

Web 2.0 and the Ontology of the Digital

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Abstract

While much valuable scholarship on the digital focuses on particular artifacts or historical processes or subcultures, this essay offers a preliminary treatment of *the digital* in general, proposing that the digital has its own ontology, a way of being, and that this ontology is manifest in the technologies and human relations that define and surround the digital. In particular, the digital places a central emphasis on abstraction, and digital artifacts and culture demonstrate this ontology of abstraction even while remaining concrete. The kinds of social structures grouped under the label *Web 2.0* exemplify the materialized abstraction of the digital, and this essay points out the formal and technical features of the digital that carry the abstract nature of the binary code into the human relations and behaviors of Web 2.0.

Ontology of the Digital

Much of culture now passes through the digital. Even if you aren't looking at a screen, there's a good chance that the text or image or object before you was digital at some point, that it was designed or accounted or customized or purchased via a digital device. Any cultural artifact today bears relations to circuits of money and other media, buffeted by the digital on all sides. Even so-called face-to-face conversation must surely now refer in its rhythms, its contexts, and its content to the digital intercourse that has elected itself the locus of culture for our time. Though this digital stew is thickest in urban areas and in post-industrial nations, the information age also exerts its influence in remote regions and developing countries, where incongruously prevalent cell phones hint at an information infrastructure that likely tracks and controls the local economy, imports and exports, documents and records, and other liminal determinants of identity. Even where digital devices are scarce, daily life now takes shape against a digital background, such that being "off the grid" is a remarkable circumstance, laced with anxiety for those whose normal activity includes a nearly constant connectedness. Not only our artifacts but our bodies, our schedules, our habits of cognition, our ways of being by ourselves and with others are now thoroughly informed by the digital.

The recent rapid spread of the digital as a vehicle of culture should raise all sorts of questions. A frenzy of attention to the digital both in the academy and in culture at large addresses bits and pieces, as reviewers pass judgment on this or that technology, popular media celebrate the technofuture, and theorists chart the historical antecedents and contemporary reception of various digital activities and phenomena. While a few thinkers, including Alexander Galloway, Friedrich Kittler, and Adrian Mackenzie, read digital culture as partly an expression of the technological formalisms that undergird it, many others avoid such formal analysis of digital culture, which flirts uncomfortably with technological determinism. Pushing formalist analysis to an extreme, this paper analyzes the digital from the inside out, reading the possibilities and perils of digital technology from the digital's constituent principles and basic capabilities. A single but significant example, the rise of Web 2.0, provides an opportunity to examine the implications of the ontology of the digital, demonstrating that the same perplexing character that shapes the basic elements of the digital also describes the actual objects and living culture that arise around digital technologies.

The digital - digital arts, culture, media, technology, and just about everything else that bears the label - derives its vast reach and much of its unprecedented ability from its chief technique, abstraction.^[1] And the definitive tool of digital abstraction is the discrete code, typically a binary code, which constitutes a bedrock of digital technologies. To abstract

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is to draw off difference, to set aside the particularities that mark each thing as singular, instead treating a thing as a reproducible arrangement of generalizable properties. Abstraction universalizes the operations of the digital, allowing it to capture and manipulate with the same basic tool any information, images, sounds, words, patterns, and more; whatever has a structure, whatever is information is amenable to digital representation. Abstraction enables the capture as well as the manipulation of this information, as not only the object but also the instructions for analyzing and altering its form are rendered in the digital code of 0s and 1s. It's not just that computers surround us with digital images, texts, videos, and songs. It's also that the production of the works themselves is digital, the means by which we create these pictures, words, and sounds is governed by a code of 0s and 1s.

Abstraction divorces the products and processes of the digital from particularities of time and place and loosens the sticky grasp of the material that ties down objects and events. Track inventory, attend a meeting, check Wikipedia, or design a building from the other side of the world on a moving train. Arrange to dial a phone number three years from now, without having to remember or think about it again. Perform billions of calculations in mere seconds on a transportable machine you can hold in one hand, nearly unhindered by material resistance. The technique of abstraction as realized using the tool of the binary code allows any information to be captured, stored, analyzed, manipulated, and transmitted in almost any medium using a minimum of material resources. Rendered digital, the whole world becomes as light as ether.

I mean to emphasize the centrality of the binary code both as the source of the digital's power and as its defining feature. No serious scholars of the digital deny the essential role of the binary code in digital technologies. But the binary, however basic in practice, is not typically regarded as a primary source of the meaning and value of high technology and the culture that attends it. Even formalist theorists such as Lev Manovich stop short of assigning to the binary an ontological primacy in relation to the digital. Manovich makes much of the *database* (for example) as an organizational structure that characterizes both digital data and contemporary cultural logics, but the database is conceptually far more complex than the simple binary code, and Manovich does not consider the ontological motives for the database, which can be understood readily as a consequence of the underlying binary. Other thinkers present a range of interest in and comfort with formal and technical dimensions of digital technologies, but none wishes to read the culture of the digital from its universal code of 0s and 1s. Alan Liu plays with formalisms of code, exposing the semantic ambiguity of that code, but his focus is on relatively high-level code that carries a substantive meaning already, unlike the bit whose inherent meaning has been evacuated to free it for its role as universal encoder. (Functioning in the binary code, a 0 means nothing except not-1 and vice versa.) N. Katherine Hayles provides insightful historico-cultural analyses of the ongoing encounter between the machinic and human domains, but her admirable aim is to outline broad patterns and historical shifts and she does not direct her attention to the simple binarity of 0 and 1. Mark Hansen concludes from the universality of the binary that the digital is essentially alien: since we humans cannot really read the binary code, it is effectively opaque, and the digital's affect is thus obscure. But this reading forecloses the opportunity to understand the digital in terms of its code, since it treats code as uninterpretable by human cognition. Perhaps the most explicit rejection of the binary as a source of meaning comes from Johanna Drucker, who posits that only phenomenally available digital artifacts are ontologically legitimate, whereas the ideal digital object, identified with the mathematical code "inside" the machine, is a sham, leading to misguided utopian visions of a perfect digital world.

The common element in all digital technologies, the unifying aspect of the cultures, arts, and media that we call *digital*, is the discrete, binary code. Whatever is digital is digital because it relies on this code, because it is made of 0s and 1s or because it manipulates objects made of 0s and 1s, using 0s and 1s. This is not just a de facto commonality among the disparate phenomena known as *digital*. For the binary code grants the digital its royal power, the power of abstraction, and is thus involved at every exercise of digital technology. Products of digital technology, artifacts of digital culture, and events of digital media can all be traced back to an underlying code to which they are in some measure equivalent. The digital admits input and generates output; both of these moments include an irreducible contact with the human world. But between input and output lies a domain of discrete code, reducing everything digital to its rigid logical mechanism. The binary code is a kind of chokepoint; every digital datum and process is captured at some point by a sequence of 0s and 1s. What follows from this seemingly innocuous claim?

Does it matter that the digital at some point is a matter of code? Isn't this just a technical fact, of little concern to the user

of the computer? When we work with digital technologies we work not with 0s and 1s but with ideas, desires, images, words, stories, designs, money, all the many complex and multifaceted things that the digital makes available for interaction. So what if the binary code operates behind the scenes? That isn't where the meaning comes from nor is it what the user attends to. The binary code is like the gears of a watch or maybe the molecules of a pair of scissors: essential to, even constitutive of the object but not equal to the principle of its operation.

My response to this worthy objection is complex and multiple. For I agree that much of the meaning that we generate with the aid of digital tools has little inherent relation to a binary code. An e-mail I send to my state senators asking them to support clean water legislation should not first of all call to mind the binary code that enables e-mail communications. And if the computer does determine some things about how I compose and transmit that e-mail, digital culture happens even where there are no computers. No doubt the latest Hollywood blockbuster made use of digital technology at every stage of planning, production, and dissemination, but we needn't seek meaning in these machines or their codes when discussing the film, which is about aliens or oil barons or the Crusades or something human and layered, not a sequence of 0s and 1s.

Artworks and political events and financial transactions do not reduce to the digital even where they encounter it. But neither is the digital heritage of a work of art or a monetary exchange irrelevant to that artifact or event. The digital has an ontology, a way of being, and products and processes generated through digital technologies bear traces of this way of being. Notwithstanding the toxic aura of technological determinism surrounding this claim, I propose that digital art and media, digital procedures, and even users of digital technologies come to behave like those technologies, to share their ontology. The hallmark of the digital is to render abstraction materially operative, to bring abstraction into the concrete without it ceasing to be abstract. Primarily by incorporating abstraction, the people, objects, and events of digital culture connect to and engage with the digital technologies at the heart of that culture.

As a passing example, consider the burgeoning field of "ebooks" and "ereaders", such as Amazon's Kindle, Barnes & Noble's Nook, or (one use of) Apple's iPad. These devices place a library of books in the palm of your hand, and many ereaders allow nearly instantaneous wireless access to hundreds of thousands of books, magazines, and newspapers, not to mention the staggering amount of text available on the Web. The drone of big numbers, the minimization of geographic or spatial boundaries, and the erosion of genre distinctions already attest to the abstraction that most centrally drives the transition from book to ebook. As opposed to books made of paper, abstract ebooks take up very little space, can be easily and quickly transmitted, and tend to blur their own identities as distinct objects, dissolving into a mass of available text.

Even the banality of page numbering on these devices reflects an ontology influenced more by the bit than by the book. Kindle includes no page numbers for its digitized books, instead substituting its own location reference numbering system. The Amazon system provides a consistent method (on the Kindle) of referring to (and jumping to) a point fixed in relation to the text around it, but it offers no simple means of finding the corresponding location in a bound copy of the same text. In a recent personal conversation, historian Eli Zaretsky proposed that Amazon's decision to eliminate page numbers was surely motivated by profit, by the desire to supplant bound codices with its own system of ebooks, since the lack of page numbers seems deliberately to snub the prior medium of books and the standard mechanism of scholarly reference. This explanation is compelling, but the lack of page numbers also reflects the underlying nature of electronic texts: fashioned out of an elementary sequence of 0s and 1s, electronic texts nominate the elementary sequence of text characters as the significant data that constitute the book, relegating any additional aspects of textuality, such as page numbers, to the secondary realm of contingent features. Though it might seem as though Amazon's location numbers are equally arbitrary, equally unrelated to the semantics of the text, the location numbers have the questionable advantage of being assigned algorithmically. Their contingency is not the inexact and historically accidental contingency of pagination but the automatic and rule-bound contingency of an algorithm. Not only are page numbers abandoned as out of step with the flattened plane of digital textuality, but so are deviant orthographic choices, from colored text to words placed spatially around the page to marginalia to font variation and more. Some of these textual possibilities are partially preserved on Kindle but only by sacrificing some of the manipulability that makes the electronic reading device so flexible and therefore useful. (For example, the Kindle can display PDFs, including graphics, but cannot alter font size, rewrap text, or allow user annotations within a PDF.) At bottom, the presentation of

electronic documents on ereaders reflects a compromise between the competing demands of traditional conventions of reading and the possibilities logically or naturally presented by text as data. Moreover these compromises begin with a contentious decision, necessary to gain entry into the abstract realm of digital textuality, about what actually counts as “the text” and what was only ever accidental or contingent. It is a question of ontology even at the design stage of the product, and the response takes its cues from the technological principles of the digital artifact.

Reacting against naïve idealizations of the digital from the early days of digital theory, many analysts take pains to insist on the messy materiality of digital technologies. In this mold, Matthew Kirschenbaum’s *Mechanisms* positions materiality as the repressed discourse of the digital, showing how the digital interpenetrates its material and demonstrating the significant insights gained by attending to this irreducible materiality. Kirschenbaum’s carefully grounded analyses remind us of the indispensable role of materiality for the digital and forge an important continuity between current studies of digital texts and longstanding practices of bibliography, philology, cultural archeology, and other scholarly approaches to texts and their contexts. However, Kirschenbaum occasionally overstates the implications of this attention to materiality, proposing that it not only supplements but replaces the investigation of digital abstraction. He introduces the “field of computer forensics, [...] a field whose method and practice routinely contradict many of our commonplace assumptions about electronic textuality and new media, notably its supposed ephemerality, fungibility, and homogeneity” [Kirschenbaum 2008, 19]. Kirschenbaum shows decisively that digital artifacts remain in important respects enduring, resistant to change, and heterogeneous, but he does not show that they cease to be also ephemeral, fungible, and homogeneous.

The principal conceptual maneuver in *Mechanisms* is the distinction between forensic and formal materiality. Forensic materiality emphasizes the singularity of every material thing, its unique history that distinguishes it in principle from every other thing in the universe and ties it to a place and a moment. Thus Kirschenbaum corrects the false belief that digital artifacts, being mostly generic, have no significant history, showing that every representation of a bit (on a hard drive or a compact disc, for instance) is unique, and that digital artifacts and events are therefore embedded in the particular histories of the hardware that supports them. The sibling concept of formal materiality aims to bridge the gap between the materiality and the ideality of the digital; it suggests that the organization of digital technologies arises out of a negotiation between formal demands and material constraints. For example, the possibility of storing and retrieving files on a hard disk depends on an accord between the logical organization of a file as a sequence of 0s and 1s and a material organization of data represented as tiny magnetic fields arrayed across the surface of a disk. Various conventions govern any actual system used to store files, and those conventions must respect both the logical nature of files and the physical properties of magnetic storage. That the demands of logic do not always align readily with the affordances of the physical is the problem of formal materiality, and its many responses tell a vital part of the history and culture of digital technology.^[2]

But the inherent tension in the term *formal materiality* signals the unsupportable burden placed on this concept. Using the category of formal materiality, Kirschenbaum hopes to mitigate the import of immaterial abstraction in the digital by harnessing it to matter. The result is productive: both formal and forensic materialities reveal crucial dimensions of digital artifacts and related technologies. These analyses supplement but cannot supplant the role of immateriality in the digital. It is its immateriality, or rather its abstraction-made-material that distinguishes the digital from other media. Only because it isn’t very particular about materials does the digital spread so widely, accommodate in its universal code so many diverse data, infiltrate so many areas of human endeavor. Only because of its thoroughgoing abstraction does the digital allow such easy manipulation of virtual objects, objects which, should they exist in the actual, might be quite resistant to alteration or difficult to access. The digital is born through an intensification of abstraction, and this principle of abstraction empowers the digital precisely by pushing against its material affiliation. Kirschenbaum rightly recognizes that the material remains essential for the effective operation of digital technologies but this is despite the standing objection of the digital, which would wish to do away altogether with materiality. (Witness the pervasive fantasy around the digital of total immersion in a virtual reality.) Materiality is indispensable, it haunts the digital, but the digital’s distinction, its particular way of being, derives from its erosion of materiality, its embrace of the abstract. Every bit may correspond to a unique magnetic inscription or it may deviate to some degree from the ideal voltage value associated (on a particular chip or logic board) with 0 or 1, but these material singularities, however irreducible, do not imbue the bit

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with its primary meaning. On the contrary, only by ignoring these departures from the ideal does the bit come into focus as an unequivocal 0 (or 1), and only this value explains the bit's meaning as it informs the activities of a human using a computer.

It is not necessarily intuitive to suggest that digital objects and digital culture behave like digital bits. Why does the abstraction of the bit carry over into those digital things that are built from bits? A house made of bricks does not, for the most part, behave like a brick. Perhaps it exhibits some of the thermal properties of brick, but it isn't uniform or stackable or rectilinear like a brick. As against this model of material construction, objects constructed in the digital share many characteristics with the binary code they are made of, including most of all the basic ontology of the code. The binary code is not only an underlying technology, propping up the digital as an invisible support, but it lends its character - abstract, ideal, discrete - to all of the processes and products of the digital, such that even icons and documents, even the non-digital issue of digital culture, even human relations forged in the era of social networking and other digital communication tend to behave digitally, abstractly, reductively. Pending the extended example of Web 2.0, below, consider the icon. Something like a digital bit, the icon is precisely defined, down to the pixel, such that a given pixel on the monitor is either part of the icon or not; it is internally homogeneous, such that clicking anywhere within it generally has the same effect; it operates symbolically in that its occasional resemblance to a recognizable object (like a manila folder or a shiny compact disc) offers little clue as to its actual use, which must be learned as part of the conventions of user interaction. Unlike a material object, icons are exactly equal to themselves, defined by an abstract code that governs their appearance and behavior.

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Why are the two cases different: the brick house does not act like a brick whereas the digital icon or document tends to behave like a bit? Ontologically this situation results from the special relationship between abstraction and the binary code. That code is not only the tool of abstraction, the building block that allows abstract structures to take shape, but is also the exemplar of abstraction, its apotheosis. To encode something in the binary is to maximize its abstraction, to replace as much as possible its qualities, its form, with a simple registration of difference, every difference represented by the difference between the two values of a bit. Conversely every abstraction involves a similar replacement, the substitution of a generic and simple difference for a singular, qualitative one. And it is the construction based on abstraction that yields an ontology typical of a binary, discrete code.

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In other words, if complex and multilayered artifacts of computing behave much like the discrete code that courses microscopically through the wires and chips that constitute the computer, this is because both the visible, clickable objects of the user interface and the quasi-material bits inside the machine are, first and foremost, abstractions. Abstraction supplants an irreducible quality with an idealization, a generic form. As idealized, the properties of a digital object act like bits: discrete, self-identical, and defined according to a limited conventional vocabulary within an expressed field of discrete differences. Abstraction draws away difference, both the specific difference that makes a given (non-digital) object unique and distinguishes it from others of the same type, and the difference between the fuzzy, generative actual quality of a material object or process and its idealized representation as a structure without quality.

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The binary is thus only the last stop - or the first step - in a process of abstraction. The bit represents a certain maximum of abstraction, the quantum of information. It is also the smallest abstraction, the elementary particle of abstraction. The digital object is not only ultimately constructed from bits as a hardbound book is from molecules; its principle of abstraction or distinction relies immediately and fundamentally on the bit. To abstract in the digital is to render something using bits, to present the figure of difference in the place of a productive or generative difference.

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Readers might suspect a circularity underlying this argument: in this account of its operation, the digital both calls forth the binary code as the essential tool of its ultimate abstraction and it also derives its power of abstraction from this binary code. Which comes first, the digital chicken or the binary egg? The answer, as ever, is *both*. The binary is abstract but is also a tool of abstraction. In itself this structure suggests the recursion so frequently associated with digital methods, but it is neither inherently circular nor question-begging. One might say much the same thing about words: as individuated elements of a language, words are themselves abstractions, but as "applied" to the world, they make other things abstract by including them into the near weightlessness of language. Like bits, words are abstractions that make abstract.

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In any case, the digital does not produce the binary but co-originates with it, and both rely most fundamentally on the (ontologically) prior operation of discretization. That is, the digital (and the binary code) depend on a way of conceptualizing the world and the objects in it as discrete, isolable entities, with independently determined, malleable properties. Digital technologies do not first create such a world nor do they produce the conditions of such a conceptualization, but they do reinforce this contrived perspective. This essay does not explore in any detail the genealogy of the digital, except to suggest that its origins lie in discreteness, which itself would require a further ontogenealogical interrogation.

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Finally, still in regard to the potential circularity of this analysis, note that digital abstraction is not simply a restatement of the abstraction of the binary. The ontology of the digital includes multiple levels of abstraction between the binary code and the phenomenal world, layered planes of abstraction, in which objects and ideas are abstracted more and less, now closer to the actual, now closer to the binary. A digital photograph of Roland Barthes' mother, presented on a computer monitor, might be viewed as primarily concrete, with only a few symptoms of its abstract provenance, such as its appearance within a resizable window or its ability to be dismissed and then recalled at will. This same digital photograph, now regarded as a file on a hard disk, seems thoroughly abstract, a set of numbers that represent colors using a conceptually simple but arithmetically demanding code; further, as this file is made of numbers, it can be readily re-presented as a list of 0s and 1s, as can any digital artifact. Each of these layers involves significant abstraction, but only the most technically basic level reduces its objects to the furthest abstraction of the binary code.

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Even if digital texts and images and other interact-able digital objects manifest the ontology of the binary code, it isn't clear how this reaches all the way to the human being who interacts with these objects. I can fry eggs without starting to behave like an egg, and I can drive a car without myself resembling a motor vehicle. So how does the digital shape the user's body, cognition, habits, self-perception, self-presentation, and other experiential and phenomenal dimensions of the personal and social context of computing?

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Of course the behaviors, the habits of thought and motion, the loops of perception and action that grow out of and around digital technologies are too varied and complex to describe exhaustively. But the ruthless logic of the digital limits the available possibilities for action and determines the consequent results. The many entities and activities that one engages at the computer are all governed by the same logic, all connected by the same kinds of relationships, all described using the same vocabulary, which is essentially the same vocabulary used to manipulate the binary code. Every action you take at the computer remains a logical abstraction, the assignment of a set of precise values to a data structure, or the choice of a subset from amongst an available set of possible choices. Even at the material level of input devices, the mouse and keyboard ensure that any input to the computer must be a matter of choosing to press one out of about a hundred buttons or moving the mouse to point to one spot on the screen. No other expression can enter the computer, mingle in its digital world, besides one of these prescribed choices.

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The signature of the digital is not so much a matter of which choices get made, as the digital is prepared to admit any domain in which choice takes place. Thus it does not color its products in a particular shade, does not urge the use of one kind of shape or form over another. (Indeed, part of its appeal is an implicit agnosticism, an indifference with regard to the particularities of choice. By refusing to favor one choice over another the digital presents itself as an unusually neutral and free surface of inscription.) But it does shape the way that colors are chosen, the kinds of choices that are available, and most of all, the very fact of choice as the basic maneuver of aesthetics, ethics, and cultural production more generally. Confronted with a digital tool, the artist need never ask "What shall I do now?", for she is immediately presented instead with the choice: "Which tool shall I use next?". The digital may offer to the user a vast terrain of choice, but as determined by the abstraction that is the universal tool of the digital, there is no choice but choice.

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Web 2.0

The hegemony of choice begins to suggest the conditions under which Web 2.0 rises to prominence. Confining interaction to choice, the digital not only eliminates avenues of resistance by determining the universal form of expression, but also renders expression generally calculable, comparable.

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This Web version upgrade depends primarily on the convergence or conflation of the two ends of the traditional medial

schema: audience assumes the role of author. (With its own history of multiple origins, the portmanteau word “produser”, from “producer” + “user”, effectively names the new subject position of Web 2.0. See [Bruns 2008].) But transforming readers into authors is not as simple as a note on a Website inviting visitor contributions. Technological and cultural machines work together to enable and even coerce participation. I am not proposing a strict causal priority; the ontology of the digital does not ineluctably lead to blogrolls or epinions.com. But the ontological basis of the digital does nurture certain phylogenetic lines, and cultural change takes its cues not only from technological affordances and limitations but also from ideologies and other fantasies surrounding technologies. Thus the digital avails a range of possibilities but promotes a subset of those possibilities that accord especially closely with its ideologically tinged cultural valence.

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The ontological characteristic of the digital most salient to Web 2.0 is the uniformity of the code. A computer can operate only on objects and processes expressed as a sequence of 0s and 1s. The process of abstraction that prepares an object for digital treatment might be conceived as incremental, but the binary code, being both the most abstract and also the chief tool of abstraction, ultimately captures everything about the object, or at least, everything that the digital can manipulate. We might equally note that the digital is hermetic: no logical calculation can ever operate on anything except 0s and 1s, and no such calculation can ever result in anything except 0s and 1s.

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A consequence of the hermeticism or univocalism of the digital code already points in the direction of Web 2.0: unable to gesture beyond itself, confined to a vocabulary of 0s and 1s, the digital challenges hard distinctions. An individual bit has no singularity, no identity; it might as well be any bit. ^[3] With every digital thing expressed according to a simple code of 0s and 1s, differences among objects are minimized in the formality of number. Every digital difference is a simple subtraction problem. This uniform or universal binary code helps to ensure that all forms of expression are equally welcome on a given Webpage, that a portal can present aggregated information collected from Websites that haven't been created yet. The simple uniformity of the code effectively means that the digital can operate on the form of digital data without assuming anything about content, and this indifference to content liberates the Web to allow participation by anyone.

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Precisely because it levels off or diminishes the resistance of differences of type, the uniformity of the binary code also enables some of the most basic powers of the digital. The universality of the code underlies the strength of algorithmic manipulation in the digital, for a simple uniform code defines the acceptable inputs, the cases that the algorithm will process. Mechanized algorithmic processing is effective only when ambiguity has been removed, when all possible conditions have already been anticipated, and the binary code makes possible the denumeration and treatment of every potential input.

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But this is misleading, for most algorithms cannot process an input of an arbitrary sequence of 0s and 1s. The input string of bits must be properly organized, the right number of bits with values that conform to the anticipations of the algorithm. Ontologically, the distinction between allowed and disallowed input values is weak. It is a distinction maintained by convention and enforced by mechanized rules that operate on syntax.

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Governed by convention, rules of syntax guard the gates of the digital algorithm, determining what counts as allowable input. This arrangement has significant consequence in practice, for the priority of syntax corresponds to the digital's indifference to content. As long as the input to a word processor consists of characters from the Unicode dictionary, the software will accept and display them, with an utter lack of regard for their sense or nonsense. A videogame will allow a player to jump to her death off of a cliff thousands of times in a row as long as the input can be interpreted as directional movement. The digital exercises no judgment over content, performing a noble indifference and pure neutrality. As long as the user expresses herself properly, she may say whatever she likes. This situation is entirely unremarkable from a technical or historical perspective; inanimate objects such as machines generally do not exercise discretion over their uses, and neither pen nor paper judges the semantic content of what gets written. What distinguishes digital tools is that unlike other machines they *can* manipulate syntax algorithmically and so encourage a reliance on this technique to the point that syntax comes to subsume semantics. We value what our digital tools are able to calculate. The generic measure of a Web page is its number of “hits,” and content is made even more irrelevant by the me-too phenomenon: increasingly, the number of views a Web page receives is driven by the number of views it has already received.

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The elevation of syntax over semantics, growing out of the ontology of leveling abstraction, colors much of the culture of Web 2.0. Syntactical gateways indifferent to content stand behind the famous flattening of the Web. When connections between two pages depend only on the proper formatting of the reference and ignore the contents of the pages, then hierarchy tends to disappear. The humble link, which has beckoned with its underlined text and blue (or red, if already visited) color since at least the public introduction of the Mosaic browser in 1993, already announces the priority of syntax over substance. As the characteristic gesture of the Web, the link demonstrates the author's deference; Web pages most typically say, "Hey, look over there!" rather than "Check out what I wrote." Alex Galloway's first book, *Protocol*, thoroughly documents the dominance and centrality of syntax, which is after all the primary object of protocological regulation.

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The recycling of collage technique in the new figure of the mashup emerges as more than an accidental aesthetic preference. The claim of the mashup is that original content takes a back seat to the form or context of presentation. Creators need not generate new material when rearrangements of existing sounds, images, and ideas can stay in lockstep with the times. This is not to say that mashups eliminate creativity. On the contrary, the best mashups show off highly creative techniques and often include original material. The point is rather that as an expressive medium, the mashup emphasizes recombination over the production of the new, perpetuating a broader trend in Web 2.0 to treat form rather than content as the predominant site of creative intervention.

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Plenty of corroborating cultural practices help to tie the mashup to its digital context. The universal code ensures ready access and seamless incorporation of disparate elements within a single work, culminating in the mashup but encouraging also a culture of quotation, remake, parody, and commentary. At the same time, the universality of the code typically ignores the distinctions that accompany these different modes of appropriative discourse, indifferently intermixing original materials and copied ones, allowing a range of remaking from exact recreation to cheap knock-off, and blurring the lines between parody, tribute, evocation, and theft. Buoyed by tools that extract video, audio, or other specific information from around the Web, producers approach their art as a series of choices, selecting items from a library of available elements and selecting relations among those items. Universal code works side by side with the principle of choice to engender a practice of paint-by-numbers.

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Again note the shift in the role of the author. In each case, from bloggers quoting bloggers to backyard memes, the author diverts attention and draws significance from the work of others. And in each case, the author is rewarded with anonymity. Occasionally a meme or a video remake or a set of tweets or an aggregation site thrusts its creator into the spotlight. Even then, the name of the author is likely hidden behind an alias that declares the author's genericness, her mundanity rather than her singularity: Star Wars Kid or even LonelyGirl15.

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Most often the author is just anonymous, another notorious aspect of Web culture. Who created the latest meme videos? Who posted that scathing riposte on the political blog? But anonymity in digital culture means more than a masking of "true" identity. As suggested by the Web's ubiquitous aliases, self-penned or nominated by others, anonymity constitutes a subject position unto itself. Writing on the Web, mashing together the words of others, listing references to pages whose contents will change even while the reference remains, this anonymous authorship claims to represent not the author but her crowd. To write an Amazon review as SoldierOfAzeroth or BiographyLover is to speak with the voice of a collective. The project itself, writing reviews from the perspective of a non-expert consumer, depends on a suspension of originality by the author, whose review will be helpful only to the extent that its claims are generalizable, applicable for other readers.

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Jaron Lanier's recent bestseller, *You Are Not a Gadget*, takes aim at this entire swath of culture, appealing to a humanist preference for individual creativity and a suspicion of the general utility of crowd thinking. Collectives might be good at certain kinds of tasks, he argues, like general knowledge queries or distributed data gathering, but books and songs and the most inspired ideas tend to come out better when guided by a strong personal vision. I don't share Lanier's humanist sensibilities, but I do echo his assessment of the magnitude of this shift in the conditions of creativity. Lanier expressly avoids placing blame on the technology, saving his invective for the culture that has, in his view, misused it. This leaves him unable to diagnose the core of the problem, and he spends his analysis documenting and lamenting the symptoms and pining for a return of the (human) subject. As I have been arguing, a more direct attention

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to the technology itself offers a greater explanatory power.

Anonymity on Web 2.0 is not a struck-through subjectivity but a generic or populist subject position, one who speaks as representative of the collective. Anonymity is also immediately recognizable as an artifact of the uniformity and leveling of the digital's ontology: lacking tools to enforce strong distinctions within a sea of data, the digital blurs lines that might otherwise separate authors, unbinds creativity from the particular time and place that would tie it to a particular embodied subject, and ensures a mediated relationship among all subjects, leaving a place for the intervention of an alias, a slippage between the subject and her digital identity.

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In fact, one need make little effort to hide one's self on the Web, as anonymity lays claim to the subject. Everyday browsing, reading, playing, shopping, and other activities are logged and accumulated in a data store. Social networks and other hardware/software systems record (and sometimes broadcast) the whereabouts of users, proposing that the availability of the data will further social interaction. In aggregate, these data constitute a new currency, as though wisdom or at least profitable knowledge will accrue to those who leverage them properly. Each participant contributes value simply by going about her ordinary activities.

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Participation itself already has value, reinforcing the deprecation of content. It doesn't matter what you do on the Web; just being a member of digital culture is already enough to make your habits legitimate. Because Web 2.0 serves as a surface of inscription for the activities of culture, all participation is effectively recorded there. The Web, whose original '90s incarnation was closest to a vast reference work, static and available, has now upended its priorities. The typical page of Web 2.0 does not supply content but only offers a portal, a context for which the collective will continuously supply the content. (And the supplied content is valuable precisely as a window onto culture, a ticker that indicates who we are.) Indifference to content helps to guarantee the auto-satisfaction of participation, since all contributions are equally welcome. Worries about evaluation can be safely submitted to the statistically balanced and reasonable wisdom of the crowd. Disruptive or radical contributions will (eventually) be roundly ignored and will soon fade into the background, as tools to aggregate the will of the collective promote the most worthy contributions. The Web thereby functions as a market of cultural capital, a market where capitalism can finally dissolve the distinction between money and product. Information serves as a universal solvent, such that exchange no longer requires an intermediary; the mediacy of the Web enables the immediate equation of information and value. Among the many consequences of this realignment of the market is the further and decisive erosion of the lines between public and private or between work and leisure. The Web makes no such distinctions so that now neither can we.

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Thus, one cannot fail to find oneself in Web 2.0. Whatever you do is recorded there and forms the outlines of a community, a co-signature shared by all the others like you. Perhaps this exceeds even the concept of the simulacrum: like the simulacrum, Web 2.0 replaces content with an image of content or a gesture of pointing to indefinitely deferred content. (We might think of a chain of hyperlinks that chases its own tail.) But Jean Baudrillard's vision hesitates when it approaches the place of the subject, who is trapped in the simulacral world but who might still recognize the shadow cast by the bars of her cage. On Web 2.0, alienation has become impossible, since each subject discovers herself there, her simpatico guaranteed by the fact of the encounter, which inscribes itself on the Web.

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The danger of this claim, like the danger lurking in most ideologies, derives from the hegemonic aspirations of the Web. The fantasy that drives the Web is the desire to erase the clumsy distinctions that separate material existence from the free-wheeling, effortless transport of Web culture. The singularity, it is said, will finally absolve individuals of responsibility even while turning their every action into a goldmine of data. But if the Web is equal to culture, not just its mirror but its stage, then the impossibility of alienation becomes absolute. Reducing material resistance calls upon the powers of abstraction that found digitality. Reducing political resistance requires the further step of heading off alienation by a structure that makes each individual already the unwitting author of culture at large.

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Reflections on the ontology of the digital lead to the question of how to intervene in a culture that neutralizes the resistance of intervention by welcoming it without prejudice. My tentative response is even more elliptical than this brief discussion of Web 2.0: search for the edge, the leading or trailing edge of the Web. Some optimists promise that Web 3.0 will once again recast the epistemological foundations of internet culture by placing the computer or the network in

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the position vacated by the creative individual. Intelligent machines will process content and not just syntax, reminding users of the value of substance and creativity. Whether this is an enchanting dream or a deepening nightmare will depend on your level of cynicism and your relationship to technology.

Notes

[1] This perspective thus contrasts with other pretenders to centrality in the digital, such as the claim that the digital is about simulation or about the rise of the database or about communication.

[2] Kirschenbaum returns to this particular example a few different times. It seems that the extra, unregulated space between the logical end of a file and the physical end of the disk space on which the file is stored can contain all kinds of interesting, leftover data.

[3] As noted above, Kirschenbaum's analysis locates a singularity for each bit, but this singularity of a bit's material instantiation does not generally contribute much to the circuits of meaning in which that bit is implicated. On the contrary, a given bit functions digitally only by ignoring or rejecting its material departure from the ideal form of a bit.

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