interviews were also conducted with members of the research team, providing contemporaneous accounts of how they understood their roles, relationships, and methodological challenges. Preliminary interpretations were subsequently discussed within the research team and presented to regional and national actors for feedback.

The second phase was a retrospective re-examination of this material from the perspective of insider action research at innovation ecosystem level. Rather than treating the original material as a dataset for a new descriptive analysis of the western Swedish automotive ecosystem, we returned to it to examine the methodological tensions that had become visible through the experience of the project and its subsequent consequences. Particular attention was given to situations in which the assumptions underlying the original action research design became problematic: when the formal beginning and end of the project did not correspond to the researchers' actual involvement in the system; when organizational and ecosystem-level loyalties conflicted; when external actors altered the boundaries and direction of the system during the intervention; and when actions at ecosystem level subsequently affected the conditions of the researchers' own organizations.

The four propositions developed in this paper emerged through an iterative movement between these empirical experiences, the contemporaneous reflections documented during POA, and the literature on insider and large-scale action research. The purpose was not to reconstruct the case as it might have been interpreted in 2005, but to use temporal distance to identify methodological conditions whose significance became clearer as their consequences unfolded. The propositions therefore represent theoretically informed retrospective interpretations of recurrent tensions in the case rather than categories generated through a formal coding procedure. They are therefore offered as analytically grounded propositions for examination in other IES-level action research settings, rather than as empirically established generalizations from the POA case.

To reduce the risk that retrospective interpretation simply replaced contemporaneous understanding, the analysis was checked against several forms of material produced during the original project: interviews with research team members and ecosystem actors, project documentation, the original POA report (Alänge et al., 2005), and feedback obtained from regional and national actors. The three surviving POA team members not listed as authors also provided feedback on the propositions and interpretations developed for the present paper. This does not remove the positionality inherent in analysing a process in which the researchers themselves participated. Rather, consistent with first- and second-person action research, we treat that positionality as part of the inquiry and make the movement from experience to retrospective theorization explicit.

3.2. The Research Team

A researcher from Chalmers University of Technology, Mats Lundqvist was asked to form one of these research teams in order to follow two “arena processes” in Västra Götaland: Open Arena Lindholmen in Göteborg and Innovatum in Trollhättan. A cross-disciplinary research team was deliberately assembled to combine expertise in entrepreneurship, innovation ecosystems, philosophy of science, quality management, and science and technology studies. Research team’s affiliations are presented in Table 2.

Table 2 Research team of POA (Alänge et al. 2005)

PhD Sverker Alänge	Chalmers University of Technology
PhD Hans Fogelberg	Gothenburg University
PhD Mats Lundqvist	Chalmers University of Technology
PhLic Clas Mellby	Swerea IVF[1]
PhD Stefan Thorpenberg	Gothenburg University

The data collection strategy involved identifying key actors at three levels: system, arena, and project. In total, 18 interviews were conducted with actors across these three levels. Two additional interviews were conducted with individuals who were not directly involved in the arena activities but were considered potential participants. The interviews were conducted according to a semi-structured interview guide that was evaluated and updated after each interview. The guide focused on mapping the actors’ views of the system they were part of and of the local innovation processes.

In addition to the formal interviews, team members interacted informally with current and potential actors in the system. One team member had previously contributed to a funding application to VINNOVA and, in that context, had met and interviewed several actors who later became relevant to POA. Another team member had encountered some of the same actors in an earlier study. The team therefore entered the project with substantial prior knowledge of both the actors and the emerging ecosystem. During the project, some team members also maintained informal contacts with actors through telephone conversations and personal meetings and contributed suggestions concerning developments in the telematics field. Minutes from relevant meetings were shared within the research team.

3.3. The National-Level Learning Context

Visanu expected the seven research teams to support learning at two interconnected levels. Regionally, the researchers were to act as sounding boards, structure emerging experiences, and provide feedback to actors involved in innovation-system development. Nationally, experiences from the regional projects were to be shared across research teams and contribute to broader knowledge development through joint meetings, reports, and seminars.

In practice, the national learning process remained relatively loosely coupled. The seven teams differed in their research approaches, degree of involvement, and progress, and no common action research methodology emerged during the programme. For POA, however, the national setting was methodologically significant because it reinforced the team's multi-level position. The researchers were simultaneously involved in regional innovation processes, members of organizations participating in those processes, and contributors to a nationally commissioned learning initiative.

[1] Industrial research institute. Now named RISE (ri.se)

4. Double Embeddedness in Practice: Four Propositions

The POA experience suggests that double embeddedness generates four interrelated methodological and ethical challenges for insider action research at innovation ecosystem level. In the following sections, we develop these as four propositions. Each proposition addresses a different manifestation of double embeddedness while remaining connected to the others: the temporal boundaries of the inquiry, the researcher's loyalties across system levels, the vulnerability of locally designed interventions to disruption from other levels, and the potential consequences of system-level research for the researcher's own organization.

4.1. Proposition 1: Temporal Ambiguity

We propose that insider action research in an IES is particularly susceptible to temporal ambiguity, because researchers may enter formal projects with pre-existing relationships, knowledge, and commitments that remain constitutive of the inquiry. Formally, a research project is temporally bounded, with a defined beginning and end. But in the case of insider action research, the members are typically already part of the system and its ongoing processes.

In our case, we were all part of the system and we were all involved in on-going processes to develop the IES, around which we formed a formal action research project. There was, in other words, no clear “zero point” at which the inquiry began independently of previous relationships and activities. The team had been assembled partly on the basis of competencies and experiences already developed within the IES. Several members were therefore simultaneously involved in other processes within the same system. Their forms and degrees of involvement differed, however, suggesting that insiderness requires a more nuanced conceptualization than simple organizational membership.

The absence of a zero-situation is not merely a practical inconvenience – it reflects something fundamental about insider action research in IES. In a single organization, the researcher may join and leave a bounded entity. In an IES, the boundaries of the system are themselves contested and evolving, and the researchers’ pre-existing relationships, prior knowledge and organizational loyalties are constitutive of the research, not incidental to it. In our case, one team member had already interviewed key IES actors as part of a funding application; another had developed a strategic plan for his

organization's participation in the very IES we were researching. These histories were not background noise – they shaped what data was accessible, whose trust was available, and which interventions were politically feasible.

We therefore propose that insider action research in IES contexts requires explicit 'temporal contracting': a deliberate early conversation within the research team – and with key stakeholders – about what counts as the beginning of the inquiry, what pre-existing relationships and knowledge are brought in, and under what conditions the action research can be considered concluded. Without this, the team risks operating with unacknowledged role histories that remain invisible to other stakeholders but actively shape the research.

The absence of a zero-situation was reflected not only in the researchers' own biographies but also in the accounts of IES actors, who experienced the research team as already positioned before the formal project began. As one arena manager noted when reflecting on the researchers' role: "I recognise this – I have been 'thrown in', and have worked in this world without having an official version. How have I managed? I am open-hearted and ask which role is mine, and which is yours as a follow researcher" (Arena Manager, interview 2004; authors' translation). [Swedish original: "Jag känner igen detta – jag har blivit 'inslängd', och har jobbat i denna värld utan att ha en officiell version. Hur har jag klarat detta? Jag är öppenhjärtlig och frågar vilken roll som är min, och vilken som är er som följeforskare."] This comment – from an IES actor who had herself been 'thrown in' without a formal starting point – captures precisely the temporal ambiguity the action research team experienced from the inside. Both researchers and practitioners were already embedded in ongoing processes; neither could claim a clean beginning. What this suggests is that the absence of a clear zero point may be more than a methodological inconvenience: it may be a recurring condition of IES-level insider action research where researchers and practitioners are already embedded in ongoing system processes.

4.2. Proposition 2: Multi-Level Loyalty Conflicts

A central dilemma arises from being an insider at two levels simultaneously: within the regional ecosystem and within one's own organization. This raises the question of "action for whom?" Is the primary commitment to the wider system or to the researcher's home organization as one constituent of that system? This introduces an additional ethical dimension, particularly when the interests of the researcher's home organization conflict with those of the wider system. The question of where the researcher's primary loyalty lies therefore becomes central. Insider action researchers therefore need to consider loyalty both from their own perspective and from that of practitioner partners in the action research process. A related question is whether, and how, such loyalties should be made explicit to other participants in the action research process.

Our team was designed to be multidisciplinary and multi-organizational, so both regular work roles and the roles played in the research differed considerably among team members. One of the team members had an assignment at his university of developing the IES around the university, i.e. participating in the

research could be seen as a natural way of working for this project connected to the university. Another team member had considerable experience of working with IES development but no formal assignment to work on IES development for his university, and hence, felt no comparable obligation to act on behalf of the university. At the start of the project, a third member was engaged in consultancy work for organizations within the IES but was not formally employed by his university, although he retained a strong affiliation with it. A fourth member was working on a project basis for both universities involved, but was positioned between different projects, and looked upon the research from a methodological point of view. Finally, the fifth member was a member of the board of his struggling and down-sizing organization, feeling a strong loyalty both towards this organization and towards the research project on IES level.

The POA case suggests that insiderness in an IES may usefully be understood along at least two dimensions: depth of embeddedness in one's home organization and degree of involvement in the wider IES. Each team member occupied a different location in this two-dimensional space, and these locations shifted during the project. This has a methodological implication that goes beyond the familiar call for reflexivity: it means that the research team itself is a microcosm of the very multi-level tensions it is studying. The team's internal dynamics – whose interpretation prevails, who withholds information, who feels licensed to act – are not separable from the research findings. Managing these dynamics openly, through regular structured reflection, is therefore not a peripheral concern but a core methodological requirement. This challenge is not unique to IES-level action research: Dreyer-Gibney et al. (2022), in an insider action research study of new service development published in this journal, document how an action researcher without formal authority must continuously navigate political dynamics and shifting loyalties within a complex multi-stakeholder process. What the IES context adds is that these dynamics operate simultaneously across organizational and ecosystem levels, multiplying both the conflicts and the stakes.

The central ethical question at this level is not 'am I an insider or an outsider?' but rather 'to which system, and at which level, do I owe my primary loyalty when they conflict?' In our experience, this question cannot be answered once and for all at the outset – it must be revisited as the research evolves and as the ecosystem itself changes.

As researchers we felt a loyalty to the action research at system level. We discussed this issue during the project, and one team member noted that his understanding of research ethics prevented him from using information obtained as a researcher for the benefit of his own organization.

The difficulty of maintaining clear role boundaries under these conditions was visible in the accounts of IES actors as well. One key stakeholder who occupied a boundary role in the system – simultaneously close to the research process and to the political structures shaping it – described the underlying tension directly: "Is there a conscious focus on learning? There is no systematic way to learn, and that is why your engagement matters. Reflect on what the success factors are, and what the obstacles are – I find it hard to see my own role when standing in the middle of it all. Follow research is therefore important. No one has

yet put their foot down." (Arena Manager, interview 2004; authors' translation). [Swedish original: "Finns ett medvetet fokus på lärande? Det finns inget systematiskt sätt att lära, och därför är ert engagemang viktigt. Funder över vad som är framgångsfaktorer, och vad som är bromsklossar – Har svårt att se min egen roll när man står mitt i smeten. Viktigt således med följeforskning. Ingen har satt ner foten än."] The phrase "hard to see my own role when standing in the middle of it all" applies with equal force to the researchers themselves. The insider action researcher operating at IES level shares this condition with the practitioners: no one in the system has a view from outside. This symmetry between researcher and practitioner perspectives – both embedded, both lacking an Archimedean point – underscores why managing the team's multi-level loyalties through explicit, recurrent reflection is not optional but structurally necessary.

There was therefore no clear-cut boundary between research activity and other forms of professional engagement. Given the different backgrounds and affiliations of the team members, maintaining research integrity depended partly on the judgement of individual researchers. Our experience nevertheless suggests that questions of loyalty – including for whom the research is being conducted – should be addressed explicitly within the research team and, where appropriate, with participating practitioners.

4.3. Proposition 3: Glocal Disruption

Proposition 3 concerns glocal dynamics: the intervention of transnational actors can override the logic of local action research intervention in ways that no local contracting process can anticipate or prevent. The Norwegian case studied by Johnsen and Normann (2004) established that local stakeholders can block IES-level action research. Our case adds a structurally distinct form of disruption: intervention from a level entirely outside the local insider network. Johnsen and Normann (2004) show how established local interests can constrain action research in multi-organizational settings, with powerful stakeholders redirecting an intervention toward partial interests. The POA case revealed a different form of disruption. Rather than local stakeholders blocking the process, an actor operating at the transnational level fundamentally changed the conditions under which the regional intervention was taking place.

In our case, the agenda was changed not by closely connected local stakeholders but by decisions taken by an actor operating at the global level. General Motors announced a competition among its European manufacturing plants over the production of the next generation of Saab cars, threatening the future of the Trollhättan plant, a major regional employer. This represented a major disruption to the autonomous regional development process. The Swedish government responded rapidly by directing substantial resources toward strengthening the region's competitive position through investments in infrastructure and competencies. The regional–national dynamic was thus overtaken by a global–local one in which decisions at the transnational level became decisive.

A participatory conception of action research might suggest including all relevant stakeholders. In a globally connected IES, however, some of the actors capable of fundamentally altering the system may lie far beyond the practical reach of a regionally anchored action research team.

The structural reason why glocal dynamics create such acute difficulty for the insider action researcher is captured precisely in the POA report's own analysis of the national level's role. Reflecting on the regional mobilization, Alänge et al. (2005, p. 36) observed that national actors might offer "a 'large picture perspective' and help avoid the potential drawbacks lying in the 'insider-involvement' of virtually everyone in such extensive regional mobilization." This is a remarkable self-observation: the researchers acknowledged in their own report that the depth of insider embeddedness in the IES – which included themselves – was itself a systemic vulnerability. When everyone is an insider, no one retains the critical distance needed to see the whole system. The arrival of General Motors and the subsequent national government intervention was, among other things, the entry of actors who were genuinely outside the regional insider network – and therefore able to redefine it. This is what makes glocal disruption qualitatively different from local political interference: it comes from a level at which insider action research has no purchase.

As our Norwegian colleagues have pointed out, working as an insider at regional system level is more complex than working within a single organization. Introducing the glocal dimension adds further layer of complexity.

The General Motors intervention illustrates a structural vulnerability in IES-level action research that has no equivalent in single-organization insider research: the possibility that the entire logic of the intervention is rendered obsolete by an actor operating at a higher systemic level and outside the reach of any local contracting process. For the action research team, this created a double displacement. First, the planned workshops lost their rationale, since the regional mobilization they were meant to facilitate had been superseded by a national crisis response. Second, the team's role shifted involuntarily from facilitators of local learning to observers of a nationally-driven process – a shift that was not re-contracted with stakeholders but simply absorbed.

The POA case does not demonstrate a deliberately designed capacity for glocal resilience; the team's response was largely adaptive and emergent. It does, however, suggest the value of developing such a capacity explicitly in future IES-level action research. We use the term glocal resilience to describe this prospective methodological capacity: the ability of an action research process to reorient when actors beyond the locally defined system substantially alter the conditions of intervention. Rasmussen's (2004) 'go slow' phases and 'meta-rules' are steps in this direction, but they presuppose a relatively stable system boundary – a presupposition that IES-level action research cannot safely make.

What glocal resilience requires in practice is not only a flexible contracting process but a specific capability that the original POA report identified as decisive: the action researcher's capacity to analyse and articulate the system's direction at precisely the moment when established frameworks are dissolving. As Alänge et al. (2005, p. 40) noted, "several actors in these types of mobilizations yet do not appreciate the power and influence of the analytical ability and articulation capability needed for understanding and communicating issues around complex systems. But this articulation capability can provide essential contributions, especially when there is a need of redirect different actors' particular

interests into shared overall missions and structures. As a result, successful interactive research may have a large impact by assisting in these articulation processes." In the POA case, it was precisely when General Motors' intervention shattered the existing regional logic that the team's analytical and articulation capacity became most valuable – and most vulnerable to being absorbed into a politically-driven national response rather than remaining a genuinely independent research contribution.

4.4. Proposition 4: Existential Consequences for the Researcher's Own Organization

Proposition 4 concerns a consequence of double embeddedness that has received limited attention in the insider action research literature: system-level analysis and intervention may become entangled with changes that materially affect the researcher's own organization. Existing discussions of insider action research ethics focus primarily on the risk that organizational loyalty may bias the research (Coghlan and Brannick 2005), or that researchers may become entangled in political processes involving more powerful actors (Pettigrew 2003). At IES level, however, the relationship may also operate in the opposite direction. Because the researcher's home organization is itself part of, and dependent on, the wider system being researched, changes at ecosystem level may feed back into that organization.

The POA case illustrates this possibility. The researchers' home organizations were all stakeholders in the regional innovation system and were involved, to varying degrees, in the mobilization under study. Members of the research team likewise occupied different positions in relation to that process, ranging from predominantly observational roles to direct participation in discussions concerning regional strategy. At the same time, national research priorities in the automotive field were being reconsidered and redirected. These changes had significant consequences for one of the researchers' home organizations, which subsequently underwent downsizing.

The material available to us does not permit a causal attribution of this organizational outcome to the action research intervention itself. Nor can the relative influence of the research team be separated from the wider political, industrial, and institutional processes taking place at the time. What the case does demonstrate is that researchers working at ecosystem level may participate in processes of analysis and strategic reorientation whose consequences extend to the organizations on which they themselves and their colleagues depend. The ethical issue is therefore not limited to whether loyalty to the home organization influences the research; commitment to what researchers understand as beneficial for the wider system may itself come into tension with the interests of their home organization.

The fragility of organizations within the IES, and therefore the potential stakes involved in changes in system-level priorities, was explicitly recognized by participants at the time. As one Innovatum manager reflected:

"Innovatum's strengths: the strength resides in individuals. It is person-dependent; entrepreneurs who create a great deal. And that simultaneously makes the operation vulnerable. As an organization we are

quite weak. We started originally because there was an opportunity to obtain EU funding, and then it was driven forward over the course of a couple of years.” (Innovatum Manager, interview 2004; authors' translation)

[Swedish original: “Innovatums styrkor: Styrkan sitter i individerna. Det är personbundet, entreprenörer som skapar mycket. Och det gör verksamheten sårbar samtidigt. Som organisation är vi ganska svag. Vi startade ursprungligen eftersom det fanns möjlighet att få EU-medel, och sedan drevs det vidare under loppet av ett par år.”]

This account illustrates an important feature of the setting in which the action research took place: organizations within the IES could be highly dependent on individuals, external funding, and changing institutional priorities. System-level reorientation could therefore have material consequences for individual organizations even when those consequences were neither intended nor foreseeable by the researchers involved.

Double embeddedness makes this particularly significant for insider action research. The researcher is not only acting within an ecosystem but is also connected to it through a home organization whose resources, strategic position, and future may depend on how that ecosystem develops. A system-level perspective may consequently lead the researcher to interpretations or recommendations that do not align with the immediate interests of the home organization. Conversely, ecosystem-level involvement may give researchers access to knowledge and perspectives that are not readily available within their own organizations, creating tensions between system-level understanding and established organizational strategies.

We therefore propose that double embeddedness exposes insider action researchers to the possibility that system-level analysis and intervention may become entangled with changes that materially affect their own organizations. The resulting ethical challenge is not only to prevent organizational loyalty from biasing the research, but also to manage situations in which commitment to the wider system may conflict with the interests of the researcher's home organization.

This proposition extends the conventional insider action research question of “action for whom?” In an IES, the answer cannot necessarily be assumed to remain stable throughout the inquiry. Action that appears beneficial from the perspective of the wider system may have adverse consequences for particular organizations within it, including the researcher's own. Such consequences cannot necessarily be anticipated or avoided, but the possibility that they may arise should form part of the recurrent reflection on roles, loyalties, and system boundaries that accompanies IES-level action research.

5. Structural Responses to Double Embeddedness

The four propositions describe challenges generated by double embeddedness; they do not imply that these challenges can be eliminated. The POA experience instead points to two structural responses that can help action researchers work with them: an interdisciplinary research team and dynamic contracting.

The first creates an internal arena in which differences in perspective, organizational affiliation, and interpretation can be surfaced and examined. The second provides a means of recurrently renegotiating roles, temporal and system boundaries, goals, and stakeholder expectations as the inquiry evolves. These responses are complementary rather than separate: effective dynamic contracting depends on reflexive dialogue within the research team, while the team's capacity to maintain multiple perspectives depends on recurrent clarification of roles and relationships, see Figure 2.

5.1. The Interdisciplinary Research Team

Although insider action research at IES level can be conducted by an individual researcher, the complexity of the setting creates strong advantages for a team combining complementary expertise, experiences, and organizational affiliations.

Through regular meetings, the team developed a shared understanding of the project's dual ambition: to contribute to regional development while maintaining academic integrity. Neither ambition was allowed to dominate at team level. Individual members could nevertheless adopt different roles, with some engaging more directly with actors in the IES and others maintaining a more research-oriented position. These orientations were not fixed but shifted over time. One team member, for example, was initially highly involved in practical development activities but later adopted a more academically oriented role.

The POA report itself reflects on this experimentation in terms that are directly relevant to the challenges documented in this paper. Among the seven Visanu research teams, the report observed important variations in “how much one is an insider or outsider, or how these roles are alternated; the ways interactivity was exercised, through informal consultative meetings or through more organized workshops; the ambitions as regards intervening in the process as well as with whom to primarily intervene – with businesses, ‘system leaders’ and/or with the policy-makers and financiers of the initiatives; how much actors are asked for sensitive information, and in return have a saying on how the research is reported” (Alänge et al. 2005, p. 39). These four dimensions – depth of insider role, mode of interactivity, intervention ambition, and information sensitivity – are precisely the axes along which our team members differed from each other. The POA project, the report goes on to note, “consciously experimented with all the above mechanisms” through a five-person team in which “different roles were consciously taken to balance different interests and knowledge perspectives” (p. 39). This conscious role differentiation within the team is what we have theorized in this paper as the two-dimensional insider spectrum.

Our interdisciplinary, multi-organizational team functioned as an arena for reflection and collective sensemaking. Some members interacted extensively with other IES stakeholders, while others maintained greater distance and therefore brought perspectives closer to those of an outsider. The team could consequently occupy the insider–outsider boundary collectively rather than requiring each individual researcher to do so. Regular team discussions enabled perspectives to be compared, challenged, and revised over time.

This interpretation is consistent with de Guerre's (2002) argument that differentiated roles within a research team can reduce the risk of “going native”. The issue is therefore not whether team members should share the same position, but whether their differences remain complementary and available for collective reflection. A central question is consequently how such differences can be maintained without fragmenting the research team. A basic precondition for a team is that the members should play different but complementary roles. Louis and Bartunek (1992) state that it is critical that members of the team monitor and maintain an experiential and cognitive distance between themselves and in relation to the practitioners they cooperate with. Our experience was somewhat different: team meetings provided a means of bringing perspectives closer together and developing mutual understanding without eliminating their differences. Regular team meetings also provided a “safe haven” for open discussion about how to proceed in interactions with other stakeholders and for collectively processing impressions from ongoing changes in the IES.

The functioning of the interdisciplinary research team is also consistent with Eisenhardt’s (1989) argument that multiple researchers can strengthen case-based theorizing by bringing divergent perspectives to the interpretation of empirical material. In our case, however, these differences were not only analytical; they also reflected the researchers’ different positions within the IES. The team therefore provided a setting in which different forms and degrees of embeddedness could be brought into dialogue rather than resolved into a single perspective.

Torbert’s (1999) Developmental Action Inquiry offers a complementary perspective by treating inquiry as embedded in ongoing processes of action and reflection. This resonates with our experience of entering the formal action research project from already ongoing relationships and activities, interacting with and attempting to influence these processes during the project, and remaining part of them after the formal project had ended. Rather than treating the action research project as a self-contained intervention, we therefore came to understand it as a temporally bounded episode within a larger and continuing process.

A related question concerns the point of departure for insider action research: whether the inquiry begins from the researchers’ close involvement in particular parts of the system or from an attempt to understand the wider system as a whole. Regardless of the point of departure, the roles of the action researchers and their modes of engagement need to be made explicit and revisited as the inquiry develops. This clarification, or contracting, is required both within the research team and in relation to other stakeholders involved in the process.

1.1. The Importance of Contracting

Dynamic contracting – the continuous renegotiation of roles, boundaries, and goals between the action research team and its stakeholders – functions in IES contexts as the primary mechanism through which double embeddedness is made manageable rather than merely acknowledged. Unlike contracting in single-organization action research, where the scope, timeline, and parties can be reasonably fixed at the

outset, IES-level contracting must be built to accommodate systemic disruption, shifting actor configurations, and the possibility that the original purpose of the action research may be overtaken by events outside any local stakeholder's control. The system-leader function – facilitating the emergence and development of the IES – had already emerged as important in our earlier research (Alänge et al., 2005).

The regional administrators, who assumed a system-leader role, interacted during the process, followed up and showed an interest in the research results. Interest among other local stakeholders, including companies and universities, was limited. As General Motors' intervention shifted the IES from a regional to a national agenda, the research team also became less visible at the regional level. The research consequently took on more of the character of third-person research (Torbert 1999), although interaction and reflection with stakeholders continued.

The researchers did not undertake specific interventions within their own organizations, although they influenced internal discussions concerning technology-based IES development. In addition, we presented our research methodology for colleagues and doctoral students, but not primarily from an interventionist perspective. One researcher, who was a board member of his home organization, nevertheless drew on insights from the IES project in internal strategic discussions. Once again, the processes are necessarily intertwined, as this researcher also had been involved in developing a strategic plan for his own organization's participation in the IES development that later on became the focus of our research.

In our project the national financing organization intentionally gave the regional authorities a central role, as they had to express a sincere interest in the research as a condition for funding. Formally, the research was financed by the regional authorities and the project plan was discussed with the regional authority representative.

The project design developed iteratively. The project leader first obtained input from the regional authority representative (RAR), which was discussed within the research team and translated into a proposed research design and methodology. This proposal was then discussed with the RAR, whose feedback informed further revisions. This iterative process was facilitated by a high level of trust. From the RAR's perspective, working with university researchers offered an advantage over working with traditional consultants, who might be perceived as having a commercial interest in securing further assignments. The resulting interaction between the RAR and the research team was therefore relatively open and extended beyond the boundaries that might have characterized a conventional consultancy relationship.

Thus, while the system leader was actively engaged in the research process, participation by other stakeholders remained limited. This raises an important question for IES-level action research: who needs to participate in the design and ongoing renegotiation of the inquiry? Heron and Reason (2006) identify a defining feature of co-operative inquiry as the full involvement of participants as co-researchers in decisions concerning both content and method. In POA, the only stakeholder deeply

involved in the design and reflection phases was the RAR, acting in a system-leader role. From a co-operative inquiry perspective, broader participation in decisions concerning both method and content might therefore have been desirable.

At IES level, however, the question of who should participate is not straightforward. Johnsen and Normann (2004) suggest including all relevant stakeholders, but determining who is relevant is itself part of the research design. Full participation by all stakeholders may neither be feasible nor necessary. The appropriate degree of participation depends on the ambition of the intervention, the system boundaries adopted, the actors with whom the researchers primarily seek to intervene, and the resources available. Engaging a large number of stakeholders requires considerable time and effort; yet insufficient dialogue may leave important actors outside the inquiry who can subsequently influence or disrupt the process.

As the outcome cannot be known from the start, especially when working in a participative way (Rasmussen 2004), the situation and the original contract need to be reviewed regularly as the inquiry develops. Hence, during the action research process there will be a need to regularly review the situation and re-contract with the main stakeholder. This need was clear in our case, as the original research design was modified in a major way due to the intervention of General Motors and national Swedish government in the development of the regional IES. In such a situation of radical change, the ability of the action researchers to contribute through articulation and process skills to the reformulation and modification of local strategies can be of considerable value for the IES development (Alänge et al. 2005). Such changes may also require a corresponding reformulation of the goals of the action research and of the researchers' relationships with different stakeholders.

These observations about dynamic contracting point toward a broader need that was already identified in the POA project's own reflections on its practice. Alänge et al. (2005, p. 40) concluded that "there is a need to create more transparent and clear ways in which interactive researchers institutionalize their contributions to a joint learning process." Specifically, the report identified four procedural requirements for IES-level action research: to support and organize processes for critical reflection and learning based on continuous research and inside understanding; to define the role of the interactive researcher as a balance act between helping financiers and policy-makers optimize their investments and supporting the interests of a broader set of actors; to assist actors' self-evaluations methodologically by asking informed questions, thereby creating learning for everyone involved, role clarity, reasonable role expectations, and transparent accountability; and to clarify and agree – within the research team and eventually with society at large – upon the various roles of the interactive researchers and their modes of operation during different phases of the process. These four requirements map directly onto the challenges identified in this paper. Taken together, they constitute a proto-framework for dynamic contracting in IES-level action research – one that our analysis has extended and theorized, but which originated in the lived experience of the POA team itself.

Conclusions and further research

2.1. Contributions to the field.

The central contribution of this paper is the concept of double embeddedness, which extends insider action research from the organizational and network levels to situations in which the researcher's home organization is itself embedded in the wider system being researched and influenced. The POA case suggests that this condition generates four interrelated methodological and ethical challenges: temporal ambiguity, multi-level loyalty conflicts, glocal disruption, and the possibility of existential consequences for the researcher's own organization.

The paper further identifies two structural responses for working with these challenges: an interdisciplinary research team capable of holding multiple insider and outsider perspectives in productive tension, and dynamic contracting through which roles, boundaries, goals, and expectations can be recurrently renegotiated as the system and the inquiry evolve. Within this framework, temporal contracting represents a specific response to temporal ambiguity, while glocal resilience describes the methodological capacity to reorient when developments beyond the locally defined system alter the conditions of intervention.

Taken together, the framework shifts attention from whether an action researcher is an insider or outsider toward the more systemic questions of inside what, at which level, in relation to whom, and with what consequences.

This paper has argued that insider action research in innovation ecosystems constitutes a qualitatively distinct research practice, not reducible to the challenges of single-organization or network-level action research. The four propositions we have developed – temporal ambiguity (P1), multi-level loyalty conflicts (P2), glocal disruption (P3), and existential risk to one’s own organization (P4) – are not independent problems. They are expressions of a common underlying condition: the insider action researcher in an IES is simultaneously a researcher of the system and a stakeholder in it, at multiple levels, in ways that cannot be fully anticipated or controlled at the outset. The two structural responses we propose – an interdisciplinary team configured to hold the insider/outsider tension, and a dynamic contracting process built to survive disruption – are not solutions to this condition. They are ways of working with it honestly.

2.2. Further research

This paper opens several specific lines for further inquiry. First, the two-dimensional insider spectrum proposed here – depth of organizational embeddedness and degree of IES involvement – needs empirical testing across a broader range of IES-level action research projects to establish whether the dimensions identified in POA generalize or whether additional axes are required. Second, temporal contracting as a practice has not been systematically studied: what forms does it take, who initiates it, and under what conditions does it survive the kind of systemic disruption encountered in the POA case? Third, the concept of glocal resilience calls for comparative work across cases where transnational actors have intervened in regional IES during active action research processes – the conditions under

which action research teams successfully reoriented versus those in which they were simply absorbed into the political response remain unknown. Fourth, the existential risk proposition raises questions about institutional design: can action research commissioning processes be structured in ways that acknowledge and mitigate the possibility that the researchers' own organizations will be affected by the analysis they produce? These are not peripheral questions – they go to the ethical foundations of IES-level action research as a practice.

Declarations

Competing Interests

The authors have no relevant financial or non-financial interests to disclose.

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Ethics Approval

This article presents a retrospective reflective analysis of data generated as part of Project Open Arenas (2004–2005). No new data involving human participants were collected for the present study. The original project was conducted in accordance with the research practices and ethical requirements applicable at the time.

Ethics approval: Not applicable. No approval from an ethics committee or institutional review board was sought, as none was required. The study draws on an insider action research engagement within Project Open Arenas (2004–2005), a government-commissioned development initiative. The interventions analysed were part of that initiative's development work and not research procedures directed at individuals. Under the Swedish Act concerning the Ethical Review of Research Involving Humans (SFS 2003:460), ethical review is required only for research involving, inter alia, sensitive personal data or procedures intended to affect research participants physically or psychologically. The study involves neither, and therefore falls outside the scope of mandatory review. Sweden has no institutional review board system comparable to the US IRB model. The study was conducted in accordance with the Swedish Research Council's guidelines on good research practice [and all participants and organisations have been anonymised].

Consent to Participate

All interview participants in the original 2004–2005 study provided informed consent to participate. Quotations included in this article have been anonymized by replacing named individuals with role descriptors.

Consent for Publication

Not applicable.

Data Availability Statement

The interview and internal documentary material underlying the illustrative case are not publicly available, in order to protect participant confidentiality and comply with the anonymization commitments described above. Anonymised excerpts may be made available by the author upon reasonable request, subject to participant consent.

Author Contributions

C. Mellby led the retrospective analysis, developed the theoretical propositions, and drafted and revised the manuscript. S. Alänge contributed substantially to the original 2004–2005 research, including the generation and interpretation of the empirical material, and to the conceptual development of the earlier project report (Alänge et al., 2005) on which the present paper draws. He also contributed to the early conceptual development of the present article. Due to illness affecting his cognitive capacity, S. Alänge was unable to participate in the later drafting and revision of the manuscript or to review and approve the final version. His continued inclusion as co-author and the submission of the manuscript have been approved by his legal representative. C. Mellby approved the final manuscript for submission.

Use of Generative AI

Generative AI tools (Claude, Anthropic) were used during manuscript preparation to support language editing and structural revision. The authors retained responsibility for the theoretical development, interpretation of the empirical material, analytical judgements, and conclusions presented in the manuscript.

References

1. Adler PA, Adler P (1987) Membership roles in field research. Sage, Newbury Park
2. Alänge S, Fogelberg H, Lundqvist M, Mellby C, Thorpenberg S (2005) Project open arenas—the evolution of the Lindholmen and Innovatum ‘arenas’ and their role for innovation in vehicle technology. https://doi.org/10.13140/RG.2.2.29122.76485
3. Argyris C, Putnam R, Smith DM (1985) Action science. Jossey-Bass, San Francisco
4. Bradbury H (ed) (2015) The SAGE handbook of action research, concise 3rd edn. Sage Publications, London
5. Carlsson B, Jacobsson S, Bergek A (2004) Dynamics of innovation systems—policy-making in a complex and non-deterministic world. International Workshop of Functions in Innovation Systems, University of Utrecht, June 2004

6. Checkland PB (1989) Soft systems methodology. Hum Syst Manage 8:273–289. https://doi.org/10.3233/HSM-1989-8405
7. Coghlan D, Brannick T (2005) Doing action research in your own organization. Sage, London
8. de Guerre DW (2002) Doing action research in one's own organization: an ongoing conversation over time. Systemic Pract Action Res 15:331–349. https://doi.org/10.1023/A:1016348421584
9. Dreyer-Gibney K, Coghlan D, Coughlan P (2022) Power and politics in new service development: an insider action research study. Systemic Pract Action Res 35:275–301. https://doi.org/10.1007/s11213-021-09571-y
10. Eisenhardt KM (1989) Building theories from case study research. Acad Manage Rev 14:532–550. https://doi.org/10.5465/amr.1989.4308385
11. Gozzoli C, Frascaroli D (2012) Managing participatory action research in a health-care service experiencing conflicts. Qualitative Res Organ Management: Int J 7:275–289. https://doi.org/10.1108/17465641211279752
12. Granstrand O, Holgersson M (2020) Innovation ecosystems: a conceptual review and a new definition. Technovation. https://doi.org/10.1016/j.technovation.2019.102098. 90–91:102098
13. Heron J, Reason P (2006) The practice of co-operative inquiry: research 'with' rather than 'on' people. Handbook of action research, vol 2. Sage, London, pp 144–154
14. Isaksen A (ed) (1999) Regionale innovasjonssystemer. STEP Report Series, Article 199902. https://ideas.repec.org//p/stp/stepre/1999r02.html
15. Johnsen HCG, Normann R (2004) When research and practice collide: the role of action research when there is a conflict of interest with stakeholders. Systemic Pract Action Res 17:207–235. https://doi.org/10.1023/B:SPAA.0000031698.50541.f9
16. Klinga C, Hasson H, Andreen Sachs M, Hansson J (2018) Understanding the dynamics of sustainable change: a 20-year case study of integrated health and social care. BMC Health Serv Res 18:400. https://doi.org/10.1186/s12913-018-3061-6
17. Louis MR, Bartunek JM (1992) Insider/outsider research teams: collaboration across diverse perspectives. J Manage Inq 1:101–110. https://doi.org/10.1177/105649269212002
18. Lundvall B-Å (2010) National systems of innovation: toward a theory of innovation and interactive learning. Anthem, London
19. Lyngsnes K (2016) A reflexive eye on a collaborative action research project in school. Qualitative Rep 21:196–211
20. Midgley G (2000) Systemic intervention: philosophy, methodology, and practice. Springer US, Boston. https://doi.org/10.1007/978-1-4615-4201-8
21. Miettinen R (2002) National innovation system: scientific concept or political rhetoric. Edita, Helsinki
22. Ngongoni CN, Grobbelaar S, Schutte CS (2022) Making sense of the unknown: using change attractors to explain innovation ecosystem emergence. Systemic Pract Action Res 35:227–252. https://doi.org/10.1007/s11213-021-09564-x

23. Nilsson J-E, Uhlin Å, Stockholm (2002) https://urn.kb.se/resolve?urn=urn:nbn:se:bth-8572
24. Normann R (1982) Skapande företagsledning, 4th edn. Bonnier fakta, Stockholm
25. Pettigrew PJ (2003) Power, conflicts, and resolutions: a change agent's perspective on conducting action research within a multiorganizational partnership. Systemic Pract Action Res 16:375–391. https://doi.org/10.1023/B:SPAA.0000005487.02702.f0
26. Rasmussen LB (2004) Action research—Scandinavian experiences. AI Soc 18:21–43. https://doi.org/10.1007/s00146-003-0269-7
27. Reason P, Bradbury H (2005) Handbook of action research: concise paperback edition. Sage, London
28. Rittel HWJ, Webber MM (1973) Dilemmas in a general theory of planning. Policy Sci 4:155–169. https://doi.org/10.1007/BF01405730
29. Srivastva S, Cooperrider D (1987) Appreciative inquiry into organizational life. Res Organizational Change Dev 1:129–169
30. Torbert WR (1999) The distinctive questions developmental action inquiry asks. Manage Learn 30:189–206. https://doi.org/10.1177/1350507699302006

Figures

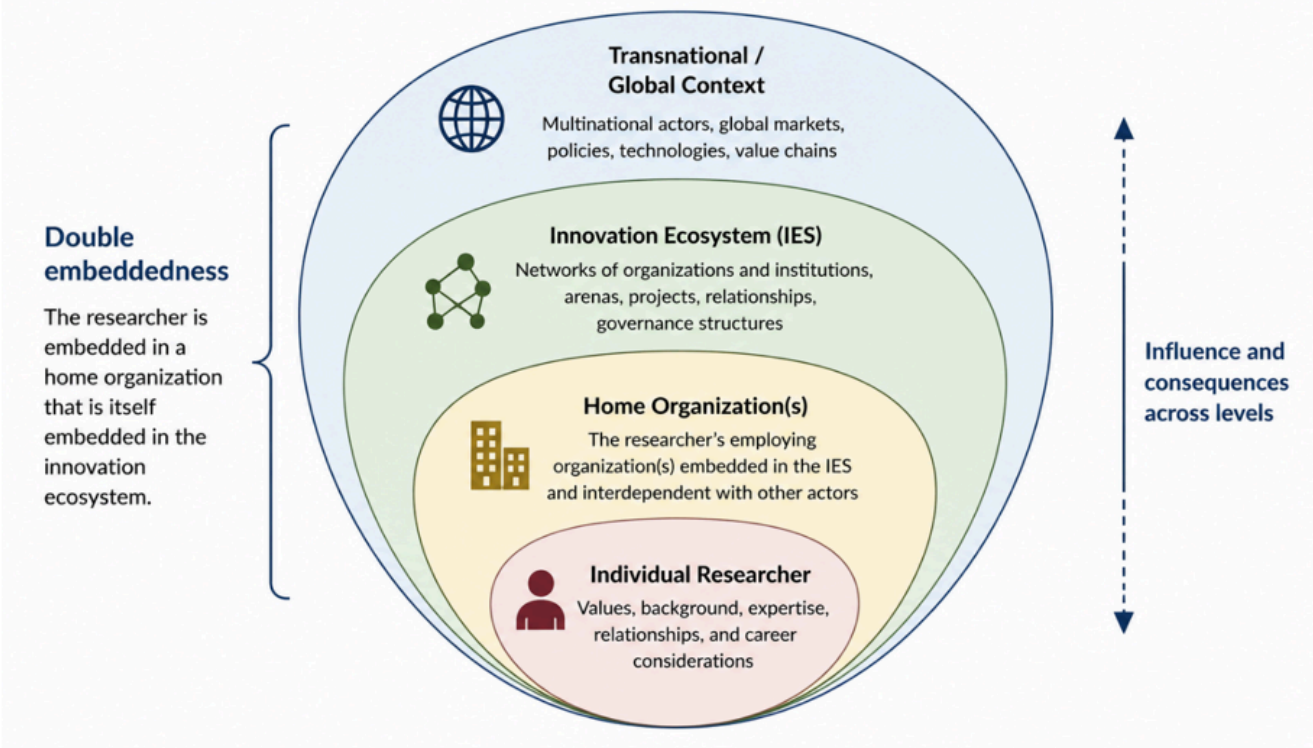


Figure 1

Double embeddedness in insider action research at innovation ecosystem level. The researcher is embedded in a home organization that is itself embedded in a wider innovation ecosystem and

transnational context. Source: corresponding author

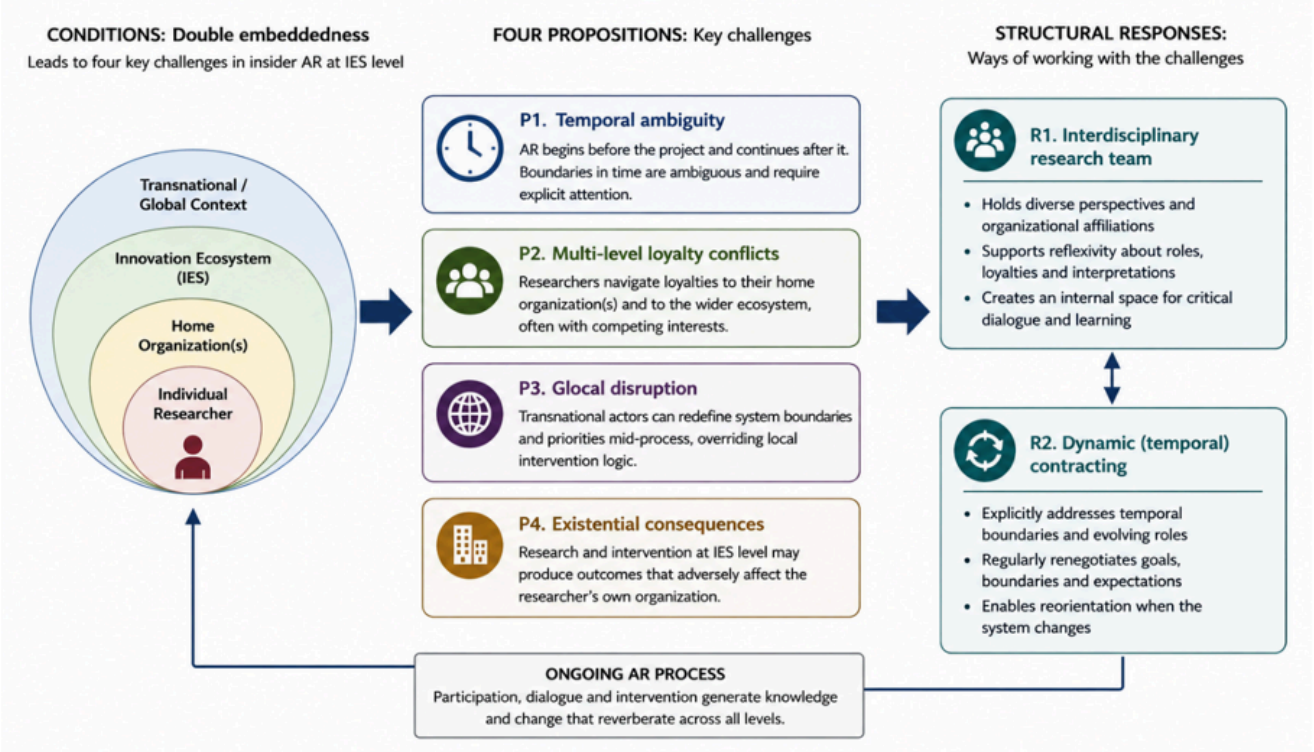


Figure 2

From conditions to response in insider action research at IES level. Double embeddedness generates four key methodological and ethical challenges (P1-P4). Two structural responses – an interdisciplinary research team and dynamic contracting – enable researchers to work with these challenges as the system and the inquiry co-evolve. Source: the corresponding author