Exchange of digital goods in the Web
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Extended abstract

Web is becoming a complex privatised space [1] difficult for users, businesses and governments to handle privacy, identity, anonymity, accountability and security. It is clear that issues like identity and data management, intellectual property, privacy, and trustworthiness in the Web are not simply technological. Their complex interactions mean that a trustworthy Information Society requires a coordinated transdisciplinary approach, which is very much in line with the Web Science framework.

The scope of our paper is to contribute to a unified analytical framework for control and exchange of digital goods in the Web.

The proposed unified analytical framework for control and exchange of digital goods (bit strings with economic value, including all electronic files, e-services and data) in the Web, models the interplay among Users (consumers or producers), Digital Identities, types of Control for digital goods, Exchange Mechanisms and Business Models (Figure).

A User could be either a consumer or a producer of a digital good. Digital identity, in a general sense, will include a set of different attributes: those needed for our identification, our personal data provided through Web community systems, the information on different sort of Web pages that register our professional lives; potentially, our full digital shadow [2]. According to Cameron's Laws of Identity the process of authentication, where a subject would use a trusted claim provider to prove its claims to the relying party, is described formally at a meta-level [2]. Clearly, the claims provided for a certain transaction depend on the transaction, the parties and the context. To obtain a passport from a public administration office, to make a payment in the Web, or simply to provide comments on a wiki, all entail different considerations when identifying oneself.

A consumer of a digital good acquires credentials that support digital good personalization and secure access of distributed information across Web. A producer issues credentials to potential consumers of his digital good. Control of use and rights over a digital good could be full and unrestricted or partially restricted to specific uses, content and time frame. For any particular exchange, the User would be required to submit only those specific credentials needed for this exchange.
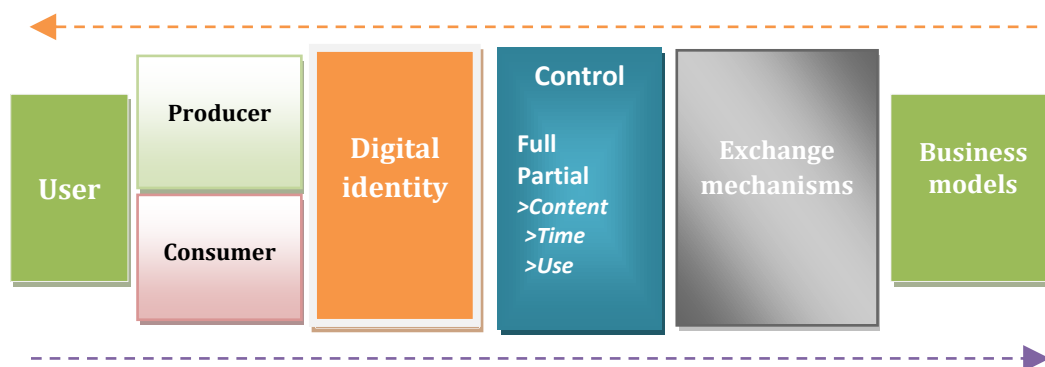
Figure: A unified analytical framework for control and exchange of digital goods in the Web

An Exchange Mechanism includes the technology, methodologies, models and incentives that facilitate trading of digital goods (i.e. Google's AdSense). Business models on the Web describe the rationale of how economic value is created, delivered and captured in cyberspace (for details see for example [3]).

A simple demonstration of the proposed framework can be made using today's *Facebook* and in a hypothetical future *Decentralized Facebook with digital credentials.* Both consumers and producers are considered as Users of digital goods. In the first case, digital identity is provided by a simple login mechanism. Producers have partial or no control in the content, use and time frame of the data created by them. The basic business model is advertising. In the hypothetical case of a decentralized Facebook-inspired platform with digital identities the supporting technologies may include Linked data [4] and e-identity software which supports anonymous credentials provision (i.e. Idemix, U-prove). The major difference with existing *Facebook* is that Users can have a spectrum of choices of credentials provision corresponding to various business model schemes. For instance, a User may choose to browse and edit in an advertisement-free *Facebook* for a monthly fee.

The features of the future analytical framework could provide a flexible approach for Users as well as business models evolution.

References

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