

## Information Infrastructure System

### **An Activity Theory Framework for Disciplining Design and Inquiry on Technology-Mediated School Practice<sup>1</sup>**

A work activity segment represents our primary unit of analysis. Each activity segment is rooted in a specific problem of practice embedded in some individual work roles (or interconnected set of work roles) within a school. IIS design efforts focus attention on how this work can be more effectively mediated by introducing new technologies and related social practices.

We recognize that individual agents occupy these work roles and bring varied prior beliefs, role conceptions and level of expertise to their efforts. The perceived self interests and competencies of these individual agents influence how any new tool and/or social practice enters the school context and shapes whether and how an innovation adoption occurs.

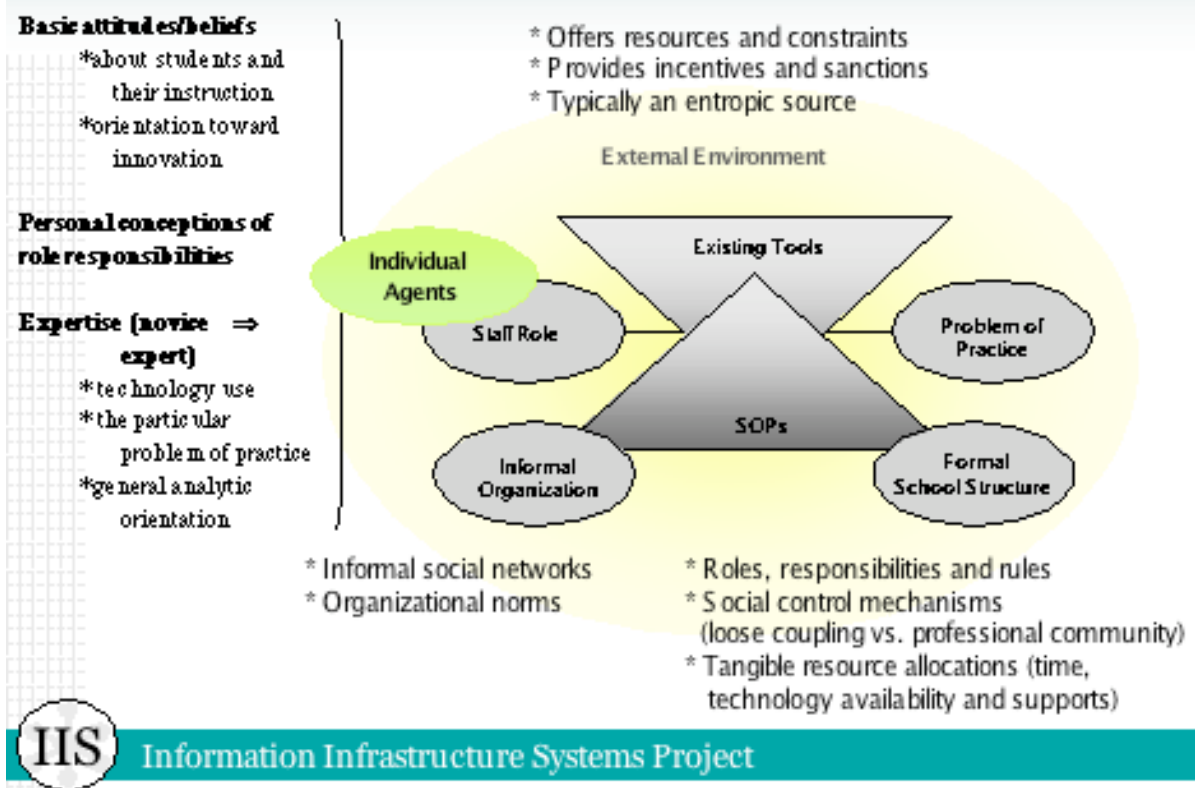
These aspects of individual agency occur within a school context, consisting of a formal organizational structure and important informal socio-normative elements, which also shape the introduction of any innovation and its pattern of adaptation. Each school, in turn, exists within an external institutional environment, fashioned by district, state and federal policies that provide resources and constraints, and that offers incentives and sanctions which aim to define and control the proper forms of agent behavior. While current reforms seek to make this environment more coherent and ‘aligned’, this external environment still tends to exert a largely entropic effect on schools which remain highly open to its influences.

All of these elements, which taken together specify a work activity segment, stand in strong, dynamic interaction with one another. (See Figure 1.) At the most basic level, the identification of problems of practice is rooted both in the formal structure of schools (e.g. a commitment to balanced literacy) and their informal social organization. The base state SOPS (standard operating procedures) are shaped by both of these organizational features as well as by the collective perceived interests of school staff.

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<sup>1</sup> This is a capsule summary from a separate working paper in progress.

Figure 1. A basic work activity segment



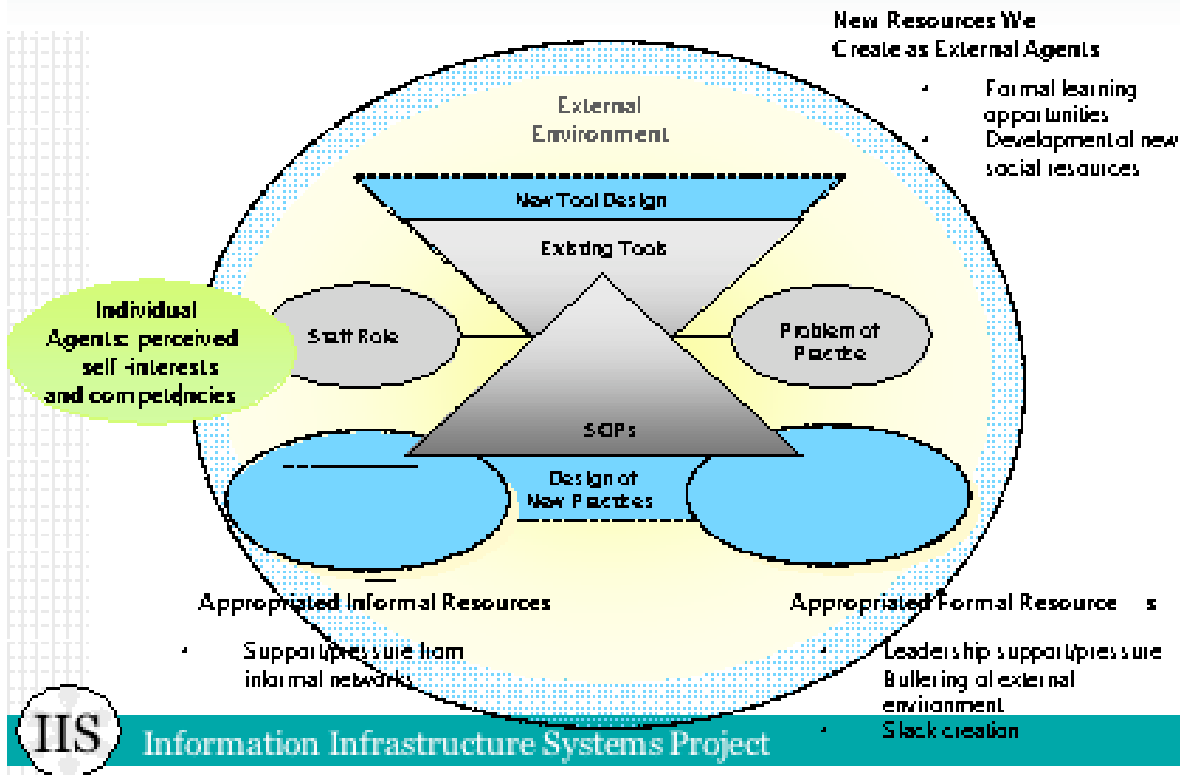
Similarly, our efforts to design new tools and social practices are anchored in, specific, work problems, which exist within a school organization with distinctive structural and socio-normative elements, and which are, in turn, subject to certain external sanctions and incentives. Each of the elements identified in Figure 1 represents a critical concern in our R and D work. To the point, an inadequate accounting for any one of these components could precipitate an overall system failure.

Filling out our design environment (see Figure 2), we also attend to: 1) the extant resources and mechanisms that can be appropriated within a school's ecology to support the introduction of innovations; and 2) any new resources which may need to be deliberately developed by the IIS team for this purpose. Together these focus us on:

- the formal and informal social organization of the school (e.g. formal and informal leaders who can exert pressure/support to engage the innovation, extant social resources that can be appropriated to assist in innovation diffusion),
- the interaction of the school and its external institutional environment (e.g. the use of formal authority by principals and officials in the external environment to buffer the innovation and create slack for agent experimentation and learning), and
- the interaction of any, or all, of these entities with members of our IIS group. We may design formal opportunities to support agent learning and draw on any social

resources that we may have built with individual school actors to influence their “self interest calculus” about their possible engagements with our work.

Figure 2. The Design Environment



Finally, we expect our innovations will culminate in three forms of outcomes: **activity level outcomes** relevant to each specific work problem which we seek to mediate with new tools and social practices; **individual level outcomes** where the aspects of individual agents, which form their initial engagements with an innovation, may in turn be reshaped as these activity cycles proceed over time; and **organizational level outcomes** which represent the primary aims of our work--the transformation of schools from a loose coupling toward a more tightly coupled professional environment characterized by a shared common language about the technical core, enhanced communication across the organization, and greater reliance and use of information in the reflective practice of individual staff and in the internal accountabilities across the school organization.

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