

*The first section of "Interface Aesthetics: Practice in the Expanded Field of Design," a 2012 undergraduate thesis.*

The structure of an interface *is* information, not merely a means of access to it.<sup>1</sup>

*Johanna Drucker, "Humanities Approaches to Interface Theory"*

Today anyone with Internet access can describe the standard structure of a web site. A navigational bar or two delineates the screen, and we determine under which category, possibly About or even Contact, our intention falls. We meet a refinement of our query through drop down menus or divisions on the following page. Behind this standardization, of course, there is a field of study. Information architecture analyzes content organization to foster a service-oriented design, yet the term "service" deserves interrogation. As with all forms of communication, a particular audience will likely be taken into account. In information architecture, ideally the audience and the institution mutually determine the useful, relevant, and accessible information. However, as the Internet took shape, web design comfortably assumed print-based layouts, and perhaps such interfaces, in turn, preemptively determined what most visitors expect to be searchable. Increasingly search engines answer users' queries for locations, hours, and even mission statements, without the user ever visiting the institution's site itself. Services such as Google Reader become the interface to news articles, parsing and organizing RSS feeds to promote a contained and centralized experience. The mediation of visitors' queries through search engines and third-party sites reinforces a model of Internet use and design conceptualized as an access-and-extract paradigm. This paradigm treats an interface as a container for data, attempting to make its storage and retrieval ever more efficient. With contemporary developers embracing an access-and-extract model, relegating the interface to an "in-between," it proves no wonder search engines subsume the role of many web sites. The search engine merely reduces the already in-between interface to its visual minimum.

An academic in the fields of cognitive science and engineering, Donald Norman develops his concept of user-centered design in his book, *The Design of Everyday Things*. To begin a conversation on good design, however, he first emphasizes a proper understanding of the structure of everyday tasks. He cites two structural elements to every task: the first either wide or narrow and the second either deep or shallow. The game of chess, for instance, proves both a wide and deep structure. At the start of the match, the player can

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<sup>1</sup> Drucker, "Humanities Approaches to Interface Theory," 10.

make a certain number of possible moves. As the match progresses, the number of possible choices for the player and her opponent increases exponentially. Whether an activity is wide or narrow depends on the “top-level choice,” the number of potential actions at the start of a chess match. Its depth or shallowness depends on the number of potential actions until the activity is finished.<sup>2</sup> Activities with narrow or shallow structures require less conscious effort to perform than those with wide or deep structures. One might imagine the minimization of an activity's breadth or depth as the good designer's utmost task. However, as Norman writes, “In games and leisure activities, the structure is devised so as to occupy the mind or to make the task deliberately (and artificially) difficult. [...] Recreational activities *should* be wide and deep, for we do them when we have the time and wish to expend the effort.”<sup>3</sup> Proceeding with the understanding that optimization need not be the ultimate aim, the designer can evaluate an interface not solely by its efficiency, accessibility, or utility but by its experiential goals in and of themselves.

Norman stresses the importance of creating “explorable” systems. A system's explorability depends on three fundamental tenets: the visibility of potential actions, a well-defined system image wherein users' actions are met with proper feedback from the system, and actions “without cost.”<sup>4</sup> The requirements complement one another, allowing the user to act experimentally and providing feedback to reinforce a proper mental model of the system, in turn encouraging further exploration. The last tenet, however, proves the most interesting; the user should be able to act within the system without apprehension for the consequences: in the case of a computer interface, acting without worry of damaging the machine or releasing private data. Returning to the example above, a chess match has a wide and deep structure, but it is not a totally “explorable” system. While the great number of potential actions adds an exploratory aspect, the rules and win state of chess limit the player's actions. However, the very cost of these actions, which “occupy the mind” and “make the task deliberately (and artificially) difficult,” proves the enjoyable aspect and of course, quite simply, the purpose of the game.

Here Norman's discussion of wide and deep structures parallels Mihaly Csikszentmihalyi's theory of flow. A popular notion in contemporary psychology, flow theory came into being from a simple question researchers asked, “Why do people perform time-consuming, difficult, and often dangerous activities for

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<sup>2</sup> Norman, “The Design of Everyday Things,” 121.

<sup>3</sup> *Ibid.*, 124-125.

<sup>4</sup> *Ibid.*, 183-184.

which they receive no discernible extrinsic rewards?”<sup>5</sup> To formulate an answer, Csikszentmihalyi and others interviewed hundreds of athletes, chess players, artists, and others. From this research, he developed the concept of flow: a state that derives from an activity experienced as an end-in-itself. During such an activity, many recall feelings of complete absorption in which they forget “time, fatigue, and everything else but the activity itself.”<sup>6</sup> This state does not stem from passive absorption or what Csikszentmihalyi describes as “homeostatic,” regulatory pleasure but from activities that promote active enjoyment and growth, meaning they require a well-defined goal set and a difficulty level appropriate to one's ability.<sup>7</sup> A task too difficult or seemingly endless will lead to discouragement and disengagement, while a task below the player's skill set will not require her concentration and investment.<sup>8</sup> For such activities, which may come in a range of manifestations for a range of players, promote active investment. This investment of psychic and physical energy fosters learning and comprehension through means utterly unavailable to the model of passive absorption of information and entertainment. The ease of play one experiences in a chess game derives from the familiarity of its predetermined rules, and enjoyment of the match stems from the various enactments of these rules. While the ease or difficulty of the match may be shaped further by the opponent's skill level, this basic interplay, between well-defined regulations and their large number of potential trajectories, makes the activity worthwhile. The game facilitates the development of the player's talent while its basic framework remains intact. In this light, one can posit Csikszentmihalyi's concept of flow as an educational model customizable to one's predetermined ability while allowing this capacity to develop further.

To connect Csikszentmihalyi's research to interface design, the concept of flow becomes a useful tool in relation to wide and deep structures. Rather than the access-and-extract model of contemporary web sites, an interface with a wide and deep structure, with several options and multilayered trajectories of navigation, encourages active engagement with the material rather than point-and-click retrieval. While the possibility of searching for content should remain open, just as one does not want to find their soup stored in Russian dolls rather than a simple can, the access-and-extract design model proves unsatisfactory alone. It neglects a component of comprehension otherwise integral to our enjoyment as human beings. With the

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5 “Flow,” 600.

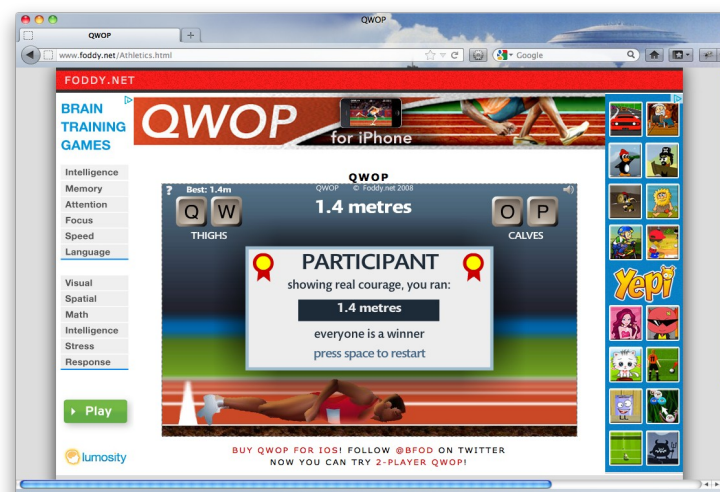
6 *Ibid.*

7 “Enjoyment of Life,” 46.

8 While Csikszentmihalyi did not focus solely on those involved in game play in his research, the term “player” proves the most apt to describe one partaking in a state of flow; for it emphasizes the ludic, recreational aspect of activities as they are experienced.

consideration of deep structures, the interface becomes not a design support for or, in some cases, barrier to information but leads to recognition of the interface itself as dynamic and compelling information itself.

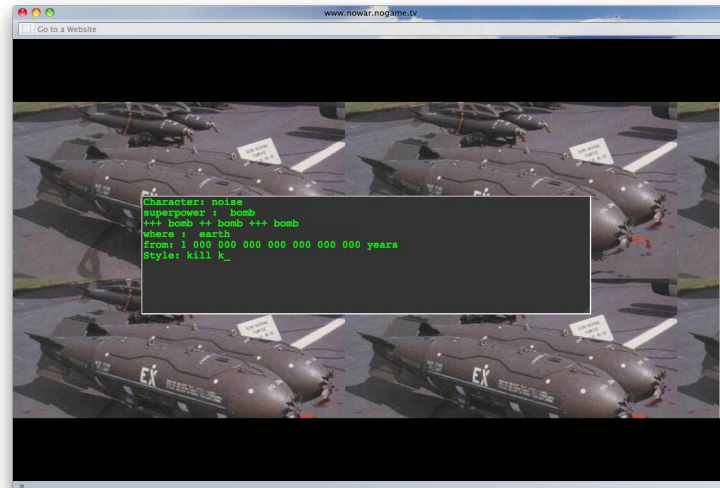
To move beyond the access-and-extract model, interface design must keep in mind the need for explorable systems. We find several manifestations of actions without cost, the last tenet of explorable systems, in digital formats: the back button, pause icon, or undo command, and so on. While not foolproof, the ease with which actions can be undone or proper intentions confirmed opens a field of explorable systems perhaps hitherto unparalleled.<sup>9</sup> The materiality of digital formats allows information to be retraced or retracted instantly compared to the relatively irreproducible or irreversible marks of a brush on canvas. The adjustable “canvas” of digital formats contains its own history, navigational trajectories, and ultimately memory, placing in the hands of user and designer both unprecedented explorable tools and methods of control. I will return to the explorable yet controlled nature of digital formats, but for now, I will infer and imagine design models that aim to exploit this explorable quality, in terms of both structure and experience. While to win proves competitive chess' end-goal, the course of the game can be an end in itself, as the autotelic experiences cited by Csikszentmihalyi suggest. Yet the goal of visiting a site online will rarely be described as an overtly autotelic experience. Even web sites for popular games such as Canibalt and QWOP, in which the address itself serves as a “destination,” present themselves as containers for gameplay.



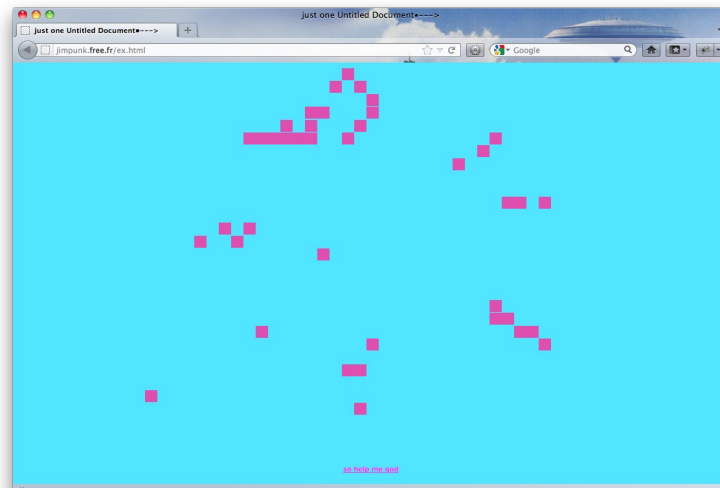
<sup>9</sup> The adverse effects of this ability may be the unseen recording of one's actions or the lack of awareness of what one is truly navigating to, in the absence of seemingly standardized pop-up warnings or explicit terms of use statements, and so on.



As Louis Dulas writes in an editorial for *Rhizome*, the “non-linear, schizophrenic performance draws attention to the form language and communication take, all the while disrupting standardized information flow and producing an irregularity in the way we expect to approach and access content.”<sup>10</sup> The site displays a frenzied and often alarming array of projects, such as the page below which constantly reads out text of “bomb” and “kill” commands.



Yet Punk tempers such works with the page below, the title bar reading “just one Untitled Document•--->,” while benignly drawing pink squares in the wake of the mouse coordinates.



The “schizophrenic” and “disruptive” nature of Punk's site compels the visitor to click with conscious intention, though surrendering to the artist's chosen system of interlinking. Punk's work forces the visitor

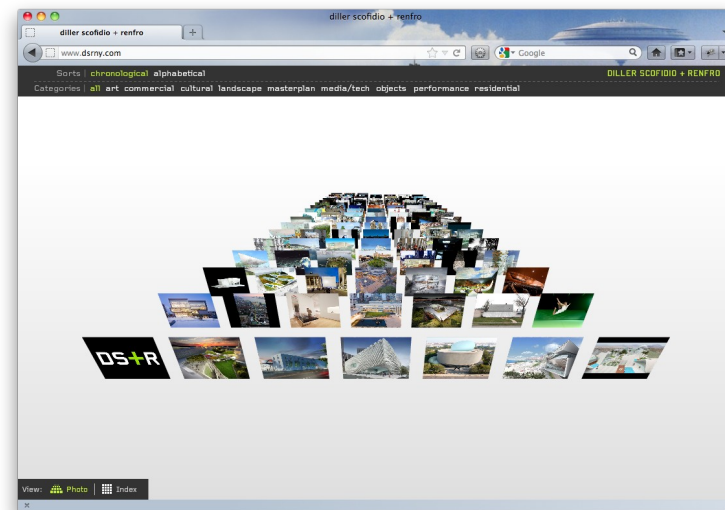
<sup>10</sup> <http://rhizome.org/editorial/2012/jan/30/jim-punk/>

into an exploratory interaction, with her unable to guess the content each mouse click will bring, whether it may be a torrent of pop-up windows or a calm set of links to another artist's site. Yet the perhaps compulsorily exploratory quality of Punk's site may not fulfill the last tenet of explorable systems Norman cites, that actions be without cost. In learning the rules and language of the interface, the visitor faces an awareness of risks usually minimized on better known web sites. She enters into a framework of slightly paranoid potential actions more at home among spam and viruses. On Punk's site, when one deletes the pound symbol from the end of the "home" page's url, [www.jimpunk.com/#](http://www.jimpunk.com/#), the screen becomes black for a moment, just long enough to cause the concerned visitor panic, until the fullscreen menu for film editing software appears. Despite the humor of this example, the awareness of risks, be they real, imagined or invisible, to one's software and data becomes a palpable anxiety in much net art during its first encounter. Still, Punk's site does function as a wide structure that begs exploration, with the computer keys displayed on the homepage suggesting a various range of navigational options with only minimal visual cues as to the nature of their path. Once one chooses a trajectory, the visitor's input, such as mouse position, browser window, and entire machine become malleable, generative tools. Whereas standardized design posits a web site's goal as the efficient extraction of information, the goal of Punk's site—as one that utilizes and exploits its format as an interface—becomes oriented toward its explorable, experiential character. The opening text-computer navigational system can be easily, for the most part, returned to through the browser's back button. The site houses many projects, but in their amalgamation, becomes a multilayered project itself, rather than a lucid or explicit gallery of discrete pieces. To borrow another phrase from Johanna Drucker, the cultural theorist prefacing this essay, the site self-consciously recognizes an interface as the "critical zone that constitutes a user experience."<sup>11</sup>

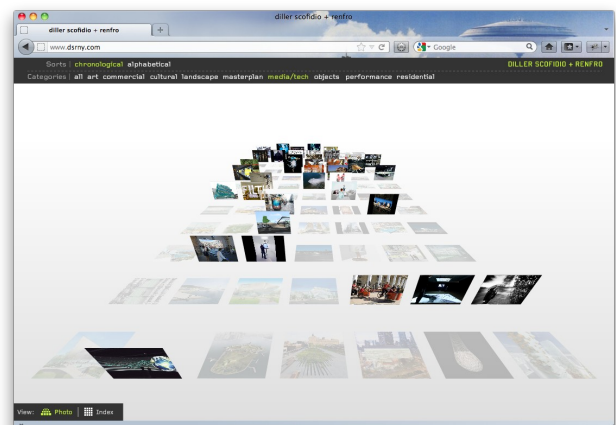
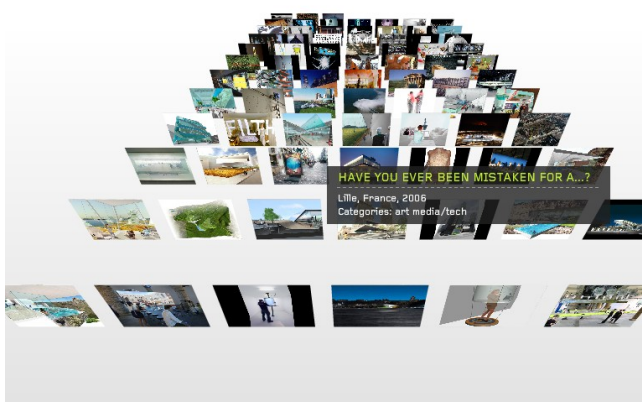
When visiting web sites linked to institutions or services, users desire—or at least, have grown accustomed to desiring—the traditional navigational menu with a narrow or shallow structure in order to access information with speed. As Punk's site takes the interface and browser itself as an explicit focus, however, many progressive institutions and design firms are coming to experiment with the dynamic and experiential qualities of Internet interfaces. One such firm based in New York, Diller Scofidio + Renfro, presents their latest projects as an array of images.

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11 "Humanities Approaches to Interface Theory," 10.

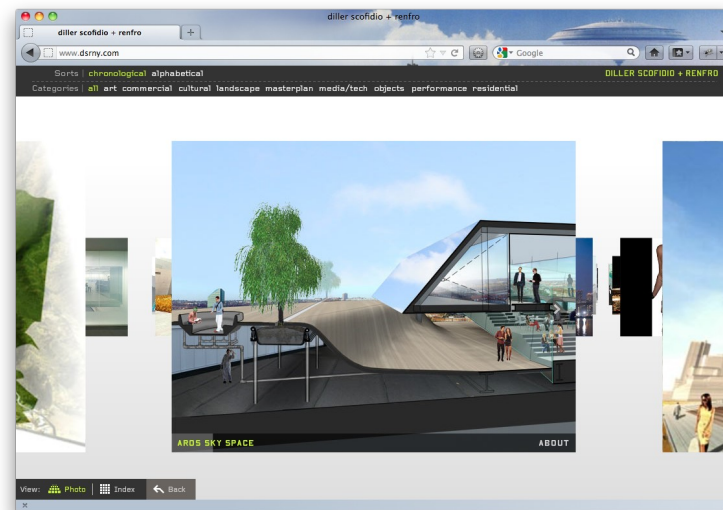


More than a two-dimensional grid, the design utilizes Adobe Flash's capability to render depth. As the mouse moves toward the “farthest” point on the array, the images shift forward and expand according to the mouse position's perspective, and when the cursor hovers over an image, the work's title, location, year, and category appear. The navigational bar at the top of the window sorts projects chronologically or alphabetically, and the “categories” function filters their display. Choosing the “media/tech” category renders images not in the category flat and partially transparent.



The site presents the firm's projects spatially, rather than the standard linear progression of a drop-down menu by means of categorical refinement. Their body of work assumes a wide structure, wherein their work can, in one sense, be geographically surveyed. The site proves explorable as well, making potential actions visible through movement corresponding to mouse coordinates and providing feedback through hover pop-ups and the images' spatial orientation. Clicking on a project zooms in to the image, still seen within the context of the surrounding projects.





Simply clicking outside of the selected image returns to the larger array, and the screen pans out. This interface exemplifies the explorable qualification that actions should be without cost. Even with one project selected, its position within the larger array is still apparent. A visitor may arrive in search of a specific project—facilitated by the image-array as well by the “Index” tab on the bottom navigational bar—but then hovering momentarily and clicking certain images and titles that attract her attention, actions less likely in a standard interface. Moreover, the design embodies architectural form, assuming the format of a perspectival grid. The projects stand in relation to one another as buildings on an urban planning blueprint. The details of a project cannot be viewed without the surrounding context of Diller Scofidio + Renfro's body of work, as a built form cannot be seen isolated from its location. While I definitely do not suggest exploratory design models must assume mimetic forms—as if electronic stores should position each item around a circuit schematic—Diller Scofidio + Renfro's site emphasizes a consideration of the spatial possibilities of web interfaces. In one reading, the images receding in time produces an experiential, perhaps a “digital,” effect of depth. While a phenomenology of the computer screen is not within the scope of this essay, Diller Scofidio + Renfro's site proves interesting for its ability to open the space for this conversation, reconceptualizing a digital interface in relation to the material it makes manifest.

These exemplary web sites work to balance standard navigational systems with exploratory, experiential, and educational models of design. To reprise an earlier statement, increasingly third party sites mediate simple search and query functions, facilitating a narrow and shallow structure for the user's intended task. This phenomenon places both a new burden and a new freedom on interface design: the ability to incorporate an exploratory model to foster the visitor's engagement, with a wide or deep structure to engender

recreational and rewarding qualities. According to flow theory, players become most engaged in activities with rule-sets that stretch but do not overwhelm their capacity or skill level, and a foreseeable end-goal that allows players to view the task as accomplishable. The crux of innovative design, then, lies in the lack of cultural standards, in which the “established use” of an object or interface does not precede its creation.<sup>12</sup> This problem may prove, however, to be the most productive space for interface design as both a concept and device, a notion that will be discussed in greater detail later. From the standpoint of digital interface design, the sites analyzed above could easily frustrate a visitor from a lack of familiar navigational cues. Aware of this perceived shortcoming, I stress the implementation of explorable systems: providing visibility of potential actions, as when the mouse hovers over the computer keys on Jim Punk's site, changing its screen and suggesting a link; proper methods of feedback, as when on Diller Scofidio + Renfro's site the mouse movement scrolls the array indicating how the user's input functions; and finally, utilizing and exploiting the built-in, yet expandable, capabilities of digital formats to make actions without cost, such as the browser's back button and previews of possible trajectories. As in the case of Punk's sometimes overwhelming and unexpected projects, a visitor can still formulate a proper “mental model” of the interface through exploring it, even if the model itself posits a certain degree of surprise.<sup>13</sup>

What occurs, however, when the end-goal becomes oriented toward exploration itself? The access-and-extract paradigm gradually gives way to an educational approach, whereby the experience of an interface becomes in part learning and exploiting its very rules. One could imagine an interface that grows and reconfigures itself each time the same visitor returns, according to his or her engagement. Our Google accounts certainly implement this idea. Rather than simply parsing relevant content, however, such an idea could be pushed further to extend to an interface's actual structure. The user can learn about the “content” of the site while simultaneously increasing her digital literacy, the site making apparent the current capabilities of interface technology and how they in turn determine design. However, a designer should not posit a user as merely input to be mirrored in the interface. Quoted previously, Johanna Drucker is a practicing author, artist, theorist, and critic. In the article “Humanities Approaches to Interface Theory,” Drucker does not strictly present an oppositional argument to “mechanistic” interface design in the Human-Computer Interaction (HCI) field, but instead she offers an evaluation within the humanities that proves both complementary and necessary, in order to augment the understanding of an interface “user” as

<sup>12</sup> Norman, “The Design of Everyday Things,” 84.

<sup>13</sup> *Ibid.*, 40.

one who performs more than simple point-and-click operations.<sup>14</sup> We must keep in mind “an embodied user” perhaps engaged in “the diversionary experience of wandering browsing meandering or prolonging engagement for the purpose of pleasure or an even lower level notion like keeping boredom at bay or idle distraction and time squandering.”<sup>15</sup> The “embodied” user's desire must not be formulated solely as efficiency, though neither for just “time squandering” purposes. A narrow and shallow structure does not necessarily trump a wide and deep structure in its utility. Each facilitates certain tasks in different ways. Yet contemporary web design favors narrow or shallow structures, reserving other forms for the gaming field or otherwise nesting them under the title of “bad design.”<sup>16</sup> The tenuous balance ultimately comes down to, as Drucker writes, the “emerging relation between diagrammatic imagination and consensual conventions.”<sup>17</sup> Perhaps HCI makes a fundamental mistake when the interface is assumed to be wholly “embedded in the motivations of an embodied user,” instead of allowing the “diversionary experience” or “prolonged engagement” to derive *from* an explorable, game-like design model.

The question still persists beyond the realm of technology and design—if one may ever actually leave it—as to the importance of this exploratory model for social, cultural, and political spheres. While this question at large will be formulated throughout the remainder of this paper, one may look to generative software artist and educator Jer Thorp for an inkling. In a talk for TEDxVancouver in late 2011 entitled “The Weight of Data,” Thorp reflects on his path as a software artist, initiated through Apple's 1987 software release HyperCard to his current vocation in the realm of data visualization for *The New York Times*.<sup>18</sup> He discusses the revelation earlier that year that Apple products, including the iPhone and MacBook, had been storing large amounts of location data based on the wireless networks in the area of the device. This lead Thorp and several collaborators to develop OpenPaths, an interface for users to upload their personal “mobility data,” establish relationships with researchers, and build their own visualizations of the data using the OpenPaths API. Thorp shares the experience of uploading his location data, recalling when he first moved to New York, signaled by landing at LaGuardia Airport, to when he met his girlfriend. He recounts the events twice, with a different series of images accompanying the narrative each time. The first visualizes these

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<sup>14</sup> Drucker, “Humanities Approaches to Interface Theory,” 1.

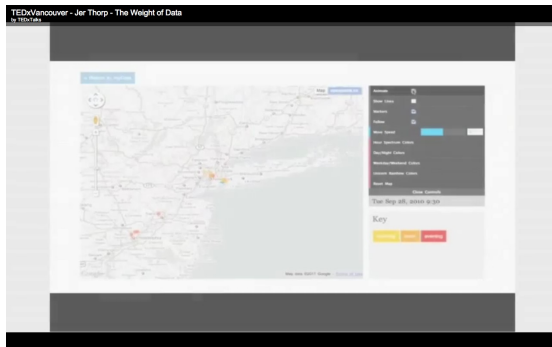
<sup>15</sup> *Ibid.*, 12.

<sup>16</sup> Such a claim could prove in large part an explanation of the rise of Web 2.0 and mobile apps, wherein interfaces are often formulated to correspond to “real world,” and thus supposedly complex, sites or events.

<sup>17</sup> Drucker, “Humanities Approaches to Interface Theory,” 19.

<sup>18</sup> Thorp, “The Weight of Data,” <http://www.creativeapplications.net/news/tedxvancouver-jer-thorp-the-weight-of-data/>

events as a trajectory over the map of North America; the second displays their longitude and latitude, as well as the device's serial number.



He notes the discrepancy of the audience reactions from the first series of images to the next; the line “this is when I met my girlfriend” seemingly loses emotional resonance when said against a backdrop of numbers not immediately intelligible. Thorp calls for data to be placed in a “human context,” that we may be able to understand its place as a documentation of “*our* histories.” However, more than orienting oneself to a personal history, placing data in a human context develops one's “empathy for people in systems,” fostering respect frequently lacking in issues of technology and privacy. Thorp states, “By understanding that these numbers are not just numbers but they're attached, they're tethered to pieces of the real world, they carry weight.” I believe, however, Thorp's claim carries further and perhaps even quite different implications than he suggests. When adjacently displaying screenshots of the data visualizations, the latter consisting of longitude and latitude read-outs proves more visually striking and more aligned with contemporary design trends, calling to mind work as influential and monolithic as the Vietnam Veterans Memorial, while the former carries implications of man's imperial mapping and transversal of the globe. The sheer power of these two interfaces to so affectively yet so differently portray an event speaks to the immense power of design. The weight data carries does not just appear from its contextual visualization, instead data possesses an inherent weight. Only due to pre-established cultural standards of design do we automatically emote over one image rather than another. We reach a discursive space between “diagrammatic imagination” and “consensual conventions.” The task becomes not to place data in a human context but to explore what human can mean. Thus when designers conceptualize an interface as only an overlay or space-between to facilitate the access-and-extraction of data, they fail to understand data as inherently material and “meaningful” in both its collective and singular weight, in its unfathomable potential to bring forms into being. Instead, an interface should be approached *as information* fundamentally entangled with the material we perceive it represents.

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<http://academic.udayton.edu/jackbauer/CsikFlow.pdf>