

## CASE STUDY: USB-IF

### Draft 2009-05-05 (Mattias Ganslandt, Jonas Andreasson and Martin Sutinen)

*Work in progress, comments most welcome!*

#### Basic facts about USB-IF

*Webpage*

<http://www.usb.org/>

*Organization tagline*

Combined SSO and marketing platform for USB technology

*Main standardization areas*

USB technology

*Best known standards*

[USB](#)

*Classification*

The non-formal organization is controlled by a handful of members. USB-IF combines all features necessary for maintaining the standard for the whole business spectra.

*Does the SSO have any explicit or implicit policy relating to interoperability?*

USB-IF states that it strives to “eliminate interoperability problems by ensuring proper implementation of USB products”. Interoperability requirements are a part of certifying a product. The USB 2.0 Adopter Agreement, which has to be signed, is also made out to promote interoperability.

*Is there an explicit strategy to facilitate or contribute to interoperability?*

USB-IF has several test labs around the world which are responsible for compliance testing of products which includes interoperability tests. There are also frequent trade shows which display interoperability of products.

*Procedures for testing of a proposed/developed standard with respect to interoperability and backward compatibility?*

Backward compatibility is incorporated in the standard development process. Testing is done at testlabs and events and there are also test suite and guidelines available from USB-IF. USB-IF supplies both testing, validation and certification.

*What are the procedures (internal or external) for implementation?*

Implementations are made by vendors which then may get them certified through USB workshops and testlabs. USB-IF offers guidelines for implementation and conformance.

*How is compliance enforced and what are the consequences of defections and deviations from the standard?*

USB-IF hold the rights to USB trademarks and conformance logos. Only certified products may use these logos. USB also have a USB-compliant product list. Failure to certify a product excludes the product from the list, however USB makes clear that this does not mean that the product necessarily is non-compliant to USB specifications.

*Did the SSO develop competing standards for the same or similar type of technical problem?*

The [IEEE](#) 1394 standard is used for the same kind of technical problem that USB addresses. Some of the IEEE 802 standards are also in competition with the USB wireless specification (Bluetooth, ZigBee, Wi-Fi).

*What is the value of interoperability in the specific area in which the SSO is active?*

Interoperability is important to the customers.

*What is the value of selection and conformity in the specific area in which the SSO is active?*

Selection is not very important since several technical solutions can coexist alongside each other while not creating a significant additional cost burden. Conformance is required for certification, which is oftentimes demanded by customers.

## Standardization Process

- Universal Serial Bus Implementers Forum was launched in 1995 and currently has 800 members.
- USB-IF focus on interconnecting devices using USB technology and is responsible for four standards: USB 1.0, 2.0, 3.0 and Wireless.
- Membership is only open to organizations.
- There are two member classes, Promoter and Participant. Advancing a new Promoter member requires approval from the current Promoter members. Participant members pay a flat fee of 4000 USD. The fees for Promoter members are not listed.
- In most cases all members are welcome into working groups but some (for example those that developed the initial drafts of USB Wireless and 3.0) are restricted to specific members. Only Promoter members are allowed to vote on approval of new standards which requires two thirds majority. There are no possibilities to appeal a decision and non-members are completely left out of the development process.
- The specifications that USB-IF develop are available for free to the public. Working material is generally only available to Promoter members and working group participants. Votes are not made public.
- The Board is the only function which may establish new working committees.

## Improvement activities

- USB-IF and Bluetooth SIG both recently received responsibility to develop the [WiMedia Alliance's](#) UWB specifications for wireless communication. This will increase the USB presence among the wireless standards.

- There is no scope for public review of standards.
- The mission of USB-IF is to promote the advancement and adoption USB technology.
- Strategic areas and actions are not released to the public.
- The closest competitors to USB-IF are [Bluetooth SIG](#), IEEE [1394TA](#) and [Wi-Fi Alliance](#). USB-IF have no official cooperation with other SDOs.

## Interoperability

- USB-IF does not state an IPR policy. Copyright of contributions is submitted to USB-IF.
- The lack of a public IPR strategy also means that there is no information on disclosure agreements.
- Interoperability test labs are situated throughout the world. Members may also participate in workshops where USB specification conformance is done.
- USB-IF provides both testing, validation and certification of standards.
- There is an absolute requirement of interoperability for products to be considered USB compliant.

## Case study

USB Implementers Forum (USB-IF) is a not-for-profit organization founded in 1995 by the group of companies which developed the specification for Universal Serial Bus (USB) and function as a forum for the promotion and further development of the USB technology.

Membership in the organization grants the right to participate in the three main activities of the organization: developer conferences, testing of products and working groups for the development of new specifications. In total more than 800 companies are members of the USB-IF and the membership fee is 4 000 USD per year. Membership exists in two levels. To become a Promoter Member the company has to be active within the research and development of USB specifications and have demonstrated leadership and dedication in accordance with the ambitions of the USB-IF. Whether a company fulfills these requirements is decided by the current Promoter Members.

The development of completely reworked versions of the USB specification, so called primary specifications, is done outside of the USB-IF. USB 3.0, the latest version, was developed by the USB 3.0 Promoter Group, consisting of [Intel](#), [HP](#), [Microsoft](#), [NEC](#), [NXP Semiconductors](#) and [Texas Instruments](#). Once they had produced the first draft for the proposed specification other members of the USB-IF was invited to contribute to the final version. Once the specification was finalized, the management of the specification was transferred to the USB-IF.

The development of complementing specifications to support the primary specifications, such as for example how a specific type of product is to use USB, is done in working groups within the USB-IF. The USB-IF is headed by a board consisting of the promoter members. In the structure below the board there is a Document Review Board and a number of working groups and subgroups. The groups develop specifications in different areas, such as mass storage, audio, video and battery charging. In most of the groups, participation is open to all members, but participation often requires that the member first sign

specific IPR agreements. Some groups are however restricted to specific members, such as the companies which contributed to the development of the USB 3.0 specification. The Document Review Board, which includes the chairs of each working group, is tasked with reviewing the working procedures of all groups and to review all proposed specifications. After the review of a proposal, a recommendation is handed to the board which takes the final decision on whether to publish a new specification.

All specifications and similar documents are made publicly available online for free. Most of the tools and procedures which are created for testing and product development are however not free, but sold in the USB-IF eStore. A lot of useful information is available in an online forum for anyone who registers, which is free but does not equate membership in USB-IF.

The USB-IF is dedicated to complete elimination of problems with interoperability when implementing USB specifications. To validate that products actually follow the specifications, the USB-IF has got a number of independent test labs situated throughout the world. Membership in the USB-IF also grants the right to participate in regular workshops, where testing of conformity with the USB specification is done. These workshops are also intended to prevent problems proactively by facilitating communication between the various vendors. Once a product has passed the tests, it is allowed to use the USB-IF logotypes and is also listed on the USB-IF Webpage as a certified product. There are currently several thousands of products which have gone through the testing procedures.

USB-IF competes with several other standards and their parent organizations. Wired standards compete with IEEE 1394 (FireWire) and with the introduction of a wireless USB competition is also increasing with other IEEE standards such as [ZigBee](#) and WiFi as well as Bluetooth. Considering this it is obvious that IEEE and organizations dedicated to IEEE standards such as the WiFi Alliance are the closest competitors of USB-IF.

### Key success factors

- The split of development of the specifications themselves and the application of the specifications in products into different organizations puts a better focus on the respective activity. This also negates interference from supporting specification hampering the development of the main specification and promotes timely development.
- The election of new Promoter Members by previous members ensures that the vision of USB-IF is kept intact and that only dedicated members achieve top level status and influence.
- The USB-IF to some extent adopt the highly successful meritocratic system that the IETF is based on but does it on a company scale instead of an individual scale.
- Control over both development and voting is highly centralized and gives a larger influence to the Promoter Members which in turn help to increase the pace of development.
- USB-IF provides several vendor oriented services which drives adoption and ascertains market deployment.