

## Interfaces – A View from Social Systems Theory

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(1) One of the most interesting features of Harrison C. White's theory of "markets out of networks" (White 1997) is its *renunciation to distinguish between firms and markets*, or better: between firms and the economy. Indeed, in an article with Robert Eccles (White/Eccles 1986), he goes so far as to describe the distinction between firms and markets as a "myth". I would like to question this renunciation. I agree with the fruitfulness of White's approach when analyzing the "structure" of markets which consists in firms and clients embedded into upstream and downstream layers of networks. I think it is a promising idea to rely on the quality of products when analyzing the social constitution and reproduction of these markets. And I think it is indeed high time to re-ecologize, that is, to re-physicalize, our thinking about the economy. I sense a whole new sociology of the market coming up. Yet I am wondering whether White is not prematurely doing away with a type of distinction analysis he is in need of when describing the embeddedness of economic action. Any embeddedness presupposes a disembedding, i.e. a distinction being drawn, a distinction, for sure, which draws on resources provided for by the social context the emerging identity is going to re-embed itself in.

(2) I won't go on to discuss White's approach in "markets out of networks". I will limit myself on White's understanding of "*interfaces*" which he developed in several articles (White 1982; Eccles/White 1986; White 1993) and in his book on "Identity and Control" (White 1992; cf. Baecker 1996). A very important trait of his notion of interface, a trait which distinguishes it from so many uses of this notion in matters of computer architecture and multimedia, is its sociological turn. An interface with White is thought to be able to define an identity. He is not starting with "identity" and then seeking its relationship with its environment. He is not taking an identity to be a "subject" of some kind. Instead it is by the emergence of an interface that an identity is constituted, defined, and maintained. That is why White (1982) recommends to do away with the notion of "boundary" which stresses too much of a quasi physical definition and delimitation of an "identity", and to use instead the notion of "interface" which allows to emphasize the importance of actual operations distinguishing and re-embedding an identity

which is nothing but the maintenance, that is, control, of distinction. Obviously, that is a notion of "interface", any thinking about artificial intelligence and multimedia would very much profit of.

(3) I would like to ask what White is watching when he is watching an "interface". I claim that he is watching, and conceptualizing, a *boundary*. Sure, he is not watching a physical boundary. We do not deal in matters of organisms, even if, maybe, we should also try to think the "physical" boundaries of organisms more in terms of interfaces than in terms of bounds cutting the organism off of its environment.

I propose the following concept of an interface. An interface is a boundary that enables actions to be selected according to second order observations, i.e. observations of other observers, and to third order observations, i.e. observations of being observed by other observers. In other words, an interface is the product of a re-entry of a distinction into the domain it distinguishes. That is, it is a boundary reflected as cutting off a domain inside a universe the domain is embedded in. Such a concept may be developed by the aid of the form calculus of G. Spencer Brown (1972; see Svozil 1996). That is, an interface is a device of re-embedding a domain into the universe it is separated of. It is a boundary defining an inside reflected as a link with the outside. There is a paradoxical aspect to this definition (see Luhmann 1993). This paradoxical aspect is important since it forces us to conceive of the interface as deciding the undecidable, the distinction of an outside from an inside, inside the domain whose interface we analyze.

I take this definition of an interface to be compatible with White's use of the concept of interface in his "Identity and Control" (White 1992, p. 30 et passim). The interface is a "discipline" which delivers "identity". "Identity", I propose, is the reflection of the distinction being drawn between inside and outside upon the distinction being re-entered into the inside. The interface is a discipline which assumes and accepts identity to be the result of paradoxical and conflictual work. I would maintain that there is no social phenomenon able to reproduce itself which is not relying on an interface in this sense. Of course, that would mean that three types of disciplines distinguished by White (1992, p. 30) are more closely related than he assumes. If you look closely at the second type of discipline, the "arena", then you realize that it relies on an identity not just produced and maintained, but valued as identity. I would speak of a second order re-entry. The "council", the third type of discipline, fits the concept, since it consists in securing the prestige of the identity being valued towards the outside of the domain. It is a third order re-entry prepared for an outside prestige presentation which evidently is of use inside as well, maintaining the value of the identity, and the identity which is valued. Thus, to analyze an interface as the re-entry of a distinction into the domain being

distinguished gives way to further re-entries of higher order, each producing a new "indeterminateness" (Spencer Brown) which becomes the territory for social conflict and cooperation for the identity in question. One of the important features of these re-entries is that "identity" becomes stronger and weaker at the same time since it is always the outside the identity is distinguished from which serves in defining the identity.

(4) When proposing an "interface" to be analyzed in terms of a distinction being re-entered into the domain it distinguishes I suggest that the interface is a coupling mechanism. It links the domain back to the universe it is cut off from. An "arena" emphasizes the identity being linked back. And the "council" maintains even the links as belonging to the identity linked to the outside. It is a process of increasing the identity of the identity while re-embedding it into the environment. Any time the identity becomes precarious (because of the constitutive distinction showing up) the identity is maintained by looping it once more inside itself. Of course, such an analysis assumes second order observations as one of the most important processes going on inside the domain in question (White 1982; Foerster 1981).

Two questions emerge from this analysis: (a) Who is doing the observation? And (b) what is being observed?

I would say that the depiction of an interface is done by structural action theory as proposed by White and operationalized, for instance, by blockmodel analysis (White/Boorman/Breiger 1976; Boorman/White 1976). That is, in order to capture interfaces you check out how actual and potential ties in a network of actions, actors, communications, or institutions, are used to produce, and reproduce, an identity. Identity shows up in rhetorics, and semantics, but you can never be sure whether rhetorics and semantics aren't already telling the stories of links failed (White 1992, pp. 66-67), thus working the memory of the society more than its structure.

Yet, as soon as the interface has been discovered the question emerges how it is being produced and reproduced. Structural action theory is rather quiet on this matter. Structures come about by structure, and they maintain themselves by conflict, story, and control. But the generative mechanism of a structure remains open to question. Sure, there is always some agency, there is blocking action and getting action. But again, how is this agency linked to the identity being controlled?

My proposition is that structural action theory is not only watching boundaries when it depicts interfaces but it is watching *social systems* as soon as it analyzes the working of the interfaces. There is no interface without a social system distinguishing itself, reproducing

itself, and re-embedding itself into the environment it distinguishes itself from. Social systems theory's terms for "interface" are "interpenetration" (Luhmann 1995) and "structural coupling" (Luhmann 1992) but "interface" captures the important mechanism which consists in linking an operationally closed system back to its environment. The interface translates some of the complexity of the environment into the different complexity of the system ("interpenetration"). It relies on mechanisms which shape events that are codified in terms of a system in the environment of the focal system as well as, however differently, in terms of the focal system itself ("structural coupling").

Thus, social systems theory would maintain that (a) social structure theory is an observer, a discipline of itself which can only see what it sees, and cannot see that it does not see what it does not see (von Foerster 1981); and that (b) it is observing social systems which themselves are observers reproducing themselves and observing what they observe.

(5) When Harrison White (1997) is analyzing "markets out of networks" he is indeed analyzing two types of social systems interfacing each other, if I may say so, and securing their identity by constituting "arenas" and "councils" to different degrees. He is analyzing *social systems of organizations* and the *social system of the economy*. Organizations are social systems producing and reproducing themselves by means of communication by decision (Luhmann 1988a; Baecker 1993). The economy is a social system producing and reproducing itself by the means of communication by payment (Luhmann 1988b; Baecker 1988). The organization of a firm is developing an interface with the economy by securing that its self-referential decisions apply other-referentially to products of a certain quality. The economy is developing an interface with organizations by securing that its self-referential payments apply other-referentially to products of a certain quality. That is why "transactions", that is decisions on payments for products, is the overall term for the type of operations reproducing a "market" consisting of organizations delivering products and an economy comparing the products' prices with other products' prices. The market, as White (1981) and Georg Simmel (1903) were able to show is nothing but the mirror which enables the producers to watch other producers' decisions vis-à-vis an economy which always changes production and consumption possibilities.

Examples for the "arena" of an organization is its management reaching from ensuring cooperation (White's getting action by blocking action) up to taking care of some communicative corporate culture, indeed all practices which underscore the value of the identity, that is certain programmes of decisions (March/Simon 1958). The "council" of an organization is Parsons' (1960) and Thompson's (1961) venerable "institutional level" which, however, lately is turning from an "opening" mechanism into a "closing" mechanism because

it is on the level of the production core that the networked organization nowadays is "open". Thus, we should look for new "councils", located not on the top but at the bottom of an organization and consisting, presumably, of links to internal hierarchies (Eccles/White 1986). The economy's "arena", that is its discipline of valuing its identity, reside in its capital markets which compare, like in Marx's (1867) analysis, different combinations of products and payments among each other, always relating to decisions that dissolve links still entertained. Of course, that makes the banking system of the economy (Baecker 1991) its "council", since it is here that links between organizations, capital markets, and the societal environment are taken care of.

(6) A decisive feature of White's (1997) analysis of "markets out of networks" is the fundamental *asymmetry between upstream and downstream links*. The thesis is, as you remind, that the firm can either individualize its supplier ties upstream, and deal with its clients downstream in a more or less anonymous way; or it can, the other way round, individualize its clients' ties downstream, and deal with its suppliers in a more or less anonymous way. But it cannot individualize both interfaces, nor anonymize both. That is a very important point which leads to look for self-similar "limitations in order to make decisions" (Barnard 1938, quoted in White 1982, p. 12). I presume that the new interface between producers and consumers, claimed by the word of the "fractal" or "virtual" organization (Warnecke 1993; Davidow/Malone 1992) which is the substitute of the old "putting-out" system of capitalist production, can only work if it is asymmetrical in the way shown by White (1997). But then, it is by linking productive units which are upstream, or downstream, interfaces that complex networks of industrial and service production may develop. Yet, it is important to underline that the very possibility of creating the links, and dissolving them again, stems from different reproductive social systems logics (the decisional logic of the organization, and the payment logic of the economy) which can only be linked by interfaces, arenas, and councils because they are operationally separated and constitute operationally closed systems. Thus, it would be interesting to supplement White's structural analysis of markets with a social systems analysis of firms and economics.

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