In The Trenches Of The Browser Wars

Standards In The Real World

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The browser wars, particularly the conflict over Internet Explorer and Windows, left us in the midst of a dilemma. Policy was suspended between a standard such as Windows, which represents an implicit monopoly, and dictates for competition policy, which eschews monopoly. In this note, we turn to actual practice in the attempt to find some new light, and perhaps policy guidance as well.

Information product – a choice

If a group of people want to set up communications, they must agree on a common method. Language itself is an example, obviously at a most fundamental level. There must eventuate, in other words, an 'information product,' the result of reaching agreement on a method. (A standard is such an information product of course. But for the moment we return to basics, in the effort to build foundation for understanding standards in practice.)

To explore the dimensions of an information product, consider two contrasting examples – Java and Windows.[1] Java is a layered information product, while Windows is integrated vertically on purpose. Java, for example, intermediates between the functionality which an applet may provide and the particularities of the operating system/OS on which the applet will run. Windows, by contrast, is to be taken as a (vertical) whole. The struggle between the US Department of Justice and Microsoft, over Internet Explorer, demonstrates amply. The conflict centered on whether Microsoft can be allowed to 'integrate' whatever it chooses into the Windows OS.

We can portray the contrast graphically.

An essential distinction emerges. A layered information product offers more points of entry, for later innovation. A vertically integrated solution, on the other side, offers fewer such

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[1] How are these part of communications? Computer protocols serve well as examples since computing is an intermediate case, relative to network protocols. Agreement on a common approach is a necessity for a network, if it is to operate; in computing however, the effect of interoperability requirements is felt quite strongly but there is still some leeway for variation. This makes computing a useful intermediate example, because it permits seeing a range of effects. Of course computing increasingly 'converges' with telecommunications, also.

opportunities; but vertical integration may bring better performance.[2] Consider one of our examples: Java, simply because it is an intermediary – layered – solution, invites more input from the developer community. But Java is notoriously a 'low(er) performer,' particularly since by design it is interposed as intermediate, between software commands and calls to the chip.

Object-oriented programming, particularly its structural relationships, offer a useful metaphor. Objects are each a part in a functional whole. An essential feature is how tight or loose are the linkages among objects. The interface between objects may afford more or less flexibility to the internal functioning for each object.

In loose linkage among objects, the functioning of a given object is afforded wider latitude, with a greater range of function possible internally for that object (which requires [perhaps ironically] more specification, and therefore rigidity, at the interface – the point of "interconnection" – among objects). Vice versa, tighter linkage entails less flexibility for a particular object (with simpler specification for the interface, or interconnection); the extreme is no flexibility and so is analog to the case of 'vertical integration' (among ideas) above.

Object-oriented structure is particularly useful as a metaphor to see that, whether layered or vertical, information product is constituted by parts in a whole (or you may prefer to speak of 'elements in context' or 'foreground in gestalt'). A central feature is the tightness/looseness of structural, or 'architectural,' relations among the parts and whole.

Now we can return to our group of people who are choosing a common method to make communications possible. At least implicitly, this group must choose between layered and vertical (of course, the choice is actually some point along a dimension between the two extremes). Layered opens new points to innovation;[3] but vertical may perform better.

We can notice now that balancing and choosing between the two seems to fly in the face of calls for 'openness' in standards. The layered case represents what often is referred to as 'open.' Where does the paradox lie? We traffic in a new notion such as information product in the hope of giving ourselves such new levers on understanding.

Standards in the real world

To answer that question, we turn to ask how choices of information product are made – how, in the real world, do(es) (a) group(s) arrive at standards?[4] We inspect two not-unrelated cases, taken from networking and computers respectively (they come together in the browser wars). In part, these are defining instances in the recent practice of standardization; in part, by the contrast between them they frame the central issues. One is the Internet Engineering Task Force/IETF; the other is Microsoft.

THE IETF

The IETF has overseen one of the more startling runs in the annals of innovation. The rate of successful innovation on the 'Net and Web is hardly paralleled, particularly as it has been sustained across years. In rough terms, the software engineers – the hackers – who comprise the 'Net community first advance some new idea. Under the aegis of the IETF, that new notion is implemented in a test form and tried out, perhaps spurring other, related novelties. After gathering some experience to test the (perhaps now competing) proposition(s), deliberations in

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[2]Since vertical integration usually applies in the same breath with thoughts about human organization, we have to be careful to notice that vertical integration in this discussion applies to the structure of *ideas*, in an information product.

[3]In the object oriented metaphor, more objects – which is one form of a 'looser' linkage ([perhaps] tighter interface!) – mean more opportunities for application to novel uses.

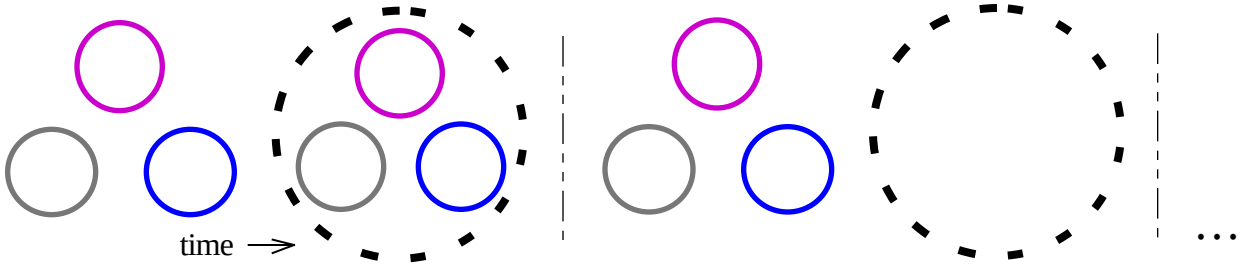
[4]We have already been clear that communications necessitates some agreement (with 'information product' the more general form of views held jointly and 'standard' one set of them).

the group proceed, to culminate in a new standard. This may involve melding more than one of the mooted, new ideas into a composite 'better' approach. Then the process starts over, with the next new idea. The pace is torrid, and the rate of change breathtaking by all accounts, with this scenario repeated over and over.

Boiled down to its essentials, the process has a simple, building-block cycle at its core. The cycle begins with innovation; it completes with a standardization. The implications in terms of industry behavior are what surprise. The innovation phase requires competition among the participants, over the new ideas put forward. The standardization phase, by contrast, requires the opposite behavior, namely consensus. The industry structure must, perforce, take on a dynamic character. During innovation, the actors in the industry are atomized and act individually on behalf of the new idea(s) that they separately have put forward. During standardization, these same actors now assume a new cloak and coalesce, accepting roles within the loose hierarchy formed by the IETF. In this mode they consider jointly what will serve a 'better' 'Net and establish the new standard – they arrive at a new information product.[5]

Through the IETF process, this transition, between behavioral opposites, is effected seamlessly numerous times, in a short span of time. The flip-flop between individual innovator and IETF member repeats frequently, seeming effortlessly. Industry structure alternates between full competition, with no market power disturbing tests on the merits, and full vertical integration,[6] in effect 'monopoly' control (though by the whole group). This alternation between competition and monopoly occurs repeatedly, again seeming effortlessly.

We can depict the basic cycle, with a repeated progression *from* atomized actors (in this stylization there are three industry members) *to* an IETF-style coalescence to deliberate some new standard; then the cycle repeats … .



How is it possible that individuals in a group can assume opposite roles, first serving each individual's separate interests, then switching to concern for betterment of the group as a whole; first competing, then finding consensus? and alternating in this way repeatedly? Clearly this *is* what happens. Just as clearly, the answer appears to be in the groundrules for behavior shared across the group. Though such social protocols are by-and-large informal, they are if anything even more binding, as the proudly held 'glue' which keeps the community together. That suggests an enlightened self interest, where *both* individual aggrandizement and

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[5]The development of Ethernet is another example, from about 25 years earlier, of the basic cycle at work. After being invented privately, Ethernet – after some years – came to be publicly held. The counterpart organization is the 802.3 standards committee of the Institute of Electrical and Electronics Engineers/IEEE. Though the cycle was not immediately repeated, the impact was profound with over 100 million users worldwide by the late '90's. Subsequently, the cycle even repeated, to produce higher capacity versions of the LAN protocol. There are other examples in the US as well, and certainly outside the US. I am indebted to John Markoff for his article bringing the Ethernet case to attention, The New York Times, May 18, 1998, p. D1.

[6]*This* vertical organization does regard human organization (rather than the structure of ideas).

preservation/betterment of the group serve the self. Then strongly held protocols serve to implement relatively complex behavior necessary to meet this 'enlightened' objective.

But does it make sense to speak of a dynamic industry structure, with individuals and companies alternately separate, then together, and repeatedly? Consider the social architecture of everyday life. We are each a member of several groups: family, work or school, play, perhaps religion, and so forth. For each group, there is an expanding ring of concentric, increasingly wider membership. The felt linkage may lessen as the circle widens; the connection extends nonetheless from the center outward. For work, as an example, the expanding circles may be the workgroup, a division in the company, the company itself, even the industry. Moment-to-moment an individual mentally switches among each of those levels, or memberships, to deal with different problems. Dynamic borders are endemic to our experience of daily life, in other words, despite our hesitance to visualize such variability.

This social architecture also serves as template for the loose hierarchy into which the IETF process periodically congeals. So now we can notice that both the human organization and its information product are characterized as being both part-and-whole – there is sound reason why vertical integration (and layering) apply, as basic ideas, to both organization and to information product. Though human organization and information product are two quite different phenomena – one regards social structure, the other the structure of shared ideas – the same notions characterize both. (We can also notice that variety[7] *not* subsumed by a standard continues to be maintained at 'lower' levels in both the social and the idea structures.)

MICROSOFT

The contrasting case is Microsoft.

Microsoft has succeeded, to become the epitome of the competitive ideal. Surely the success of its chairman is the fulfillment of the American dream, as conventionally defined. When it comes to standards, Microsoft maintains control, at all costs. It has now even been revealed that Gates was willing to "put a bullet through the head"[8] of his own online service, Microsoft Network, to crush Netscape and maintain the supremacy of Windows as the standard. This is in contrast with the IETF process, where all are invited to contribute with new ideas – Microsoft's obsession with control means the company takes all available steps to limit discretion to those inside the Microsoft circle.

Microsoft control over the standards process has predictable effects.

The input of new ideas onto turf controlled by Microsoft is progressively chilled. Reports indicate that venture capital simply is not available for innovations that would tread on territory where Microsoft holds sway.[9] The operating system is of course at that heart, with spreading borders progressively proscribed from innovative input by industry participants outside Microsoft. Whole swaths of new ideas are not even stillborn.

The standards we get serve the economic interests of only the one party, Microsoft. Among the very many examples, a prominent one is the fate of OpenDoc. Though widely acknowledged to be far better as an object technology than Microsoft's Object Linking and

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[7]In other words, the trace left by an earlier innovation.

[8]"[I]n order to induce America Online to promote Internet Explorer instead of Netscape's Navigator [and so protect Windows], Microsoft agreed to promote AOL in Windows at the expense of Microsoft's own online service … . Gates purportedly [described this tactic in the terms quoted in the text.]" "Smoking gun in Microsoft memos?" Dan Goodin and Jeff Pelline, CNET NEWS.COM, May 18, 1998, 5:40 p.m. PT.

[9]"[Because of Microsoft dominance, i]n recent years venture capital has simply not been available for software start-ups focused on desktop applications, programming tools or, in your dreams, operating systems." The New York Times, May 24, 1998, Money&Business Section, First page.

Embedding/OLE, and progeny, the Microsoft juggernaut helped to seal the fate of OpenDoc, so removing the (much) better technology as an option for any of us.

Because vertical integration – in ideas – may serve to reinforce control of, for instance, the operating system, the Microsoft penchant for control leads to over-choosing vertical integration for the technology it permits the rest of us to enjoy. As an ironic (if not canonical) case, the difficulties presented by the *open* Intel-based hardware platform impel Microsoft even further to integrate its Windows software OS *vertically*.

Policy lessons, from the real world

There is a fundamental opposition – some would say a war – between these two contrasting approaches to innovation and its Janus face, standardization. The two approaches see, in effect, radically different social organization to be appropriate for the inflow of innovation into a society. One insists absolutely on the control by one company of the process, and particularly the standard. The other, a substantially more complex social 'dance,' emphasizes both inclusiveness of ideas from all, as well as rapid progress through joint choice to serve the entire group. If we would consider the latter for policy, we need not only competition, but also a dynamic alternation with consensus.

Can we decipher our original paradox, where the choice might potentially select what is ordinarily considered 'not open'? With information product separated from the industry organization which produces it, we can now treat the question of 'openness' more accurately. 'Open,' in this expanded understanding, refers to inclusiveness in organization. Each industry participant may have a useful good idea to contribute. In the fairly complex scenario, with industry structure alternating between atomization and coalescence, the cardinal requirement for openness is the inclusion of ideas from all quarters. We all have to depend on each other, for the distinct-and-privileged view that each perosn has. For information product, by contrast, either vertical or layered may be chosen – in fact, balancing vertical for performance against layering for more access points to later innovation is typically a challenging task. By separating information product analytically, and specifying the dynamics of industry organization, we try to see the process clearly.

Perhaps Robert Metcalfe, one of the inventors of Ethernet, put 'open' in the most accurate real-world terms: "Standards are genuinely open … only when they are publicly documented, nonproprietary, and when there is a public forum for updating the standard [– something, in other words, which] the public owns."[10,11]

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[10]The Markoff article referenced in footnote 5.

[11]My "Microsoft vs. Netscape: Policy for Dynamic Models" treats theory of the two opposed models (chapter in *The Limits of Government: On Policy, Competence and Economic Growth*, Gunnar Eliasson & Nils Karlson, eds., City University Press, Stockholm, 1998).