

CHALLENGES IN FIELDING "PLANNED STANDARDS"

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ABSTRACT

Standards are primarily motivated by economics, VHDL is no different in this respect. An analysis of the rationale for the introduction standards such as VHDL will be explored in terms of economic impact on the community as well as methods and challenges involved in the introduction of the standard into the community.

There are perhaps many criteria that might be used to determine whether a standard should be developed. But no matter what criteria one might use to measure standards, the major contributor is economics. That is, the expense of doing business has reached a threshold that warrants the introduction and use of a standard in order to gain an economic advantage.

Because standards are driven by economic motives, the evolution and use are balanced by the rules of a free market place. This gives rise to their being two basic types of standards. "Defacto" and "Planned". Defacto standards can loosely be called "band wagon" type standards. That is they are predominately not formal standards sanctioned by a standards body, but were introduced by an organization as a product, and have gained acceptance by the "band wagon" effect. The most notable example of this type of standard in recent years is in the personal computer arena. No one can argue the impact on the industry of the IBM PC as a defacto standard. Because they are not formal standards, and the control of the standard is totally up to the company that introduced it, defacto standards have a tendency to be somewhat unstable and unpredictable.

This leads to the introduction of the next type of standard. That is the "Planned Standard." These standards are developed out of a common need, are generally developed by a group, rather than a single company, and were introduced to enhance communication within the industry. While "Planned Standards" are not driven by the same type of economic motivation as "bandwagon" standards - greed. They are

still driven by the strong economic motivation that the cost of doing business has reached a threshold so that a standard is necessary to keep costs down.

VHDL - IEEE 1076-1987, ADA, and EDIF are examples of Planned Standards. As such they have different attributes than defacto standards and a different path of introduction into the community.

By its very nature defacto standards are accepted and already inserted into the community. The problem with these standards is one of instability.

In general, since Planned Standards, were developed to fill a void there is not the same degree of economic necessity as in a defacto standard. The primary reason that the defacto standard is a defacto standard is that a company comes out with a product using the standard and others get on the bandwagon to ride the economic wave. Since "Planned Standards" are developed and are not fielded at the point of standardization, insertion into the community is different time phasing than the defacto standard. There are challenges involved in getting a Planned Standard fielded.

While there are economic motivations involved with a Planned Standard, they are not as strong as that of the reactionary profit motive incentive of most defacto standards. Since "Planned Standards" are designed to fill a void in that there may not be a standard in place, there is in general something that is in use by companies already that may be somewhat equivalent to the standard. In the case of VHDL while there was no standard Hardware Description Language, there are some seventy languages in use that are classed as HDL's. In the case of EDIF, one of the primary objectives is to replace a defacto standard, GDSII, with a formal one. As such there is a transition period before the "Planned Standard" is effectively fielded. Some of the challenges are discussed below.

After a standard is created, balloted, and published the work has just begun. Everyone wants information. Information must be available at low cost, and in plentiful supply. Dissemination of information is perhaps the most complex problem in fielding a standard. Managing this information flow is a formidable task. The standards body that created the standard is generally ill equipped to handle the problem. The standards body basically just ballots, approves and, publishes the standards. Thus other facets of the professional organization must be utilized in order to disseminate information. Since all of the professional organizations are voluntary, organizing a well organized program of information flow presents challenges.

The length of this transition period depends on many factors. In the case of standards like VHDL, several items are critical in effectively and expeditiously fielding a new standard. Perhaps the most important issue that must be addressed is education. In order for a new standard to be effectively fielded, the community must understand how to use it. Not only is it important to institute seminars, workshops, and more formal training programs for the standard, but the standard must be inserted into the educational system. This is itself a difficult task, because academic institutions characteristically do not get that involved with standards.

Because software standards are complex and expensive to implement, it is difficult to get universities to invest valuable resources in developing tools that take a lot of manpower or take a long time. Rather, university participation must be couched in the realistic terms that if a single graduate student cannot do a complete tool by himself to get his thesis requirement met universities will not develop a tool. They will however use a tool. However, that too comes with constraints. Universities are notorious for not having funds to purchase and maintain software. With that constraint, getting standards into university hands is challenging.

Not only is it important for the technical people to be aware of a standard, but management must be trained as well. This is especially true for new technology.

To facilitate the insertion of the standard, especially software standards like VHDL, there must be good tools developed for the standard as expeditiously as possible. It takes time to develop the tools and there is a lag in bringing the tools to market. In general tools are expensive to develop and commercially are pretty much dependent on variables such as the current economic condition.

The community must sponsor user groups, and develop practices for use of the standard. This is a difficult task to accomplish because professional groups are voluntary. Because of this voluntary nature of the groups, getting things accomplished in a timely manner is difficult.

Ideally there is a stimulus to use the standard, in the case of VHDL that stimulus will be first applied by the government in requiring its use on programs and giving guidance on its use in conjunction with industry and academia.

In summary, "Planned Standards" such as VHDL-IEEE 1076-1987, are different than defacto type standards. Fielding these standards involves planning and coordination between the standards groups, industry, academia, and government. Most of the problems discussed above are being addressed for VHDL by a combination of efforts by the IEEE, government organizations, and academia. But the task of fielding a standard, however rewarding, is much larger than anyone involved in the standardization process would have thought. In retrospect that is probably because if a person had gone through the exercise once, he would not volunteer for a second.