Design's Processional Character

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ABSTRACT
In this paper, we examine the ideas behind and reactions to a prototype online tool designed, in-house, for an art college's interaction design department. The web-based prototype, the *Digital Scrapbook*, was initially intended as a tool for tutors to oversee their students' work. However, our ongoing discussions with the department's members indicate that it is more interesting to its target audience for a variety of other reasons, including its role in design inspiration; group representation and collaboration; and as a repository for documenting the creative process. We speculate on the reasons behind this by further reflecting on the reactions to the tool. We come to the conclusion that members of the department value the Digital Scrapbook because it is seen to reflect the *processional* character of design. That is, we suggest the system is seen as promising because it reveals the often messy, unintended and meandering routes design can follow. In closing, we suggest how we might support further ways of displaying design's processional character and discuss the broader implications of displaying collective processes.

Author Keywords
Design, design practice, collective creativity, processional.

ACM Classification Keywords
H.5.3 [Information Interfaces and Presentation]: Group and Organization Interfaces—collaborative computing, synchronous interaction; J.5 [Computer Applications]: Arts and Humanities—Arts, fine and performing.

INTRODUCTION
It seems fairly obvious to suggest that design departments are highly creative communities, as well as places where students and staff generate large quantities of visual material. One could argue this is their main purpose. Digital technologies have provided design departments with new ways of creating these materials, whilst the internet has furnished additional possibilities for displaying and sharing them. However, this increased opportunity for proliferation has a downside in that it can be difficult to keep track of content that has been, as it were, released into the ether. This is in contrast to design work that utilizes physical materials [19]; whilst there may be a lot of content hanging around design departments and possibly in messy piles, it at least has a tangible presence. The form, arrangement and indeed messiness of physical materials give some indication of where things are and the state of work [17, 26]. So, for designers, the upside of digital technologies, this ability to rapidly create and widely distribute content, comes at a price—namely, an increased difficulty in keeping track of where content has been put and where and how it has been disseminated [28].

In this paper, we report on an interaction design department's efforts to tackle this problem. We describe the design of an early prototype, the *Digital Scrapbook*, that automatically aggregates student and staff content from a variety of online sources, most notably *flickr*, *Vimeo* and personal blogs. Our interests lie beyond the specifics of the technology, however. By considering the various influences and motivations involved in creating the Digital Scrapbook, our aim is to provide some insights into design's ongoing and collective processes. In particular, we offer evidence of design having a *processional* nature and being valued as such. That is, we use the Digital Scrapbook to reveal how design can be valued for the circuitous routes and parallel trajectories it follows, and the importance given to displaying the work in this way. As for the design department in question, we hope to show that an openness to and the pursuit of these characteristics are central to how it understands and constitutes its collective creativity.

Related work
Much has been written about design [13, 18, 21, 22] and its fluid and evolving practice. For example, Schön [24, 25] contests Simon's [29] now canonical proposal for design in which it is seen as an instrumental, problem solving activity focused on optimization. Through example, Schön details design as an ongoing reflective process, something he refers to as *reflection-in-action*. His aim is to draw attention to the dynamic and open-ended qualities of this complex process or 'global experiment' [25], highlighting how the designer reaches an unspecified end point by repeatedly contemplat-

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ing, testing out and juggling the many facets of a design problem.

With its increasing interest in design's practices, the Human-Computer Interaction (HCI) community has been participating in a range of research programmes informed, in part, by these discussions. By and large, the aim has been to develop particular perspectives on design to inform designers' tools (e.g. [14, 28]) as well as shape HCI's own design practices (e.g. [1, 3, 10, 23, 31, 32]). Underlying much of this research—if not always stated explicitly—has been an undercurrent of debate around what, exactly, can be gleaned from further explicating design [6-8, 16, 31]. Loosely grouping the different perspectives, there appear three broad camps. One is concerned with the relevance design has to scientific research, a second focuses on the complementary role design might play alongside HCI's methods, and the third examines the disruptive effect design can have on HCI. These are perhaps best summarised by three relatively recent publications.

Design's relevance to scientific research

In a recent paper, Haynes et al. [8] consider the role of design in research and specifically how design might contribute to the goals of explanation and understanding, i.e., scientific knowledge. Investigating how design has been used in the applied research fields of HCI and CSCW, they examine to what extent the methods applied in designing interactive systems contribute to broader theories of explanation and understanding. In effect, their goal is to frame design research in terms of scientific principles and, in doing so, identify the ways it may be made more scientific.

Design complementing HCI

Wolf et al. [31] give emphasis to what they characterise as the formative, non-linear character of "creative design", contrasting it with HCI's largely engineering-oriented approach. Studying a specific project, they consider the kinds of methods and reasonings applied in creative design settings, revealing them to be at odds with or at least new to HCI's more formalised approach to design. From this, they draw the conclusion that HCI must better enable and support creative design processes to make the most of designers' contributions. In short, Wolf et al. foreground the differences between creative design and HCI, seeing the two as complementary but useful as separate endeavours.

Design disrupting HCI

In their article on cultural probes and their prolific use in HCI, Boehner et al. [1] articulate design's provocative and even disruptive influence. They demonstrate how design strategies can introduce not only new methods to interactive systems design and HCI, but also shifts in epistemology. In the case of probes, Boehner and her colleagues highlight how they provoke more open-ended ideas of interpreting empirical results and draw attention the partiality of those results. The probe is intended to open up the imagination rather than explain or refute some overarching theory of behaviour or interaction. Boehner et al. thus see design offering a means to critically reflect on HCI's practice; as such, design offers new and fundamentally different ways of thinking about HCI.

In the following, we wish to further contribute to these efforts to understand design and reflect on its relevance interactive systems design and HCI. Rather than align ourselves with any one perspective, our overall aim has been to gain a better grasp of what goes on in design and amongst designers. As we detail in the next section, we've sought to do this by participating in design as it is done in a department of interaction designers and, specifically, by reflecting on the progress of a shared online resource, the Digital Scrapbook. We trace the Digital Scrapbook's in-house development from its inception to its current stage as an early prototype. Our description of the factors involved in the Digital Scrapbook's short history, will include perspectives discussed in past research. We will see the department promotes the rapid generation of content [2, 3], is opportunistic with the methods used [6, 7], is open to ambiguity and interpretation [5, 27], and struggles with making its work visible [9, 28]. There are two points we wish to emphasize, though, and that we will develop in the discussion section.

First, as we noted earlier, we want to draw attention to the unfolding, processional nature of design raised in the design and discussions of the Digital Scrapbook. We borrow this idea of processional from the anthropologist Tim Ingold and specifically his description of what, on the face of it, appears the unlikely analogy of carpentry [12]. To explain what he means by processional, Ingold compares walking to sawing a plank of wood:

> "In walking, every step is a development of the one before and a preparation for the following. The same is true of every stroke of the saw. Like going for a walk, sawing a plank has the character of a journey that proceeds from place to place, through a movement that—though rhythmic and repetitive—is never strictly monotonous." [12, p. 67]

What we hope to show through the Digital Scrapbook is how a similar idea of the processional is thought about and valued in the design department prototyping the system. It is worth noting here that we see this as attending to details of a subtly different order to Schön's processes of reflection-in-action and the related ideas around creative design in HCI [16, 31]. We might think of the processional act as *embedded in* Schön's "global experiments" of process; they are the steps and deviations—the different strokes of the saw—that are eventually subsumed into reflection-in-action. The processional, then, refers not to standing-back and reflecting, but the being-in and doing.

> This is not the awareness of the mind that holds itself aloof from that messy, hands-on business of work. It is rather immanent in practical, perceptual activity, reaching out into the surroundings along multiple pathways … [12]

Our second point relates to the first. We draw on the opinions the design department's staff and students are beginning to formulate about the Digital Scrapbook to suggest that one of the values that is being inscribed into the system is its support for a particular kind of collective endeavour,

specifically its capacity for displaying the processional nature of others' work. In other words, the students and staff articulate a value in seeing others' idiosyncratic design processes collectively unfold and, crucially, talk of the visual availability of this as a source of creative inspiration.

Thus, overall, our aim is to offer some sense of how a design department participates in its own fluid processes in taken-for-granted ways, and, by doing so, recursively produces it own orderings and priorities (see [15, 30]). Our discussion and concluding remarks aim to make sense of this and its relevance to HCI.

METHOD

The following work has emerged from an ongoing, 18-month research fellowship at an art and design college in the UK. Located in the interaction design department of the college, the research fellow (the primary author) has used an ethnographic approach to better understand design practice and to reflect on how such an understanding might contribute to research in HCI and Interactive system design. In practice, the fellowship entails taking part in a variety of the daily activities in the department, including project briefs, roundtables, tutorials and critiques (crits), but also less structured activities such as everyday conversations, administrative logistics, chance encounters, idle chit chat and the like. Spending the large part of a year, thus far, interacting with students and staff in this capacity has led to a gradual although still partial understanding of some of the values and ethos embedded in this setting, as well as some sense of how this department 'does' design.

The department in question is comprised of 30 students in total, spread over two years in a masters program, with four part time staff members and the department head making up the core group of faculty, and approximately 5 other staff members having various other responsibilities. One of the staff members is the department's technical coordinator, with her job being primarily concerned with developing and maintaining various aspects of web related technology, including the Digital Scrapbook.

Adopting a recognizably innovative approach, the department fosters a distinctive sense of design that stands in stark contrast to how it is understood in HCI. In fact, there is little awareness in the department of the design processes in HCI or, for that matter, of HCI as a whole; the department, for the most part, takes its cues and patterns for process from a mixture of other design disciplines, most notably from industrial design, product design and architecture, as well as it own instincts, history and practices.

The Digital Scrapbook, and its continuing development in the department has become one important component of the fellowship for the past three months. The research fellow's interest in it was initially peaked not because it appeared to be a particularly novel or groundbreaking example of technology—although it does have several notable attributes—but more because she found it to embody and draw upon some aspects of the department's design practices, and make them manifest. Thus, the way the Digital Scrapbook has been envisioned, used, critiqued and discussed sheds light on the department's design practices and has helped to reify, for an outsider at least, a few of the department's foundational practices. In this sense, the Digital Scrapbook can be thought of as a probe in both the cultural and technological uses of the term [1, 4, 11]. Distinctive, here, and arguably something that might identify the Scrapbook as a 'probe' *par excellance*, is that it has been designed and implemented by the department itself, and, better yet, conceived of without any intention of being a probe.

The system has been running as an early prototype and available to the entire department for approximately two months. The analysis and interpretative work that follow are based, in part, on very loosely structured, one-to-one discussions about the Digital Scrapbook the research fellow had with seven of the department's students, three research staff and two support staff (all having varying degrees of familiarity with the system). The discussions involved each department member talking about the system as he or she navigated its content and hand-written notes taken of their comments. Importantly, the presented work has also been informed by the research fellow's ongoing participation in the department. In this respect, the research reflects the established ethnographic tradition of undertaking and reporting fieldwork in longer-term projects, where emphasis is not given to the details of any one interview or conversation, but to the researcher's ongoing participation in the setting alongside periods of writing, interpretation and reflection (e.g., [30]).

In the presented work, the approach to the analysis was informed by a material cultures perspective [20]. Using this perspective, the analyst interprets the material form and arrangement of things to make sense of a setting's social/cultural specificity. It was through this perspective and a working up of the recurrent themes in the fieldwork that the idea of the design department's processional character was identified. The analysis and theme development were done in conjunction with the paper's other two authors.

THE DIGITAL SCRAPBOOK

This section begins by summarising three aspects of the department's internet use that have been explained as instrumental in the Digital Scrapbook's initial conception and continuing design. After this, we describe the actual design of the Digital Scrapbook prototype and some of the issues the developer has explicitly attempted to address. Last, we discuss some of the ways the staff and students have begun to interpret and make sense of the system.

Influences from department's web use

General Web uptake

One major factor contributing to the Digital Scrapbook is the general popularity of the Web. In the same way the students use web based services (Google, Facebook, flickr, online news services, etc.) in an everyday, taken for granted manner, they also increasingly use the web as a medium for

their output. All of the students, for example, maintain web sites and many also maintain personal blogs. These are used to display images, video and textual material detailing their work. That their websites contain content showcasing their completed designs is perhaps unsurprising; what is more interesting is the variety of material that is displayed online. That is, work in progress and experimental content, as well as abandoned or unfinished design projects (that in the past might have been confined to sketchbooks) are now appearing on the web. Students are also posting content they are simply interested in, either informationally or inspirationally, as a means of showing and sharing with other students and anyone else who is interested. In short, the web, through various sites, has become a major repository of student work, in varying forms and states of completeness.

Shared blogs

Another influence in the creation of the digital scrapbook is the department's use of blogs. For the past several years, the department has been using blogs as a collective resource for design projects. Typically at the onset of a new design project, a dedicated blog is set up to act as a repository for relevant material gathered during the course of a project. These blogs are meant as group blogs, with students and staff encouraged to use them as a place for depositing ideas, thoughts, questions, interesting literature or news stories and any video or web based material related to the project's topic. Although these blogs are considered an extremely helpful resource during a project, their fate after a project has ended is less clear. The majority tend to be abandoned after a period of time; after the initial burst of activity, the postings become sporadic and occasional, until falling off to none at all at the project's close. The blogs then tend to disappear onto the college servers, with the posted material effectively unavailable to students, if only because they are unaware of it.

Department website

The department has an official online website in keeping with the overall college regulations. This website details application requirements, course modules, tuition fees and other administrative aspects of the course. There are also examples of student projects which figure prominently in the website's design, as well as brief profiles for each of the current students. The department website is intended to function primarily as an informational resource for the outside public, in particular for prospective students and members of the press. It is updated periodically, usually about once a month (or less, depending on how busy the responsible parties in the department are), and displays finished student projects, as well as those from a few former students who have had particularly noteworthy and successful projects. The website has fairly strict guidelines governing its content in order to present an image that is in keeping with the rest of the college. There are also space limitations as to how much material can be displayed via the website due to the capacity of the college servers.

In sum, the department is a setting where the students generate voluminous digital material, much of which is posted on online sites, with flickr, Vimeo and Facebook being the favourites. The staff also produce a variety of digital content, with various design projects documented online. In addition, the department has numerous blogs associated with specific design projects, to which the students and staff are encouraged to contribute as a communal resource. And finally there is also the departmental website, intended as a vehicle for the outside world and prospective students to get some sense of the department. The end result is a multitude of material in a variety of places, with varying degrees of visibility and no simple means of access.

Digital Scrapbook prototype

The person most aware of this situation is the technical coordinator of the department. As part of her job of maintaining the various systems the department uses, she finds the issue of what to do with aging material problematic. Due to space limitations on the college servers, not all material can be archived and because the departmental website is meant to function as a public, outward facing site, much of the available material is not appropriate for inclusion. This means that the decision of what material to jettison falls largely upon her, if only inadvertently.

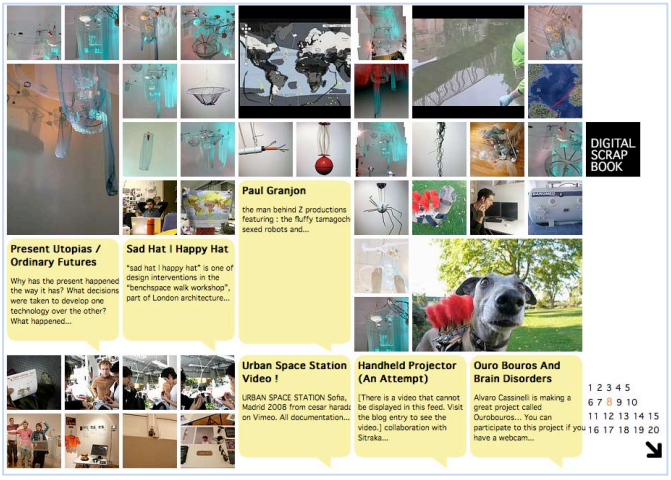

Figure 1. Digital Scrapbook's top-level UI displaying dynamic grid aggregating content from Flickr, Vimeo and RSS feeds.

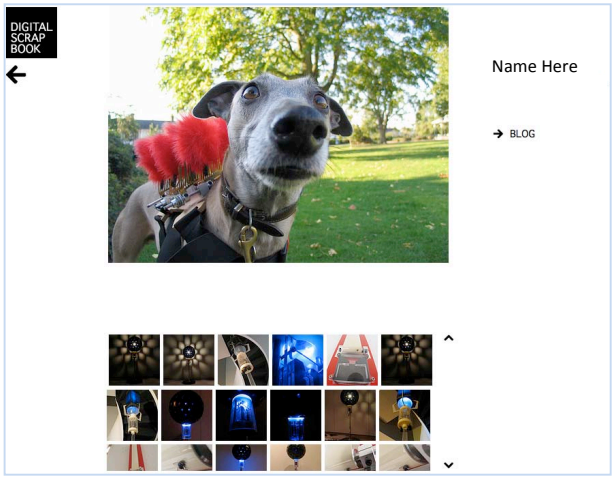

Figure 2. Individual content from department member displayed by selecting image in top-level UI.

To address some of these issues, she has begun experimenting with ways to aggregate the department's assortment of media. The Digital Scrapbook is one of her experimental efforts that has gained traction with the department head and received interest from others both inside and outside of the department. The technical coordinator designed the Digital Scrapbook to automatically aggregate and display the content produced by the department, bringing together different members' images, videos and blog entries from distributed sites. The prototype version of the system collects content from a group of students and researchers who are known to routinely use web services such as Flickr and Vimeo, or have RSS feeds enabled on their web/blog sites. In this respect, it is a typical mash-up application built by accessing a set of APIs and filtering the extracted data using lists of tags (free text labels) specified by the users. The outcome is a web-based user interface providing a concentrated source of content related to exhibitions, installations, work in progress, events, trips, and so on.

The Digital Scrapbook presents the web data at two levels. The first level might be considered organic in some sense, in that it is a stream of mixed content displayed in a set of dynamically generated grids (Fig. 1). To do this, a person's individual content is merged, more or less randomly, with content from other students and staff. The second level focuses on individual contributors, with different views dictated by different types of content (i.e., images, videos or RSS feeds). The source of the web data is hidden and the emphasis is on a simply structured interface that still provides a relatively comprehensive view of a contributor's web content (Fig. 2). The system also allows users a number of ways to navigate to the original source materials, typically by clicking on an image or feed title. This is intended to enable the person using the system to gradually discover the different layers of work behind an individual or a group, depending upon their level of interest.

The system is purposefully designed to take content in the form it is originally posted by the students or staff, devised as such for its simplicity, technological appeal and labour saving aspects. The displayed content is thus somewhat raw, i.e. involves no editorial intervention other than that of the creators. Consequently, the prototype acts as an uncensored funnel for output from staff and students, which besides maintaining the integrity of the content, conveys the level of finish (or lack thereof) of the different projects and exercises. This is in marked contrast to the department website which, as noted, has specific constraints on what is allowed to be posted.

From the technical coordinator's viewpoint, there have been two main challenges. These are, one, presenting a large volume of different people's web content with equal emphasis and, two, trying to encourage the free flow of browsing and discovery of the department's work through one unified UI. To address the first challenge, she has used some relatively simple methods for programmatically filtering and organising the materials displayed on the Scrapbook's top-level page. The gathering of content and application of filters is a relatively straightforward process since the services being used provide APIs for doing so. The only generic problem with applications that rely on third party APIs is the lack of standardization, meaning that data is provided in different formats and under a variety of naming conventions. This has made scaling the prototype to new web services somewhat daunting and, more importantly perhaps, suggests there may be problems in providing equal presence for those using non-standard services.

The technical coordinator frames the second challenge in terms of an initial conception of the Digital Scrapbook as a teaching tool. As she sees it, the aggregation of the students' online material in one place will give tutors better access to students' work. This is based on discussions she's had with the head of the department and various staff members who have repeatedly remarked on the increasing level of online material that students are posting, particularly in comparison with students from previous years. Staff members find themselves checking their students' progress by looking at their flickr accounts, for example. But because the students are constantly looking for online services that will best suit their needs (Vimeo, for example, is currently the preferred video hosting site due to its allowance of free unlimited video storage), the sites they use are subject to change, which makes keeping track of online student material difficult. The technical coordinator has reasoned that by implementing a system such as the Digital Scrapbook, tracking the students' online material could become a more centralized and less labour intensive process, and one that could be handled electronically for the most part.

Making Sense of the Digital Scrapbook

Looking at (and to) each others' work

As the Digital Scrapbook is still in its very early stages, it is difficult to tell if it will be utilized as intended. Regardless of its suitability or appeal as a tutoring tool, however, one thing that has become apparent is that the students and staff find the system engrossing as an artefact in its own right. Instead of thinking of it in the way the developer intended (i.e., as a tool primarily intended for tutors to check their students' progress), both staff and students discuss the Digital Scrapbook most commonly as a means for looking at each other's work. Indeed, the tutors who have used the Digital Scrapbook do not confine themselves to looking at their students' work, they also use it to look at work from across the department. Similarly, students familiar with the system have used it to view the work of other students and staff alike.

While it is not particularly surprising that members of a community might become engrossed in looking at images related to themselves, what is perhaps less expected is how the Digital Scrapbook is used as a means of discovery. Browsing the Digital Scrapbook allows members of the department to find out about their colleagues' design work and work in progress. Based on the aggregate periods of observation of staff and students using the Digital Scrap-

book, surveying others' work was clearly the most immediately interesting and compelling activity. Somewhat curious, however, are the many ways the department already have to achieve similar ends. In practice, the whole department is physically collocated: the students work together side by side in a large studio, and the staff are situated in offices alongside the studio. Moreover, although some staff members work part time, all the students are fulltime and encouraged to spend as much time as possible at the college as opposed to working at home. Combine this with the fact that there are regular crits, roundtables and reviews of design work, and one might imagine it would be difficult to be unaware of what other people were working on. In spite of this, several participants made comments such as "I didn't know he was doing that." or "I've never seen this. I wonder if she did it before the stuff on bacteria." The popularity of the Digital Scrapbook as a means of overseeing the department's work thus seems to reconfirm the difficulty of surveying and sharing digitally based design work.

Seemingly intrinsic to and intertwined with this practice of looking at other people's work is doing so to gain inspiration. The interest students and staff display in looking at each others' material extends beyond mere inquisitiveness. By their own admission, they are looking to each others' work as inspiration for their own designs. One student mentioned, in reference to a blog "I like when people write what they're reading. I can see if I want to read it—like, to inspire me." Furthermore, this surveillance and garnering of potential inspiration is not confined to their own department. During one discussion, several people ended up gathered around the computer after a staff member had managed to click through, via the Digital Scrapbook, to a member of the textiles department's flickr site, and specifically to her wedding pictures. The bride, a textile artist, had knitted a wedding cake and champagne bottles, and several minutes were spent admiring her skill and craftsmanship. Such examples of looking for inspiration beyond the department boundaries suggest that if a system like the Digital Scrapbook was department specific, but allowed access intra-departmentally throughout the college, it might provide even further sources of inspiration.

Inspiration from work found on the Digital Scrapbook occurs in other unexpected ways. Although the Digital Scrapbook has been designed to aggregate a range of media, the predominance of content is made up of visual content. The students' and staff members' websites are composed primarily of images, drawings and video links; many use text only as tags for images. The various blogs rely heavily on images; very few of the student feeds have text-only blog entries and the project-related blog posts nearly always contain a photo or a video link. This heavy use of images means that management of media accounts such as flickr can become problematic for the students and staff. Whilst the blurring of divisions between work and personal life is undoubtedly a concern for many flickr users, it is an issue the members of this department face daily. Photos of events like a dog show and a relative's wedding end up displayed on the Digital Scrapbook, due to being grouped with photos taken as possible design inspiration. Discussions concerning which flickr accounts should be used revealed some interesting issues for the department's members. Somewhat predictably it appears that the divisions between work and life are extremely fluid, and thus the photos of the dog show did indeed end up being a source of inspiration for one student's project. Perhaps more unusually though, one student found inspiration from photos of another student's sister's wedding, in spite of not attending the wedding (nor indeed even knowing the sister). Thus, the Digital Scrapbook's mixing of personal and work material is seen as beneficial by some of the students, in that it is provides more sources of possible inspiration. The department, it would seem, places great importance on finding inspirational material and the Digital Scrapbook is valued because of how it is seen to contribute to this.

Documenting process

Also of fundamental importance to the department (and arguably most design departments) is the documentation of the design process. The students in the department are encouraged and expected to document their design process: what sort of resources and materials they draw upon for inspiration, how they envisage their designs, which tools they use, and any unexpected circumstances they encounter. In spite of this emphasis placed on documentation, the students don't always manage it successfully. Understandably, they are often too preoccupied with building things to remember to take photos or video of their processes.

It's in light of this that the Digital Scrapbook's automatic aggregation of content is seen to provide an unexpected benefit. During one period fieldwork observation, a tutor commented, "Oh there's Xavier's frame. I wondered how he had built it." She then scrolled through the series of photos showing the building of a large structure and discovered they were from another student's flickr page. The tutor remarked that Xavier should ask for the pictures for his own documentation. She commented that he probably didn't even know that the other student had taken the photos of his work. The aggregation of content from multiple sites and from multiple creators of content thus means the Digital Scrapbook provides a wider pool from which to assemble process-related documentation.

The students show an interest in exploiting this aspect of the Digital Scrapbook, but less for academic reasons than for career development possibilities. One student explained that potential employers like to look at students' material to get a sense of how they work and specifically what their design processes looks like. His impression was that the Digital Scrapbook made this much easier and also allowed ongoing work to be scanned from a range of students. Likewise, another student, who was initially uncomfortable with the idea of having several of her 'failed experiments' on display on the Digital Scrapbook, decided that having "evidence that I can think 'around' a problem and come up

with interesting solutions" was actually quite useful when presenting herself to potential employers.

Reflecting on the Digital Scrapbook's role in documenting process raises an interesting issue, namely, what qualifies as 'documenting process'? From time spent in tutorials with the students, it appears that they are themselves unsure. Several students had photos displayed via the Scrapbook they apparently didn't consider associated with their design process, but their tutors did. Similarly, the Scrapbook incorporated things such as books read and random items that may not have seemed to qualify as part of the design process, but were in unexpected, tangential sources of inspiration. Thus, one aspect of the Digital Scrapbook some tutors found promising was its capacity to help clarify process. Not only was it seen to make the documentation of process easier to access and more available to the department, staff and tutors alike felt it provided for an opportunity to explore what, exactly, constitutes process. In some respects, the Digital Scrapbook was thought to open up the practice of documentation.

Representative of the department

Probably evident by now is the emphasis the department give to making use of inspirational materials and using them to trigger fresh ideas. This ethos is palpable in the department. Its hallways and the students' studio (Fig. 3) are continually cluttered with half-finished, curious-looking installations and pieces of apparent junk waiting to be incorporated into someone's work. Ideas literally take shape—seemingly spurred on by materials that have been found lying around in the college or while out and about. The physical spaces and the plethora of 'stuff' found in them are testament, then, the enthusiasm the department has in pursuing ideas and then casting them away, or reinterpreting the premise for a project some time into it.

Revealing is how the Digital Scrapbook is worked into this mode of thinking. Like the physical spaces in the department, the prototype system appears to succeed in conveying the dynamic spirit of the department. The collection of disparate, unusual and often peculiar things that students post online offers a glimpse into some of the workings of these designers' minds. The overall visual appeal of the Digital Scrapbook pays compliment to the material that the students produce. The Scrapbook, though, does play or at least is seen to play an active role in distilling and presenting the work.

Both staff and students feel that the Digital Scrapbook not only captures the more disjointed processes involved in individual work, but also conveys the collective dynamism of the department as a whole. One student wrote the following about the Digital Scrapbook in an email: "I really like the idea that we are presented as a pool of things, that individualities are behind the group facade, so people can dive into a group identity, not individuals…"

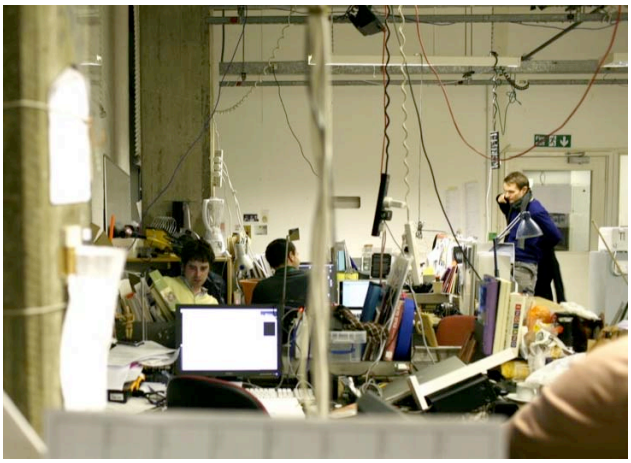

Figure 3. Area of students' studio.

In some cases the degree of automation incorporated into the Digital Scrapbook appears to have been overestimated. Several of the department's members are under the impression that the system's interface has been purposefully designed to achieve this. They describe the system as being designed to do things such as group different people's work together in specific ways or group projects by particular themes. However, the layout is simply determined by a few basic algorithms that gather data from the web using preassigned tags and filters, and juxtapose the resulting content in a random fashion. Moreover, other than using a grid-like structure and particular fonts, the system is not intended to look a certain way or, for that matter, have a particular aesthetic (indeed, because the prototype is under construction and the department as a whole cares deeply about aesthetic, the final appearance has yet to be decided).

Whatever the case, the Digital Scrapbook is seen to play a distinctive role in representing the department. During one observation, the course administrator reflected on how the Digital Scrapbook was a good counterbalance to the official department website. She thought it was particularly useful as a resource for prospective students, to give them a better sense "of how people work, you know, of what people really do here." The department website was thought to offer a more finished, polished result. Several of the students interviewed also felt the Digital Scrapbook was a particularly apt representation of the department. There was a general consensus that the system was better at capturing the feeling of what is going on in the department on a day-to-day basis. In sum, then, despite its overall simplicity and crudeness, or perhaps because of it, the consensus is the Digital Scrapbook more accurately represents the sense of the department 'at-work'.

DISCUSSION

Earlier, we introduced the idea of the processional, explaining how it can be used to characterize the unfolding, contingent nature of particular kinds of activity. Rather than following a discrete sequence of pre-defined steps, a processional activity progresses incrementally, so that preceding steps shape what follow and outcomes are only certain

once they are reached. Thus, the contingencies faced as an ordinary feature of doing the activity unavoidably give shape to its progress and outcome.

In subsequent sections, we have described some of the major influences on the design of the Digital Scrapbook. We've tried to provide a sense of the sort of work that contributed to the Digital Scrapbook as well as some of the core principles and ways of working within the design department in question. We hope these details capture some of the reasons why designers might value the idiosyncratic and haphazard nature of their work and its processes; in short, why they might value design's processional character.

As we've noted, it has been recognised for some time that designers find inspiration in others' examples [9, 28] and adopt non-linear trajectories in their creative endeavours [16, 31, 32] (due, in part, to their ongoing processes of reflection [24, 25]). What we have found particularly interesting in examining the Digital Scrapbook, however, is the impact an online repository can have on these fluid processes. With the Digital Scrapbook, we see that an availability of examples of others' work not only provides inspiration; but, by displaying how designs unfold, can also alter the way the processional is seen and valued.

Displays of process and the processional

Evident above should be the amount of work both staff and students put into displaying what they do and how they do it. Sites like Vimeo and flickr, and personal blogs, are used to show final work, but we see that equally important can be their use to display the progress being made and the decisions taken along the way. Revealing the creative process, it appears, can be just as important as the end product.

In this way, the Digital Scrapbook complements sites like Vimeo and flickr, and personal blogs. But in a number of ways it also extends the possibilities. As shown in the preceding sections, students don't always manage to document their process, and are sometimes unaware of what constitutes documentation or even what their process is. The Digital Scrapbook broadens the notion of 'process' by drawing in things that might not strictly fit with the idea of process but are still part of it. Moreover, by automatically aggregating different people's content, the Digital Scrapbook achieves two further results. First, it provides multiple perspectives on any one project or design exercise; media, from blog entries to photos and video are assembled, allowing the process to be richly documented. Second, it visually juxtaposes the processes followed by different staff and students, which in turn can prompt new ways of thinking about the work.

Process is of central importance to designers and it makes sense that a design department would value systems that present how they go about their work. The previous section has described how the department's staff see process to be particularly important and are keen that the students show their ways of working. It is worth considering, however, what the displays of process using the Digital Scrapbook achieve for the department's members. From discussions about the Scrapbook's content, it appears that displaying process offers one way of demonstrating creativity. It is seeing the varied routes followed as well as the apparent leaps in thinking that demonstrate what could be thought of as a dexterity in creative thinking. It's not just that process is important. Critical, as well, is the freedom to find inspiration in unexpected things and a readiness to reject one line of work in pursuit of another.

It would seem, then, that the Digital Scrapbook may supplement the sorts of things that are shared through being physically co-present in the department and the students' studio. Being physically present offers a sense of the work-in-progress in the department at any one point in time, but the Digital Scrapbook allows temporal trajectories to be viewed all at once and even juxtaposed against one another. In effect, the processional character of the projects is made visible through the system and becomes available as a resource for judging the work as well as a visibly explicit means of demonstrating creativity.

Collective displays of the processional

Something else clearly evident in the students' studio and more generally in the work people generate in the department is the cross-pollination of ideas. Being in the department, surrounded by people sawing, cutting, gluing, hanging, crafting, etc. as well as producing digital content is considered a principal source of inspiration. In other words, the continual visibility of others at-work is a contributing factor to the department's overall creative processes.

With their use of online services, we see the staff and students attempting to augment the activities that are visibly performed in the department. Their online visibility, as we've said, provides both a wider distribution of their work and also more detail about their processes. On a practical level, an impetus for the Digital Scrapbook has been to collate and help manage this wide distribution of material. However, the comments from staff and students suggest the system could provide a more subtle function.

More than a simple repository, the Digital Scrapbook is spoken of as an additional resource for visualizing the collective design processes of the department. The students see the value of having the Digital Scrapbook present their work to outsiders and especially potential employees. As we've seen, some students (as well as staff) consider the Scrapbook a more accurate face to the department and its work in contrast with the departmental site. They feel that their work's messy and haphazard nature, as captured by the Digital Scrapbook, is a better expression of their creativity.

There seems more to this idea of the Digital Scrapbook providing a means of collectively displaying work, however. There is also a sense that it relays something of the collective-*at*-work. The staff find the Scrapbook provides new ways of seeing their students' progress, the students discover the skills of their colleagues, all are inspired by the

multiple threads of interleaving projects, and so on. These perspectives are a consequence of viewing the Scrapbook's visual record. The displays of the processional—the fluid twists and turns of designers doing what they do—unavoidably capture what the department's members are collectively doing and what they are capable of.

The Digital Scrapbook, then, is not so much a proxy for being physically present. Being present in the department, as the tutors mentioned, is not always an adequate criterion for knowing what is going on. What the Digital Scrapbook appears to provide are new ways of seeing the collective work of the department. The department's varied projects that are physically spread across time and space are, in a manner of speaking, collapsed on the Scrapbook's pages so that they are seeable at once, as an assemblage. Not everything is seen together, but this can prompt further circuitous strands of work; things can be discovered by chance and lead to new and unexpected routes. So it seems the displays of the processional using the Digital Scrapbook also have the potential to be transformative. In this case, the visibility of design's processional character provides new perspectives on the department's collective endeavours.

CONCLUSION

We've attempted, in this paper, to use the Digital Scrapbook to further explicate design practice, adding to a growing corpus of research on the topic. As a technology, the Digital Scrapbook provides one example of numerous efforts to manage the problem of coordinating, documenting and sharing the work produced by designers. Although non-prescriptive and lightweight in its use, it shares some basic principles with other projects that have recognized the importance of making design work visible (e.g., [19]).

Writing about what influenced the system's design and describing the related discussions with the design department's staff and students, our emphasis has not been so much with the specifics of the technology, however. Instead, the focus has been on drawing out *why* documenting design work is considered important and, by extension, the function that such documentation might serve amongst a collection of designers. Specifically, we have used the Digital Scrapbook to draw attention to the processional qualities of design and described how such qualities can be seen as central to a form of collective creativity.

On a superficial level, we have seen that one simple reason for documenting the work produced by a design community is because, more often than not, individual projects follow their own distinctive and circuitous routes. The documentation therefore acts as a record of a non-sequential and idiosyncratic activity, i.e., a processional one. Yet seen in the context of a design department and shared online tools like the Digital Scrapbook, it turns out there are further dimensions to this documentation. We discover it is seen as a way to express a dexterity in creative thinking and foster creativity in others. In an iterative or circular way, the creative leaps and the visual display of factors that led to them provide a community with an ongoing source of inspiration.

In closing, we want to suggest these insights into a design department and its practices have both narrow and broad implications. The perhaps obvious narrow implication is that collaborative design work might benefit from tools that allow the processional character of design to be captured and visualized. Although certainly not ideal in every respect, the Digital Scrapbook offers some pointers that might be instructive in this regard. We feel four points to be of particular relevance:

1. A flattening of time/space – by automatically aggregating content from multiple online sources, the Digital Scrapbook offers alternative ways of seeing the collective processes of designers. It assembles work that has occurred over time and been physically distributed to be viewed all at once. In a fashion, it flattens sequences of time and space.

2. Broadening of process/aggregating multiple perspectives – by aggregating various threads of content, the Digital Scrapbook offers different perspectives on how any one piece of work came about. The ways that processes are made visible are not necessarily explicit or obvious as in, for example, a crit or show. Instead, the aggregation of multiple perspectives gives emphasis to the processional.

3. Collective awareness – having a different means of seeing the collective-at-work offers new forms of awareness. In displaying the processional character of a collective's work, the Digital Scrapbook allows the collective to gain a sense of what skills are available and how they might be distributed and re-used.

4. Juxtapositions of the processional – finally, the different trajectories displayed in the Digital Scrapbook serve to inspire others. Visually presenting the kinds of decisions made and reasons for them are the source of inspiration. Also, the Digital Scrapbook's more or less random juxtaposition of different processes inspires alternative possible trajectories.

The broad implication we want to consider has to do with the relations between the processes and products of design, and what influence interactive systems have on this relationship. What is hopefully evident in the materials we have presented is the symmetry between the design of the Digital Scrapbook and projects it contains. As with its content, there is a processional character to the Digital Scrapbook's development. Its ongoing design continually responds to but also dictates how the students and staff think about and articulate it. So it would seem the processional persists across different levels, that there is a recursive layering to the unfolding, step-by-step design in the department.

It's this apparent pervasiveness of the processional that we want to give some thought to in closing. What we want to suggest is that for the design department in question—and, we imagine, others like it—interactive systems are an inexorable feature of the continual and recursive processes of production. As with Ingold's plank sawing, the tool's use shapes the outcome but, at the same time, it shapes the process—the rhythmic to and fro of the saw governs the cut into the wood but also shapes the sawing itself. In using the

tool, then, the product and process are made inseparable. The Digital Scrapbook is an especially apt example because it illustrates how such systems can be not only embedded in and constitutive of processional processes, but can also make the processional visible and sustain it as a something of value. This suggests that the business of developing tools to support design—in this department, at least—should give careful consideration to the continuous, interleaving relationships between tools, process and product.

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