The Different Faces of Openness: How to Further Software Innovation

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Abstract

Today, one of the major discussion points in government and industry is the policy towards Open Software. But the issue is often misunderstood and many decision makers are under the impression that Open Source alone will already solve all the issues in their IT development and operation. The "Open" issue is far more versatile and we will discuss the different "faces" of open:

- Open Software
- Open Source
- Open Systems
- Open Standards
- Open Formats

The presentation will discuss all of these aspects with examples of their uses. Today all government and industry bodies should embrace the Open approach and thereby further local innovation, international cooperation and competition on an even playing field.

Keywords: open software, software innovation

From the Information to the Participation Society

Our society is currently in the process of transitioning from the Information Age to the Participation Age. While until recently the focus has been on the net as a source of content from information suppliers, it is increasingly becoming a collaborative platform for developing and sharing content. In this context open systems (systems with revealed/published interfaces) and open standards (publicly agreed interfaces and procedures) emerge under Open Source (open source program code). Unfortunately, these very different concepts are easily mixed up. It is important to understand the different aspects of openness, their use and ultimately how to benefit from these.

Open Source – Cooperation of the Developers

Open Source is particularly useful for developers. It functions similarly to Wikipedia, an on-line encyclopedia where everyone can contribute and in which users provide content. Open Source enables developers to share knowledge and expertise with their peers. Open Source means that developers distribute the binary code as well as the source code which can then be further redistributed and modified. The code base is discussed and examined with many other developers in public forums. Such co-developed software

generally exhibits a very high degree of quality. Access to source code is free or available for a nominal charge. For developers access to Open Source means deepening of their programming knowledge. In addition, Open Source enables the individual developer to contribute to a code base independently of his organizational affiliation.

Open Source:

- furthers innovation through third parties
- provides developers with the possibility to innovate and advance an existing code base
- improves quality of solutions by comprehensive Peer Review
- offers equal chances for developers world-wide
- provides outstanding training material

Open Systems – The Lego Approach

We call those systems "open" where interoperability is guaranteed through exposed structures with their functionality (data and process interfaces). Open Interfaces allow for different implementations of such an open system. If the functional interface is served in the same way, these solutions are interoperable. The implementation of such an open system can be done in Open Source or in a proprietary undisclosed way. As is the case for Lego, it can be a published but proprietary and patent-protected standard.

Open Systems:

- permit different implementation of identical functionalities
- enable some degree of exchangeability
- can be manufacturer specific
- use of the interface can require royalty payments to the manufacturer

Open Standards – ISO, DIN, and Friends

Open standards are pervasive in our society. From the track width of our train systems, the diameters of the canal lids on our streets up to the bolts and nuts we use anywhere in industry we are basing our industry on open standards. It is such open standards that enable us to cooperate and compete in the market. What would a light bulb cost, if each region or canton used a different voltage?

In ICT, Open Standards specify interfaces, file formats, transmission protocols and much more. These standards are being created in a publicly accessible process and are subject to (again) public discussion and examination. Such standards are the prerequisite for producer/provider-independent interoperability. They promote the competition, since everyone, without restrictions by licenses or fees, can develop own solutions, which correspond to such a standard. Open Standards enables industry to agree on a standard and to compete on its implementation.

Example: Open Document Format

In the range of Office applications the open document format (ODF, ISO 26300, http://www.odfalliance.org) is a prime example for an open standard. The original XML file format of StarOffice/OpenOffice.org, is available today as ODF for a multiplicity of applications

(among them IBM Workplace, KOffice, Textmaker, Abiword, Gnumeric, Writely). ODF thus offers an open, standardized alternative to the proprietary formats (doc, xls, ppt) of Microsoft. Plugins for the Office Suites of Microsoft permit meanwhile the use of ODF also from Word, Excel and Powerpoint.

The fact that a standardisation of file formats is important becomes apparent with the following example. A file has to be re-opened for an audit. But the file extension looks unfamiliar and a search yields that the software which produced the file is no longer available. Even the author of such files is powerless. Contents are irrevocably lost for all times, since the appropriate software is no longer available.

Open Standards:

- enable and promote interoperability
- promote contention by competition, leading to lower prices and innovation
- prevent manufacturer dependence
- provide exchangeability of solutions
- minimize the costs of changing to a software
- give choice to users and consumers

The Right Mix Yields the Benefit

Open Source alone does not automatically lead to interoperable systems. It is easily possible to build closed systems with Open Source. In the spirit of the Participation Age we need the integration of Open Systems with Open Source, or better still with Open Standards as well. Open Systems can be implemented both with Open Source and with proprietary code. Whenever such Open Systems follow valid norms we call them Open Standards. Such Open Standards can be implemented as Open Source as well as a closed system.

In the age of Web 2.0 a combination of Open Source with Open Systems and Open Standards is the most promising approach. Participation happens not only with photo sharing and blogging but also with shared knowledge and shared code bases --- even in poorer countries, this contributing to bridging the Digital Divide.

Biography

Dr. **Hellmuth Broda** has worked since 1995 for Sun Microsystems, today as Chief Technology Officer for Global Government Strategy. In 2006 he became Distinguished Director and received the Chairman's Award for Innovation. As an elected member to the SATW (Swiss Academy of Engineering Sciences) he is active in its ICT commission and serves as vice-president in the scientific advisory board.