

**Elements of a Framework to Increase Usability of Systems  
Linked to the Web  
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**Abstract**

Information Systems of the future will have a Web front-end and will be strongly influenced by Web architecture, constraints and environment.

The lack of a self-evident conceptual framework, together with the paradoxical situation of having to design an information system for a community of users whose needs and abilities are mostly unknown, forces us to look for preliminary steps towards a framework. Those steps include looking for regularities in specific situations of human consumable data types and the fundamental media to represent information and transforming the results into Metadata, exploiting theories that seem pertinent in analogous situations such as conversation theory, identifying what constitutes a style of design for the Web and deriving guidelines for styles of design from guidelines for styles of writing, in particular the Classic Style.

It is expected that a pertinent conceptual framework might emerge by following this course.

**1. Evolution of Information Systems and the Web**

In the areas of Information Technology and Society today, one can hardly find any significant Research and Development project that does not have a Web front-end or is not strongly influenced by the Web architecture, constraints, tools and environment. In other words, in Information Technology now, almost all Information Systems which are intended for use by a group of interconnected people must be designed taking into account “some interface” to the Web. Of course, the value of interconnection through the Internet has been recognized for some time, and is highly stressed again now. As Borenstein notes [1]:

“There is a very powerful dynamic at work, driving us towards a world in which every person and computer are interconnected by a single complex thing we call the Internet.”

However, the level of awareness of the importance of interconnection and of the dynamic at work is directly correlated to the growth of activities of the World Wide Web, since all the other activities on the Internet seem either to stable or to regress [2]. So, it seems that we are going to live with the Web and the potential it represents for quite some time. How should this be taken into consideration in the design of information systems which will interface to the Web?

Let us look at what some experienced people have to say on this subject. For Dan R. Olsen [3] the key forces that will shape computing for the next ten years will be:

1. exponential growth in digital technology;
2. market driven diversity;

3. limited human capacity.

As for the interface to the Web, we are faced with the following situation: each information system is best designed when tailored for a particular community, needs and abilities. But the approach that dominates the Web is different: each Web site is not open to a well-defined and well-understood set of users but rather to the entire Internet community. Therefore the paradoxical situation arises of having to design an information system suited to a community of users whose needs and abilities are mostly unknown. Olsen calls this a Chaotic Order: small differences in design may result in widely different user-perceived systems. How can we meet both ends?

## **2. First Steps: Looking For Regularities In Certain Classes Of Situations**

For Dan Olsen, in order to overcome this chaotic situation we have to look for some sort of regularity. Human usage demands regularity. Where is the regularity hidden in human consumption of information? Human usage exhibits a finite number of ways to receive information and a finite number of ways to communicate. In order to characterize those ways and exhibit that regularity, we should focus our work on elements intended for direct human consumption. We should concentrate on human consumable data types and the fundamental media for representing information. He then identifies six key data types:

1. text/language;
2. images and pictures;
3. audio;
4. video;
5. 3D environments;
6. tactile information.

An underlying assumption is that each of these (data types) constitutes a fundamental way in which experience is communicated to human beings. Moreover, we want to delineate, manipulate, and reproduce what is communicated (the experience communicated to human beings). We would then be able to build tools that exploit the “regularity” uncovered. This seems to be a long term research project, as although we assume there are regularities, we are only at the beginning of understanding and naming those regularities .

## **3. Recent Evolution Of The Web: The World Of Metadata**

We have just seen that treatment of information to be presented for efficient human consumption on the Web is in general a problem which does not have an immediate or systematic solution, although there are obviously some successful Web-applications. Web technology is changing at a dramatic pace. What can we learn from looking at the evolution of Web structure, architecture, domains of interest?

In an interesting paper humorously entitled “The origin of (document) species”, R. Khare and A. Rifkin [6] in a section aptly called “Evolution not Revolution” notice a

decisive shift from structural markup to semantic markup, from structural HTML markup to semantic XML markup, from presentational terms: bold, italic, indented and so on, to declarative terms: title, address, etc. They call that trend a critical phase in the “struggle to transform the Web from a global information space into a canonical knowledge network”. From the publications of the W3C consortium, we can also witness a tremendous activity in the area of Metadata. (Let us recall that Metadata is the generic term used to describe data that can be used by searchers to identify features shared by different documents). But identifying the types of features shared by widely different documents - and therefore the metadata that can be associated with a particular document - is part of a metaphoric process, i.e. being able to discern the similarities between two different situations. This may eventually lead to an infinite variety of metadata. How can we cope with that situation? Can we get some guidance from our goals?

#### **4. Expression Of Goals From Early Visions Of The Web**

Vannevar Bush is usually credited for his work [6] on MEMEX with one of the earliest expressions of services offered close to what some people dream of now for the World Wide Web “an infinite, instant, ordered source of reliable, trustworthy and pertinent information”. This expression seems a complete, and at the same time abstract, definition of Web Services. It does not surprise us today as an expression of valid goals.

Borge’s “Library of all books of the World is another early vision”. Based on his writings in Labyrinths, as reported in [5] by K.Kelly, his library contained all possible books, past, present, and future. In some ways this is a restricted vision of the Web, as sound, music, and images are not explicitly mentioned. However, the stress on past, present and future books implies a constant expansion and reorganisation of the Web, while maintaining access to the past.

Closer to us, D. Englebart and Alan Kay among others can be credited for a vision for tools such as using the screen to display relevant textual information at the clicking of a mouse. Englebart had an early implementation of some services of the Web in the Augment System, as early as 1969 [7]. Alan Kay had an implementation in the 1970s [8] for some tools considered now as an absolute commodity for the user interface, such as the Browser.

Tim Berners-Lee, the inventor of the Web itself, is going one step further when he talks about the Web of Trust and the “Oh Yeah? ” button designed to ask your Browser “Prove it, convince me!”. His vision is to go from a Web of Knowledge to a Web of Values [9], drawing attention towards how Trust could be built.

#### **5. Can We Learn Something From Analogous Situations?**

Man has the ability to notice analogy and similarities between two situations which may be far removed. That is sometimes the source of powerful metaphors. The situation of a website designer confronted with website visitors neither whose needs

nor abilities are known to, visitors who may come for a visit to get interested in objects under his responsibility, brought to my mind the situation described in an essay by the philosopher Louis Marin in [11].

The situation is a visit to a Museum, where the Artist, or the Curator or the Guide knows very little about the visitors. In order for an encounter between those two persons who know very little of one another, who may have completely different objectives, in order for this encounter to be somehow fruitful and positive for both, according to Marin, there are conditions to be fulfilled. Basically, the two persons are going to have a conversation about some objects, some artefacts, that have been designed or built by one of the persons, and that are located around the place of encounter. That is the case of a visit to an exhibition in the presence of the Author or of the Critic of art. Browsing in the artist crafts shop leads to a conversation about things, feelings, attitudes, etc. Louis Marin is looking for principles and rules that could govern this type of conversation. He specifically makes reference to the work of Paul Grice [11] on conversational theory.

Below is reproduced a summary of Grice's Laws as expressed in [12].

A quick examination of that work reveals one Cooperative Principle:

“make your conversational contribution such as is required, at the stage at which it occurs, by the accepted progress or direction of the talk exchange in which you are engaged.”

and two Conversational Maxims:

on Quantity

1. Make your contribution as informative as is required (for the current purpose of the exchange)
2. Do not make your contribution more informative than is required.

and on Quality

1. Do not say what you believe to be false.

Could those rules and principles be expressed as Guidelines for the design of Websites? I believe, this might be worth trying. I have the feeling that this whole field called Computational Implicature (see [12] for an annotated bibliography on Conversational Implicature), which has been receiving recently much attention (a recent workshop, for example, was held in Italy on this subject in May 1998), is likely to provide at least some of the guiding rules that we are looking for in order to establish and maintain this “conversation about the objects”.

## 6. A Look At Styles, “What Constitutes The Classic Style”?

The recent evolution of Web tools from HTML to XML has shown a decisive step towards more abstraction with the introduction of so-called Cascading Style Sheets (CSS). But if Style Sheets are certainly attributes of styles, they do not define a particular style as we generally understand styles. An interesting comparison could be made between learning to write and learning to design a document for the Web. Learning to write cannot be reduced to acquiring writing skills as learning to write is inevitably learning styles of writing, and styles derive from conceptual stands. In a similar way learning to design a document for the Web cannot be reduced to acquiring programming skills. Styles of design for the Web are likely to derive from conceptual stands also.

A taxonomy of styles of designs will probably soon exist to parallel the taxonomy of styles of writing: reflexive, practical, plain, romantic, etc and Classic. In particular what can be said about the Classic conceptual stand for writing is likely to hold for the Classic conceptual stand for designing for the Web.

Below, we will borrow from a recent book on Classic Style in Writing a set of clear and precise statements that characterise Classic Style. Most of them should inspire a transposition into Guidelines and Criteria.

“Classic Style is focused and assured.

Its virtues are clarity and simplicity.

It declines to acknowledge ambiguities, unessential qualifications, doubts.

Classic Style is, above all, a style of presentation with claims to transparency.

Every word counts.

Clarity everywhere is not Accuracy everywhere.

The model is one person speaking to another.

Classic style is energetic but not anxious.

Elite is not exclusive.

Classic style is for everybody.

The reader is competent.

The writer is authentic, sufficient, competent, does all the work invisibly.”

## 7. Conclusions

We were looking for elements of a Framework to increase usability of information systems linked to the Web. This is a difficult problem due the paradoxical situation of designing for a community of users whose needs and capabilities are mostly unknown. To increase the usability of “Interacting in Chaos” we have suggested several preliminary steps along what seems promising lines of research:

- Identifying regularities in specific classes of situations, such as those mentioned by Olsen.
- Translating those regularities into Metadata concepts.
- From early visions of the Web we have derived the expression of some goals, ambitious enough to make sure the Framework is set up at an appropriate level.

- The search for practical Guidelines can be helped by looking at analogous situations such as those leading to a conversation about objects in a particular place.
- Conversation Theory may be pertinent and interesting to look at.
- Finally the propositions that apply to a classical style of writing could very likely be maintained for the equivalent style for Web design.

Thus, with proper goals, a rich domain of research, potentially interesting theories which are derived from analogous situations, and trustworthy although general guidelines, we may have some hope that an appropriate framework will emerge soon.

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