

Diversification and Challenges of Software Engineering Standards

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"In the future, should there be just one software engineering standards set? If so, how can we work towards that goal? What are the challenges of internationalizing standards?"

Based on my personal view, the statement of my position is as follows: "There should not be just one set of software engineering standards in the future. At the same time, there should not be the proliferation of standards, and the number of sets of standards should be kept to a minimum. "

It is important to understand the diversification of the areas which are spanned by the software engineering standards (See Reference 1).

1. Diversification of processes

Software engineering is a diverse field and involves many processes. Using the classification of processes established in Reference 1, these processes include the primary processes, support processes, and organizational processes. Examples of the primary processes include acquisition, supply, development, operation and maintenance; examples of the support processes include configuration management, quality assurance, documentation, verification, and validation. In addition, management, infrastructure, improvement, and training are examples of the organizational processes.

2* Diversification in the national and international character of standards organization

There are a dozen standards organizations which produce software engineering standards on a national or multi-national level (See Reference 1). Examples of national standards organizations are the American National Standards Institute (ANSI), Canadian Standards Association (CSA), British Standards Institution (BSI), Japanese Industrial Standards (JIS), and Deutsches Institut für Normung e.V. (DIN). An example of a multi-national standards organization is the European Committee for Standardization (Comité Européen de Normalization, CEN), which draws on the participation of a group of European nations. International organizations which develop software engineering standards include International Organization for Standardization (ISO), international Electrotechnical Commission (IEC), Joint Technical Committee 1 (JTC1) which is a joint committee from ISO and IEC for information technology, international Atomic Energy Agency (IAEA) and International Telegraph and Telephone Consultative Committee (CCITT).

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3. Diversification of the professional organizations producing the standards

These organizations represent the interests of the related professions. Examples of professional organizations are Institute of Electrical and Electronic Engineers (IEEE), American Institute of Aeronautics and Astronautics (AIAA), American Society of Mechanical Engineers (ASME), and American Society for Testing and Materials (ASTM).

4. Diversification of the types of businesses and industries

By far there is more diversification in this category than the other categories. Examples include DoD, NATO, Electronics Industry Association (EIA), National Institute for Standards and Technology (NIST), Federal Food and Drug Administration (FDA), Air Transport Association of America, and United Kingdom Department of Trade and Industry (UK DOTI).

Is it possible to have a single set of software engineering standards which can accommodate the four categories of diversification presented above?

Yes, it is possible, but highly unlikely, to have just a set of software engineering standards. It is not even desirable, since a single set of standards, if it ever exists, will have to be all-encompassing and may be too inclusive and broad to be useful.

What are the challenges of internationalizing standards? Let me suggest the following:

1. Maximize the use of the existing international organizations CCITT, IAEA, IEC, and ISO. JTC1 is a good example of cooperation between two well-known organizations.
2. Encourage more international participation in IEEE standards activities. Even though most of the activities and participation of IEEE are centered in North America, IEEE is inherently international in character. For example, there was a marked increase in European participation when the Software Engineering Standards Symposium 1993 was held in Brighton, England.
3. Encourage feedback from the international producers and users of standards, and maximize the use of the Internet for communications.
4. Minimize standards proliferation by consolidating the appropriate software engineering standards.

REFERENCE 1. "Survey of Existing and In-Progress Software Engineering Standards, Version 1.0," Software Engineering Standards Imaging-Range Study Group, December 1, 1993

This work was supported by the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration,