What does 'user interface for all' mean?
Some preliminary considerations.

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Abstract. This topic entails a discussion on some general and open issues. We outline some of these and focus on those most related to our experience.

From an IS (Information Systems) perspective the interface is considered as an organic part in IS development and its role has grown due to the organizational change caused by technological development [Kuutti 91]. Some useful frameworks to conceptualize the interface between users and computers are already provided: multilayered models intended originally to master the complexity of the IS design [Iivari 85] can be extended to the interface design [Clarke 86], [Kuutti 93]. The relations between the interface and the applications thus depend on the definition of different design domains of the application, each containing a fully integrated interface. The framework unifies the various perspectives inside the application, but it could also provide a useful methodology for defining the relationship between the 'interface' and the 'application' that could vary by changing the application domains. In some programs (e.g scientific visualization) the interface represents the whole application since it expresses the complete process from locating the source of data to the delivery of information to the users.

Is the layered framework design promising for the 'interface for all' perspective?

When dealing with organizational changes and in a Open Systems situation there is, however, a difficult problem to solve: how to maintain the effectiveness of interfaces and applications, since the organizational changes due to external factors are difficult to manage and consider in the system design process. Guidelines have been developed by Eason [Eason 89], contextualizing the system design process has been considered, and discussion on this 'vulnerable' aspect is open [Buchanan 91]. The question we suggest should be investigated is if and how a layered framework model could mitigate the effects of the problem. Considering that organizational changes are unpredictable, looking for an exhaustive model maybe entails proceeding by approximation, using a simplified framework that coexists with a management model of the organizational development and change process. What is lacking is a framework that can conceptualize such an interrelation between the information systems and the evolutionary world of organization: maybe a linking architecture connecting the world rather than owning it like the Dexter model [Halasz 94] from the multimedia world for hypermedia implementation.

Another issue that might affect the 'interface for all' concept concerns the relation interface/information representation and retrieval facing the information highway era. The interfaces of the last few years have been characterized by widespread use of customization using information searching strategies and multimedia and visualization technologies in a

cooperative way [Ozkarahan 95]. Customizing the search for information and exploring all aspects of some information is a consolidated target in the IS interfaces of today, but exploiting the network information sources needs some different capability.What kind of frameworks does this double faced emergency conjugate? How do we manage information distribution and save the costumization heritage? We need some more abstract mechanism to design our 'interface for all' in which domain-specific frameworks coexist and collaborate in order to accomplish the abstraction/specialization cycle.

The problem throughout the networks is to be careful not to share low level content or inconsistent information. From the point of view of the information consumer there is a fundamental stuctured information problem. We can look at the information world as unstructured or structured; this double representation introduces some problematic questions regarding interaction development methodologies. Moving from unstructured information makes it necessary to develop some structure around the flat file to transform data into information; otherwise we have to capture and transmit the semantics of the information structure to make the information meaningful. Users throughout the networks must capture real information, i.e. the semantic connection that relates raw material to the purpose of an information system. The 'interface for all' means satisfying also the new expectations of the users for an information 'in any depth' that cannot be found by reading a book. The client server architecture, born in the middle of computer network interaction problems has opened the road to an effective separation between client software and server software. How could the questions, mentioned above, be managed using this paradigmatic view? Should the 'interface' concept be reformulated?

Furthermore, on the information highway we are forced to use intelligence to search for information over a net flooded with data and to use intelligent agents to retrieve and filter information [Gladman 94]. The challenge now is not only to provide information, but to correlate into a coherent framework all the information contained in separately designed databases. Is the era of global information thus an era of 'knowledge representation' even at some higher abstraction level? (domain knowledge representation + intelligent brokers?). One could imagine some kind of engine that can interpret the query, understand its semantics by domain knowledge acquisition and then direct it to the most appropriate nodes in the semantic network of the considered domain. It is therefore essential to have an abstract representation of the domain, or rather of the domains (due to the need to represent reference associations as well), and to provide a grammar to express the semantics of the query to be understood by the smart engine located along the network. Does the question match some expectations of the 'interface for all' users?

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