Standards for Everyone: Mobilizing Interest by Expanding the Agenda
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Our Project
Rationale

The lack of interest in standards education has always perplexed me. Although my introduction to the subject of standards and standard setting was somewhat unforeseen (the request from Congress to do an OTA study), once I became acquainted with the subject, I was totally fascinated by it. There were so many questions to explore: What was the source of contention in the standards setting arena; what accounted for different national approaches to standard setting; how were standards related to the network economy; what effects might globalization have on the standards setting system; and how would newcomers be incorporated within it, to name but a few?

Hearing about the lack of university courses and course materials relating to standards and standards setting, I hoped to bring some of my insights and enthusiasm to bear on the problem. It seemed to me that there were a number of aspects to it. For one, many students are unaware of standards; that is to say, they hardly know what they are and why they matter. Likewise, because standards are something tangential to existing university disciplines, faculty members are generally uninterested and/or unable to dedicate time and effort to incorporate a standards component into their courses. In turn, university administrators, given their limited resources, see no need to prioritize standards as a special area of academic concern.

My experience as the former director and associate professor in the Communication Culture and Technology Program at Georgetown University gave me some insights as to how one might overcome such reluctance. The CCT Program, I should mention, is uniquely interdisciplinary (https://cct.georgetown.edu/program), so a course on standards could be broadly conceived and have wide-ranging appeal. Moreover, standards issues are directly related to many CCT courses; they only need to be pointed out. Consider, for example, teaching the following courses without some reference to standards and standard setting!

- Global Standards: What’s at Stake
- The Network Economy
- Robotics and Society
- Infrastructure Studies
- Expressive Computation
- Privacy and Security
- Intellectual Property
- Networks and International Development
- Cyber-learning: Theory and Practice
- Networks and the Creative Process
- Cultural Hybridity: Mixing Media
- ICT Law and Policy
- Sustainability: Foundations, Technology and Design
- Product Development in the Digital Age

Georgetown University
Fortunately, my growing interest in standard setting education coincided with the National Institute of Standards and Technology’s effort to foster it. To encourage the development of standards curricula, NIST initiated a new grant program DLP 12-1015-NOO. I based my application for the NIST grant on my belief that, if an educational standards curriculum could benefit the CCT Program, then it might benefit other university courses as well. The obstacle to generating such course materials appeared to be one of creating a critical mass of users, as well as developing a critical supply of content. Fortunately, in a digital environment, such obstacles might be more easily overcome. For example, in an on-line environment, demand can be agglomerated not only across departments but also across universities. Likewise, the supply problem can be addressed by presenting course materials in short modules, so that the size of the effort would be greatly reduced, and faculty members could mix and match the modules to tailor course materials to meet their own specific needs.

This was the rationale behind our NIST application, Standards for Everyone: A Modular Curriculum. Our specific aim was to develop prototypes of standards modules that could generate a broader interest in standards, while serving as on-line materials for a variety of courses. As described below, in the process of implementing the project, we found it necessary to adapt our ideas and make some changes in the face of unanticipated obstacles.

Implementation of Our Project

A first step in carrying out our project was to decide which modules we should develop first. To get some feedback, we interviewed a number of faculty members to find out what kinds of materials might be most useful to them. Their reaction was telling. With few exceptions, standards and standardization issues were basically new to them, so as it turned out it was we, rather than they, who had to make the connections. Based on this experience, we determined that the first modules to be developed should be those that defined standards, identified their importance, and laid out the institutional framework for standard setting.

Not surprisingly, the first module we developed was entitled: Why Study Standards? Its aim was to illustrate the ubiquity of standards and identify the stakes involved in their development. Conceiving standards broadly, as the building blocks of society, this module provides a number of illustrations showing how we ignore standards at our peril.

The second module, The Standards Universe, provides a framework for studying standards issues; it defines standards, and lays out the standards universe and a rationale for differentiating standards for the purpose of analysis. Based on our idea that standards are ubiquitous, and essential to the proper functioning of most everything, we chose a very abstract definition. Our hope was that with a general abstract definition, we, together with others interested in specific standards or standards related issues, might subsequently fill in additional modules working their way of up the ‘ladder of abstraction.’

According to our definition, standards are interfaces that govern all interactions, be they individuals, machines, words, or elements of the natural world. These interfaces might govern the mode of interactions; define the conditions under which interactions can take place; and/or signify the appropriateness of an interaction. This abstract definition allowed us to view standards not only from an interdisciplinary perspective, but also from a comparative perspective, comparing and contrasting standards processes across a variety of diverse settings. (For an example of the kind of ‘standard’ that is vastly different from that normally envisioned, see the script for the module Standards & Identity: Who are You? attached to this article.)

The value of such comparisons should not be underestimated: As physicist and science writer Steven Johnson has pointed out:

> Traveling across . . . different environments and scales is not intellectual tourism. Science long ago realized that we can understand something better by studying its behavior in different contexts.

To differentiate standards according to their specific purposes and according to how they are established, the module identifies three different kinds of standards—control standards, product standards, and platform standards—as well as three different types of standards setting mechanisms—a de facto process, a regulatory process, and a voluntary consensus process. When matched together, they form a three by three matrix that constitutes what I characterize as the “standards universe” (see Figure 1).

The module Standards: A Comparative Perspective contextualizes standards and standard setting processes within their sociocultural environments. It compares and contrast the diverse approaches to standard setting both at the national and international levels. This module not only characterizes diverse standards organizations, and the means by which they arrive at standards, it also identifies the challenges of reconciling differing approaches in an increasingly networked global environment.

Turning to specific classes of standards, I drew upon examples that not only were diverse, but also not typically addressed by
standards experts nor associated with the subject of standards. The aim was to generate a greater fascination with standards, and a desire to learn more about them.

Our module Standards: The Building Blocks of Life is most suited to this purpose. This module is intended not only to be of general interest, but also to spark inquiries into standards in such disciplines as biology, physics, and chemistry. In it, we examine the role that standards play in the make-up of life. Thus, we look at how the molecules in cells carry out their functions via a rule-based standardized order, functioning in effect as “molecular machines”.

As well, the model describes how creatures such as slime molds and ants use standardized signals to respond to their environments in predetermined and predictable ways. It shows, moreover, how interactions among diverse species exhibit a hidden order based on emergent, rule-based, self-reinforcing behavior.

Many standards inquiries, which focus on the realm of business, are concerned with micro level issues, such as how standards address a specific economic problem, or how they are used strategically to gain a competitive advantage. In contrast, to illustrate the importance of standards to the economy as a whole, our module Standards: How the West Was Won, traces the movement to the US west, and document how standards, often ad hoc in nature and negotiated en route, became the infrastructure, or platform, upon which, and according to which, travelers journeyed; battles were fought and won; trade was established; and a culture was born. The module illustrates how, as standards paved the way west, the new activities that were thereby made possible generated an even greater need for standards.

Our module Standards: The Coin of the Realm highlights the role that social actors play in developing standards as well as the role that standards play in integrating the social order. This module is designed to expand our thinking beyond the technoeconomic perspective of standards. In particular, it counters the generally accepted neoclassic economic view that coins first evolved spontaneously in the market as a media of exchange. Building on the recent work of archaeologists and historians, it details how political authorities established the first widely used coins to serve non-economic purposes, such as blood and bride money. Only later when local politics had guaranteed that specific coins were redeemable at a standardized value did coinage become a means of exchange and an impetus to expanded trade.

While time and resources limited the extent to which I could pursue this project further (and in particular put our modules on line), the project experience was extremely enlightening, inspiring me to design and teach a standards course, as well as continue writing modules when time permitted. As well, I believe this approach to studying standards has enlivened the dialogue around standards education. As one standards scholar mentioned to me, “if your standards focus is too abstract, you will open a can of worms.” But that is exactly what I had wanted to do, and I am deeply grateful to NIST for having provided me an opportunity to do so.

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2 James Rosenau, “Thinking Theory Thoroughly,” (www.esu.edu/~eliasson/…/Thinking%20Theory%20Thoroughly.pdf)

Standards & Identity: Who Are You?

I recall the time several years ago, when I was making a presentation to a conference in Japan on standard setting. It was my first trip to Japan, and I didn’t quite know what to expect. To screw up my courage and buffer my morale, I donned a brand new outfit, decorated with feminine frills accented by a stylish pair of pumps. The speech went exceptionally well, and I returned home brimming with pride. Not long thereafter, I received some nice photos of the event. What a surprise! Despite my efforts to portray a certain image of myself, the photos of me were labeled MR. GARCIA. Apparently, I had little control over my identity; how I was defined, it turned out, had little to do with my appearance and everything to do with the role that I played as a ‘standards expert’—a role clearly associated in Japan with the masculine sex.

I had not remembered this experience until this morning when reading The New York Times. From a piece written by Didi Kirsten Tatlow, entitled In China, a Respected Ms. May Be Labeled Mr., I learned that in China today, female opinion leaders and scholars are referred to in masculine terms. In fact, such labels are considered a sign of great respect. As described by David Moser, a Chinese language specialist, “Sometimes a woman just has to be one of the guys” (as quoted by Tatlow, 2013). It seems that in Japan I had met the standard for ‘standards expert,’ but had failed to live up to the standard for women.

Thinking along these lines, I am reminded of Alice’s encounter with the Caterpillar during her adventures in Wonderland. You might recall the instance as well.
The Caterpillar and Alice looked at each other for some time in silence: at last the Caterpillar took the hookah out of its mouth, and addressed her in a languid, sleepy voice.

‘Who are YOU?’ said the Caterpillar. ‘This was not an encouraging opening for a conversation. Alice replied, rather shyly, ‘I hardly know, sir, just at present—at least I know who I was when I got up this morning, but I think I must have been changed several times since then.’”

‘What do you mean by that?’ Said the Caterpillar sternly. ‘Explain yourself!’

‘I can’t explain MYSELF,’ I’m afraid, sir,’ said Alice, ‘because I am not myself, you see.’

‘I don’t see, said the Caterpillar. ‘I am afraid I can’t put it more clearly,’ Alice replied very politely, ‘for I can’t understand myself to begin with; and being so many different sizes in a day is very confusing.’ (Lewis Carroll, 2009).

Alice’s problem—believe it or not—was one of standards. In that strange, wacky Wonderland, Alice lacked a common standard against which to de

standards. In that strange, wacky Wonderland, Alice lacked a common standard against which to determine the identity of a thing, as for example in the case of a product description, it is somewhat more difficult—especially if we are technologists—to think about the role standards play in identifying people in standardized terms. After all, we pride ourselves in fostering individualism as well as diversity! But, in fact, even in today’s individualist culture, it is standard identities (or roles) that provide the interfaces that allow us to interact and cooperate with one another. For in any given societal context, individuals occupy positions that carry with them a complex set of role expectations defining appropriate behavior, obligations, and values (Merton, 1949; Biddle, 1986; Burke and Stets, 2009). Individuals form their identities by taking on and performing standard roles from the repertoire that, in the context in which they are situated, are available to them. Individuals recognize each other and develop expectations about each other based on the identity roles that each chooses to play. It is in this way that coordination takes place.

How does this all come about? According to psychological identity theories grounded in the works of Erik Erikson (1968), and sociological identity theories based on the symbolic interactionism of George Herbert Mead (1934) and Herbert Blumer (1969), identity formation is the product of three components: the core personality, the self in interaction, and the social structure in which interaction takes place (Cote and Levine, 2002, 30). Individuals define themselves not only by virtue of their unique “core” personal characteristics but also, and perhaps more importantly, by reflecting upon and adapting to how, in any given situation, others perceive them and communicate their role expectations in the course of meaningful communication acts, which is to say, “symbolic interaction.” In the process, the self becomes encapsulated as a symbol or standard (Burke and Stets, 2009, 10).

Although not formally associated with symbolic interactionism, Erving Goffman’s view of identity formation is in many ways consistent with it. In fact, Goffman goes so far as to use a theatrical metaphor to describe the process of symbolic interaction. In his schema, the individual (actor) performs certain roles, during which he strives to frame his image and the situation so as to gain approval from his audience, while “others” in the audience are doing the same. In contrast to Mead and Blumer’s emphasis on individuals ‘taking on’ societal roles, Goffman claims that actors gain agency by consciously manipulating their performances—through their appearances, demeanors, and behaviors—to construct a mutually agreeable role (Goffman, 1959). Of course, the extent to which individuals can do so will depend not only on the specific context, but also on the resources (identity capital) available to them, a point that Stryker and Serpe (1982) emphasize in their exposition of “structural symbolic interaction.”

Based on these analytical perspectives, we can see how identity constitutes a negotiated standard attached to a particular role, position, or thing, which is the product of meaningful symbolic communication that occurs within a specific, structured social situation (Burke and Stets, 2009, 4). Hence, our identities—like all standards—serve as interfaces that mediate our relationships to society (Burke and Stets, 2009, 4; Hogg, et al, 1995). By adopting socially agreed upon identity roles, individuals determine with what/whom and how they are able to interact. This relationship between individual selves and social structure is reciprocal. At any one time, the roles available to us reflect the structure of society, which can be conceived of as a web of interdependent roles, whereas how we perform our roles will serve either to reinforce or to undermine this structure (Stryker and Serpe, 1982, 206; Burke and Stets, 2009).

Not surprisingly, therefore, the repertoire of available roles and the way they are allocated among a population has differed significantly from situation to situation and from society to society (Taylor, 1989). Thus in Roman times, roles were associated with a hierarchical social pyramid of legal statuses, each rung being linked to a distinct social style reflected in clothing, art and architecture (Stewart, 2008, p. 40). In the Middle Ages, chaos reigned, but a semblance of stability was maintained through strict adherence to prescribed roles and relationships as established by the chivalric code, monastic life, and long-standing traditions based on feuds, blood ties, and gift exchanges (Becker, 1981, 4; Huizinga, 1999, 1). The Renaissance witnessed a more individualist, open-ended approach to role formation due in part to the proliferation of the bourgeoisie statuses that accompanied the rise of a mercantile culture. Linking these identities together, Italian humanists provided a common script that defined codes of behavior for all Renaissance Italians, while the literati wrote extensive treatises, such as Machiavelli’s The Prince, outlining (Continued on page 6)
the behavior expected for specific roles (Kristeller, 1990). During the Enlightenment, the search for universal scientific facts based on observation and reason rather than religious precepts and tradition led to efforts to classify all phenomena according to common, standardized definitions, the prime example being Diderot’s *Encyclopédie* (Gay, 1977). At the same time, new role identities proliferated due to greater specialization and a deepening division of labor (Burke and Stets, 2009, 45). These trends intensified during the Industrial Revolution, so much so in fact that formal standard setting arrangements became required to designate and define the growing number of economic products as well as organizational roles (Beniger, 1986).

Growing up today in the land of High Modernity (Giddens, 1991), Alice might believe that she had returned to Wonderland. For once again she would find herself confronted with a multitude of shifting circumstances requiring her to adjust her demeanor and take on any number of possible roles. How would she manage? What if her identities conflicted? This is a question that many identity scholars ponder. Some predict that, given a world in which digital technology and social networking abound, Alice would have much greater agency and many more options in determining which roles to play and how to perform them. They note that, to support her identity claims, she could select from the wide variety of props and appurtenances afforded by today’s consumer society (Cote and Levine, 2002). Others are less sanguine. They point out that Alice, operating in an uncertain world, and absent the type of community connections and institutional arrangements that provided existential security in pre-modern cultures, would lack a guiding compass and coherent basis for making her identity choices. Overwhelmed, she might not be able to make any choices at all, and in the process lose sight of herself (Cote and Levine, 2002; Giddens, 1991; Burke and Stets, 2009, 259–261).

How successfully identity claims are worked out has implications not only for individuals like Alice, but also for society in general. For, as is argued by structural

symbolic interactionists, the way individual actors perform their role identities feeds back to determine the network of interdependent role identities that constitute the social order. Hence, we might ask, if role identities become excessively fragmented, what might be the consequences for society as a whole? This is a question that preoccupied Emile Durkheim in the early modern era, and the answer that he provided then is still relevant today (Durkheim, 1984). Noting that increased specialization and a deeper division of labor threatened to undermine the cohesion of society, he said that norms—that is to say, standards—were needed to hold society together.

Recall that standards are specifications that define the relationships between the parts of any given whole. As such, they are the *rules of the game*, bounding the system as well as providing affordances and constraints to the actors within it. However, in the period of High Modernity, the number and variety of role identities has increased exponentially together with the complexity of society, but the institutional arrangements to integrate these roles have not kept pace (Grewal, 2009). Thus, it would appear that just as problematic as the individual identity crises that many people may experience is a larger societal crisis due to a lack of institutional standards, making it extremely difficult for individuals to connect to others and integrate themselves within society in any meaningful way (Giddens 1991).

References