Knowledge Exchange in the Digital Era

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Introduction

Digital computing has fundamentally changed the way that our society creates, digests, and exchanges knowledge. Although these changes increase access to information, enable global discourse, and connect minds on opposite sides of the world, they also have troubling power and privacy implications. These implications are not widely discussed in popular literature. However, some scholars and activists have long been aware of the dangers of knowledge exchange in the digital age. In his 1979 work "The Postmodern Condition: A Report on Knowledge" (specifically chapter one: "The Field: Knowledge in Computerized Societies"), the French philosopher Jean-François Lyotard predicted a shift in the status of knowledge. He believed that the advent of computers would cause knowledge to become commoditized, a unit of exchange rather than something with inherent value. Furthermore, he detailed the problematic political and economic consequences of this shift. As we will see, many of his predictions have already come to pass.

More recently, software developer and privacy activist Richard Stallman has articulated many similar concerns. Although Stallman primarily talks and writes about software, the concerns of his philosophy closely parallel those of Lyotard's book. Stallman believes that the idea that software can have an owner leads to invasive privacy breaches and a growing power imbalance in which business interests trump those of the greater good of society. Stallman advocates for a simple but powerful solution to this problem: software should not have owners. He offers a compelling case for "free software" (Stallman explains this concept with the phrase, "free as in freedom, not free as in beer"), and in his many essays and talks he demonstrates why free software solves the privacy and power concerns he sees in the modern world.

In this paper, I endeavor to show how Stallman's "free software" philosophy can be used to address Lyotard's concerns about knowledge in the digital era. I begin with an analysis of Lyotard's concerns for the changing state of knowledge, tracing his reasoning from its foundations to its consequences. Next, I perform a similar analysis of Stallman's problem, and explain how free software solves it. I show that Stallman's conception of software plays the same role in his work as does knowledge in Lyotard's. This sets the stage for the body of the paper, in which I extend Stallman's reasoning about software to the field of knowledge in general. I show that, when generalized, Stallman's "free software" philosophy offers hope that Lyotard's concerns could be mitigated. I conclude with an exploration of the implications of "free knowledge".

Lyotard's Prediction

In order to understand Lyotard's predictions about the changing status of knowledge, we must first investigate his conception of knowledge. He begins by narrowing his topic of discussion to scientific knowledge only; this allows him to get specific about how and why knowledge is changing. Having settled on a topic, Lyotard gives a preliminary definition of knowledge: "Scientific knowledge is a kind of discourse" (Lyotard 299). For Lyotard, then, knowledge is not simply a unit, something that one has or does not have; instead, knowledge is a conversation, a shifting shared entity that changes over time as point leads to counterpoint. Lyotard contends that - at the time of writing - "for the last forty years the 'leading' sciences and technologies have had to do with language" (299). Language, in this context, is taken very generally: Lyotard cites not only sciences of linguistics, communication, and translations, but also algebra, data, and computer programming. Language sciences, in other words, are those that deal with manipulating symbols of meaning. This shift towards language sciences is the first sign of the change in the status of knowledge, and lead to the change's symptoms: first, a tendency in other fields of research to draw on language sciences; second, and crucially, an increased use of "information processing machines" (300) to circulate knowledge on a broader scale than was previously possible. Lyotard supposes that this latter change will have "as much of an effect on the circulation of learning as did advancements in human circulation (transportation systems), and later, in the circulation of sounds and visual images (the media)" (300). In this, as we will see, Lyotard has proven to be prescient.

Having understood the type of knowledge that Lyotard writes about, as well as a broad overview of the change in the status of this knowledge that will come about, we can investigate the specific concerns that Lyotard raises about this transition. He writes, "We may thus expect a thorough exteriorisation of knowledge of knowledge with respect to the 'knower' " (300). What does this mean? Lyotard draws an analogy to industry: "The relationships of the suppliers and users of knowledge to the knowledge they supply and use is now tending [. . .] to assume the form already taken by the relationship of commodity producers and consumers to the commodities they produce and consume - that is, the form of value" (300). In the face of new language sciences, knowledge ceases to be a conversation. Instead, it becomes a commodity. Why does this come about? In short, because of computers. Computers understand only data, so all knowledge that passes through a computer must be in the form of data. Lyotard predicts that "anything in the constituted body of knowledge that is not translatable [to data] will be abandoned and that the direction of new research will be dictated by the possibility of its eventual results being translatable into computer language" (300). This necessity means that knowledge must become discrete instead of continuous. One can speak of this piece of knowledge or that piece of knowledge, and each piece has physical limits defined by its file size or data type. Knowledge becomes an object - one that, like all objects, can be

owned, bought, and sold.

Lyotard explains that the commoditization of knowledge will have broad societal, political, and economic consequences. First, as a commodity, knowledge is now a thing that can be produced and exported by a nation-state; indeed, Lyotard writes that "knowledge has become the principal force of production over the last few decades; [...] In the postindustrial and postmodern age, science will maintain and no doubt strengthen its preeminence in the arsenal of productive capacities of the nation-states" (300). This shift has a noticeable effect on a nation's workforce. It creates an increasingly important and lucrative "white-collar" job market. Knowledge workers make more money than laborers, and this in turn bolsters the nation's economy, creating a positive feedback loop in which a better economy means more tech companies, and more tech companies means more knowledge workers, which leads to an even better economy. However, in order to kick off this process there need to be knowledge workers and tech companies already working in that nation; this means that developing nations without such resources get left further and further behind.

Second, Lyotard points out that commoditized knowledge becomes a scarce resource over which nations and businesses must compete. He writes, "Knowledge in the form of an informational commodity indispensable to productive power is already, and will continue to be, a major [...] stake in the worldwide competition for power" (301). In other words, knowledge resources both enable and are themselves a force of production, and therefore a source of power. Nation-states will need to develop new industrial, economic, and military policies to succeed in this new world.

Third, Lyotard predicts that knowledge's new status will upset the power balance between the public sector and the private sector. Traditionally, the state controlled the "production and distribution of learning" (301). When talking about learning, Lyotard means more than simply going to a university or reading a book; he means control over the transmission of knowledge, from the individual level all the way up to determining the *ethos* of a generation. Before the commoditization of knowledge, the state enjoyed regulatory power over the majority of knowledge discourse. However, as knowledge becomes a product, control over the contents of that product moves to the product's owner - usually, a private business entity. In particular, Lyotard is concerned about the rise of multi-national corporations - businesses so large and so distributed they do not fall under the jurisdiction of any one nation-state. He gives a pertinent example:

> Suppose, for example, that a firm such as IBM is authorised to occupy a belt in the earth's orbital field and launch communications satellites or satellites housing data banks. Who will have access to them? Who will determine which channels or data are forbidden? The State? Or will the State simply be one user among others? New legal issues will be raised, and with them the question: 'who will know?' (301)

Lyotard demonstrates the full frightening implication of knowledge's new status: the entity that controls the channels of knowledge controls the knowledge itself. That entity therefore has power over everyone who wants or needs that knowledge. The questions that Lyotard asks about the communications satellites concern every vehicle of knowledge: questions of access control, censorship, privacy. Although Lyotard wrote in 1979, these questions have become increasingly relevant. Many of Lyotard's predictions about the status of knowledge and its consequences have come to pass. Richard Stallman, in his many writings and talks, has taken up Lyotard's banner and continues to raise concerns about the breadth and scope of the power of those who control the knowledge. Furthermore, as we will see, Stallman offers hope that that power could be redistributed back to those to whom it rightfully belongs: the people themselves.