Viewpoint ■

The Decline and Fall of Esperanto:

Lessons for Standards Committees

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Abstract In 1887, Polish physician Ludovic Zamenhof introduced Esperanto, a simple, easy-to-learn planned language. His goal was to erase communication barriers between ethnic groups by providing them with a politically neutral, culturally free standard language. His ideas received both praise and condemnation from the leaders of his time. Interest in Esperanto peaked in the 1970s but has since faded somewhat. Despite the logical concept and intellectual appeal of a standard language, Esperanto has not evolved into a dominant worldwide language. Instead, English, with all its idiosyncrasies, is closest to an international lingua franca. Like Zamenhof, standards committees in medical informatics have recognized communication chaos and have tried to establish working models, with mixed results. In some cases, previously shunned proprietary systems have become the standard. A proposed standard, no matter how simple, logical, and well designed, may have difficulty displacing an imperfect but functional ''real life'' system.

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Growing up in 19th century Poland, Ludovic Zamenhof (1859–1917) faced a plethora of languages. His own family spoke Polish and Yiddish, the official government language was Russian, and his neighbors were Lithuanians and German-speaking Poles. Sadly, Zamenhof witnessed firsthand, in his homeland, the often violent struggles between different ethnic groups and concluded that the diversity of languages was the main cause of division in the human family.

Although his training was in ophthalmology, Dr. Zamenhof had lofty nonmedical aspirations—to unite the world through a common language. At first he thought the solution was to revive Latin or classic Greek, but his own studies of those tongues quickly convinced him that they were far too complex. Instead, over a period of years he devised an ''artificial,'' or planned, language. In 1887, Zamenhof introduced Esperanto[1,2]; the name means ''one who hopes.'' The lexicon had a Romantic influence, while the syntax and morphology resembled those of Slavic languages. Esperanto was designed to be easy to learn and pronounce—the grammar was simple, verbs were never irregular, spellings were always phonetic.

Certainly the logic was appealing. There are perhaps 5,000 different languages in the world today. Whenever two people of different ethnic origins converse, the non-native speaker is always at a disadvantage. Wouldn't international communication be facilitated by a standard language, one that is simple, politically neutral, and independent of cultural bias? Could a common tongue bring peace to a bloody, war-torn Europe? Such was Zamenhof's vision.

Reception of Zamenhof's efforts was mixed—Tolstoy praised the idea and claimed to learn Esperanto in just a few hours. The Czar smelled a seditionist plot and, in 1895, banned all materials written in Esperanto. Despite opposition, a number of enthusiasts began studying Esperanto. The rudimentary components proposed by Zamenhof soon evolved into a blossoming language that seemed destined to become the international lingua franca. Works translated into Esperanto included the Old Testament and Shakespeare's *Hamlet*. Original literature written in Esperanto also appeared, penned by a growing cadre

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of speakers. After World War I, the League of Nations received a favorable report on the language from its Assistant Secretary-General. At the same time, in Germany, Hitler denounced Esperanto in *Mein Kampf* as a tool of Jewish world domination, and outlawed all Esperanto organizations.

After the Second World War, Esperanto became increasingly popular in Eastern Europe and China, where governments saw the need for a common language but were wary of the American ideology that could accompany English. In the rest of Europe and the United States, Esperanto did not generate as much interest. Despite this snub from the West, by the 1970s, Esperanto was receiving serious attention from linguistic scholars, with numerous publications appearing in academic journals. Perhaps two to five million people studied or spoke Esperanto. Conventions were held; periodicals and more books appeared. Zamenhof would have been justifiably proud, but he did not witness the fruits of his labor. He died during World War I, when men who couldn't speak the language of their foes fought and died by the millions for nationalistic causes.

What has happened to Esperanto in recent years? Has it flourished and become the international language of choice? Well, not exactly. After the heady days of the 1970s, scholars turned their attention elsewhere, and interest in Esperanto, if not dwindling, is growing at a painfully slow rate. There was talk of making Esperanto an official language of the new European Union, but this has not happened.

Instead, English has become the closest thing to an international language. Close to a billion people either know or are learning English, a language with idiosyncratic syntax and grammar, nonphonetic spelling, and attendant cultural biases. How could this bastardized form of low German achieve such stature? What about the dream of a neutral, standard, planned language?

Esperanto, despite its intellectual appeal, was simply not practical. It was no one's mother tongue; finding other speakers outside conventions was nearly impossible; and it wasn't even a true standard, as unofficial words appeared and spread. English, on the other hand, is the contemporary language of science and research, financing and investment, music and movies. When the Berlin Wall fell, English flowed over the rubble. Even on the Internet, which some consider the only true vehicle of international communication, English is the language of more than 80 percent of Web sites, while only relatively few Esperanto pages exist. Esperanto retains a certain cerebral charm, but English is far more practical.

Does the history of Esperanto hold any lessons for the struggle for standards in the informatics community? The two situations have many parallels. For both human communication and the sharing of medical information, two sides need to speak a common language, ideally one that is neutral and does not confer special privilege on one of the parties. For those who work in medical informatics, the lack of standards is a well-known source of frustration. Data may be in digital form, safely cocooned in one proprietary system, and completely inaccessible to providers who could benefit from access to the information but have the misfortune of working with a different vendor.

The obvious solution to this informatics tower of Babel is to establish standards, which is the work of standards committees. The first medical data standards committee was American Society for Testing and Materials (ASTM) E31, established in 1970 for the purpose of defining standards related to medical information. The first open-consensus medical data exchange standard was E-1238,[3] first published in 1988. It specified a data exchange standard for sending clinical laboratory results between heterogeneous computer systems. Besides ASTM E31, current standard committees include Health Level Seven (HL7), Digital Imaging and Communications in Medicine (DICOM), European Committee for Standardization Technical Committee 251 (CEN TC 251), American National Standards Institute (ANSI) X12N, National Committee on Prescription Drug Programs (NCPDP), Institute of Electrical and Electronic Engineers (IEEE) Committee 1073, and CORBAmed, the medical domain task force of the Object Management Group. These groups address the specific problems of sharing images and clinical, financial, and administrative data between medical devices and heterogeneous medical computing systems.

To date, standards committees have produced some notable successes. For example, the DICOM standard[4–6] is used almost universally for the transmission of medical images. The HL7 standard[7] is the predominant standard for communicating clinical data, and ANSI X12N is widely used for transmitting patient administration and billing data. The use of LOINC (Logical Observation Identifiers, Names, and Codes)[8–10] facilitates the sharing and comparison of laboratory data. These standards have reduced the time and cost needed to create interfaces between disparate medical computer systems.

Major communication problems remain to be solved, however. In some domains, competing standards exist, resulting in redundant work by those who develop and implement the standards. The reference in-

formation models, message syntax, and terminologies used in these standards may all differ. Each time an interface is implemented, point-to-point negotiations arise between interfacing parties over terminology and other interface details. Thus, even though the interfaces should save time and money, true plug-and-play interoperability has not been achieved in medical standards in the same way that it has in stereo components or automobile parts. As the saying goes, The problem with medical information standards is that there are so many to choose from!

A key to successful standards is to not let ''perfect'' get in the way of ''good.'' An example can be taken from the IEEE MEDIX work, where the intent was to have a strong formal model on which to base the semantics of medical data exchange. However, at the time of the initial endeavor, the building of a complete formal model using existing tools and volunteer labor proved infeasible. Eventually the MEDIX project collapsed under its own weight.

The HL7 organization took a different, more pragmatic approach. Members made their best guess about what would work, without the benefit of a strong formal model, and then built interfaces based on a simple design. If something didn't fly, they fixed it and tried again. Version 1 of the standard was never widely implemented because of its many shortcomings, but trial and error resulted in an improved version 2, and subsequent versions of the HL7 standard proved even more useful and were more widely accepted. In a twist of irony, better tools and development processes have now made it possible for HL7 to pursue the original goals of MEDIX, and the establishment of a formal reference information model has been crucial in developing the HL7 version 3 standard. Some good ideas just have to wait for technology to catch up with them.

Similarly, the first version of the DICOM standard had a problem like that of the MEDIX standard. It included not only a syntax for transmission of images but a specification for unique network connectors and network protocols optimized for fast image transmission. The initial version was not widely accepted, because participating institutions did not want to support a separate network for image transmission, even though the design was technically superior to what was already in place. Wisely, the second version of DICOM was implemented using readily available industry-standard network connections and protocols.

Recognition of communication chaos, the proposal of neutral standards and their attempted dissemination, failure of the standards to achieve universal approval, and reluctant acceptance of flawed but workable substitutes—these are common themes for both Esperanto and informatics. The bottom line seems to be that a proposed standard, no matter how logical and well intentioned, will not flourish if it overlooks the practical issues inherent in ''real life'' systems. As one informatics guru remarked, ''You can design all the standards you want, but in the end you have to do it Microsoft's way.'' This statement represents both a degree of hyperbole and a dose of reality. The key for standards committees is to find the narrow line between developing superior but difficult-to-implement standards and exploiting imperfect but functional strategies that build on existing systems. Such an approach may not always be aesthetically pleasing, but it could hasten the growth and development of our specialty.

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