Visualising care: representing decision models for conservation

Jane Henderson & Ashley Lingle

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Jane Henderson [1] and Ashley Lingle [2]

¹School of History, Archaeology and Religion, Cardiff University, Cardiff, United Kingdom;
²Department of Archaeology, University of York, York, United Kingdom

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Abstract

This article critically examines the visual models that represent conservation decision-making, arguing for a shift from linear, exclusionary frameworks toward inclusive, reflexive and systems-based approaches. Traditional models, such as decision trees, flow diagrams and scoring matrices, offer structure and clarity, particularly for novice practitioners. However they can oversimplify complex realities, prioritising measurable outcomes and technical certainty over subjective, emotional and ethical dimensions. These models risk narrowing our perspectives on care by marginalising stakeholders, reinforcing hierarchies and excluding diverse perspectives, particularly in sensitive or contested heritage contexts. We use case studies and examples including the Hillsborough disaster archive to discuss how prioritising material preservation over access and social responsibility can result in profound failures of care. In such cases, the conservator's role must shift from control to facilitation, recognising that true care may lie in enabling others' engagement with heritage. To address the limitations of the dominant visual models for conservation decision-making, the article proposes a systems-thinking approach that embraces complexity, interconnectedness and change. The care that conservators offer is reframed as a dynamic, co-evolving practice shaped by relationships across time, space and disciplines. A double helix model is offered that visualises this interplay, integrating material and socio-cultural dimensions of care. This model supports adaptive, feedback-informed decision-making that aligns technical actions with cultural meaning and long-term sustainability. Our care should value plural perspectives, embrace uncertainty and reposition conservation as an enabling, collaborative practice. By reimagining how care decisions are described we can better reflect the lived realities of heritage and the communities it serves.

Introduction

'Taking care' is a common way of describing the practice of looking after collections. This expression signifies the location of the power and control in that care practice. Conservators have long suffered difficulties in sharing their decisions, creating the impression of exclusionary practice.[1] In conceiving this article, the authors wondered whether exclusionary practice is inevitable due to the complex and sometimes technical nature of conservation, or whether it is chosen (even if unconsciously) and has become habituated, used without reflection or reflexion, making change difficult and exclusion the default. To explore this question, we focus on how conservators represent their decision-making processes visually. We wish to explore whether there is a reinforcing feedback loop within the profession of seeking to describe our own experiences based on our observations of how they are described in our professional spaces, rather than capturing our realities. The aspiration is to explore ways to widen the framework of understanding in conservation by representing a more open-ended process that may help us express our practice with less cer-

1 Alison Heritage, and Copithorne, 'Sharing Conservation Decisions: Current Issues and Future Strategies', *International Centre for the Study of the Preservation and Restoration of Cultural Property* (Rome: ICCROM, 2018), 200.

tainty. We wish to consider what the concepts of giving or taking care express, based on a concern that both centre the conservator as the actor and the care framed as a token that is offered and controlled by the conservation professional.

Decision-making in conservation

One way to examine the accessibility of conservation decisions is to look at how conservators describe their own decision-making processes. We hypothesise that many commonly used decision models in the conservation canon, and some of the academic writing that support them, prioritise measurable and certain factors, reflecting a cultural bias that values what can be quantified over what cannot.[2] These measurable and certain decision criteria create the positivistic trend in conservation that centres on provable facts and objective evidence whilst ignoring or decrying the subjective.[3] An unintended consequence of traditional conservation models is the de-prioritisation of emotion, connection and critical judgment; these qualities are often central to the value of the materials we care for. This disconnect becomes especially stark in sensitive cases. For example, conserving clothing linked to a brutal murder requires far more than knowing how fabrics fade or how to remove stains. Conservation cannot begin until conversations are held about what the garments mean to those affected. These conversations may produce complex, conflicting perspectives that resist easy translation into treatment steps.[4] Improving our metacognitive awareness, how we think about decision-making, could create space to challenge and reshape the foundations of our practice.

Unlike other areas of heritage work, conservation decisions are rarely reversible.[5] Conservators often assess complex systems with conflicting demands to make binary, sometimes permanent, choices: should this tear be repaired? Should the corrosion layer remain? The consequences of these decisions may later be experienced in dramatically different ways, depending on cultural, temporal or spatial context.

The illusion of a single best outcome

An early career conservator will evaluate multiple factors before deciding to remove a varnish. However, after years of repetition, this process can become instinctive, with decision cues fading from awareness. Expertise involves balancing intuition and analysis,[6] but if repeated without reflection, intuition can solidify into habit. Rather than recognising this shift as a loss of critical engagement, conservators may justify it as adherence to principles. When habit becomes codified as principle, repeating familiar practice becomes the measure of conservation success. This dynamic is reinforced by professional pressures. Conservators fear judgment by their peers, with professional bodies guiding interactions.[7] Yet the mechanisms for peers to evaluate a conservator's work are limited. Additionally, conservation has long been framed around identifying an object's ideal historical state,[8] reinforcing the belief in a single, correct outcome. As a result, a conservator's decision-making is often evaluated by a consideration of the outcomes rather than the process, creating the illusion of seeking fixed conservation truths rather than context-driven professional judgment.

To seek an alternative vision, we must counterpose this situation. If we believe that plurality is important when understanding an object, we must also recognise that plural perspectives mean multiple and potentially changing meanings. This will involve conservators involving others on conservation decisions which is a commonly described practice, but there

2 Donella Meadows, *Thinking in Systems: A Primer*, ed. Diana Wright (Vermont: Chelsea Green Publishing Company, 2008), 175.

3 Joseph A. Tainter and John G. Lucas, 'Epistemology of the Significance Concept', *American Antiquity* 48, no. 4 (1983): 707–19; Łukasz Sułkowski, 'Two Paradigms in Management Epistemology', *Journal of Intercultural Management* 2, no. 1 (2010): 109–19.

4 Jane Henderson and Tanya Nakamoto, 'Dialogue in Conservation Decision-Making', *Studies in Conservation* 61, suppl. 2 (2016): 67–78.

5 Hanna Hölling, 'Time and Conservation', in *Linking Past and Future. ICOM-CC 18th Triennial Conference Preprints, Copenhagen, 4–8 September 2017*, ed. Janet Bridgland (Paris: International Council of Museums, 2017).

6 Institute of Conservation (ICON), *Novice to Expert Scale. Adapted from the Dreyfus Model of Skills Acquisition: Dreyfus, S. E. (1981) and Dreyfus, H. L. & Dreyfus, S. E. (1984), Icon Accreditation Handbook* (London: Institute of Conservation, 2021), https://www.icon.org.uk/resource/novice-to-expert-scale.html (accessed 28 January 2024).

7 Australian Institute for the Conservation of Cultural Material (AICCM), *Code of Ethics and Code of Practice: Principle 6* (2002), Principle 6.

8 Barbara Applebaum, 'White Complicity and Social Justice Education: Can One Be Culpable without Being Liable?', *Educational Theory* 57, no. 4 (2007): 453–67.

9 Henderson and Nakamoto, 'Dialogue in Conservation Decision-Making'; Mariana Raimundo and Vivian van Saaze, 'Decolonising the European Conservation Curriculum', *Journal of the Institute of Conservation* 47, no. 3 (2024): 250–62, https://doi.org/10.1080/19455224.2024.2391280 (accessed 3 August 2025).

10 Hölling, 'Time and Conservation'.

11 Julia Giebeler et al., 'A Revised Model for Decision-Making in Contemporary Art Conservation and Presentation', *Journal of the American Institute for Conservation* 60, no. 1 (2021): 1–11, https://doi.org/10.1080/01971360.2020.1858619 (accessed 3 August 2025).

remains a fear of engaging non-conservation in technical decision-making.[9] This form of technocratic exclusion is one of the profession's unconscious or conscious biases. By exploring how conservators, consciously or subconsciously, approach their practice of care is it possible to shift from a singular authority dictating 'best practice' to a more inclusive, collaborative process? Rather than a fixed approach, conservation becomes an enabling practice, navigating multiple valid options and enhancing chosen meanings through accountable decision-making. We believe that inclusion in conservation decision-making requires a conceptual shift in the sector away from linear processes with controlled outcomes to deliver best practice. To deliver representative practice we must embrace multiple possibilities and the opportunities of uncertainty. The concept of giving care must give way from the measurable now to the experienced whole.

Challenging linear progression

Heritage research offers established precedents for rejecting linear temporal frameworks, instead privileging layered, cyclical and plural conceptions of time to account for the complex, lived rhythms of cultural memory and practice.[10] Although some of the conservation models describe fluid and iterative dynamic relationships in their writing,[11] by simplifying and presenting them as iterative flow charts (boxes in rows with arrows between), the visual models eschew dynamism and uncertainty in favour of clarity and structure with an impression of linear progression (see Fig. 1). This reduces the opportunities to capture emergence—the phenomenon where a complex system (such as the expression of heritage)
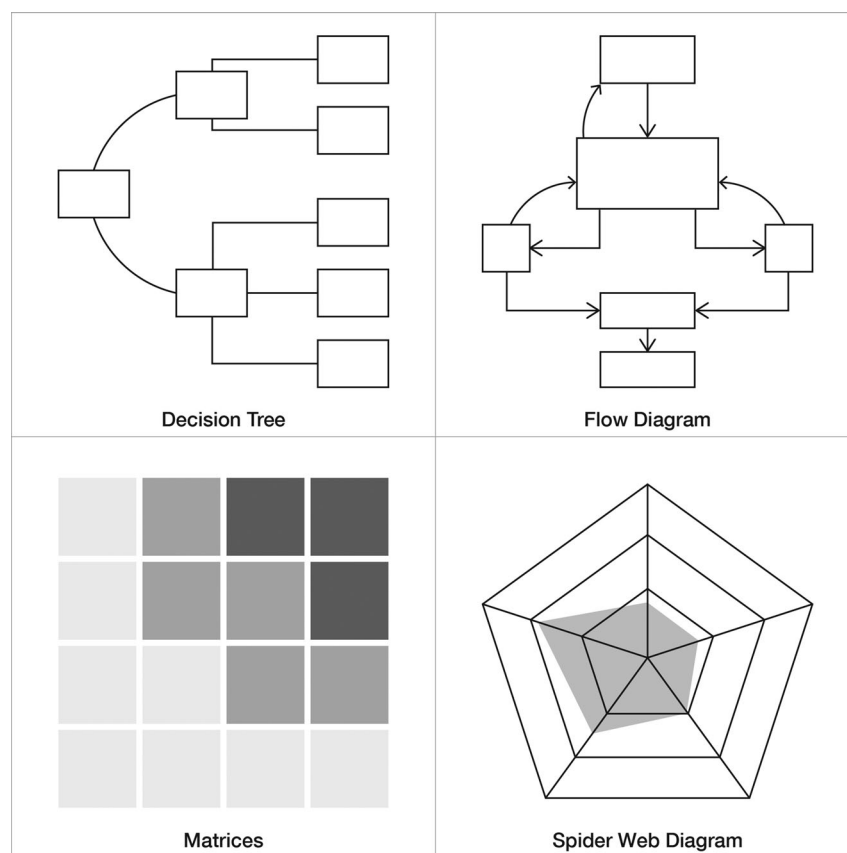

Fig. 1 Illustrative examples of visualised decision-making models commonly used in conservation. Clockwise from top left: decision tree, flow diagram, spider web diagram and matrices.

exhibits properties or behaviours that are new or different from the originating components. Peter Checkland explains emergence as 'entities [that] exhibit properties which are meaningful only when attributed to the whole, not to its parts'.[12] For conservation this would suggest that outcomes arise from the interactions and relationships between inputs but do not arise as simple, predictable, combinations of those inputs.

Through seeking clarity, flow-chart models suggest that each step emerges from prior conditions. It is possible to analyse the outcomes of a messy, creative, emergent process and produce a retrospective explanation with linear flow, but this retrospective clarification does not accurately capture the experience. Hanna Hölling attempts to challenge the concepts of permanence or of 'fixity' countering the idea of artworks as changing and evolving entities.[13] Conservation becomes another input in the recurring emergence of the artwork or heritage experience each time a new dynamic relationship can create unexpected outcomes. Emergence thrives on feedback, where outputs influence future inputs, as a performer responds to audience reaction or a dancer to their partner. This creates circular or recursive patterns that defy linear flow, a phenomenon that Renata Peters represents as concepts on a spiral to capture 'contemporary decision-making processes in conservation' as 'continuous, nonlinear, recursive and cross-disciplinary'.[14]

Decision-making from novice to expert

Dreyfus and Dreyfus's novice-to-expert model offers a useful framework for understanding professional development in conservation, forming the foundation of Icon's accreditation scheme.[15] The model outlines five nonlinear stages, from novices, who rely on rules and supervision, to experts who operate intuitively and adapt fluidly to context.[16] In conservation education, if decision-making is taught as a structured sequence —assess condition and significance, analyse and diagnose, plan treatment, then intervene—then this step-by-step approach provides structure and clarity for learners.[17] Recognising novice and beginner stages of development and ensuring educational challenges are appropriately constructed to operate in their zone of proximal development makes such as progressive task-based approach meaningful.[18] However, this sequence does not reflect how experienced practitioners work. Experts often make rapid assessments based on tacit knowledge, pattern recognition and contextual awareness.[19] Decision-making models should be different between novices and experts, not as a hierarchy but as a reflection of growth.

Crucially, progress from novice to expert is not automatic. Real-life expertise does not unfold in neatly defined stages and experts' practice is not the same as novices.[20] Consider an optometry student conducting an eye exam—it might take an hour, but an experienced practitioner can verify their findings in minutes. Recognising this reality invites us to re-evaluate how we frame, teach and communicate conservation expertise, and to consider whether our current narratives truly reflect how expertise works in the field.

Whilst education often frames decision-making as linear and logical, with structured stages marking professional growth, Henderson, Lingle, and Parkes argue for a model that embraces complexity, reflection, reflexion and nuance as signs of maturity.[21] Development depends on talent, motivation, feedback and access to learning opportunities.[22] Deliberate practice (not simply repetition) with effective feedback loops is needed to support this growth.[23] Mid-career conservators will sit across the spectrum with decision-making skills that are more holistic than entry level but less instinctive than experts. Over time the areas in which mid-career practitioners

12 Peter Checkland, *Systems Thinking, Systems Practice* (New York: John Wiley & Sons, 1999), 314.

13 Hanna Hölling, 'The Aesthetics of Change: On the Relative Durations of the Impermanent and Critical Thinking in Conservation', in *Authenticity in Transition*, ed. Erma Hermens and Frances Robertson (London: Archetype Publications, 2016), 13–24.

14 Renata Peters, 'Conservation and Engagement: Transforming and Being Transformed', in *Heritage Conservation and Social Engagement*, ed. Renata Peters et al. (London: UCL Press, 2020), 6–29, https://doi.org/10.14324/111.9781787359208 (accessed 28 July 2025).

15 H.D. Dreyfus and S.E. Dreyfus, 'Mind over Machine: The Power of Human Intuition and Expertise in the Era of the Computer', *IEEE Expert* 2, no. 2 (1986): 237–64.

16 Stan Lester, *Novice to Expert: The Dreyfus Model of Skill Acquisition*, Stan Lester Developments, 2005, https://devmts.org.uk/dreyfus.pdf (accessed 3 August 2025).

17 As for example following the ECCO competency framework for access to the profession; ECCO, *Competences for Access to the Conservation-Restoration Profession* (European Confederation of Conservator-Restorers Organisations A.I.S.B.L., 2011), https://www.ecco-eu.org/wp-content/uploads/2021/01/ECCO_Competences_EN.pdf (accessed 28 July 2025).

18 Lev Vygotsky quoted in Saul Mcleod, 'Vygotsky's Zone of Proximal Development and Scaffolding Theory', *Simply Psychology,* 1 February 2024, http://www.simplypsychology.org/zone-of-proximal-development.html (accessed 6 August 2025).

19 Gary Klein, 'Developing Expertise in Decision Making', *Thinking & Reasoning* 3, no. 4 (1997): 337–52.

20 S.E. Dreyfus, 'The Five-Stage Model of Adult Skill Acquisition', *Bulletin of*

Science, Technology & Society 24, no. 3 (2004): 177–81.

21 Jane Henderson, Ashley Lingle, and Phil Parkes, 'Reflexive Autoethnography: Subjectivity, Emotion and Multiple Perspectives in Conservation Decision-Making', in *ICOM-CC 20th Triennial Conference Preprints, Valencia 2021*, ed. Janet Bridgland (Paris: International Council of Museums, 2023).

22 Jane Henderson, Ashley Lingle, and Phil Parkes, 'Levels of Competence in Conservation Education/Niveles de Competencia en la Formación en Conservación', *Educación y pedagogía*, no. 3 (2024): 105.

23 Daniel Kahneman et al., 'Noise: How to Overcome the High, Hidden Cost of Inconsistent Decision Making', *Harvard Business Review* 94, no. 10 (2016): 38–46; Meadows, *Thinking in Systems*.

24 Kahneman et al., 'Noise'; Henderson et al. 'Levels of Competence'.

25 Chris Caple and Emily Williams, *Conservation Skills for the 21st Century: Judgement, Method, and Decision-Making* (London: Taylor & Francis, 2023).

26 Sanneke Stigter, 'Autoethnography as a New Approach in Conservation', *Studies in Conservation* 61, suppl. 2 (2016): 227–32, https://doi.org/10.1080/00393630.2016.1183104 (accessed 3 August 2025); Henderson, Lingle, and Parkes 'Reflexive Autoethnography'.

27 Stephan Michalski, 'Sharing Conservation Decisions: Tools, Tactics, and Ideas', in *Sharing Conservation Decisions: Current Issues and Future Strategies* (Rome: ICCROM, 2018), 183–204; Chris Caple, *Conservation Skills: Judgement, Method and Decision Making* (London: Routledge, 2000); H. Kalman and M. R. Létourneau, *Heritage Planning: Principles and Process*, 2nd edn (London: Routledge, 2020); Giebeler et al., 'A Revised Model for Decision-Making'.

28 Jane Henderson, 'Beyond Lifetimes: Who Do We Exclude When We Keep Things for the Future?', *Journal of the Institute of Conservation* 43, no. 3 (2020): 195–212.

29 Salvador Muñoz Viñas, 'Conservation Science, Conservation Practice and the Conservator's Knowledge: A Naïve Exploration', *Journal of the Institute of Conservation* 45, no. 3 (2022): 173–89.

30 Sian Jones and Thomas Yarrow, *The Object of Conservation: An Ethnogra-

become expert will extend from their core competency areas. For this article, it is sufficient to note that either they will have a step-wise approach or a holistic one with reflection and they are likely to identify with step-by-step progression models, even if on some occasions they operate far more fluidly than those models suggest.

How conservators describe care decisions

Mirroring our pedagogical approach, models shared in the professional literature tend to frame us as linear or processual decision makers working in the measurable now, seeking an ideal state that must be delivered to 'best practice' levels. This framing risks oversimplifying real-world expertise, which is often fluid, negotiated and context dependent. Growth is not automatic; it requires motivation, access, feedback and deliberate practice.[24] As conservators develop their skills, they can begin to gather a degree of comfort and security in their practice. A gap opens between how decision-making is described and how it unfolds in expert practice.[25] When decision-making models overemphasise certainty and structure, they may unintentionally suppress reflexivity, adaptability and responsiveness, the very qualities that define expert practice. Post-decision rationalisation often leans on broad notions of 'ethics' or tradition. Could this discrepancy be influenced by the lack of effective models to describe real-world practice?

To better reflect the realities of conservation, we must embrace models that support complexity, encourage reflexion[26] and recognise the limitations of step-based approaches. Expert decision-making in conservation is not simply the execution of knowledge, but an evolving, situated process shaped by judgment, experience and uncertainty. We contend that how we describe decision-making influences our conceptions of our practice. Thus, there is a value in discussing commonly used decision-making models and asking what opportunity there is to change and improve them.

Conservation decision-making models

Sequential decision-making methodologies for conservation abound.[27] It is thus beneficial to examine models which focus on the workflow of decision-making to reveal intended or unintended implications that stem from them. Decision-making in conservation is challenging; often our decisions are made in one-of-a-kind scenarios with little feedback from previous decisions. Where feedback opportunities exist, they may take decades to be of value. There is an inability to control variables, and our work is often high stakes with responsibility directly attributed to our actions.[28] Some conservators actively reject the ideas of structured scientific-style decision-making and argue for the centrality of the intuition that is carried by experts.[29] For example, Sian Jones and Thomas Yarrow note that divergent project assessments can come from practitioners with similar training but with different specialisations and personal experiences.[30] We acknowledge this perspective but also note that whether descriptions are technical or tactile, they often sit on a linear or processual model progressing forward with feedback loops. Some models insist that there is a clear interplay and interactions between elements which captures more nuance and complexity, however when this is captured visually this is reduced to a procedure with fixed start and end points.[31] In a sense, the models are like the game of snakes and ladders—although there are opportunities to loop back or forward the process inexorably moves from the starting point to the single best outcome at completion. A single thread that, even if iteratively reviewed, sits at the centre of decision-making with the conservator guiding progression from input to

output supports a conventional notion of giving and receiving care as a simple and predictable exchange. It can also risk excluding alternative temporalities and engagement. Our vision of care is of a shared, complex and generative process where many parties contribute to the heritage-making process and we seek a model of care that represents this.

A conservator with a rich and varied career may attempt to capture every decision and variable when building a decision-making model. If a panel is involved, each member will want their own practice represented. The results are models with often exhaustive considerations, presenting conservation as a process of carefully weighing every measurable option and metric. Yet, in practice, experts quickly narrow the decision pool, focussing only on the most relevant factors. Key priorities are obscured behind an excess of measurables, overvaluing technical details while diminishing crucial elements.

An inclusive, flexible approach to care must focus on identifying what matters most, rather than cataloguing every measurable consideration. The burden of a careful analysis of every option will weigh heavily on conservators, especially those who believe a 'best' course of action exists. To find this best outcome it becomes easier to narrow the decision-making perspective to a catalogue of smaller, easier tasks that are easier to measure and control. Collectively examining common representations of decision-making strategies provides insight into how the sector represents its processes. A simplified figure of these types of models is provided for illustration although the authors do recognise that the models offer more complexity and nuance (Fig. 1).

1 Sequence-based conservation decision-making

The first set of decision-making strategies examined are sequence-based models such as decision trees and flow diagrams. Sequential decision-making outlines a process where the decision-maker makes successive observations of a process before a final decision is made. In most sequential decision problems, there is an implicit or explicit cost associated with each observation.[32]

Decision trees graphically represent decision-making processes, showing options as branches connected to potential outcomes.[33] Chris Caple calls them valuable tools for conservators.[34] They provide accountability, divide decisions into components, and evaluate costs, benefits and risks. Decision trees simplify complex ideas numerically but may lack nuance for subjective factors. Limitations include inadequate weighting of measurables and restrictive criteria. Flow diagrams similarly visualise decision processes, illustrating stages and outcomes using formatting like colour or shape.[35] They are useful for modelling strategies in risk management, such as drainage installation or monitoring systems.[36]

2 Dynamic decision-making models

Dynamic decision-making models, including scoring systems and matrices, involve choosing actions over time to optimise outcomes in context.[37] Scoring systems, like decision matrices or web charts, assign values to criteria (e.g. material costs or owners' wishes), providing a structured approach to decision-making.[38] For example, scoring can help prioritise heritage elements based on significance or condition.[39] However, criteria may be excluded for lacking numerical scores, and balancing multiple perspectives often requires separate scoring grids, limiting usefulness in complex cases.

Decision matrices determine relative scores by aligning characters across categories, often used to assess risks in the heritage sector.[40] Stefan

phy of Heritage Practice (London: Routledge, 2022).

31 Giebeler et al, 'A Revised Model for Decision-Making'.

32 Jerome R. Busemeyer and Adele Diederich, 'Survey of Decision Field Theory', *Mathematical Social Sciences* 43, no. 3 (2002): 345–70.

33 Stephan Michalski and M. Rossi-Doria, 'Using Decision Diagrams to Explore, Document, and Teach Treatment Decisions', in *ICOM-CC 16th Triennial Conference Preprints, Lisbon, 19–23 September 2011* (Lisbon: Critério, 2011), 1–8.

34 Caple, *Conservation Skills*.

35 Reid Hastie and Robyn M. Dawes, *Rational Choice in an Uncertain World: The Psychology of Judgment and Decision Making* (London: Sage Publications, 2009).

36 Jane Henderson and Rob Waller, 'Effective Preservation Decision Strategies', *Studies in Conservation* 61, no. 6 (2016): 308–23.

37 Busemeyer and Diederich, 'Survey of Decision Field Theory'; Giebeler et al., 'A Revised Model for Decision-Making'.

38 Kalman and Létourneau, 'Heritage Planning'.

39 Ian MacLeod and Rinske Jantina Car, 'Determining Treatment Priorities for Ecclesiastical Textiles Using Significance and Conservation Assessments', *Journal of Cultural Heritage* 15, no. 6 (2014): 628–36.

40 Jonathan Ashley-Smith, *Risk Assessment for Object Conservation* (Oxford: Butterworth Heinemann, 1999); Robert Waller, *Cultural Property Risk Analysis Model: Development and Application to Preventive Conservation at the Canadian Museum of Nature* (Göteborg Studies in Conservation, Gothenburg: Acta Universitatis Gothoburgensis, 2003); Agnes Brokerhof and Anna Bülow, 'The QuiskScan—A Quick Risk Scan to Identify Value and Hazards in a Collection', *Journal of the Institute of Conservation* 39, no. 1 (2016): 18–28; Cordelia Rogerson and Paul Garside, 'Increasing the Profile and Influence of Conservation: An Unexpected Benefit of Risk Assessments', *Journal of the Institute of Conservation* 40, no. 1 (2017): 34–48; Caple and Williams, *Conservation Skills for the 21st Century*.

41 Michalski, 'Sharing Conservation Decisions'.

42 Jane Henderson and Shumeng Dai, 'Towards a Common Understanding of Standards?', in *Climate for Collections —Standards and Uncertainties. Postprints of the Munich Climate Conference 7 to 9 November 2012*, ed. Jonathan Ashley-Smith, Andreas Burmester, and Melanie Eibl (London: Archetype Publications/Doerner Institute, 2013), 21–34.

43 Rob Waller and Jane Henderson, 'The Problem of Compromise in Conservation and Exhibit Decision Making', *Collections* 20, no. 2 (2024): 298–312, https://doi.org/10.1177/15501906241232454 (accessed 3 August 2025).

44 Edgar Morin, 'A New Way of Thinking', *The UNESCO Courier*, 1996, https://en.unesco.org/courier/fevrier-1996/new-way-thinking (accessed 20 June 2023).

45 Hasheem Mannan et al., *Systems Thinking for Global Health* (Oxford: Oxford University Press, 2023); UK Government, *Introduction to Systems Thinking for Civil Servants: Driving Improved Outcomes in Complex Situations* (London: UK Government Office for Science, 2022), https://assets.

Michalski highlights their ability to distil complex issues into value judgments and aid shared decision-making.[41]

Spider web charts graphically represent multivariate data with axes beginning at a single point, effectively balancing decisions across criteria.[42] Though rarely used in conservation, they holistically address multiple variables in a single form, though assumptions about optimal outcomes and criteria disarticulation limit their effectiveness, similar to other methods.

3 Limitations of common conservation decision models

While these models are helpful for visualising choices they often oversimplify. Their comfort lies in turning complexity into ordered steps, especially reassuring for students or early-career conservators. But this clarity can come at a cost: a selective focus on simpler quantifiable measures removes elements from the decision space, making them invisible. In multi-stakeholder contexts, this can mean ignoring critical perspectives, mirroring systemic issues like colonial exclusions.

The sequence- and dynamic-based models described above reinforce an illusion of neutrality and certainty, obscuring unconscious bias. Most conservators are not trained in decision-making psychology, so the commonly used and referenced hegemonic models have a powerful influence on practice. Typically, they emphasise linear steps (even when iterative) framing care as something delivered by the conservator from a fixed present toward a defined outcome. The need to narrowly frame the concerns limits conservators to measurable technical decisions.[43]

A systems-thinking approach offers an alternative. It supports integrated thinking across material, ethical, social and contextual factors. Rather than following fixed sequences or ranking variables, systems thinking recognises interconnections and dynamic relationships. It encourages reflection on uncertainty, skill development and long-term impact, broadening the reflexive scope of care to include engagement, values and meaningful change. Letting go of control allows us to hold space for complexity, and to prioritise what matters most, not just what is most easily measured. Conservation often deals with emergent information and evolving circumstances, yet traditional models tend to promote rigid hierarchies and reductionist outcomes. While useful, these tools can constrain diverse thinking and be misapplied in complex contexts. We ask: can we create models that embrace fluidity, dissent, uncertainty and interconnectedness?

Systems thinking for conservation decision-making

Systems thinking encourages us to see conservation not as a set of isolated tasks, but as part of an interconnected whole: 'the whole is more than the sum of its parts'.[44] Understanding a system requires examining how elements interact, shape the whole and are shaped in return. In conservation, this shift in perspective can reveal the broader implications of our actions, such as their impact on sustainability and adaptability. It moves us from rigid systems that strive for stability (homeostasis) to ones that evolve in response to change (allopoiesis). Systems thinking has been applied across fields, from education to public health and governance and offers conservation a way to avoid overly compartmentalised or material-focussed approaches.[45] Focussing only on what we know now can create a false sense of certainty. Our knowledge is shaped not just by the questions we ask, but also by those we fail to ask.[46] Conservation can become caught in recursive practices, narrowing our focus to the present and the tangible. But as Paul Philippot reminds us, a work of art is not its materials alone, it is a unity that evolves over time.[47] Meaning lies in relationships, not just components.

1 Application of systems thinking in a conservation context

In response to this audit of currently available conservation decision-making models and approaches we propose the addition of the insights generated by systems theory. The sector has investigated systems-based approaches but nonetheless our predominant models remain hegemonic.[48] A system can be an institution like a museum, a network of people like a professional body or a project team. Each component in the system interacts with the others, consequently, changes to one component can have implications throughout the entire system. For example, imagine a historic building in need of repair; if the building is not properly maintained, it will deteriorate over time, which could lead to safety concerns, decreased property values and even loss of the building's historic significance. In this case, the physical structure of the building is just one component of a larger system that includes economic and social factors, such as the availability of funding for repairs, policy frameworks and the community's attachment to the building. To successfully conserve a heritage site, it is necessary to understand these interconnections and to develop strategies that take them into account. This may involve working with multiple stakeholders, including government agencies, community groups and private individuals, to develop a comprehensive approach to heritage conservation that addresses the needs of all involved.

In real-world problems where the 'control' of scientific conception is removed, every project or system has flexible boundaries, is influenced by its context, defined by its structure, function and role, and is expressed through its relations with other systems. Projects do not have fixed start and end points but rather offer multiple points of departure and opportunities for cyclical revision. Systems theory provides a method for the description of systems in which feedback-controlled regulation processes occur.[49] Systems thinking provides a lens for analysing conservation decisions on both spatial and temporal scales, by identifying the components of a conservation challenge, elucidating the relationships among them, and assessing how changes to one element may influence the system as a whole, and in turn, how the system may affect individual components.

2 Systems creativity and multiple perspectives

Systems thinking inspires us to conceive of the inter-relatedness of the elements of decisions. This universality connects aspects that are tangible and intangible, and through physical as well as temporal dimensions. A systems approach allows a coherent approach to our evolving and changing contexts, allowing conservation to be simply another change in the pathway of a thing. Jamie MacKee states that 'everything is a part of everything else, not only spatially but also temporally for [cultural heritage] since their creation there has been a continuum that ties these to each period in time as much as the previous and the future'.[50] This suggests that this heritage is interconnected to each period and relevant to each period in equal proportions. Conservation should then aim to maintain the coherence of associated narratives and meanings. This soft system approach allows the complex interaction between various activities and external factors impacting on cultural heritage management to be examined as a single entity. For example, the contributions made by human interaction, environmental impact and the properties of the material heritage itself, on the preservation or loss of a cultural object.[51]

3 Creative modelling to support conservation decisions

To capture conservation as a contributor to an interconnected journey of things, loosely inspired by systems thinking, we offer an alternative visual-

publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1079880/GOScience_Introduction_to_Systems_Thinking_2022v1.0.pdf (accessed 3 August 2025).

46 Pramod Paliwal, 'Sustainable Development and Systems Thinking: A Case Study of a Heritage City', *International Journal of Sustainable Development & World Ecology* 12, no. 2 (2005): 213–20.

47 Paul Philippot cited in Joyce H. Stoner and Muriel Verbeeck-Boutin, 'The Impact of Paul Philippot on the Theory and History of Conservation/Restoration', in Bridgland, *Linking Past and Future.*

48 Suzanne Keene, *Managing Conservation in Museums* (London: Routledge, 2012), 2; Jeremy Hutchings and May Cassar, 'A Soft System Framework for the Conservation Management of Material Cultural Heritage', *Systemic Practice and Action Research* 19, no. 5 (2006): 201–16; Jamie MacKee, 'Restoring Non-Secular Cultural Heritage in South and Southeast Asia in the Aftermath of a Natural Disaster', *Historic Environment* 23, no. 2 (2011): 48–56; Joelle Wickens and Anisha Gupta, 'Leveraging Systems Thinking to Dismantle Systemic Racism in Conservation', *Journal of the American Institute for Conservation* 63, no. 4 (2024): 259–76.

49 M.E. Schneider, 'Motivational Development, Systems Theory of', in *International Encyclopedia of the Social & Behavioral Sciences,* ed. Neil Smelser and Paul Baltes (Oxford: Pergamon, 2001), 10120–5.

50 MacKee, 'Restoring Non-Secular Cultural Heritage', 51.

51 Hutchings and Cassar, 'A Soft Systems Framework'.

isation for conservation decision-making. This model offers a more fluid and connected way of describing our decision-making, which is neither complete nor finished. It acknowledges relationships, response and continuity.

A systems-thinking model structured as a double helix offers a dynamic framework for cultural heritage conservation by capturing the evolving relationship between conservation interventions and contextual shifts, allowing for adaptive, feedback-informed decision-making over time. This model supports a more integrated and responsive conservation process, aligning technical actions with cultural meaning and long-term sustainability. Consider the conservation of a historic community theatre facing both physical degradation and declining public engagement. In the double helix model, one strand could track the material conservation needs such as stabilising the structure, repairing plasterwork and upgrading lighting, while the other strand would follow the socio-cultural dimensions, including the community's attachment to the theatre, its evolving use and local heritage narratives. As renovations progress, insights from community consultations might prompt design adjustments, thereby influencing the material strand. In turn, these material interventions may reinvigorate community interest, generating new cultural practices and stewardship models, illustrating the dynamic, co-evolving nature of the double helix in practice.

The double helix model could be applied to the conservation of the Edward Colston Statue in Bristol in the UK, a site of intense public scrutiny following its toppling during the 2020 Black Lives Matter protests. In the double helix model, one strand could track the material conservation needs, such as stabilising the paint, managing corrosion and documenting distortions sustained during its fall, while the other strand would follow the socio-cultural dimensions, including contested public memory, ethical considerations around display and the broader reckoning with colonial legacies. As conservation planning progressed, public consultations and curatorial debates informed decisions about whether and how to conserve the statue, influencing material approaches.[52] In turn, the physical treatment and recontextualisation of the statue, now displayed horizontally in a museum with interpretive materials, have catalysed new conversations around history, representation and public space. This demonstrates the double helix model's capacity to reflect and guide the co-evolution of material and cultural dimensions in complex heritage conservation.

By offering this visualisation we are not presenting a definitive model for all decision-making, but it is intentional that we challenge the linear and sequential nature of many of the common models. We suggest that for more complex conservation processes and for expert practitioners this may help their reflexive thinking on their own practice in a non-reductionist way. We hope that more fluid models will allow others to see and interpret connections in the system in which they are working and provide a conceptual framework to more practically incorporate opposing views, neglected aspects, connections and disconnections. In attempting to represent the management of complexity we hope to create greater opportunities for inclusive practice and embracing dissenting opinions rather than failing to capture the impact of each input upon the other.

Based on the double helix of DNA, our model presents past and future as entwined and supportive features, with present condition at a random point (Fig. 2). We seek to draw attention to the commonalities of past and future. The double helix model embraces fluidity by allowing continuous movement and feedback between the dimensions of conservation. Evolution represents a purposeful thread that is built on both by mutation and continuity. It accommodates dissent and uncertainty by positioning

52 Fran Coles, 'Conserving Bristol's History as It Happens', *Iconnect Magazine: The Magazine of the Institute of Conservation*, Winter 22/23 (2022): 12–8.

Fig. 2 A DNA helix-inspired model of the interconnectedness of factors in conservation decision-making. When using this approach, the past and future are not lined up one on either side of the present but are always present in all the nodes and can be treated as relevant all the time.

conflicting values and unpredictable outcomes as generative forces that inform rather than obstruct decision-making. Through its intertwined structure, the model foregrounds interconnectedness, illustrating how material conditions, cultural meanings and stakeholder perspectives are mutually shaping over time. Integrating a soft systems structure, we draw on Checkland's framework recommending the following elements of the system: Customers, Actors, Transformation process, World philosophy, Ownership and the Environment (CATWOE).[53] We argue the following elements can be more broadly applied to conservation decision-making: values, uncertainty, materiality, resources, skills and stakeholders. Weighting these aspects across the past and future in terms of consequences, traditions, risk, actions and options, offers a pathway for a more holistic assessment of complexity. For example, the prioritisation of traditional craftsmanship in the restoration of a historic monument may differ markedly from the stakeholder-driven negotiations required in the adaptive reuse of an industrial site, highlighting the need for context-sensitive application of these elements.

The model is intentionally constructed with space to allow other features in decision-making to be placed within the DNA chain. Such decision criteria may exist only in the past, may join past and future, or may only be a future option. There is no intention to provide all the decision-making criteria, instead the authors envisage that conservation decision-makers add their own criteria.

Exclusionary practices in conservation decision-making

When conservation decisions exclude individuals from heritage, it may result from ignorance, inaction or disregard for downstream consequences. To improve decision-making, we must consider outcomes across broad social and temporal dimensions. A key example is the prohibition of touching documents, often linked to recommendations by conservators.[54] Consider the case of archives in the justice campaign for victims of the Hillsborough disaster of 1989 when 97 Liverpool FC fans were crushed to death in a crowd surge at a football match in Sheffield, UK. The official time of death for most of the victims was determined to be between 2:57pm and 3:15pm. This timeline was subject to a prolonged dispute between the authorities and the bereaved families who argued that their loved ones could have survived if they had received timely medical intervention. The Hillsborough Independent Panel, set up in 2009, used the archival records to produce a report in 2012, which exposed the institutional failure and the alteration of evidence.[55] A second inquest concluded that 96 of the victims were unlawfully killed and that 28 of them had signs of life after 3:15pm. Consider the moment when family members accessed the actual time of death records from the Hillsborough enquiry—they might crumple the page or cry onto these archival fragments yet obviously denying access to prevent paper 'damage' would represent a profound failure of care.[56] Prioritising material fragility over the political and ethical significance of access ignores critical factors.[57] True conservation considers preservation with social responsibility; success depends on how practices are applied within their broader context. The essential care in this scenario is social and beyond any traditional technical definition of conservation. The conservators will neither give nor take care of the archives, the care that is required is that of the families and the conservator's role is to relinquish control. Balancing concerns of authenticity, the management of ephemeral materials and conflicting temporal priorities requires a more nuanced framework, one that recognises the Hillsborough archive not only as a fragile assemblage but also as a living witness embedded in ongoing struggles for justice, memory and care.

53 Peter Checkland, 'Soft Systems Methodology: A Thirty Year Retrospective', *Systems Research and Behavioral Science* 17, suppl. 1 (2000): S11–S58.

54 Jane Henderson and Ashley Lingle, 'Touch Decisions: For Heritage Objects', *Journal of the American Institute for Conservation* (2023): 1–13.

55 The National Archives, HO536 *Hillsborough Independent Panel Website*, Home Office, 1782, Inquiry into Hillsborough Stadium Disaster, 1989–1990, 2012, https://discovery.national archives.gov.uk/details/r/C14176659; The National Archives, 'The Hillsborough Independent Panel', n.d., https://discovery.nationalarchives.gov. uk/details/r/C14176659 (both accessed 28 January 2024).

56 David Sarsfield, 'Hillsborough: The Archive as a Vehicle for "Truth Recovery"', *British Online Archives*, 2021, https://microform.digital/boa/posts/category/articles/423/hillsborough-the-archive-as-a-vehicle-for-truth-recovery (accessed 28 January 2024).

57 Helia Marçal and Rita Macedo, 'From the Periphery to the Centre: Community Engagement and Justice

Exclusion in conservation often stems from poor communication and inaccessible language.[58] Words and actions exist within real social and political contexts, carrying meanings that vary between different groups. Unfortunately, some in the heritage sector still perceive conservators as poor team players, disconnected from their institutions' broader missions.[59] This perception may be reinforced by a cycle of exclusion—both being excluded from, and withdrawing from, institutional decision-making. Some conservators, feeling powerless within their organisations, may compensate by asserting control over technical decisions at the conservation bench.[60] In turn, overly technical language can create an illusion of authority and expertise, which may feel reassuring when professional status feels threatened.[61] The problem deepens when communication is further clouded by semantic uncertainty—the use of imprecise or jargon-heavy terminology.[62] Consider the term 'damage'. Officially, European conservation standards define it as a 'non-beneficial alteration'.[63] Yet, the term is also used to describe wear from use, vandalism or any material change, carrying strong negative connotations such as harm, loss and impairment. In contrast, 'change' can imply uncertainty but also progress, adaptation and growth.[64] If a conservator labels any use-related change as damage, they have already framed the conversation negatively, potentially leading to conflict rather than collaboration.

Physics dictates that all interactions create change, making use and transformation inseparable from heritage conservation. An educator might view wear as evidence of learning, engagement and growth.[65] However, if a conservator's response to use is solely that it leads to damage, then use itself becomes a problem. Take the Hillsborough archive: no amount of data on paper quality, ink composition or prior damage outweigh the primary concern of bereaved families seeking truth. If conservators prioritise exhaustive technical factors equally, they risk making the wrong choice. Narrow framing risks alienating other stakeholders and reinforcing conservation's exclusion from wider institutional and public discourse. Shifting communication toward broader, more inclusive language—one that recognises multiple perspectives—can help break this cycle, ensuring conservation remains an enabling, rather than restrictive, practice. Thus, conservators may tend to narrow their focus to the technical aspects they feel they can control whilst seeking to deliver an illusory single and best outcome. This control of care excludes intangible values and multiple perspectives, creates stagnation and is ignorant of exclusionary practices.

Responsive conservation

Much of our description of practice follows logical measurable steps from a definitive start to a best end. We argue that the sector should reframe from the measurable now versus the experienced whole. Donella Meadows invites us to dance with the system: 'we can't control systems or figure them out. But we can dance with them!'—because we learn to 'stay wide awake, pay close attention, participate flat out, and respond to feedback', to move in flow with the challenge.[66] Just as you first learn to dance by studying steps and foot positions, you embody dance when you respond quickly to changes, understand the whole and share goals with your dance partners. The success lies first in the mastery of the elements but ultimately in the partnership and shared embodiment of the spirit of the piece. Perhaps we can envisage conservation making this form of progression?

If culture is lived, felt and intuitive, then experiencing it goes far beyond measuring or categorising it. Culture isn't just data or abstract theory—it's how people live, connect and create meaning. Caring for culture, then, cannot be a fixed, linear act rooted solely in the present.

in Conservation Decision Making', in Bridgland, *Linking Past and Future*, 1905.

58 Jane Henderson, 'Influence: The Impact of Language, Credibility and Gender', *The Conservator* 29, no. 1 (2005): 63–72.

59 Janet Berry, Louise Hampson, and Adam Klups, 'Conservation for Mission: Conservation of Historic Church Interiors in the Church of England', *Studies in Conservation* 65, suppl. 1 (2020): 1–8.

60 Marçal and Macedo, 'From the Periphery to the Centre'.

61 Suzanne Thomassen-Krauss, 'Conservation in the Public Eye: Musings from the Other Side of the Glass', in *The Public Face of Conservation* (London: Archetype Publications, 2013), 143–8.

62 Henderson and Dai, 'Towards a Common Understanding of Standards?'.

63 British Standards Institute, BS EN 15898: 2019, *Conservation of Cultural Heritage–Main General Terms and Definitions* (2019).

64 Naomi Luxford and David Thickett, 'Change or Damage? Using Dissemination to Encourage Public Involvement in Conservation Research', in *The Public Face of Conservation*, ed. Emily Williams (London: Archetype Publications, 2013), 66–75.

65 Ellen Pearlstein, 'Conserving Ourselves: Embedding Significance into Conservation Decision-Making in Graduate Education', *Studies in Conservation* 62, no. 8 (2017): 435–44.

66 Meadows, *Thinking in Systems*.

Conservation must become a process of dancing with culture—responsive, attuned and sensitive to its rhythms and shifts. Different dances follow different beats and movements, but none are defined solely by their steps. In the same way, our efforts to be exhaustive and comprehensive in conservation can unintentionally drown out the very rhythm we're trying to protect. A rigid model may silence nuance; a flexible one can amplify meaning. The model we propose leaves space—space for practitioners to bring their own concerns, for values to shape decisions, and for past, present and future to remain fluid and interconnected. It aims to weave together practice and pragmatism with human insight and philosophical reflection. By embracing this dance, we allow conservation to move with culture, not merely preserve it. In doing so, we honour cultural heritage not just for what it was, but for what it means to people now, and into the future.

Conclusion

Conservators, like all humans, may have a weak insight into their decision-making methods so the consequences of their decisions are substituted as a metric for evaluation. The quality of outcome is not a guaranteed output from the quality of the decision-making process, but the examination of outcomes does provide opportunities for reflection. At times the consequences of conservation practice are woefully underexamined. A treatment may be examined on the bench and pronounced effective—a coating has stuck, or a retouch is satisfying—but this narrow examination of the deliverables is not an examination of the outcomes. Like any other heritage professional, the conservator may be ignorant of the social impact of their decisions. A narrow framing of the task and outputs, especially a technical framing, allows a reductionist assessment of conservation practice that fails to recognise that any 'care' given to the heritage is only a good outcome if there is a consequent care for the people for whom that heritage matters.

Understanding the past and working toward the future are both active, evolving processes rooted in the present. In conservation, our assessments of condition and discrepancy are always made in the now, and shaped by present-day values, knowledge and biases. As time passes, our interpretations of both past and future shift, continually reframed by the present moment. While existing decision-making models in conservation have value, we must do more to address dynamic complexity and move beyond the illusion of a fixed past or a predictable future. Systems thinking helps us embrace this complexity. It invites us to consider relationships, patterns and change over time, rather than isolating variables or pursuing linear solutions. As Meadows warns, 'pushing for control destroys diversity'.[67] By decentring objectivity, we open space to acknowledge subjectivity, lived experience and context as valid and valuable elements of conservation decisions. Instead of striving to measure and control every variable, we can prioritise what matters most honestly and fluidly. This shift allows us to reflect on unseen influences and overlooked consequences, including those from inaction. Systems thinking guides us to move from a structured cause-and-effect mindset toward a more holistic, relational narrative, where care is not just measurable in the present, but meaningful for people across time.

67 Meadows, *Thinking in Systems*.

ORCID
Jane Henderson http://orcid.org/0000-0003-3027-8452
Ashley Lingle http://orcid.org/0000-0002-0825-9426

الملخص

تصوير العناية: تمثيل نماذج اتخاذ القرار في الترميم

تتناول هذه المقالة بالنقد النماذج البصرية التي تمثّل عملية اتخاذ القرار في مجال الترميم، داعيةً إلى الانتقال من الأطر الخطّية و الإقصائية نحو مقاربات شاملة، تأملية، قائمة على التفكير النظمي (systems-based approaches). فرغم أن النماذج التقليدية - مثل أشجار القرار (decision trees)، والمخططات الانسيابية (flow diagrams)، ومصفوفات التقييم - توفّر بُنية ووضوحًا، خصوصًا للمرممين المبتدئين، إلا أنها كثيرًا ما تُبسّط الواقع المعقّد، من خلال تركيزها على النتائج القابلة للقياس واليقين التقني، متجاهلةً في المقابل الأبعاد الذاتية، والوجدانية، والأخلاقية. تُخاطر هذه النماذج بتضييق نطاق فهمنا للعناية، من خلال تهميش أصحاب المصلحة، وتعزيز الهياكل الهرمية، وإقصاء وجهات النظر المتنوعة، لا سيما في السياقات التراثية الحساسة أو المثيرة للجدل. من خلال دراسات حالة وأمثلة - من بينها أرشيف كارثة هيلزبورو (Hillsborough disaster archive) - تناقش المقالة كيف أن إعطاء الأولوية للحفاظ المادي على حساب الإتاحة والمسؤولية الاجتماعية يمكن أن يؤدي إلى فشل جوهري في تقديم العناية. ففي مثل هذه الحالات، ينبغي أن يتحوّل دور المرمم من السيطرة إلى التيسير، إدراكًا لأن العناية الحقيقية قد تكمن في تمكين الآخرين من التفاعل مع التراث. ولمعالجة أوجه القصور في النماذج البصرية السائدة لاتخاذ القرار في الترميم، تقترح المقالة اعتماد نهج يقوم على التفكير النظمي، يحتضن التعقيد، والترابط، والتغيّر. ويُعاد تأطير العناية التي يقدّمها المرممون باعتبارها ممارسة ديناميكية، تشاركية، تتشكّل من خلال العلاقات عبر الزمن، والمكان، والتخصصات. تقدّم المقالة نموذجًا بصريًا يُعرف بـ النموذج الحلزوني المزدوج (double-helix model)، يجمع هذا التفاعل، ويدمج بين الأبعاد المادية والاجتماعية-الثقافية للعناية. يدعم هذا النموذج عملية اتخاذ قرار تكيفية قائمة على التغذية الراجعة (feed-back-informed)، تُوازن بين الإجراءات التقنية والمعاني الثقافية، وتستند إلى مبادئ الاستدامة بعيدة المدى. ينبغي أن تُثمّن ممارسات العناية وجهات النظر المتعددة، وأن تتقبّل الغموض، وتُعيد تموضع الترميم بوصفه ممارسة تمكينية، وتعاونية. ومن خلال إعادة تصوّر الكيفية التي تُمثّل بها قرارات العناية، يمكننا أن نُعبر بشكل أدق عن الواقع المعاش للتراث والمجتمعات التي تخدمها.

Resumen

Este artículo examina críticamente los modelos visuales que representan la toma de decisiones en materia de conservación, abogando por un cambio de los marcos lineales y excluyentes hacia enfoques inclusivos, reflexivos y basados en sistemas. Los modelos tradicionales, como los árboles de decisión, los diagramas de flujo y las matrices, ofrecen estructura y claridad, especialmente para los profesionales principiantes. Sin embargo, a menudo simplifican excesivamente realidades complejas, dando prioridad a los resultados cuantificables y a la seguridad técnica por encima de las dimensiones subjetivas, emocionales y éticas. Estos modelos corren el riesgo de restringir nuestras perspectivas sobre el cuidado al marginar a las partes interesadas, reforzando las jerarquías y excluyendo las perspectivas diversas, especialmente en contextos patrimoniales sensibles o controvertidos.

Utilizamos estudios de casos y ejemplos, incluido el archivo de desastre de Hillsborough, para debatir cómo el dar prioridad a la preservación material por encima del acceso y la responsabilidad social puede generar fallos en el cuidado. En tales casos, el papel del conservador debe pasar del control a la facilitación, reconociendo que el verdadero cuidado puede estar en involucrar a otros en el patrimonio.

Para abordar las limitaciones de la toma de decisiones sobre conservación con los modelos visuales dominantes, el artículo propone un enfoque de pensamiento sistémico que abarca la complejidad, la interconexión y el cambio. El cuidado que ofrecen los conservadores se replantea como una práctica dinámica y coevolutiva, moldeada por las relaciones a lo largo del tiempo, el espacio y las disciplinas. Se ofrece un modelo de doble hélice que, integrando las dimensiones materiales y socioculturales del cuidado, visualiza esta interacción. Este modelo apoya la retroalimentación

para tomar decisiones informadas, alineando las acciones técnicas con el significado cultural y la sostenibilidad a largo plazo. Nuestro cuidado debe valorar las perspectivas plurales, aceptar la incertidumbre y reposicionar la conservación como una práctica habilitadora y colaborativa. Al volver a imaginar cómo se describen las decisiones de cuidado, podemos reflejar mejor las realidades vividas del patrimonio y las comunidades a las que sirve.

Resumo

Este artigo examina criticamente os modelos visuais que representam a tomada de decisão em conservação, defendendo uma mudança das estruturas lineares, excludentes, em direção a abordagens inclusivas, reflexivas e baseadas em sistemas. Modelos tradicionais, como árvores de decisão, fluxogramas e matrizes de avaliação, oferecem estrutura e clareza, particularmente para profissionais iniciantes. Entretanto, frequentemente tais modelos simplificam demais realidades complexas, priorizando resultados mensuráveis e certezas técnicas em detrimento de dimensões subjetivas, emocionais e éticas. Esses modelos correm o risco de restringir nossas perspectivas sobre o cuidado ao marginalizar partes interessadas, reforçar hierarquias e excluir visões diversas - especialmente em contextos patrimoniais sensíveis ou contestados. Utilizamos estudos de caso e exemplos, incluindo o arquivo do desastre de Hillsborough, para discutir como a priorização da preservação material em detrimento do acesso e da responsabilidade social pode resultar em falhas profundas no cuidado. Nesses casos, o papel do conservador deve deslocar-se do controle para a facilitação, reconhecendo que o verdadeiro cuidado pode residir em possibilitar o envolvimento de outros com o patrimônio. Para tratar das limitações dos modelos visuais dominantes para a tomada de decisão, o artigo propõe uma abordagem baseada no pensamento sistêmico, que englobe a complexidade, a interconexão e a mudança. O cuidado que conservadores oferecem é reformulado como uma prática dinâmica, em conjunto, modelada por relacionamentos que atravessam tempo, espaço e disciplinas. Um modelo dupla-hélice que visualiza essa interação é oferecido, integrando dimensões materiais e sócio-culturais de cuidado. Esse modelo apoia uma tomada de decisão adaptativa, informada por feedbacks, que alinhe ações técnicas com significado cultural e sustentabilidade a longo prazo. Nosso cuidado deve valorizar perspectivas plurais, abarcar incerteza e reposicionar conservação como uma prática facilitadora e colaborativa. Ao reimaginar como decisões de cuidado são descritas, nós podemos refletir melhor as realidades vividas do patrimônio e das comunidades que ele serve.

摘要

可视化照护: 文物保护决策模型的再现

本文批判性检视了现有文物保护决策的可视化模型，主张从线性、排他性框架转向包容性、反思性及系统化的新范式。决策树、流程图和评分矩阵等传统模型虽为初学者提供了结构与清晰度，却往往过度简化复杂现实，偏重可量化结果与技术确定性，而忽视了主观、情感与伦理层面。这些模型的风险在于通过边缘化利益相关者、强化等级关系、排除多元视角，进而在敏感或存在争议的遗产情境中窄化了我们对"照护"的理解。

通过包括"希尔斯堡惨案档案"在内的案例，本文探讨了当物质保存优先于开放性和社会责任时，可能导致保护工作的严重失误。在这种情况下，保护人员的角色应从控制转向促进，并认识到真正的照护或许在于促成他人与遗产的互动联结。

为应对主流可视化决策模型的局限，本文提出了一种系统思维方法，它强调复杂性、互联性与变化性。保护人员提供的照护被重新定义为一种动态共生实践，其形态由跨越时空和学科的关系所塑造。文章提出了一个双螺旋模型，以可视化这种相互作用，并将物质与社会文化维度的照护整合起来。该模型支持基于反馈的适应性

决策，使技术行动与文化意义及长期可持续性相协调。研究呼吁，我们的照护应重视多元视角、接纳不确定性，并将保护重新定位为一种赋能型协作实践。通过重新构想保护决策的呈现方式，我们可以更好地反映遗产及其所服务社区的真实状况

Biographies

Jane Henderson, ACR, FIIC, SFHEA, FRHistS, is a Professor of Conservation and the Secretary General of the International Institute of Conservation (IIC). Jane serves on the editorial panel of the *Journal of the Institute of Conservation* and is a co-opted member of the Welsh Federation of Museums and Art Galleries. Jane serves on the European standards body CEN TC/346/WG11 and is the chair of the British Standards Institute standard group B/560 concerned with the conservation of tangible cultural heritage. Jane was able to spend time developing her ideas for this work thanks to the University of Melbourne Grimwade Miegunyah Visiting Fellowship for which she is incredibly grateful.

Ashley Lingle, ACR, FIIC, FHEA, is a Lecturer of Conservation at the University of York, where she co-directs MAs in Conservation of Historic Buildings and International Conservation Studies. She serves on the editorial panel of the *Journal of the Institute for Conservation.* Ashley is an active researcher in the preservation of archaeological heritage and conservation education. She has published on issues related to archaeological materials, natural history collections, digital preservation, preventative conservation and sustainable conservation practice.