

Knowledge Transfer as Contested Practice: Professional Hierarchy and the Mechanisms of Electronic Patient Record Implementation in an NHS Hospital Trust

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Research Article

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Abstract

Knowledge management research on health information technology has tended to treat implementation as a technical or managerial problem to be resolved through better system design or change management. Drawing on a longitudinal qualitative case study of Electronic Patient Record (EPR) implementation at an NHS hospital trust, this paper argues that knowledge transfer in professionalised healthcare settings is better understood as contested practice: a site in which technical, managerial and professional actors hold incompatible conceptions of what counts as knowledge, what counts as successful transfer, and what the technology itself is for. Drawing on thirty semi structured interviews, participant observation and documentary analysis conducted over an eight month fieldwork period, we show that the EPR project, despite securing early clinical cooperation, was progressively abandoned by clinical staff as an instrument of surveillance and administrative burden rather than a channel for knowledge circulation. We identify the mechanism through which this occurred: a mismatch between the declarative knowledge the system was built to capture and the procedural knowledge constitutive of clinical practice, compounded by the redistribution of new administrative burden along existing lines of professional hierarchy rather than its resolution by the technology. The paper contributes a multiple perspective framework for analysing knowledge transfer practice in professionalised organisations, extends affordance based accounts of generative mechanisms to a professionally fragmented setting, and offers guidance for organisations attempting technology enabled knowledge transfer under conditions of entrenched professional autonomy. More broadly, the case illustrates how policy commitments to research based knowledge circulation can fail in implementation when they are operationalised through, rather than independently of, existing professional hierarchy, a dynamic of relevance to health systems and policy actors seeking to translate research based knowledge management commitments into practice.

1. Introduction

Knowledge management research has long promised that information technology can make organisational knowledge more mobile: easier to capture, store, retrieve and apply where it is needed (Alavi and Leidner, 2001; Davenport and Prusak, 1998). Healthcare has been a particularly attractive setting for this promise, given the volume of information generated in clinical work and the cost of its loss or misapplication (Bose, 2004). In the United Kingdom, Electronic Patient Records have accordingly been positioned by policymakers, first through the National Programme for IT and subsequently through successive commitments to a paperless health service, as a vehicle not merely for digitising records but for transforming how clinical knowledge circulates within and across healthcare organisations (Greenhalgh et al., 2009).

The empirical record is markedly less optimistic than the policy rhetoric that accompanies it. Large scale UK health IT programmes have been characterised by delay, cost overrun and, in the most severe cases, abandonment (Robertson et al., 2010; Sheikh et al., 2011). Existing explanations for this pattern divide along disciplinary lines. Technical accounts emphasise interoperability failure and poor system design (Kuziemy and Varpio, 2011). Managerial accounts emphasise change management and stakeholder alignment. Sociological accounts emphasise professional resistance rooted in the defence of occupational jurisdiction (Ferlie et al., 2005; Currie and Suhomlinova, 2006). What is missing is an account that treats these three registers not as competing explanations but as simultaneously operating and mutually constitutive: an account of how technical, managerial and professional perspectives on knowledge itself interact to produce outcomes that none of the three groups intended.

This paper develops such an account through a qualitative case study of EPR implementation at an NHS hospital trust, referred to throughout as BP Trust, conducted between 2014 and 2015. The study comprises thirty semi structured interviews across technical, managerial and clinical roles, ten days of participant observation in the Accident and Emergency department, and analysis of organisational documentation including the project business case. Our central research question is how coexisting technical, managerial and professional conceptions of knowledge interact, through the mediating structure of professional hierarchy, to determine the trajectory of a major clinical information system implementation.

We argue that the EPR project failed to achieve its intended knowledge transfer function not because of a single point of technical or managerial failure, but because the system was built around a conception of knowledge, explicit, declarative, extractable and auditable, that was systematically at odds with the tacit, procedural and relationally embedded knowledge that constitutes clinical practice. This mismatch was not incidental. It was reproduced, and in places actively deepened, by the professional hierarchy the system was implemented into, such that new administrative burden created by the EPR was redistributed downward from doctors to nurses rather than absorbed by the technology as intended.

The paper makes three contributions. First, it specifies a precise generative mechanism, the collision between declarative and procedural conceptions of knowledge, for a pattern of clinical disengagement that prior research has attributed to generic resistance or jurisdictional defence. Second, it uses multiple perspective theory explanatorily rather than descriptively, showing that the interaction between incompatible perspectives, not merely their coexistence, drives implementation outcomes. Third, it identifies a boundary condition in affordance based mechanism theory: in a professionally stratified organisation, a single artefact generates divergent and competing affordances whose actualisation is mediated by pre existing occupational status hierarchy rather than by a shared organisational logic, a condition not yet articulated at the intra organisational, professional level in the critical realist information systems literature.

More broadly, the case addressed in this paper is a policy relevant one. The EPR programme it examines was not a purely local or technical initiative but the operationalisation, at organisational level, of a national policy commitment to research based knowledge circulation in health systems. The paper therefore speaks to a wider question in the health policy and systems literature: why commitments to evidence based knowledge management, made at policy level, so often fail to translate into practice at the level of the health system tasked with implementing them, and what role the receiving system's own professional structure plays in that failure. We return to this question directly in the discussion.

The remainder of the paper proceeds as follows. Section 2 reviews the knowledge transfer, health informatics and critical realist information systems literatures and consolidates the gaps this study addresses. Section 3 develops the theoretical framework combining multiple perspective theory, the declarative and procedural distinction, and affordance based mechanisms. Section 4 describes the case and the methods used to study it. Section 5 presents the findings, organised around three perspectives and a cross cutting mechanism. Section 6 discusses theoretical, methodological and practical contributions. Section 7 concludes.

2. Theoretical Background

2.1 Knowledge Transfer: Object Transfer and Practice Based Traditions

The dominant tradition in knowledge transfer research treats knowledge as an entity that moves, with more or less friction, from a source to a recipient (Szulanski, 1996; Szulanski et al., 2004). This tradition has produced a durable vocabulary. Knowledge can be sticky, resisting transfer because of causal ambiguity, low absorptive capacity on the part of the recipient, or an arduous relationship between source and recipient (Szulanski, 1996). It can also leak, moving beyond organisational boundaries against the interests of those who originally held it (Ritala et al., 2015). Much of this literature treats sender and recipient as relatively stable entities whose main challenge is overcoming friction in an otherwise well specified transfer process.

A second tradition, associated with Brown and Duguid (2000, 2001), Orlikowski (2002) and Tsoukas (1996), treats knowledge not as an object that survives transport but as something continuously enacted and reconstituted through situated activity. On this view, transfer is something of a misnomer for what is actually a process of reconstruction, negotiation or dissolution as knowledge encounters a new community of practice. Comparatively little empirical work brings these two traditions into direct contact within a single technology implementation, tracing how an artefact designed on object transfer assumptions is received by actors operating on practice based assumptions about what knowledge is and how it comes to be known. Efforts to bridge this gap through structural rather than purely technological means show mixed results: Wye et al. (2020), evaluating an embedded knowledge brokering team in an English healthcare commissioning context, found that even a dedicated multi-professional broker team depended heavily on senior sponsorship and secure funding to sustain knowledge flow across professional boundaries. This is the first gap this study addresses.

2.2 Knowledge Transfer in Healthcare Settings

The healthcare knowledge transfer literature has identified three recurring characteristics of the sector that complicate technology mediated knowledge circulation. Healthcare knowledge is markedly heterogeneous, encompassing clinical, administrative, technical and tacit craft knowledge that resist a common representational format (Nicolini et al., 2008). The sector is intensely professionalised, with strong occupational boundaries, particularly between medicine and nursing, historically defended to protect jurisdiction, status and autonomy (Ferlie et al., 2005; Currie and Suhomlinova, 2006; Currie and White, 2012). Healthcare organisations also operate under chronic uncertainty that makes standardised, evidence based approaches to knowledge transfer sit uneasily against the localised, contingent nature of clinical decision making (Gabbay and le May, 2004; Greenhalgh et al., 2009).

A systematic review by Pentland et al. (2011) found that most healthcare knowledge transfer research addresses either the tacit and explicit properties of knowledge in the abstract or individual level barriers and enablers, with comparatively little attention paid to how knowledge transfer unfolds inside a specific, bounded technology implementation. Ferlie et al. (2012) similarly note that health sector knowledge management research has been dominated by generic management literature poorly adapted to the specifics of professional bureaucracies.

More recent scoping and systematic reviews confirm that this picture has not substantially changed. Finnegan and Mountford (2025), reviewing twenty five years of electronic health record implementation research, found that the great majority of studies remain outcome focused, measuring whether implementation succeeded,

rather than process focused, tracing how the meaning of the system was negotiated among the groups who had to use it, and called explicitly for more process centred accounts of implementation. Dehghan et al. (2026), in a scoping review covering studies published between 2010 and 2024, identified weak governance, workforce shortages and lack of interoperability as recurring barriers to electronic health record implementation internationally, but treated these as a checklist of independent factors rather than as outcomes of interaction between differently positioned organisational actors. Olakotan et al. (2025), reviewing usability challenges in electronic health records within the NHS, showed that interface and workflow design choices systematically increase documentation burden and fragment clinical attention, but did not trace how this burden is subsequently redistributed among professional groups once a system is in use.

A smaller number of recent qualitative studies come closer to the phenomenon this paper addresses. Moy et al. (2023), interviewing doctors and nurses in United States emergency departments, found that electronic health record design fragmented clinical workflow into competing streams of attention and materially increased documentation burden, a finding that closely parallels the experience reported by clinicians at BP Trust. Karnehed et al. (2022), studying nurses using an electronic medication administration record in Swedish home healthcare, found that the system shifted nurses' professional role toward administration and that nurses responded by increasing their own delegation of tasks to healthcare assistants, a pattern of downward redistribution of burden that mirrors, at one professional level lower, the doctor to nurse delegation identified in the present study.

A further cluster of studies published since 2023 reinforces this picture. Torkman, Ghapanchi and Ghanbarzadeh (2025), drawing on seventy eight interviews across two Australian hospitals and using the same Braun and Clarke thematic analysis and NVivo supported coding approach adopted here, identified four themes describing healthcare professionals' experience of electronic medical records: engagement with the system, effects on job performance, collaboration among healthcare professionals, and quality of care and patient satisfaction. As with the studies discussed above, these themes are presented as coexisting categories rather than as elements interacting through occupational hierarchy, leaving open the question this paper addresses directly. Papadopoulos et al. (2024), reviewing qualitative research on public trust in national EPR systems, found autonomy and comprehension central to whether a record is trusted by those who must use it, consistent with the professional autonomy concerns raised at BP Trust, though addressing patient rather than workforce trust. Sarraf and Ghasempour (2025), reviewing evidence on artificial intelligence's impact on EHR related clinician burnout, similarly treat documentation burden as an established antecedent of burnout rather than examining how that burden is distributed unevenly across an occupational hierarchy.

Two further strands bear directly on the theoretical apparatus used here. Knop et al. (2024) and Stacey (2026), both writing in the *Journal of Advanced Nursing*, found that digital technologies reshape nurses' professional identity and their relations of power with other occupations, with Stacey's study finding that nurses can, under some conditions, use digital tools to clarify rather than erode their professional identity, in contrast to the erosion reported by nurses in the present case, a divergence we return to in Section 6.3. Pereira and Fernandes (2025), reviewing sixty nine studies of knowledge management in health organisations, identified no cluster addressing the interaction between technology design and occupational hierarchy directly. Karsikas et al. (2025), surveying one hundred and sixteen managers across six Finnish health and social care organisations, found that although almost every organisation's strategy mentioned knowledge management, close to half of managers reported insufficient resourcing in practice, a finding that echoes the gap this study observes

between BP Trust's business case and the resourcing of the requirements process needed to reconcile it with clinical practice.

In short, there remains limited research that treats a single electronic patient record implementation as a site where multiple professional groups simultaneously and differently experience knowledge transfer, and that analyses the interaction between their incompatible perspectives, rather than the perspectives themselves, as the explanatory object. This is the second gap this study addresses.

A parallel literature on task-shifting reaches a compatible conclusion through different methods. Sako, Qian and Attolini (2022) argue that a profession's jurisdictional control determines whether newly created digital tasks are absorbed into or displaced from that profession's remit, a logic this paper extends to a setting where the weaker profession absorbed what the stronger declined. Saga et al. (2024), interviewing physicians and leaders in Norwegian emergency departments, found task redistribution toward nurses was experienced as a cultural and relational challenge rather than a simple handover. Otsuka et al. (2023) found Japanese physicians particularly reluctant to delegate medical record entry itself, suggesting documentation carries jurisdictional significance beyond its time cost. Paier-Abuzahra et al. (2024), reviewing systematic reviews of physician to nurse task-shifting, found its effects on workload and professional satisfaction inconsistently measured across the literature, a gap this paper's mechanism based account is positioned to address.

The documentation burden literature has also expanded considerably since the studies discussed above. Shan et al. (2023), observing one hundred and forty five nursing shifts in a Chinese tertiary hospital, found frequent EHR task interruptions measurably raised nurse mental workload. Upadhyay and Hu (2022) found clinicians' assessments of EHR value varied systematically by role, with nurses more positive about efficiency gains than physicians, a divergence consistent with the affordance actualisation argument developed in Section 3.3. Sieck et al. (2020) found physician adaptation depended heavily on peer support and locally improvised workarounds rather than designed functionality. Blijleven, Hoxha and Jaspers (2022), reviewing sixty two studies, catalogue the forms such workarounds take and their consequences for patient safety, while Mörike, Spiehl and Feufel (2022) reframe workarounds as necessary local repair rather than deviance. Ball et al. (2024), following staff through a twelve month EHR transition, found clinicians absorbing a further, previously undocumented burden: managing patients' frustration with the new system.

2.3 Mechanisms, Affordances and Critical Realism in Information Systems Research

Critical realist information systems research explains observed events by identifying generative mechanisms, causal structures rooted in the properties of social and technical objects, rather than by statistical regularity (Wynn and Williams, 2012; Mingers and Standing, 2017). Bygstad, Munkvold and Volkoff (2016) operationalise this through the concept of affordances, the potential for action arising from the relation between a technology and a goal directed actor, actualised only under specific stimulating and releasing conditions. Their case, an airline IT architecture, derives three generalisable mechanisms, innovation, adoption and scaling, from a relatively unified professional and technical assemblage.

Subsequent work has extended this framework into healthcare settings, though not yet into the professionally fragmented pattern this paper identifies. Mihailescu and Mihailescu (2018), applying Archer's morphogenetic approach to a longitudinal case study of EPR implementation across three wards of a Swedish geriatric clinic,

identify three tentative generative mechanisms of digitalisation: data sharing, process streamlining and connectivity, which they describe as mutually reinforcing, each enabling the next. Their analysis is instructive for the present study in two respects. First, it demonstrates that professionally grounded resistance to declarative data capture is not unique to the NHS: nurses in their geriatric ward A continued to rely on paper notes during ward rounds despite the EPR mandate, and nurses in ward A rejected computer mediated handover in favour of oral handover, judging it necessary for patient safety, a pattern of situated, procedural reasoning that anticipates the declarative and procedural distinction developed in Section 3.2 below. Second, their morphogenetic model tracks structure and agency at the level of the ward as an undifferentiated collective of agents, rather than distinguishing systematically between the technical, managerial and professional actors whose divergent stakes are the analytical starting point of this paper. Where Mihailescu and Mihailescu describe three mechanisms that feed on each other toward cumulative digitalisation, the present case traces a single mechanism that fragments cooperation along the lines of professional hierarchy. The contrast is instructive rather than contradictory: it suggests that the direction of a morphogenetic cycle, cumulative or fragmenting, may itself depend on whether the workforce into which a system is introduced is professionally differentiated or comparatively homogeneous, a possibility their study does not test because it does not disaggregate agents by occupational position.

Bemgal and Haggerty (2019), studying the transformation of a hospital laboratory unit using a critical realist grounded theory approach, propose five candidate generative mechanisms, including one they term actualising affordances, but their case concerns a single occupational group working toward a shared transformation goal rather than divergent professional interests. Most recently, Ndubuisi Obi, Chen and Tsai (2025), in a fourteen year critical realist study of the District Health Information System in Sierra Leone, extend the Bygstad, Munkvold and Volkoff framework with two further mechanisms, infrastructural capture and socio technical debt, to account for the way a shared health information system accumulated instability across successive cycles of decentralisation, centralisation and fragmentation driven by different bureaucratic actors. Their study demonstrates that a single health information infrastructure can generate persistently competing demands from different institutional actors over time, supporting the plausibility of the boundary condition this paper proposes, but their unit of analysis is inter organisational and international rather than intra organisational and professional.

The affordance mechanism framework has, therefore, still not been applied to a single organisation in which the same artefact generates divergent, even directly competing, affordances depending on the professional position of the actor engaging with it, mediated by pre existing occupational status hierarchy within one workplace. Even the most recent extensions of the framework, including the CR based digitalisation literature exemplified by Mihailescu and Mihailescu (2018), address fragmentation between organisations, or treat the workforce as a relatively undifferentiated collective, rather than fragmentation between professions inside a single organisation. This leaves open the question of whether affordance based explanation retains its explanatory power, or requires modification, at this more granular, occupationally stratified level of analysis. This is the third gap this study addresses.

Recent work continues to extend affordance based and critical realist analysis beyond the settings addressed above. Wheaton and Kreps (2023) apply critical realism to unintended, harmful consequences of digital transformation in the gambling industry, demonstrating that generative mechanisms can produce outcomes unforeseen and unwanted by any actor, a pattern this paper's own burden redistribution mechanism shares.

Pandey and Zheng (2023), studying mobile health in India, show that an actor's social position, not only the releasing conditions specified by Bygstad, Munkvold and Volkoff, determines which affordances of a shared platform become available to them. Within the NHS specifically, Li et al. (2023), interviewing chief clinical information officers, and Payne et al. (2024), in a multi-site longitudinal study of hybrid general practice, both find that digital infrastructure continues to generate uneven, unresolved burden across professional groups, corroborating this paper's central finding in more recent NHS settings.

2.4 Consolidated Gaps and Positioning

Table 1 positions the present study against the recent literature reviewed above. Three gaps emerge, operating at different levels of the argument. The first is conceptual: the object transfer and practice based traditions in knowledge transfer research are rarely brought into contact within a single implementation. The second is empirical: healthcare knowledge transfer studies still predominantly examine one stakeholder group's experience in isolation rather than treating the interaction between groups' incompatible perspectives, captured within the same case, as the explanatory object. The third concerns a boundary condition in existing theory: affordance mechanism theory has been extended to inter organisational and international settings, and to occupationally undifferentiated single sites, but not tested within a single, professionally stratified hospital workforce, where the same artefact may generate competing rather than aggregating or cumulative affordances along lines of occupational hierarchy.

Table 1
Positioning of the present study against recent literature

Study	Setting	Method	Unit of analysis	What it establishes	What remains open
Bygstad, Munkvold and Volkoff (2016)	Airline IT architecture	Case study, critical realism	Single, professionally unified organisation	Affordances as generative mechanisms: innovation, adoption, scaling	Whether the framework holds in professionally fragmented settings
Mihailescu and Mihailescu (2018)	Geriatric clinic, Swedish hospital	Longitudinal case study, morphogenetic analysis	Ward level structure and agency cycle, undifferentiated agents	Three mutually reinforcing mechanisms: data sharing, process streamlining, connectivity	Mechanisms explicitly tentative; agents not differentiated by professional status
Bemgal and Haggerty (2019)	Hospital laboratory unit	Grounded theory, critical realism	Single occupational group	Actualising affordances among other mechanisms	Divergent affordances across occupational groups not examined
Moy et al. (2023)	US emergency departments	Semi structured interviews, examined separately	Doctors and nurses, examined separately	Workflow fragmentation and documentation burden as empirical outcomes	A theoretical account of why burden follows occupational hierarchy
Torkman, Ghapanchi and Ghanbarzadeh (2025)	Two Australian hospitals	Seventy eight interviews, Braun and Clarke thematic analysis, NVivo	Multiple professional roles, analysed as parallel themes	Engagement with EMR, job performance, collaboration and quality of care/patient satisfaction as parallel, non interacting themes	How these themes interact through occupational hierarchy
Ndubuisi Obi, Chen and Tsai (2025)	Sierra Leone health information system	Fourteen year critical realist case study	Inter organisational, national institutions	Infrastructural capture and socio technical debt as mechanisms of instability	Intra organisational, occupational fragmentation within one workforce
Present study	NHS hospital trust, EPR implementation	Thirty interviews, observation, documents	Technical, managerial and professional actors within one organisation	Occupational hierarchy alone generates divergent affordances from one artefact	Generalisation across other professionally stratified sectors

3. Theoretical Framework

3.1 Systems Thinking and Multiple Perspectives

Following Checkland (1988), the hospital is treated as a complex system exhibiting emergence, hierarchy, communication and control, properties that make single perspective analysis inadequate. Building on Linstone's (1989) multiple perspective theory, we distinguish three analytical lenses corresponding to distinct organisational positions. The technical perspective is concerned with system design, interoperability and the gap between designed function and actual use. The organisational, or managerial, perspective is concerned with cost, efficiency, accountability and the business case for transformation. The personal, or professional, perspective is concerned with the lived experience of practitioners: their autonomy, workload, professional identity and the tacit craft dimension of their work. We refer to this structure throughout as the technical, organisational and personal framework, following its use in the source fieldwork on which this study draws.

Each perspective is not simply a different opinion about a shared reality. Each constitutes a different reality of what the EPR is, what problem it solves, and what would count as its success. The technical perspective sees the EPR as an interoperability problem. The managerial perspective sees it as a cost and accountability problem. The professional perspective sees it as a threat to, or occasionally a support for, the knowing how that constitutes competent clinical practice, following Ryle's (2009) distinction between knowing that and knowing how. The framework's continued relevance is illustrated by Yoo (2021), who applies Linstone's multiple perspective model to Australian government organisations and finds it an effective device for integrating stakeholder perspectives and sustaining knowledge flow across collaborative projects.

3.2 Knowledge as Declarative and Procedural Practice

Fieldwork surfaced a further distinction, treated here as an emergent rather than an a priori element of the framework. Declarative knowledge is knowledge that can be stated as fact: test results, medication records, administrative data, the kind of knowledge the EPR was designed to capture. Procedural knowledge is knowledge embedded in the act of doing: clinical judgement, situational awareness, the capacity to prioritise among competing demands, the kind of knowledge clinicians argued the EPR could not, and in their view should not attempt to, standardise. This distinction was not built into the research design in advance; it emerged inductively during coding, once it became apparent that this was the recurring axis along which professional respondents explained their disengagement, and it is treated here as a sensitising concept discovered through analysis rather than a hypothesis specified before fieldwork began.

Much of what follows can be summarised in a single observation. The EPR was designed around an implicit theory of knowledge as declarative, while the actors whose cooperation it required operated with an implicit theory of knowledge as procedural. This is not simply a design flaw correctable through better requirements gathering. It reflects a deeper tension between the managerial need for auditable, transferable knowledge and the professional need for autonomous, situated judgement, a tension long noted in the sociology of professions (Freidson, 1988) but rarely traced through the fine grained mechanics of a specific information technology implementation.

Recent nursing research reinforces the procedural character of this knowledge. Dresser, Teel and Peltzer (2023) found that frontline nurses recognise patient deterioration through tacit, experience based cues that precede

any change in recorded vital signs, a form of knowing that resists declarative capture by design. Zhang et al. (2025), studying obstetric nurses' risk recognition, similarly found that clinicians actively manage conflicts between subjective clinical impressions and objective recorded indicators, precisely the tension this paper locates at the centre of EPR implementation.

3.3 Affordances and the Actualisation of Divergent Outcomes

Following Bygstad, Munkvold and Volkoff (2016), an affordance is the potential for action arising from the relation between a technology and a goal directed actor. Affordances are neither properties of the technology alone nor intentions of the user alone but emerge from their relation, and their actualisation depends on stimulating and releasing conditions present in the surrounding context. This concept provides analytic purchase on a pattern that recurs throughout the data. The EPR afforded different things to different actors. For nurses, it afforded, potentially, faster access to test results. For doctors, it afforded, unintentionally, new secretarial burden. For managers, it afforded improved cost coding and auditability. The same artefact, embedded in the same organisational context, generated divergent, and in places directly conflicting, affordances depending on the professional position of the actor engaging with it.

3.4 An Integrated Model

Figure 1 sets out how the three elements of the framework combine. The three perspectives sit at the top of the model, each generating a distinct conception of what the EPR is for. These conceptions map onto the declarative and procedural distinction, which in turn determines which affordances are actualised, and under what releasing conditions, for each professional group. The model's central proposition, developed empirically in Section 5, is that the same artefact generates different affordances depending on which perspective actualises it, and that professional hierarchy determines who ultimately absorbs the resulting burden.

4. Research Context and Method

4.1 Research Setting

BP Trust is an NHS hospital trust in England that implemented a commercial EPR system, referred to here as Alert, between 2011 and 2015, beginning in the Accident and Emergency department before extending, with mixed success, to other clinical areas. The project was formally justified through a business case emphasising improved data accessibility, reduced medical errors, more accurate patient tariff coding for the purposes of financial reimbursement, and progress toward national digitisation targets set by the Department of Health. Figure 2 situates BP Trust within the wider structure of the NHS in England, showing the macro, meso and micro levels at which decisions affecting the EPR project were taken; the fieldwork for this study was conducted entirely at the micro, operational level.

Figure 2. Organisational structure of BP Trust and the location of the case within the wider NHS hierarchy.
[Figure retained from original manuscript.]

4.2 Philosophical Position and Research Design

The study adopts a relativist ontology and an interpretive epistemology (Easterby Smith et al., 2012; Klein and Myers, 1999). This position follows directly from the theoretical commitment underlying our first research question: if knowledge is constituted through practice rather than existing as an external fact awaiting

discovery, a positivist, variance based research design would presuppose the answer to the very question the study investigates.

The study adopts a single, in depth qualitative case study design (Yin, 2013; Walsham, 1995), appropriate where the research question takes the form of how or why, concerns a contemporary phenomenon within its real life context, and where the researcher has no control over the events under study (Yin, 2013). Generalisability from a single case is claimed in the analytic rather than the statistical sense: the purpose is to extend and refine theory, specifically the technical, organisational and personal framework and affordance mechanism theory, rather than to produce claims that hold across a defined population.

4.3 Data Collection

Three data sources were combined over an eight month fieldwork period. Semi structured interviews were conducted with thirty participants, sampled purposively and through snowball sampling to capture the full range of stakeholder positions relevant to the technical, organisational and personal framework: six technicians and IT developers, seven project and IT managers, five clinical and medical managers, seven doctors and five nurses. Interviews were conducted face to face, lasting on average ninety minutes, with a range from forty five minutes to three and a half hours, and were audio recorded and transcribed verbatim. An interview protocol was developed and refined through a pilot phase involving three developers and four EPR users before the main fieldwork began.

Participant observation was conducted over ten working days in the Accident and Emergency department, focused on how staff used the EPR alongside residual paper based processes. Field notes were taken during observation and, where possible, discussed with participants afterward to check the accuracy of interpretation. Documentary analysis was conducted on organisational materials, including the EPR business case, which provided an independent check on claims made by interview participants about the project’s intended objectives and stated benefits.

Table 2 summarises the interview sample by role and by the perspective it represents within the analytical framework.

Table 2
Interview participants by perspective

Perspective	Role	Number of participants	Percentage of sample
Technical	IT technicians and developers	6	20%
Managerial	Project managers and IT managers	7	23%
Managerial	Clinical and medical managers	5	17%
Professional	Doctors	7	23%
Professional	Nurses	5	17%
Total		30	100%

4.4 Data Analysis

Analysis followed the six phase thematic analysis process described by Braun and Clarke (2006), combined with the template analysis approach of King and Horrocks (2010). Template analysis occupies a position between grounded theory, which relies on fully open coding, and matrix analysis, which relies on fully fixed categories established in advance. This approach was appropriate because the study entered fieldwork with sensitising theoretical concepts, the technical, organisational and personal structure, but required the coding process to remain responsive to categories that emerged only once data collection was underway, notably the declarative and procedural distinction described in Section 3.2.

All thirty interview recordings were transcribed in full and read repeatedly alongside field notes and documentary sources. Transcripts were then coded line by line using NVivo, which supported indexing of text segments to nodes, retrieval of coded material across the full transcript set, and the linking of analytic notes to specific codes. Nodes were generated inductively and refined iteratively through constant comparison across interviews. Coding proceeded through three levels: open coding assigned codes to discrete text segments, axial coding re categorised these into related clusters, and selective coding identified overarching themes from the axial clusters. Table 3 sets out the resulting coding structure.

Table 3
Template analysis coding structure

Overarching theme	Sub theme	Example open code	Perspective
EPR project characteristics	Interoperability	Standalone systems, disconnected departmental records	Technical
EPR project characteristics	Business case framing	Tariff accuracy, cost saving, auditability	Managerial
Knowledge transfer practice	Declarative capture	Data entry, test results, medication records	Technical, managerial
Knowledge transfer practice	Procedural resistance	No right or wrong procedure, situational judgement	Professional
Knowledge transfer practice	Delegation of burden	Documentation passed from doctors to nurses	Professional
Knowledge transfer practice	Loss of professional autonomy	Reduced control over pace and content of documentation	Professional
Knowledge transfer practice	Requirements gap	Insufficient clinical involvement in system design	Managerial, technical

Coded segments were subsequently checked against the full dataset to confirm that each theme held together internally and remained distinct from adjacent themes, consistent with recommended practice (Braun and Clarke, 2006); NVivo's node and source matrix functions were used to verify that themes were supported across multiple respondent types rather than resting on one or two accounts. The final thematic structure comprised two overarching themes: the characteristics of the EPR project in relation to collaborative clinical work, drawn primarily from technical and managerial accounts, and knowledge transfer practice itself, differentiated by perspective and cutting across the declarative and procedural distinction.

NVivo was used for the mechanical tasks of indexing, retrieval and cross case comparison, where computer assisted analysis adds genuine value in a dataset of this size, but it was not treated as a substitute for

interpretive judgement. The identification of the declarative and procedural distinction as a cross cutting analytic theme, and its subsequent tracing onto the structure of professional hierarchy, was an interpretive act carried out by the researcher. Where NVivo's structured node system proved too rigid to capture the cross referential coding required to connect themes across categories, coded material was exported and reconciled manually; we report this limitation rather than leave it unstated.

4.5 Quality Criteria and Ethics

Trustworthiness was pursued through four measures. Triangulation combined interview, observational and documentary sources. Respondent variety involved interviewing more than one person within each role category, reducing reliance on any single informant's account. Member checking involved discussing interpretations informally with key informants during and after fieldwork. Theoretical triangulation compared findings against two established frameworks, the technical, organisational and personal structure and affordance mechanism theory, rather than relying on a single theoretical lens.

All participants were guaranteed anonymity. The trust and all individuals referred to in this paper are pseudonymised throughout. The lead researcher's position as an external doctoral researcher with no institutional stake in the project's success or failure is noted as relevant to the interpretive validity of the account, since this positioning is likely to have supported access to critical perspectives that participants might have withheld from an internal evaluator.

5. Findings

5.1 The Technical Perspective: Interoperability as an Unmet Precondition

Technical staff consistently identified the absence of interoperability between the EPR and pre existing departmental systems, including laboratory, radiology and theatre management systems, as the central obstacle to the system functioning as intended. This was not merely a technical inconvenience: it directly undermined the declarative knowledge function the system was meant to serve. Where the EPR could not communicate with an existing system, such as the operating theatre's information management system, staff were required to manually reconcile records across systems, the very duplicative and error prone process the EPR had been introduced to eliminate. One technician argued that the entire premise of a standalone EPR was mistaken, proposing that a lighter touch clinical portal integrating existing systems would have served the organisation better than a system intended to replace them.

5.2 The Managerial Perspective: A Business Case Built on Declarative Knowledge

Managerial actors framed the EPR primarily in terms of accuracy, auditability and cost. The single most frequently cited managerial benefit was improved tariff coding accuracy, the administrative process determining NHS reimbursement for episodes of treatment. As the Clinical Director explained, the financial stakes of poor coding were substantial, with the trust losing close to seven hundred thousand pounds a year prior to the EPR's introduction. This framing treated clinical knowledge as fundamentally declarative: information to be captured accurately, retrieved on demand and audited for compliance and cost purposes. Management's account of

implementation difficulty was correspondingly framed in terms of resistance to be managed rather than a fundamental incompatibility of purpose to be resolved. The Clinical Change Manager estimated that a large majority of clinicians were not receptive to the change, and attributed this to a professional culture that experienced the EPR as a threat.

Several managerial informants acknowledged, in hindsight, that clinical involvement in requirements definition had been inadequate. One technician, reflecting a view shared more broadly among managers, observed that the implementation team had struggled to achieve a genuinely bottom up approach and had, in effect, developed pieces of software intended simply to replace paper with a computer screen.

5.3 The Professional Perspective: Declarative Capture Versus Procedural Practice

The professional perspective is where the central tension of this study is most visible. Health professionals, particularly doctors, initially welcomed the EPR on the understanding that it would support rather than supplant their existing practice. This support eroded as clinicians experienced the system as redistributing administrative work onto their own time, work previously performed by secretarial staff whose numbers had been reduced as part of the same transformation programme. The E prescribing Project Manager described the practical experience of prescribing through the system as long winded, requiring doctors to navigate multiple screens simply to record medication that would previously have taken a fraction of the time to write down.

More significantly, doctors reported that the additional administrative burden generated by the EPR was frequently delegated downward to nurses, reproducing rather than disrupting the existing professional hierarchy. The Clinical Change Manager summarised this pattern plainly, observing that physicians wanted the documentation work done for them rather than by them. Nurses, in turn, described absorbing this burden without any corresponding increase in professional recognition, career progression or reward. One nurse stated that nursing staff had no fear of losing job security or intellectual property to the new system, but had no time to take on additional work, and that what was needed was more staff, particularly more nurses.

Clinicians further distinguished between the declarative information the EPR was well suited to capture and the procedural judgement they regarded as constitutive of competent practice, insisting that the latter could not, and should not, be reduced to a standardised digital protocol. A consultant explained that in most clinical cases there was no single right or wrong procedure, that there were many ways of doing the same thing, and that although some steps were mandatory, these were often contested and could not be identified reliably in advance. This distinction is consequential: it explains why declarative knowledge success metrics favoured by management, coding accuracy and data completeness, coexisted with widespread professional experience of the system as a hindrance to, rather than a facilitator of, effective knowledge transfer.

Table 4 sets out representative quotations from each perspective, organised against the themes identified in Table 3.

Table 4
Illustrative quotations mapped to perspective and theme

Theme	Technical perspective	Managerial perspective	Professional perspective
What the EPR is for	"The whole point of the EPR system was to have one system that does everything" (Technician 6)	"We were losing almost seven hundred thousand pounds a year through poor coding" (Clinical Director)	"It has strongly intervened in the professional practice" (Technician 6, describing clinician sentiment)
Requirements process	"We are only developing some e-pieces to replace the paper by computer" (Technician 5)	"It is very difficult for suppliers to get a bottom up approach" (Technician 5, view shared by managers)	"What you designed is very clever, but this comes with too much stuff, which we don't need" (Clinical Change Manager, relaying clinician feedback)
Administrative burden	Not directly reported	"Eighty per cent of the clinicians are not up for change" (Clinical Change Manager)	"They want the documentation work to be done for them, not by them" (Clinical Change Manager, describing doctors)
Nature of knowledge	System centric rather than patient centric holding of information (Technician 1)	Tariff and coding accuracy as the primary measure of value (Clinical Director)	"There is no right or wrong procedures, but there are many ways to do the same things" (Consultant 4)
Consequence for nurses	Not directly reported	Not directly reported	"We don't have time to do more work. We need more staff, and especially nurses" (Nurse 3)

5.4 Professional Hierarchy as a Cross Cutting Releasing Condition

Drawing on the affordance framework set out in Section 3.3, the EPR can be characterised as affording at least three distinct outcomes, declarative capture, administrative redistribution and clinical disruption, whose actualisation depended on releasing conditions specific to each professional group. For doctors, the releasing condition was their capacity to delegate. For nurses, the absence of an equivalent capacity meant the same affordance, additional documentation work, was actualised as burden rather than choice. For managers, the releasing condition was the tariff coding system itself, which made declarative capture immediately and tangibly valuable regardless of its cost to clinical time. Professional hierarchy thus functioned as a background mechanism, largely unaddressed by the technology's design, that determined how the same artefact's affordances were distributed across the workforce.

Table 5 sets this pattern out systematically across the groups represented in the interview sample, and Fig. 3 presents the same pattern as a process map, tracing the flow of burden from the original business case through to its point of final absorption in the workforce.

Table 5
Affordance matrix across professional groups

Group	Affordance perceived	Releasing condition	Outcome actualised
Technicians	Interoperability and system integration	Absence of a supplier able to deliver full integration	Persistent manual reconciliation across systems
Managers	Improved tariff coding and audit accuracy	Direct link between declarative capture and reimbursement	Financial value realised, but attributed lower priority to clinical time cost
Doctors	Faster access to patient information	Capacity to delegate documentation tasks to nurses	Reduced net burden for doctors relative to nurses
Nurses	Faster access to patient information, in principle	Absence of a further group to delegate to	Increased net administrative burden, unmatched by reward or recognition

Figure 3. Mechanism map showing how the EPR generated divergent affordances mediated by professional hierarchy. Burden generated by declarative system design does not disappear: it is redistributed along existing lines of professional hierarchy until it settles on the group with no further group to delegate to. *[Figure retained from original manuscript.]*

6. Discussion

6.1 Theoretical Contributions

This study extends the knowledge transfer and health informatics literatures in three respects.

The first contribution concerns the mechanism behind professional resistance. Rather than attributing clinical disengagement to a generic resistance to change or a general defence of professional jurisdiction, as much of the sociology of professions literature has tended to do (Ferlie et al., 2005; Currie and Suhomlinova, 2006), this study specifies the mechanism precisely. Resistance tracks the mismatch between a system designed around declarative knowledge capture and a form of practice that is substantially procedural. Recent qualitative studies of documentation burden in emergency and home healthcare settings (Moy et al., 2023; Karnehed et al., 2022) have independently observed the empirical pattern this mechanism predicts, workflow fragmentation, increased administrative burden and downward delegation of tasks, but neither study offers a theoretical account of why this pattern occurs. This paper supplies that account, and in doing so offers a more testable and more falsifiable claim than the generic resistance explanation it refines.

The second contribution concerns the use of multiple perspective theory. Rather than using the technical, managerial and professional distinction as a descriptive device for organising findings, as in much prior multiple perspective work on information systems implementation, this study uses the distinction explanatorily. The interaction between incompatible perspectives, not merely their coexistence, is shown to be the mechanism producing implementation outcomes.

The third contribution concerns the boundary conditions of affordance based mechanism theory. Where Bygstad, Munkvold and Volkoff (2016) derive relatively unified innovation, adoption and scaling mechanisms

from a professionally cohesive setting, where Mihailescu and Mihailescu (2018) derive three mutually reinforcing digitalisation mechanisms from a ward level structure and agency cycle that does not disaggregate agents by professional status, and where Bemgal and Haggerty (2019) extend the framework to a single, occupationally unified hospital laboratory transformation, this study shows that in a professionally stratified organisation a single technology generates divergent and competing affordances, whose actualisation is mediated by pre-existing status hierarchy rather than by a shared organisational logic or a cumulative digitalisation trajectory. Ndubuisi Obi, Chen and Tsai's (2025) study of the District Health Information System in Sierra Leone demonstrates that competing demands on a shared health information system can also arise between organisations and institutional actors over an extended period, proposing infrastructural capture and socio-technical debt as the relevant mechanisms at that level of analysis. The present study identifies a related but distinct boundary condition operating within a single organisation and over a much shorter implementation period: occupational hierarchy, rather than inter-organisational politics or the ward level accumulation of digitalisation mechanisms described by Mihailescu and Mihailescu, is sufficient on its own to generate persistently divergent affordances from the same artefact. This boundary condition has not previously been articulated at the intra-organisational, professional level, and it suggests that affordance-based explanation may need to incorporate occupational status as a standing contextual variable whenever it is applied to a professionally stratified workforce, not only when it is applied across organisational or national boundaries.

This boundary condition also resonates with contemporaneous work on professional jurisdiction outside healthcare. Petersson (2025) argues that the materiality of digital health artefacts, not only their content, actively transforms the boundaries of physicians' professional knowledge, a materiality-based account compatible with the mechanism identified here. Trupia, Mathieu-Fritz and Duong (2021) propose a sociological framework for studying the invisible work users perform to make digital health innovations function, work this paper locates specifically among nurses rather than distributing it evenly across the professions engaged in digital health integration.

Returning to the policy-relevant question raised in the introduction, these findings suggest that the gap between research-based knowledge management commitments made at policy level and their operationalisation within a given health system is not primarily a gap of technical design or managerial planning. It is a gap produced by the receiving system's own professional structure, which determines whose conception of knowledge the technology ultimately serves. Policy actors and health system leaders seeking to translate research-based knowledge circulation commitments into durable practice would accordingly need to attend explicitly to the professional hierarchy of the implementing system, not only to the design of the technology itself.

6.2 Methodological Contribution

This study offers two methodological contributions. It provides a template for combining stratified, multiple perspective interview sampling with mechanism-focused thematic analysis in professionally heterogeneous organisational settings, offering future researchers a replicable structure for studying contested technology implementations. It also contributes a transparent account of the appropriate scope and limitations of computer-assisted qualitative analysis, specifying where NVivo's structured coding architecture proved inadequate for capturing cross-cutting, emergent analytic themes and how this limitation was addressed through manual reconciliation of coded material.

6.3 Practical Implications

Three practical implications follow from the findings. Requirements definition for clinical information systems must engage procedural, not only declarative, knowledge needs, and clinical input should shape how a system accommodates situational judgement, not only what data fields it contains. The distribution of new administrative burden created by a system should be explicitly planned and resourced, rather than left to default to existing professional hierarchy, since our findings show this default systematically disadvantages nursing staff, a pattern also visible one level further down the hierarchy in Karnehed et al.'s (2022) study of nurses delegating to healthcare assistants. Business cases built solely on managerial and financial metrics, such as coding accuracy and cost savings, are unlikely to secure durable clinical engagement in the absence of an explicit account of value for everyday clinical judgement, a conclusion reinforced by Karsikas et al.'s (2025) finding that stated knowledge management strategies in health organisations are frequently not matched by the resources needed to implement them in practice.

It is worth noting, briefly, that erosion of professional standing is not the only outcome digital technology can produce for a subordinate occupational group. Stacey (2026) found that nurses in some settings used digital tools to clarify and strengthen their professional identity rather than see it diminished. The difference between that outcome and the erosion described by nurses at BP Trust is plausibly explained by the mechanism identified in this paper: where a system is designed primarily around declarative capture for managerial and audit purposes, as the EPR was at BP Trust, professional erosion is the more likely outcome, whereas where a system is designed or adapted in ways that recognise and support procedural, relationship based skills distinctive to a profession, identity clarification becomes possible instead. This suggests that the declarative and procedural distinction developed in this paper may help explain divergent outcomes reported elsewhere in the literature, and is offered as a direction for future comparative research rather than a claim tested directly in the present case.

6.4 Limitations and Future Research

This is a single case study conducted within one NHS trust over a bounded period, and while this design affords depth, its generalisability should be understood in the analytic rather than the statistical sense (Yin, 2013). Future research should examine whether the mechanism identified here operates similarly in other professionally stratified settings undergoing comparable processes of digitisation, including settings, such as the Swedish geriatric wards studied by Mihailescu and Mihailescu (2018), where occupational stratification is less pronounced, in order to test directly whether the direction of a morphogenetic or affordance based cycle, fragmenting or cumulative, depends on the degree of professional differentiation in the workforce. Future work should also examine whether more participatory design processes for clinical information systems measurably alter the distribution of affordances described in Section 5.4 and Fig. 3.

7. Conclusion

This paper has shown that knowledge transfer practice around a major clinical information system implementation cannot be adequately understood through any single perspective, technical, managerial or professional, because each perspective constitutes a different reality of what the technology is for and what would count as its success. The central tension driving implementation difficulty at BP Trust was a mismatch between the declarative conception of knowledge embedded in the EPR's design and the procedural conception of knowledge that constitutes competent clinical practice, and this tension was channelled through, and often

deepened by, pre existing professional hierarchy rather than resolved by the technology itself. For researchers, this suggests the value of multiple perspective, mechanism based analysis in professionally fragmented organisations, and points to occupational differentiation as a variable that future critical realist and affordance based studies of health information systems, including studies in the tradition of Mihailescu and Mihailescu (2018), would benefit from incorporating explicitly. For practitioners, it suggests that durable knowledge transfer through technology requires designing not only for data capture, but for the professional and hierarchical dynamics through which that data capture is actually accomplished.

Declarations

Ethical considerations: All participants were guaranteed anonymity and the trust and all individuals referred to in this paper are pseudonymised throughout, as set out in Section 4.5. This study received ethical approval from the host trust's Research Ethics Committee in 2017 [Author: insert the committee's exact name and the approval reference number here before submission; the journal will require both].

Consent to participate:

Informed consent to participate was obtained individually from all thirty interview participants and from staff involved in the participant observation [Author: confirm here whether this consent was given in writing or verbally, as the journal will require this to be stated explicitly].

Consent for publication:

Not applicable. The manuscript contains no images, videos or individually identifying details beyond anonymised, pseudonymised quotations.

Declaration of conflicting interest

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Author Contribution

F.M. conceived and designed the study, secured ethical approval, conducted all data collection, including interviews, participant observation, and documentary analysis, carried out the formal analysis, and wrote the manuscript. F.M. is the sole author and takes full responsibility for the content of this work.

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Data Availability

The interview transcripts, fieldnotes, and documentary data that support the findings of this study are not publicly available due to the confidentiality and anonymity assurances given to research participants and the host NHS trust as a condition of ethical approval. Anonymised excerpts supporting the reported findings are included within the manuscript. Further access to the underlying data may be considered upon reasonable request to the corresponding author, subject to the terms of the original ethical approval.

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Figures

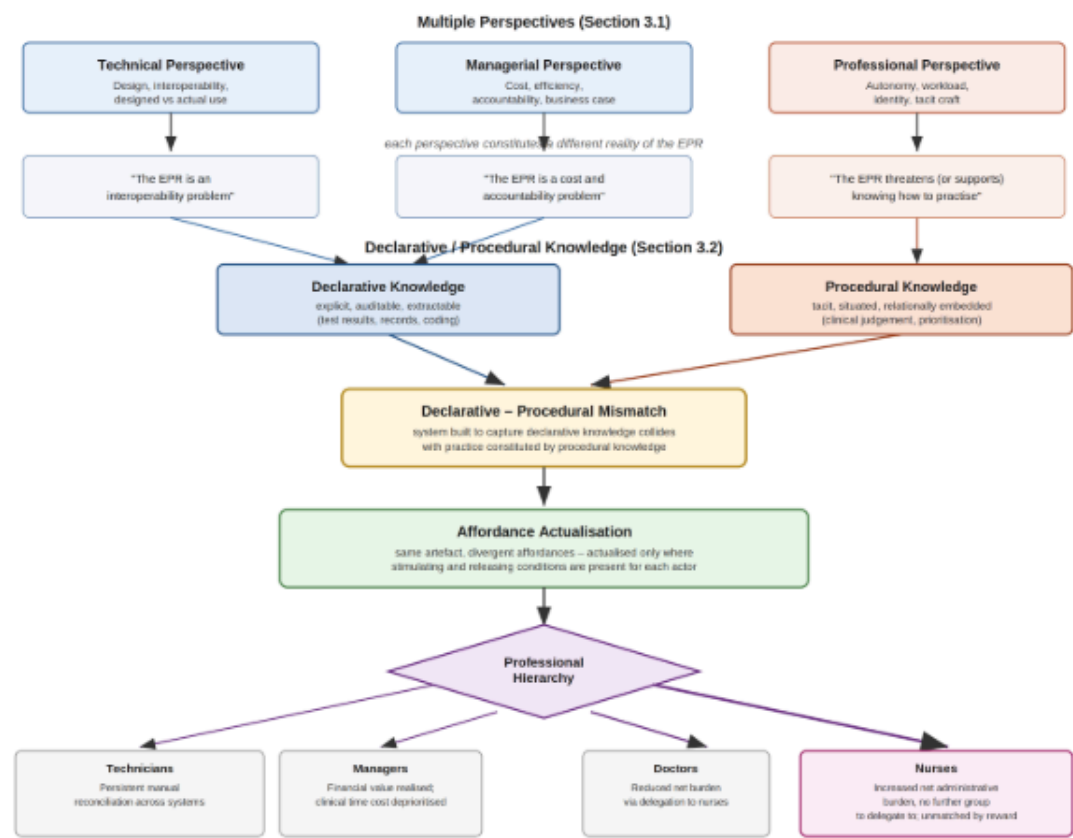


Figure 1. Theoretical framework linking multiple perspectives, knowledge type and affordance actualisation.
Burden generated by declarative design does not disappear: it is redistributed along professional hierarchy

Figure 1

Theoretical framework linking multiple perspectives, knowledge type and affordance actualisation.