Review of Engineering Rules: Global Standards Setting since 1880

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30 September, 2021

This insightful 2019 book is divided into 9 chapters and includes 338 pages of text with a very extensive bibliography which includes private records, a detailed index and acronym list. The authors explain technical standardization [establishing similarity and compatibility standards] since 1880 as occurring in three waves: national standardization (1880-1930 3 chapters), international standardization (1930-1980 3 chapters) and global standardization (1980-2017 3 chapters). The three waves of standardization presented, are not so different as the authors recognize, represent the evolution of standardization due to the increasing significance of technology.

The first four chapters provide a detailed history of national and international standardization organizations (specifically Western standardization, as technical standardization was limited in other parts of the world) and their major participants between 1880 and the end of World War II. These four chapters represent about half the book.

The authors identify multiple individuals who developed, refined and promoted the now world-wide technical standardization organizational structure and procedures. These four chapters are worthwhile reading for anyone interested in the basic concepts underlying many technical consensus standardization organizations, the history behind how these organizations operate and to appreciate the altruistic standards entrepreneurs (the author's term) who sometimes devoted their working careers to creating and supporting the early national and international standardization organizations.

The author's extensive research identifies the characteristics of standards entrepreneurs: significant technical skills, advanced diplomatic skills, and a recognition that technical consensus standardization makes the world a better place. Not surprisingly, there is always a shortage of such people.

The general history of consensus standardization presented through WW II (first 4 chapters) changes to specific standardization project histories after WWII. Included are standardization histories (based on earlier histories) of shipping containers (considered a success) and color television (considered a failure). Since both standardization efforts resulted in multiple incompatible variations, it is not clear why one is seen as a success and one is seen as a failure.

The standardization work on radio frequency interference (RFI) and electromagnetic compatibility (EMC) from the end of WW II to the 1980s in Chapter 6 is described in greater depth and represents an original history of this significant work based upon standardization committee documents. This history identifies that the "success" of standardization may be less

in the reduction of variation and more in establishing a wider technical understanding of how the variations differ, which over considerable time brings about some forms of convergence.

Chapter 7, addressing the standardization of the internet, is based on earlier histories of the Internet. While a clear history of how the internet emerged is presented, the reasons behind the success of the internet verses the alternative (ISO and ITU) standardization activity are not recognized. The authors identify that ISO usually standardized existing technology - responsive standardization. Standards must come first when establishing a communications channel. The ITU, which usually standardizes communications channels, supports anticipatory standardization. The authors note the IETF (internet standardization organization) rejected anticipatory standardization in favor of multiple implementations during standardization which is participatory standardization. This was possible because the IETF standardized just the IP and TCP protocols which were in the middle (layers 3 & 4) of the open system interconnect (OSI) seven layered model of communications from ISO.

The ITU attempted, impractically, anticipatory standardization of all the layers of the OSI model. The IETF applied participatory standardization to standardize protocols in the middle two layers. Then any lower layer communications channel (layers 1 & 2) could be designed to transport the IP and TCP protocols and any application (layer 5 in the IETF layer model) could be designed to transfer data and control over these same protocols.

The reason for the success of the IETF standardization was a new approach to technical standardization which took advantage of the layered model of communications systems developed by ISO.

Chapter 7 goes on to describe the rise (1980 forward) of standardization consortia including the World Wide Web Consortia (W3C) as the next wave of global standardization, The W3C and many other consortia operate on a global basis, not national or international. The limits on consensus standardization in the IETF, W3C and other consortia and how consensus may be expanded when consortia standardization is promulgated by ISO or the ITU is discussed.

Chapter 8 is quite interesting as it describes the work of one W3C committee, on the project WebCrypto, from launch to recommendation, a 4 year period. This offers a non-participating and more people oriented view of a technical standardization committee's operation that explains how personalities and different commercial goals impact the results of one standardization process.

Chapter 9 offers another standardization view, discussing the rising need, not fulfilled by governments, for global quality, environmental and social responsibility standards and the financial success of ISO and many other consensus standardization organizations in addressing these society wide requirements. A balanced discussion (applause) of the economic and political aspects of these society wide standardized requirements is presented.

This book presents the rise of national consensus standardization, which evolved into the rise of international and global standardization and concludes with discussing how many different organizations are trying to augment national political processes by establishing global solutions for societal needs. Where there is a need, evolution engenders many possible solutions. The political will that may sort through these possible solutions is just emerging. The next succession of technical standardization - adaptability standardization (e.g. machine learning), could change the entire issue, e.g., by negotiating among different solutions to societal needs.

Engineering Rules, similar to consensus standardization, is a long and winding trip which explains how consensus standardization continues, not usually as expected, to make the world a better place.