Too Cute to Cut: How Designed Things Continue after They End

ANONYMOUS AUTHOR(S)

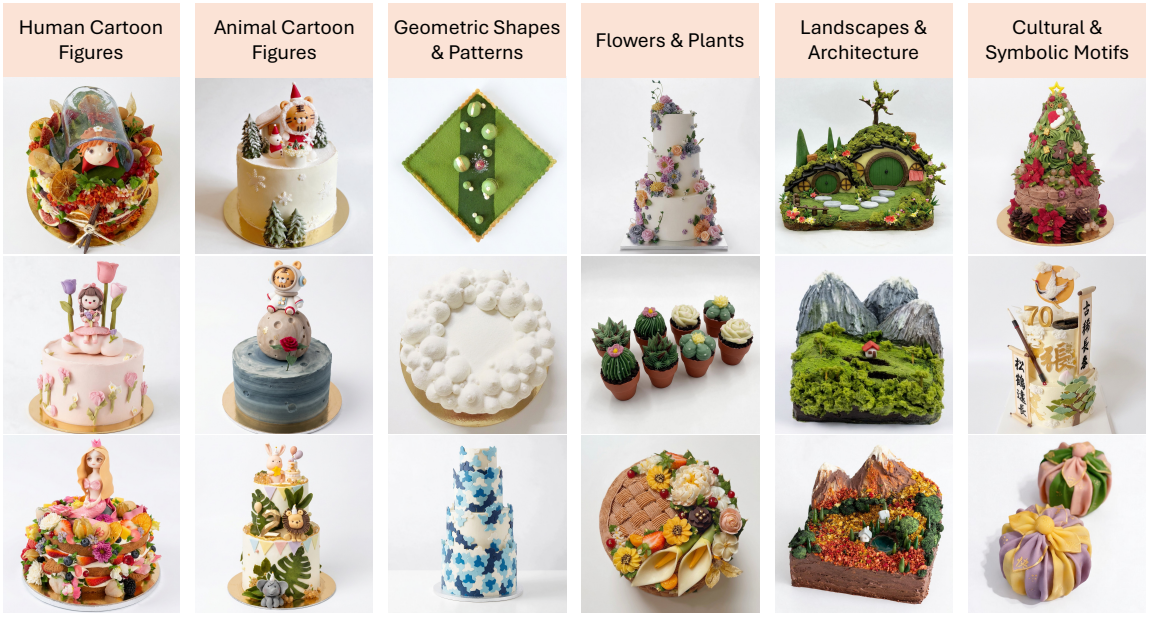


Fig. 1. Six decoration categories that span the first author's five-year archive of commissioned cakes: human cartoon figures, animal cartoon figures, geometric shapes and patterns, flowers and plants, landscapes and architecture, and cultural and symbolic motifs. The ten autoethnographic cases (Section 3.1) were selected to cover all six, and to vary in how each cake ended: cut ceremonially before witnesses, dismantled before cutting, pulled apart with no first cut, or never cut at all.

HCI has studied how digital things persist (e.g., archives, versioning) and how they disappear (e.g., forgetting, unmaking). Less attention has been paid to what continues when the thing itself does not. We study this through decorated celebration cakes, whose intended use requires losing their intact form. Drawing on 11 photo-elicited client interviews and 10 autoethnographic cases from the first author's five-year cake practice, we find that cutting changes what can be valued: it enables new experiences, while aspects of the cake continue through saved decorations, memories, recurring practices, and remaking by others. We derive three principles for designing things that are meant to end: design for what the ending enables, prepare for what should remain, and shape what others can carry forward. We contribute an approach for HCI that treats endings and what continues afterward as part of design.

CCS Concepts: • **Human-centered computing** → **HCI theory, concepts and models**; **Empirical studies in HCI**; • **Applied computing** → *Arts and humanities.*

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Additional Key Words and Phrases: Temporal HCI; continuity; persistence; ephemeral artifacts; irreversible transformation; decorated cakes; ritual; autoethnography; collective memory; afterlives of things

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1 INTRODUCTION

Some of the things we make with the greatest care are never meant to remain as we made them. A Tibetan sand mandala may take days to construct, remain complete only briefly, and then be ritually dispersed [53]. A celebration cake may require hours of skilled work, yet fulfilling its purpose requires cutting through the beautiful designs. Both are carefully made, appreciated in their finished form, and then taken apart: the mandala as part of a ritual, the cake through cutting, sharing, and eating. The end of the intact object is not necessarily the end of what mattered about it. A cake can continue through a decoration kept for years, or a story retold long after the cake itself is gone. The whole may disappear, while different parts of what people valued remain. This points to a distinction that is easy to miss when preservation is technically effortless: preserving a thing and preserving what matters about it are not the same design problem.

HCI has approached the temporal lives of designed things from several directions. Research on digital possessions, archives, and technologies for revisiting the past has examined how things can persist [9, 18–20, 48, 65–67]. Other work has examined forgetting and letting go, decay, unmaking, service closure, and deliberately irreversible interaction [3, 82–84, 87, 88, 91, 92]. Research on digital legacy and bereavement has further shown how relationships, memories, and digital materials can continue beyond death [15, 54, 63, 96], while work on digital and documental afterlives has considered what remains when services, projects, or infrastructures end [33, 69]. Together, this work shows that endings do not necessarily break people's relationships with what came before. We ask what this means for designed things that must eventually change or disappear in order to fulfill their purpose.

What happens to the value of a designed thing when the thing itself comes to an end? We use persistence to describe an artifact remaining substantially as it was, and continuity to describe what carries forward as the artifact changes or disappears. What continues do not need to take the same form as what came before. A decoration may be kept, an experience remembered, or a practice repeated with a new object. A cake may take tens of hours to make and become the focus of a social occasion, yet keeping it intact would prevent the cutting, sharing, and eating for what it was made for. Its ending is therefore part of its intended use. Cakes allow us to examine what happens when preserving a valued artifact is incompatible with fulfilling its purpose: how people prepare for its transformation, what becomes possible once they cross that threshold, and how value continues in other forms.

We investigate this question through a five-year archive from the first author's professional cake practice, including 10 structured autoethnographic cases, alongside 11 photo-elicited interviews with clients who commissioned, cut, ate, and later remembered cakes. We analyzed the interview and autoethnographic data separately before comparing them across six stages of the cake's trajectory [59]. We ask three questions. **RQ1 (before the cut)**: What do people value about an intact cake, and how do they prepare for its transformation? **RQ2 (at the cut)**: How does cutting change what people value and how they experience the cake? **RQ3 (after the cut)**: What continues after the cake no longer remains intact, and how do people's relationships with it change? These questions allow us to design for how they change, what they leave behind, and what designers can and cannot shape.

This paper makes three contributions to HCI and design. First, we distinguish continuity from persistence and show how value can migrate as a designed thing changes state. What mattered in the intact object may continue through different experiences, materials, and memories. Second, we show that an ending can itself be a site of design. People prepare for irreversible ending, negotiate how and when approach it, and encounter new possibilities once the artifact no longer remains in its original form. Third, we derive three principles for designing things that are meant to disappear: design for what the ending enables, prepare for what should remain, and shape what others can carry forward. Together, these contributions invite designers and HCI researchers to treat change and endings as part of design, and to ask what should continue, in what form, for whom, and under whose control.

2 RELATED WORK

2.1 Persistence and Disappearance in Temporal HCI

Work on photography, evocative objects, and mediated memory has long examined how things become connected to personal and collective remembering [7, 93, 94].Research on personal photography and archives has examined how people capture, organize, and return to materials from the past [48, 74, 75, 89, 95]. Lifelogging extended this toward the possibility of extensive capture [9], while subsequent work questioned whether capturing more necessarily supports meaningful remembering [85]. Research on virtual possessions has examined how people relate to digital things and how these relationships change as possessions move from physical and locally stored forms into the cloud [66, 67]. Other work has explored how large digital archives can return to everyday attention. Systems such as Chronoscope [20], PhotoClock [18], Slide2Remember [47], Reveal [57], and Photobox [65] use time, location, music, chance, and physical interaction to bring stored photos back into people's everyday lives. Other work shows how interface design affects how people remember the past [4, 99], how past social-media content becomes evidence of personal change [46], and how personal memory extends into family history [50]. Across these examples, the artifact or representation remains available so that it can be encountered again.

Digital infrastructure makes such persistence easy. Copies can be made at negligible marginal cost; version histories can accumulate; cloud archives can retain by default; and generative systems increasingly make reconstruction possible [72]. However, researchers have repeatedly criticized indiscriminate capture [85]. Yet the technical ease of keeping digital things contributes to what we call a *preservation default*: when a thing can be kept, keeping it is often treated as the safest route to preserving its value.

A substantial body of HCI and design research has also considered how things change, decay, or become irreversible. Slow Technology challenged the emphasis on efficiency in interaction design by exploring technologies that unfold slowly and invite reflection [38, 61]. Temporal Design expands this by asking designers to consider how technologies develop and change over different timescales, rather than focusing only on the immediate use [6, 70, 77, 78, 80, 97]. Other work engages more directly with irreversible change. Rossmy et al. [82] challenge reversibility as a default in interaction design and show how irreversible actions can stimulate reflection and make consequential transitions more meaningful. Tsaknaki and colleagues [91, 92] examine how aging and impermanence can become resources for design rather than problems to prevent. Seznec et al. [87] explore destruction as a way of engaging with personal digital media that might otherwise accumulate indefinitely. Song and Paulos [88] extend design beyond the finished artifact through "unmaking", showing how artifacts can be designed to change through failure, destruction, decay, and deformation.

Research on forgetting examines what happens when people want digital things to go away. Sas and Whittaker [83] study how people dispose of digital possessions after a breakup, while Sas et al. [84] explore how rituals of letting go can

inform the design of digital disposal. Mayer-Schönberger [55] examines the consequences of digital systems that make remembering easy and forgetting difficult. More recently, Ankenbauer et al. [3] bring forgetting into contemporary HCI discussions of digital persistence. Work on absence takes a different direction. Ishii et al. [43] show how traces of absent loved ones can evoke a sense of presence without recreating the person directly, while Cheng et al. [21] explore how absence itself can become part of how relationships are experienced.

Together, this work shows how design can engage with persistence, change, irreversibility, and disappearance. It also raises a further question: what happens to value across such changes?

2.2 What Continues After Things End

HCI has long examined what remains when people, technologies, or relationships come to an end. Research on digital legacy and bereavement shows how photographs, messages, profiles, and other digital materials can sustain relationships with the deceased [15, 54, 63]. Work on technology heirlooms similarly examines how digital materials acquire significance as they are passed across generations [5, 62], while Gulotta et al. show that people make different choices about what they want to preserve as a digital legacy [36].

Other work shows that continuation does not always depend on preserving an artifact in its original form. Research on ephemerality demonstrates that experiences can remain meaningful even when their digital traces disappear [8, 28, 98]. Research on repair and reuse shows how objects can acquire new uses and meanings as they are modified or passed on [34, 41, 44, 52]. Odom et al. [64] also show that decisions to keep or discard possessions depend on the relationships and meanings attached to them.

Theories of memory and material culture further broaden what continuation can involve. Halbwachs [37] describes remembering as socially produced and sustained through groups, while Connerton [22, 23] shows how memories can endure through repeated practices. Kopytoff's account of the cultural biography of things shows how objects can acquire different meanings and values as they move through different stages of their lives [49].

We use *continuity* to describe what carries forward as a designed thing changes or disappears, and *persistence* for cases in which the artifact remains substantially as it was. Existing work shows that meaning, relationships, and practices can continue without the original artifact remaining unchanged. Our interest is in a particular case: designed things whose ending is expected and necessary to their intended use. In such cases, persistence may conflict with what the thing was designed to do.

2.3 Celebration Cakes as Designed Things That End

Celebration cakes offer a distinctive case for studying designed endings because their intended use requires the loss of their intact form. For example, Wedding-cake cutting has historically carried symbolic meanings and marks the cake's transition from display to sharing [17, 58]. The Japanese aesthetic concept of *kire*, or cutting, is also relevant because a cut can mark an ending while opening another form of existence [68, 71]. Here, transformation is part of how the artifact fulfills its purpose.

Cutting also changes how a cake can be experienced. Before cutting, a decorated cake can be viewed and appreciated as a crafted whole. Cutting makes other experiences possible: its interior becomes visible, portions can be distributed, and the cake can be tasted and eaten with others. Food research has long shown that eating involves taste, smell, texture, memory, and social relations [25, 29, 32, 90]. Grimes and Harper [35] examine technologies that support pleasurable and social experiences around food, while Deng et al. [26] explore computational capabilities embedded directly into edible objects. This work establishes that experiencing food extends beyond appreciating its visual or material form.

Decorated cakes also carry the time, skill, and material work involved in making them [11, 42, 81]. Yet the maker's control over the cake changes once it enters the social occasion for which it was made. Clients commission it, guests photograph and cut it, recipients may preserve decoration fragments, and online audiences may later make new cakes based on its design. What happens to the cake, and what continues from it, therefore extends beyond the intentions and control of its maker. The cake allows us to follow a designed thing as it moves from a crafted artifact under the maker's control, through an irreversible and socially negotiated transformation, to what continues once its intact form is gone.

2.4 First-Person, Practice-Based, and Photo-Elicited Methods

Our study brings together the maker's first-person perspective on her cake-making practice and recipients' retrospective accounts of their experiences with the cakes. Three methodological traditions inform this study.

The first is first-person research. Autoethnography uses the researcher's own experience as empirical material [1, 30, 79]. Lucero [51] draws on two periods of living without a mobile phone across nine years to examine its effects on everyday life , while Biggs et al. [10] combine birdwatching, journaling, and making to examine experiences that emerge through sustained practice. Cavdir [16] draws on five years of performance practice and accumulated documentation to examine how relationships with technology develop over time. Autobiographical design similarly shows how researchers can learn from long-term experience with their own designs [60], while Desjardins and Ball [27] identify methodological tensions around intimacy, reflexivity, and the researcher's multiple roles . These studies support our use of the maker's sustained experience while also requiring us to make her different roles in the research explicit.

The second is research grounded in making practice. Sennett [86] describes craft knowledge as developing through accumulated skill and judgement, while Ingold [42] emphasizes knowing materials through working with them over time. Rosner and Ryokai [81] show how making can leave memories and meanings available to the maker that are not visible in the finished object alone. This is important for our study because the maker's archive provides access to decisions made during production, including choices intended to shape what could happen when the cake was shared.

The third concerns how recipients recall brief and partly forgotten experiences. Photo elicitation uses images to support recall and elicit memories that may not emerge through verbal questioning alone [39]. Micro-phenomenological interviewing similarly slows attention around a particular experience to elicit detailed descriptions of how it unfolded [73], and has been adapted for studying lived experience in HCI [40, 76]. Our interviews draw on these approaches by using participants' cake photographs to reconstruct the moments around cutting and sharing the cakes.

We therefore use the two perspectives for different purposes: the maker's account gives access to making and decisions made before the cake delivered, while recipient interviews give access to cutting, eating, keeping, and remembering afterward. We first analyze these perspectives separately and then compare them across the cake's trajectory, as described in Section 3.

3 METHODS

The research is anchored in the practice of the first author, a cake artist with 12 years of commission-based experience across weddings, birthdays, anniversaries, cultural events, and conferences. The five-year archive used in this study contains 619 social media posts and 4,150 photographs documenting 1,512 cakes. We use this archive as the broader context for the study rather than as a systematically coded dataset. We categorized the cakes into six groups based on their decoration (see Fig. 1): (1) human cartoon figures, (2) animal cartoon figures, (3) geometric shapes and patterns,

(4)flowers and plants, (5) landscapes and architecture, and (6)cultural and symbolic motifs. The archive is uneven across the cake's lifecycle: photographs of finished cakes are abundant, while making, cutting, and sharing are documented less often. Event documentation exists mainly when the maker attended the event. We treat this unevenness as a limitation, but also as part of what the archive reveals, since participants similarly documented the intact cake much more extensively than its cutting, eating, and sharing.

The study combines analytic autoethnography [1, 2, 10, 16, 30] with photo-elicited interviews and comparative cross-case analysis [59]. This combination captures different parts of the cake's trajectory. The maker provides access to decisions made during production, while recipients provide access to what happens after the cake leaves the maker. We analyze the two perspectives separately before comparing them across the cake's trajectory.

3.1 Structured Autoethnography of the Maker

Ten cases were selected from the archive for structured autoethnographic accounts (A1–A10). The selection criteria were that the first author made the cake, attended the event, and cut the cake, providing first-person access to both its making and what happened when it was presented, cut, and shared. A case could comprise a single cake or a small series of related cakes. Cakes were grouped into one case when they formed a recurring practice. The cases were selected to cover all six cake-decoration categories in the archive and to vary in how each cake reached its end state: cut ceremonially before witnesses, dismantled before cutting, pulled apart with no first cut, or never cut at all. The selected cases were presented in Table 1.

Each autoethnographic account was written using the same 12 questions, following the cake from making through its afterlife and present reflection. The questions addressed the occasion, design intention, making, completion, reveal, experience before cutting, preparation for the cut, the cut itself, what happened immediately afterward, eating and sharing, afterlife, and present reflection. Accounts were written in two passes: first from memory alone, then against photographs and videos. The first author then discussed each case with a co-author. These discussions were used to question initial interpretations, consider alternative explanations, and identify cases that challenged emerging interpretations [1, 2, 30]. The full structured autoethnographic accounts for all ten cases are provided in Supplementary Material A.

3.2 Photo-Elicited Client Interviews

Eleven clients (P1–P11), nine females and two males (P1 and P11) were recruited to provide variation in occasion, cake type across the six categories, time elapsed since the event, and preservation practice (Table 2).Interviews lasted 30–45 minutes. Participants selected at least one cake whose cutting they had attended and for which photographs were available. The interview protocol covered commissioning and anticipation, the reveal and pre-cut experience, the cutting and sharing process, and later memories and encounters with photographs or saved pieces. The walkthrough of the cut drew on micro-phenomenological interviewing [40, 73]. The full interview guide is provided in Supplementary Material B. Interviews were recorded and transcribed. The research was determined to be exempt from IRB review (Exempt ID: E-8013), and the three authors who conducted the research were certified Social & Behavioral Research Investigators at X Institute.

3.3 Data Analysis

Analysis proceeded in two stages, keeping the two data sources (i.e., client interview data and maker's autoethnography data) separate before comparing them.

Table 1. Ten selected autoethnographic cases. Some cases comprise multiple related cakes when they formed a recurring series or were analytically relevant to examine together.

ID	Case	Image	Occasion / context	Relevant characteristics
A1	Einstein		Conference anniversary	Cake for approximately 200 guests; the maker attended the event and co-cut the cake.
A2	Ponyo		Baby shower	The maker attended the event and was asked to cut the cake.
A3	Hobbit House		Personal milestone	The cake was kept intact for a period and was never cut.
A4	Christmas		Recurring Christmas celebrations	A yearly series examined together, including a pull-apart wreath that was shared without a first cut.
A5	Jungle Forest		Child's birthday	Decorations were removed before the cake was cut and shared at the event.
A6	Tiger		Godson's birthdays	A four-year series in which the tiger and surrounding design changed with the child's growth.
A7	Lucky Bag		Chinese New Year	Related cakes with a perishable outer skin, making material change and consumption particularly salient.
A8	Cotton Flower		Maker's birthdays	Two related birthday cakes examined together; one was accidentally damaged before consumption.
A9	Landscape		No formal occasion	Two landscape cakes examined together because of their related design and cutting experiences.
A10	Zen		Birthdays	Related cakes with removable figurines, some of which were taken home by guests.

Stage 1: open coding by data source. The client transcripts were analysed using reflexive thematic analysis [12–14]. Two authors coded the transcripts inductively, without applying a predefined coding framework. Each code consisted of a short title, a one-sentence explanation, a verbatim quotation, and a participant tag. The two authors met

Table 2. Participants, focal cakes, time elapsed between the cake event and interview, and decoration categories. Categories correspond to those used for the archive in Figure 1: Human = human cartoon figures; Animal = animal cartoon figures; Floral = flowers and plants; Landscape = landscapes and architecture; Cultural = cultural and symbolic motifs.

ID	Occasion	Focal cake	Time Elapsed	Category
P1	Own birthday	Likeness figurine cake	4 yrs	Human
P2	Father-in-law's 70th	2-tier calligraphy cake	1 yr	Cultural
P3	Friend's birthday	Chestnut flower cake	2 mo	Floral
P4	Son's 3rd birthday	Elephant forest cake	5 yrs	Animal
P5	Daughter's birthdays	*Frozen*-themed cake	3 yrs	Human + animal
P6	Children's birthdays	Windmill cake	2 yrs	Landscape
P7	Wedding	3-tier flower cake	3 mo	Floral
P8	Son's birthday	Minion cake	4 mo	Animal
P9	Son's birthdays	Tiger cake series	8 mo–3 yrs	Animal
P10	Multiple occasions	Flower cakes	4 mo–4 yrs	Floral
P11	Birthdays	Sausage dog; cactus cakes	2–3 yrs	Animal + floral

regularly to discuss their interpretations, compare codes, and refine the developing code set. This process produced 320 codes across P1–P11 (14 to 45 per participant). The ten autoethnographic accounts were coded separately using the same procedure, yielding 67 codes that distinguished what the maker intended, what occurred, and what she understood retrospectively.

Then, we introduced a temporal structure to compare the two data sources across the cake's trajectory. We organized the codes around six lifecycle phases: *making*, when the cake was designed and made; *intact display*, when the completed cake was presented and experienced as a whole; *preparation for change*, when people anticipated or prepared for its transformation; *transformation*, when cutting or damage changed its intact form; *consumption*, when the cake was divided, shared, and eaten; and *continuation*, how the cake continued to matter after its intact form was gone.

Stage 2: cross-source matrix and theme synthesis. After open coding, the two code sets were brought together in a matrix display [59]. Rows represented six lifecycle phases and columns represented the recipient and maker perspectives. Codes from each source were mapped to the relevant lifecycle phase. We then compared the two perspectives within each phase, identifying where they converged, diverged, or revealed experiences visible from only one perspective. The six lifecycle phases were an analytical scaffold. Mapping the inductively generated codes onto this scaffold made temporal changes and cross-perspective differences visible. Through these comparisons, we developed six themes presented in Section 4, which clustered around three broader periods relative to the irreversible transition: before the cut, at the cut, and after the cut. We did not calculate inter-rater reliability; differences in interpretation between the authors were discussed in daily meetings and used to refine the themes [13, 56].

4 FINDINGS

We present six themes organized around the cake's irreversible transition and the three research questions. Themes 4.1 and 4.2 concern the period before the cut (RQ1): what people value in the intact cake and how they prepare for its transformation. Themes 4.3 and 4.4 concern the cut and its immediate consequences (RQ2): what becomes possible through transformation and how cutting changes who can act on the cake. Themes 4.5 and 4.6 concern what continues afterward (RQ3): what photographs preserve and the other ways in which the cake continues to matter. Within each

theme, we present the two data sources separately. *Recipients* draws on the eleven client interviews (P1–P11), while *Maker* draws on the ten structured autoethnographic cases (A1–A10). *Across the two* brings these perspectives together and highlights where they converge, differ, or complement each other.

4.1 Before the Cut: Irreplaceability Shapes the Sweet Hesitation

What participants valued in the intact cake varied across cases. For some, it was a particular decoration or figurine. For others, it was the visual composition as a whole or what the cake represented within the celebration. When cutting threatened something they valued in this intact state, participants sometimes experienced a brief reluctance to proceed. We call this the *sweet hesitation*. Across the cases, this hesitation was strongest when what participants valued felt difficult to keep or recreate. It was weaker when part of the cake could be saved, the design could be made again, or people were looking forward to what cutting would make possible.

Recipients. Several clients described wanting to keep the intact cake or particular parts of it. P9 recalled feeling reluctant immediately before cutting: "*When I cut it, I really felt a little reluctant. I had the feeling that I wanted to keep it. But then I thought: a cake is meant to be eaten… The purpose is also for everyone to be happy.*"[P9] For P1, the attachment was concentrated in a figurine made in his likeness: "*No one is allowed to eat this. This figurine is too cute… I can't cut it; I can't destroy it.*"[P1]

Other clients described little hesitation because they were looking forward to what cutting would enable. At her wedding, P7 understood cutting as part of sharing the cake with others: "*The cake artist worked very hard on it, and then it came to life. Now you get to enjoy the result. Cutting it is symbolic because everyone witnesses us cutting it together and celebrating our marriage. I was looking forward to sharing it with family and friends.*"[P7] For P2, the intact cake had already fulfilled an important role before it was cut. His father-in-law's calligraphy cake had made him n feel proud and happy: "*Before he cut it, he felt very proud because everyone was asking him, "This cake looks amazing. Where did you order it?" Questions like that make him happy and proud. So the purpose had already been achieved.*"[P2]

Across the interviews, hesitation therefore reflected both attachment to the intact cake and what people expected from cutting it. Participants could be reluctant to lose the cake's current form while still wanting to eat and share it.

Maker. The maker's cases allowed us to compare hesitation with the labor invested in different cakes. The comparison showed that more labor did not necessarily produce greater hesitation. The Einstein cake (A1) took around 40 hours to make, followed by a seven-hour drive and on-site assembly, yet the maker described: "*I was looking forward to finally sharing it with everyone, and there was a sense of relief.*"[A1] By contrast, the Landscape cakes (A9) took only two to three hours each but were among the hardest to cut: "*Cutting into them felt almost like bringing an earthquake into a tiny fairyland.*"[A9]

What distinguished these cases was less the amount of work involved than what could remain once the intact composition was changed. In A9, the landscape formed a continuous scene with no obvious decoration that could be removed and saved. In other cases, the possibility of keeping or remaking something reduced the hesitation. The Tiger figures (A6) would be preserved, the Lucky Bag design (A7) could be made again, and the Christmas cakes (A4) belonged to a tradition that would continue in subsequent years. In contrast, the Jungle Forest cake (A5) felt harder to cut because the maker understood its particular composition as unique: "*I rarely make exactly the same cake twice, so I was very aware that this particular intact composition would exist only once.*"[A5] The Cotton Flower case (A8) provides another contrast. Because the cake had already been accidentally damaged, the loss of a perfect intact state had occurred before cutting. The maker described it as having "already crossed the boundary from perfect to imperfect."

Across the two. The two perspectives show that the sweet hesitation was shaped by the perceived irreplaceability of what was about to change. For recipients, this was often experienced as wanting to keep a beautiful or meaningful cake while also wanting to eat and share it. The maker's cases show why similar moments of hesitation could differ across cakes: what mattered was whether the valued part of the intact cake could be saved, remade, or continued in another form.

4.2 Before the Cut: Preparing for Change Shapes What Can Continue

Participants rarely moved directly from admiring the intact cake to cutting it. They took photographs, removed decorations they wanted to keep, decided who would make the first cut, and sometimes discussed where to cut. These actions prepared the cake for its transformation and shaped what could remain afterward.

Recipients. Clients often removed decorations they wanted to keep before cutting the cake. "*I told my son not to cut the elephant. I took the little elephant and the house off first. I wanted to keep them (Fig. 2a).*"[P4] P5 explained: "*We try to keep the decorations, so when you cut the cake it does not hurt as much, because you still have the beautiful toppings. We try to keep the decorations intact.*"[P5] Photographs were another way of preserving the cake before it is cut. P6 described trying "all kinds of ways to make a complete record of it" before cutting. For P8, her son handmade additional decorations to go with his graffiti-themed cake. "*Before cutting, he wanted to add his handmade little airplanes that matched the graffiti theme (Fig. 4c).*"[P8] The first cut was usually made by the person being celebrated, sometimes with others helping. "*Because it was his birthday, I let my son make the first cut. He was still very small, so I held the knife together with him.*"[P4]

Maker. At celebrations, the maker also removed decorations, documented cakes, and helped decide how they should be cut. Her autoethnographic accounts show that preparation to be cut often begin during the making of the cakes. For the Tiger cakes (A6), she knew that the figures would later be kept: "*I knew that my friend intended to preserve the tiger figures. Because fondant is vulnerable to moisture, I deliberately added an extra layer of sugar paste underneath each tiger... Preservation was something I considered during the design and making process.*"[A6] The maker also recorded the making process so that the birthday boy could later see how the cakes had been made for him by hand. In other cases, preparation happened immediately before and during cutting. For the Landscape cakes (A9), the group started from a corner and discussed where to make each subsequent cut so that the remaining landscape stayed intact for as long as possible.

Across the two. Both perspectives show that what continued after cutting was partly shaped before the cut. Recipients photographed the intact cake, saved particular decorations, and decided how it would be cut. The maker could prepare even earlier. She could design decorations to be removed and preserved, and document the making process so that her work could also be remembered. These preparations shaped what remained after the cake was cut.

4.3 At the Cut: Cutting Makes New Value Available

Cutting changed what could be experienced and valued. The intact visual composition was altered, while the interior became visible and the cake became available for tasting and sharing.

Recipients. Clients frequently experienced the cut as a reveal. "*When it was cut and served, everyone went, 'Wow,' because then you could see the layers inside the cake. That was another surprise... Only when you take out a slice can you see the careful design inside.*"[P3] P6, a designer, compared seeing the inside of the cake to inspecting another designer's work: "*Looking at the cake is like opening another designer's Figma file.*"[P6] For P2, cutting changed the cake's identity: "*Its identity suddenly changed at that moment. At first it was a symbol... a symbol that this is my birthday gift from my*

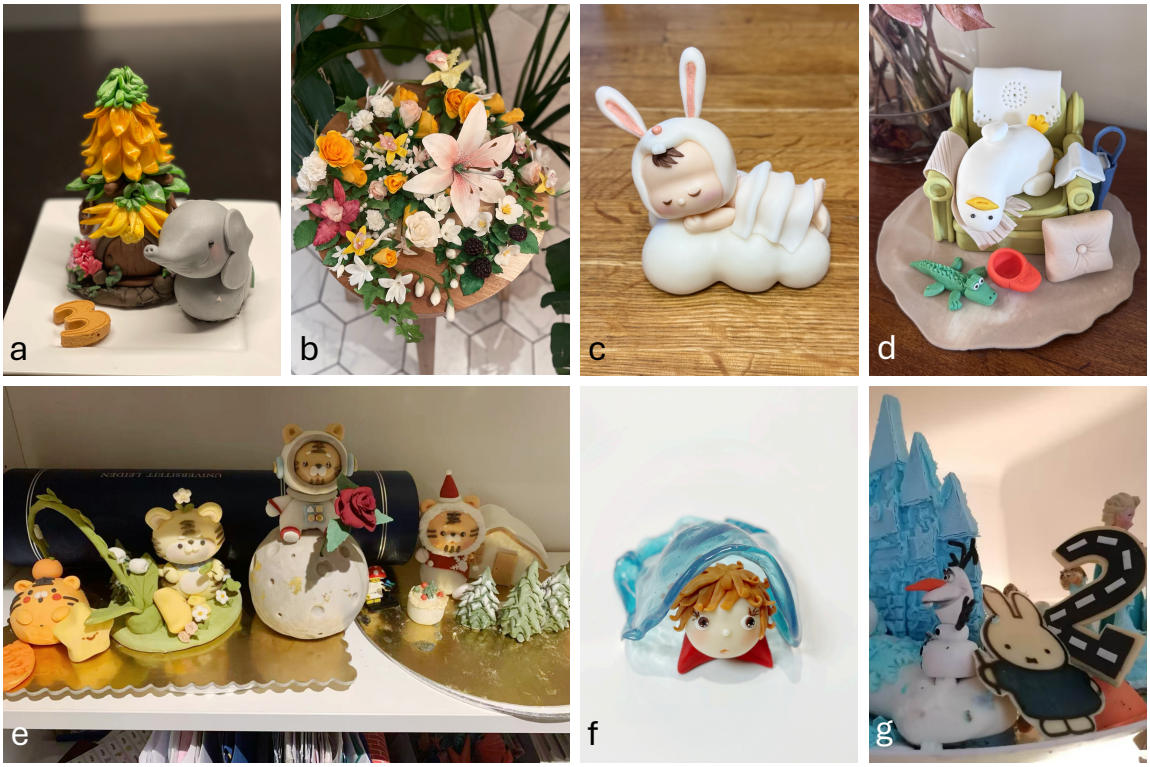


Fig. 2. Examples of cake decorations saved before cutting: (a) elephant decorations from the forest-themed cake (P4), (b) sugar flowers from a wedding cake, (c) a baby figurine from a one-month birthday cake, (d) an animal figurine from a Zen-themed birthday cake (A10), (e) tiger figurines from a series of tiger-themed cakes, (f) a Ponyo figurine from a baby shower cake, and (g) a collection of cake decorations saved over the years (P5).

children and I am loved by my children. Once you cut it, it becomes a cake again, a food."[P2] P11 did not consider the cake to have been destroyed: "*It was not destroyed. We enjoyed it and it was complete."[P11]*

Maker. The maker experienced cutting as the point at which other intended aspects of the cake became available. For the Einstein cake (A1), which featured the Einstein tile (Fig. 4b), a geometric shape that tiles a plane without forming a repeating pattern, sharing the cake with a mathematics and computer science audience created an opportunity to explain the mathematical idea and connect cake art with science: "*Cutting it felt like moving into the next part of what I had made it for: sharing it with the community."[A1]* Some cakes deliberately incorporated reveal into their design. Lucky Bag (A7) was designed around this change: "*Before cutting, the cake looked like a wrapped gift whose contents could not be seen. Cutting it effectively unwrapped the cake (Fig. 3d)."[A7]* The Christmas tree cakes similarly prompted interest in their internal construction: "*Cutting the Christmas tree cake would reveal how I had constructed and supported the tall tree internally."[A4]*

Across the two. Recipients experienced the cake interior as a reveal, while the maker understood it as something already designed into the cake. Cutting changed the cake, but it also made new experiences and forms of value possible. The Hobbit House (A3) provides a contrasting case. Because it was never cut, its interior was never revealed, and it



Fig. 3. Different ways of cutting cakes. (a) Cutting from a corner to keep the remaining cake intact for as long as possible; (b) cutting equal slices while maintaining the visual integrity of each slice; (c) making the first cut together in front of others; (d) cutting to reveal the cake's interior; and (e) sharing a pull-apart cake without cutting. These examples show how the way a cake is divided shapes what is preserved, revealed, and shared through the transition.

never entered the shared experience of eating. The case shows that preserving the intact state can also leave some intended forms of value unrealized.

4.4 At the Cut: Cutting Changes Who Can Act on the Cake

As the cake was divided, more people could act on it. Cutting therefore changed both the material state of the cake and who could shape what happened next. For recipients, this became visible as more people joined in dividing and serving the cake. For the maker, it meant having less control over what happened to it.

Recipients. Cutting allowed more people to become involved with the cake. P11 described how dividing it involved decisions about what different people would receive: "*It's a kind of social gesture through the splitting of the food... I take into consideration that all the pieces have a piece of strawberry.*"[P11] After the ceremonial first cut, other guests or family members often became involved in dividing and serving the cake. P2 described the scene: "*A few family members were helping. They took off the decorations and brought the cut pieces to the guests.*"[P2] As the cake was divided, acting on it was no longer limited to the person making the ceremonial first cut. More people could further divide it and decide how its pieces were distributed.

Maker. The maker experienced the same moment as a change in her role. At the conference, she described this shift: "*My role shifted again, from designer and presenter of the cake to the person physically dividing and serving it.*"[A1] At the Jungle Forest party, several parents changed the cake before serving it to their children: "*Several parents scraped the mascarpone cream from the outside of the cake before giving the slices to their children... The cream was not a decorative layer to be removed. I had developed a particular recipe that was tasty, less fatty and more resistant to the summer temperature.*"[A5] Although she understood the parents' decision, she was disappointed. The case led her to reflect: "*Once the cake enters the celebration, other people decide how to photograph it, cut it, eat it, modify it or save parts of it.*"[A5] Recipients also extended the design in ways she had not planned. With the Landscape cakes, the group tried to preserve the composition as they ate: "*Eating it while preserving the visual coherence of what remained.*"[A9] They cut the leftovers so that: "*Each slice became a kind of miniature landscape.*"[A9] Christmas guests similarly paid attention to the appearance of the remaining slices: "*They cared about how the slices looked when packing them into takeaway boxes.*"[A4]

Across the two. Both perspectives show that cutting changed who could act on the cake. After the ceremonial first cut, more people became involved in dividing and serving it. For the maker, this also meant having less control over

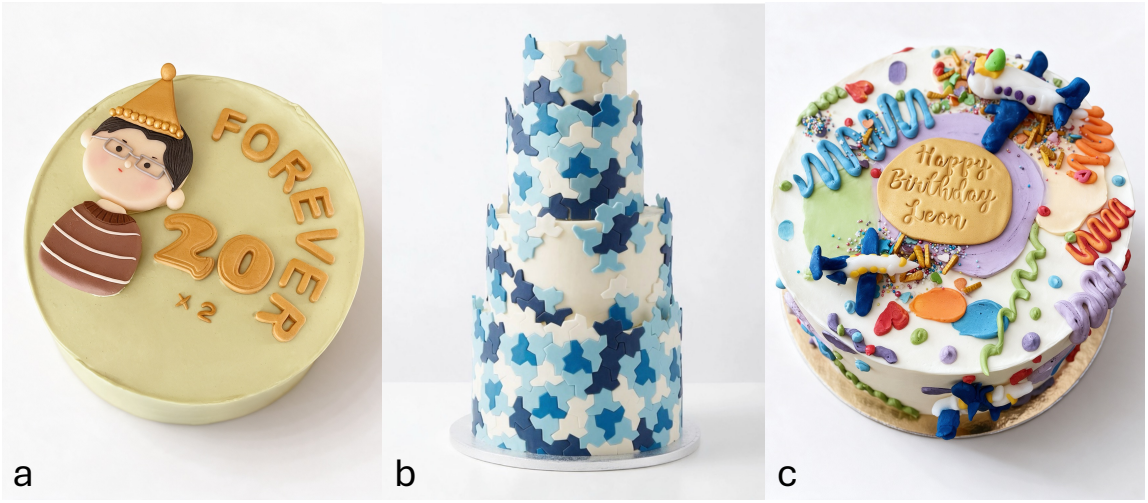


Fig. 4. Examples of themed decorated cakes in the archive: (a) the *Forever 20 × 2* birthday cake; (b) the Einstein monotile cake, whose decoration is based on the mathematical aperiodic tile; and (c) a graffiti-themed birthday cake to which the recipient added his own handmade decorations before cutting.

what happened to the cake. She could prepare for how it might be cut and shared, but once others became involved, they made their own decisions about what to eat, alter, or save.

4.5 After the Cut: Photographs Partially Preserve the Cake Experience

Photographs were the most common way participants documented the cakes, but they primarily captured the cake while it was still intact. Across the two perspectives, other parts of the cake's trajectory were less visible in these records. Recipients described photographs as preserving the cake's appearance while sensory experiences and details of cutting were often forgotten. The maker's photographs similarly preserved the finished cake more readily than the work and experiences involved in making it.

Recipients. Participants' later recollections were often stronger for the cake's appearance and design than for its taste or cutting. Four years after his celebration, P1 remembered the creative idea more clearly than the flavour: "*I really don't remember the flavor very well anymore, but I remember the creative idea very clearly. It says "Forever 20×2." It was my 40th birthday. The tiny ×2 was so funny (Fig. 4a)."[*P1*]* Few photographs were taken after the cut: "*Everyone was gathered around the cake, taking photos from all angles. After the cut, it seemed like nobody took photos anymore."[*P2*]* Photographs also gave recipients little access to the making process. During the interview, P6 reflected on learning how the cake was made through the maker's social media posts: "*I suddenly realized from the cake maker's social media posts that my story was only half of the story. Normally, you only saw the photos and had no chance to learn the creator's story or how the cake was made."[*P6*]* Together, these accounts show that photographs helped recipients retain the cake's intact appearance, while taste, cutting, and making were less available through the photographic record.

Maker. The maker's photographs also focused mainly on the finished cake. However, from her perspective, what was missing was much of the experience of making it. In the Einstein case (A1), photographs captured the completed cake and the public event, but not much of what happened during its making: "*The photographs preserve the finished cake and the public celebration, but they do not fully preserve what I remember most vividly: the fatigue of making it, the*

repetitive physical work, the anxiety of transportation, the problem-solving involved in arranging the tiles, the pressure of assembling it on site, and finally the relief and excitement of seeing approximately 200 people eat something that had taken so much of my time and attention."[A1] The Cotton Flower case (A8) also showed a difference between what photographs preserved and what remained most salient in memory. Photographs captured the second, intact cake, while the maker's strongest memory concerned the first cake, which had been accidentally damaged: "*The red cake survives in photographs as a perfect finished object, while my memory of the white cake is connected to what happened to it… What I remember most strongly is actually not the perfect red cake but the accident with the white one."*[A8] Across the maker's cases, photographs therefore preserved the completed visual form more readily than the labor, difficulties, accidents, and experiences surrounding its making and transformation.

Across the two. Both perspectives show that photographs preserved the intact visual state well, while other aspects of the cake were less represented. For recipients, these included taste and details of cutting. For the maker, they included much of the labor and experience of making. Photographs therefore supported continuity selectively: they kept the cake's appearance available after it disappeared, but did not preserve the full experience of making, cutting, and consuming it.

4.6 After the Cut: Continuity Takes Multiple Forms

After the cake was eaten or no longer remained intact, participants described several ways in which it continued to matter. Across the interviews, this occurred through saved decorations, sensory memories, stories, and recurring cake traditions. The maker's cases showed similar forms of continuity and also revealed how a cake could continue through later remaking by other people. These forms preserved different aspects of the cake and did not require the whole cake to remain.

Recipients. Keeping selected decorations was common across the interviews. Many participants had kept a physical part of a cake. These fragments often became reminders that remained in participants' homes long after the edible cake had disappeared. P5 had kept decorations for four years and even moved them when the family changed homes: "*It was so delicate and beautiful that we tried to keep the decorations intact and stored them in the refrigerator. Even four years later, when we moved house, we moved them into another refrigerator… Every time you open the refrigerator, you see them. It is a constant reminder."*[P5] P4 also kept the elephant, house, and number from her son's birthday cake under a glass display cover: "*I specially bought a glass display cover and put the little elephant, the house, and the number three inside it. I still have them now."*[P4] Other aspects continued without a physical object. Participants remembered sensory experiences, particularly taste. P7 still remembered the first bite of her wedding cake: "*I still remember the first bite of that matcha after we cut it. I want the same taste again on our 1st anniversary."*[P7] Cakes also continued through stories and recurring practices. P6 imagined a miniature replica as a way of carrying the memory of the cake into the future: "*When my older child turns eighteen, I could give him the miniature and say, 'This is what your first birthday cake looked like.' The memory can be passed to different people, and perhaps one day given to his grandchildren."*[P6] For families who commissioned cakes repeatedly, individual cakes became part of a longer sequence. Recurring cakes also allowed the practice to continue across multiple years. For P9, the changing tiger designs across a series of birthday cakes became a way of recording her son's growth: "*Every year, the tiger is different, and those changes reflect my son's growth, from a baby tiger to an astronaut tiger."*[P9] Across the interviews, the cake continued to matter in different ways after it was gone. Participants kept parts of it, remembered its taste, told stories about it, and carried it forward through recurring birthday traditions.

Maker. The maker's cases also showed that physical preservation could extend the presence of a cake or its parts, but could not make them permanent. The Hobbit House cake (A3) was kept first in the refrigerator and then in the freezer, but eventually had to be discarded: "*Eventually, we had to accept that we could not preserve it indefinitely and threw the entire cake away.*"[A3] This experience led the maker to reflect that preserving the cake temporarily did not prevent its eventual disappearance: "*Preserving the cake temporarily did not prevent its disappearance. It only changed how it disappeared.*"[A3] In other cases, continuity lay in repetition and remaking. Reflecting on the Christmas series (A4), the maker explained: "*I am not particularly attached to preserving any one Christmas cake. I am making Christmas cakes every year.* "[A4] The Cotton Flower case (A8) showed that the accidentally damaged cake became more memorable: "*Its damage and imperfection made it an interesting story to tell.*"[A8] The maker's perspective also revealed forms of continuity that occurred beyond the original recipient. After she shared the making process of the Hobbit House (A3) on social media, other people used it to create their own cakes: "*Other people began creating their own versions of the Hobbit house cake. Some followed my process and later shared photographs of their cakes with me.*"[A3] The Zen cake (A10) continued differently. A guest removed the bird figure and added it to her own collection of bird crafts: "*One lady took the bird from the cake home with her. Later, she sent me a photograph of it in her house and told me that the bird had 'found a new home.'*"[A10] These cases show that the maker could observe forms of continuity that extended beyond the original cake and celebration, including repeated traditions, stories, preserved elements, and new uses or remaking by other people.

Across the two. Both perspectives show that continuity did not require the whole cake to remain. Recipients kept selected parts, remembered sensory experiences, retold stories, and repeated cake traditions. The maker see how designs and fragments continued through other people's actions. Across both perspectives, six *carriers* appear in the data: representations, fragments, bodily memory, stories, repeating practices, and remaking by others. By carriers, we mean the forms through which something valued about the cake continues after the cake itself is gone. Different carriers preserve different aspects of the experience. We characterize these, and what each can and cannot carry forward, in Table 3.

5 DISCUSSION

Decorated cakes present an unusual design problem: they are valued in their intact form, yet fulfilling their purpose requires that form to end. This makes them a useful case for examining how designed endings unfold over time. In this section, we first return to the three research questions and discuss what the findings contribute to understanding designed endings. We then consider their relevance to computational systems, digital products, and services with expected endings. From this, we derive three design principles and conclude with limitations and open questions.

5.1 What the Findings Tell Us about Designing Endings

For RQ1, hesitation was shaped less by the labor invested in a cake than by what people expected the cut to change. It was stronger when valued aspects of the intact cake were difficult to preserve or reproduce, and weaker when something could continue or when cutting enabled valued experiences such as tasting, sharing, or revealing the interior. This extends work on irreversible interaction, which shows how irreversibility can heighten commitment and reflection [82]. Our findings show that the experience of irreversibility is also shaped by its anticipated consequences: what will be lost, what can remain, and what will become possible through the transition.

The findings answering RQ1 also show that people prepare for an expected ending before it happens, for example by taking photographs, negotiating how to cut, or making valued decorations easier to keep. These preparations shape

Table 3. Six carriers of continuity identified across the two data sources. The design-relevant property of a carrier is not what it holds but what it cannot hold.

Carrier	Example in data	Carries	Cannot carry	Held by
Representations	Photographs, videos, social posts (P1, P2, A1)	Appearance, occasion, evidence of the event	Taste, labour, the cut, scale, accidents	Recipients, maker, publics
Fragments	Detached figurines and decorations kept for years (P4, P5, A6)	Character, craft, a durable domestic reminder	Composition, the coherence of the whole	Recipients, guests
Bodily memory	The first bite recalled at the wedding (P7)	The consumed experience; available only after the cut	Transfer to anyone who was not present	Individuals; non-transferable
Stories	A damaged cake retold as an interesting story (A8)	Occasion and relation; robust to material failure	Sensory and visual specificity	Anyone present or told
Practices	Annual Christmas cakes; four-year tiger series (A4, A6, P9)	The relationship over time; needs no single artifact	The particular cake; the singular composition	Families, communities
Remaking	Strangers rebuilding the Hobbit House from a process video (A3); the bird figure becoming part of another person's existing collection of bird-shaped objects (A10)	Design language, method, influence	Authorship, control, original meaning	Others, beyond the maker

what can continue afterward. This locates a design opportunity earlier in an artifact's life. Temporal Design attends to how technologies unfold across longer timescales [6, 70, 77], while work on unmaking [88] and material impermanence [91, 92] examines change and disappearance as part of design. Our findings connect these concerns by showing that an expected ending can be shaped in advance.

The findings answering RQ2 show that an ending does not reduce value. It changes what can be valued and experienced. Different states of the same artifact can support different forms of value, some of which become accessible only through the transition. This extends work on irreversibility [82] by drawing attention to what an irreversible action enables. It also resonates with *kire*, where cutting separates while opening another mode of existence [68, 71]. For design, this shifts attention from what an ending removes to what it makes possible.

The findings answering RQ2 further reveal a shift in agency. Once the cake was cut and shared, the maker had less control over its form, while others increasingly determined what was kept, altered, consumed, discarded, or reinterpreted. Research on repair, reuse, and divestment has shown how objects acquire new meanings as they are modified and move between people [34, 41, 44, 52], while Kopytoff [49] describes how their value can change across their social lives. Our findings identify the ending as a moment when control can shift between people. Transformation therefore concerns what happens to the artifact and who can shape what happens next.

For RQ3, the findings show that the lifespan of an artifact and the lifespan of what matters about it can diverge. What continued after the cakes ended took different forms, each carrying some aspects forward while leaving others behind. This extends work on ephemerality, which shows that meaningful experiences do not depend on permanent traces [98], and on digital legacy and technology heirlooms, where meaning can continue through selected materials [36, 62]. It also connects with accounts of memory as sustained through practices [22] and social relationships [37]. Our

findings bring these perspectives together by showing that an artifact can end while what matters about it continues selectively through different forms.

Taken together, the findings show that an ending redistributes value across time. What matters can move from the intact artifact into new experiences, other people, materials, memories, and practices. The lifespan of the artifact therefore does not determine the lifespan of the value it creates. This is the central insight we carry from cakes into HCI: designing across time includes considering what happens when the current form ends and where its value can go next.

5.2 From Cakes to HCI: Designing for Expected Endings

Cakes matter to HCI partly because they differ from most digital artifacts. Their material properties make indefinite preservation impractical. A cake therefore forces a question that computational infrastructure can often postpone: if the current form cannot remain, what should happen as it ends?

Nowadays, digital artifacts can be copied, versioned, and retained with little effort, while generative systems increasingly enable the reconstruction of past artifacts [72]. Our findings suggest that this ease of retention often stops us asking a question: *what actually needs to continue*? A version history may retain every state of a project while the knowledge needed to interpret those states leaves with the team. Thousands of photographs may remain while the embodied or social experiences they document become inaccessible. The cake cases make this tension visible. Photographs were the most common and durable records, yet they disproportionately preserved the finished visual state while carrying much less of the taste, labour, cutting, accidents, and social interaction. This tension echoes research questioning whether increased capture necessarily leads to meaningful remembering [85], as well as work exploring forgetting, ephemerality, destruction, and unmaking as meaningful alternatives to indefinite retention [3, 8, 88]. Digital preservation is necessary and valuable in many settings. However, technical persistence does not by itself ensure that what matters will remain useful or meaningful as the original context changes. Keeping a record makes it accessible, but does not determine what should continue or who should be able to use it afterward.

The cake case is most relevant to computational systems, digital products, and services in which an ending is expected and people have some opportunity to prepare for what happens next. Research on the closure of virtual worlds and online communities shows that people use this period to gather, share memories, establish communication spaces elsewhere, and plan where their communities will go next [31]. For example, before the AltspaceVR platform closed, communities held farewell events, migrated activities to other platforms, and worked to preserve aspects of the worlds and communities they had created. Mozilla Hubs provided time and tools for users to export assets while its open-source code continued beyond Mozilla's operation of the service. These cases show that the ending of a service does not determine the ending of everything created through it.

This is the temporal condition that connects these cases to cakes. Although the artifacts are very different, an expected ending creates a period in which people can prepare for loss, decide what should remain, and shape what becomes possible afterward. For HCI, this extends the scope of design beyond the lifetime of a system or digital artifact to include how it ends and what can continue afterward.

5.3 Three Principles for Designing Things That Are Meant to End

The findings lead to three principles for artifacts, systems, or states whose current form is expected to end. These principles apply when an ending is already part of the artifact's trajectory or when maintaining the current state would prevent another valued state from emerging.

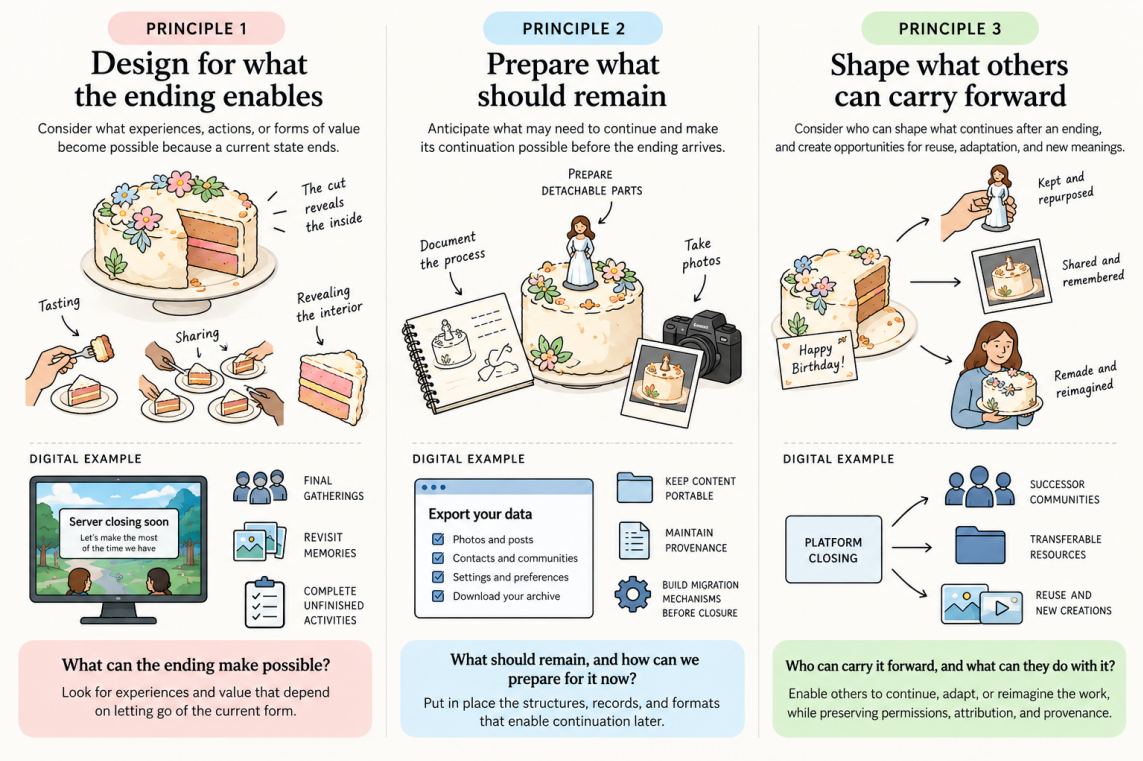


Fig. 5. Three principles for designing things that are meant to end, illustrated as prompts for design practice: consider what the ending enables, prepare what should remain, and shape what others can carry forward.

5.3.1 Principle 1: Design for what the ending enables. This principle asks designers to consider what experiences, actions, or forms of value become possible because a current state ends. In the cake cases, cutting enabled tasting, sharing, and revealing the interior. These experiences depended on giving up the intact form.

This principle can inform digital products and services with known endings. Research on the closure of the virtual world *Faunasphere*, for example, found that its announced shutdown changed how people used the world during its final month. Players revisited meaningful places, completed unfinished activities, took screenshots, and gathered with others [24]. Social VR platforms, online games, and other persistent virtual environments could similarly treat an announced shutdown as a distinct phase of interaction, supporting final gatherings, revisiting personal histories, completing unfinished activities, or collectively marking the end.

5.3.2 Principle 2: Prepare what should remain. This principle asks designers to anticipate what may need to remain and make its continuation possible before the ending arrives. In the cake cases, photographs captured the intact state before cutting, while detachable figurines and process documentation were prepared even earlier. What can continue afterward is therefore partly shaped while the artifact is still being created and used.

This principle can inform systems in which data, content, or communities may eventually need to move elsewhere. Research on data portability shows that transferring digital materials between platforms can be constrained by how those materials and their relationships are represented [45]. Systems could therefore prepare for future transitions by

keeping user-created content portable, maintaining provenance as content is created, or recording project decisions and their rationale before a handover occurs. Social platforms could similarly build migration mechanisms into the service before closure, allowing people to move selected content, identities, and social connections when needed.

5.3.3 Principle 3: Shape what others can carry forward. This principle asks designers to consider who can shape what continues after an ending. In the cake cases, guests kept and repurposed decorations, families developed recurring traditions, and strangers remade designs from process documentation. The maker could create opportunities for continuation without determining what form it would eventually take.

This principle can inform systems whose content, resources, or communities may continue beyond their original creators or platforms. Research on repair and reuse shows how people reinterpret artifacts beyond designers' original intentions [41, 44, 52], while online communities can re-establish themselves and their practices across platforms [31]. Digital services could support successor communities, transferable resources, or reuse after closure. Such mechanisms should also preserve relevant permissions, attribution, and provenance so that people can carry things forward without separating them from the conditions governing their future use.

Together, the three principles address different parts of an expected ending: what it can enable, what needs to be prepared beforehand, and who can shape what continues afterward.

5.4 Limitations and Open Questions

This study is situated in one maker's practice and among clients connected to that practice. The maker's involvement as a co-author and in some of the interviews may have shaped participants' narrated descriptions of their experience. To reduce this influence, interviews and data analysis were conducted collaboratively with co-authors, and the interview protocol focused primarily on reconstructing participants' experiences rather than evaluating the maker or the cake. The study is also retrospective. Photo elicitation supported recall, but both participants' photographs and the maker's archive documented the intact cake more extensively than cutting, eating, and social interaction. Our account of these less-documented moments therefore relies more heavily on participants' retrospective recollections, which may omit details or reflect how the experience was remembered later.

The three principles were derived from cake experiences and have not yet been tested in computational settings. Cakes have material constraints that differ from digital artifacts, because they cannot be preserved indefinitely in their original form. Future work should examine how the principles apply to digital systems where persistence is easier and endings may take different forms. Finally, expected endings raise questions of power and rights that the cake cases only begin to expose. People may know that a platform is closing without having meaningful control over what happens to their data or communities. What can be transferred, reused, or carried forward may also involve competing claims around ownership, privacy, consent, attribution, and access. Future work should therefore examine who can prepare for an ending, who can decide what continues, and under what conditions.

6 CONCLUSION

Decorated cakes make visible a temporal problem that digital systems can easily obscure: a designed thing can fulfil its purpose by giving up its current form. Our findings show that endings can enable new forms of value, while what matters can continue through what people preserve, remember, repeat, and remake. For HCI, this shifts attention from preserving the artifact itself to designing its transition and what follows. When a thing is meant to end, the design question is not how to make it last, but what should continue after it is gone.

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