

History of Machine Translation in the United States

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Background

- 2012 contacted by Routledge Publishing to write an article with Jost Zetsche on “The History of Translation Technology in the United States” for the *Routledge Encyclopedia of Translation Technology*, published 2014
 - 2019 contacted to write an update, to be published in 2022
 - Discussed with AMTA and ATA leadership that this is a topic to cover as a community
- Like most people in this audience, I have:
 - Taught classes and workshops that included MT and NLP history
 - Provided conference presentations on the history
 - Been around for much of MT development
 - Always had a passion for MT anthropology
- In this presentation, I would like to describe:
 - The history of the history of MT
 - Reality Check: Xerox
 - Gaps
 - Recommendations



The History of the History of MT: W. John Hutchins

1939 – 2021

- 1960 Graduated with a bachelor's degree in French and German
- 1962 Obtained a diploma in librarianship
- 1962-1998 Worked as a librarian, publishing in translation and information retrieval
- 1978 Authored "Machine Translation and Machine-Aided Translation" in the *Journal of Documentation*
- 1986 Authored *Machine Translation: Past, Present, and Future*
- 1992: Co-authored with Harold Somers: *An Introduction to Machine Translation*
- 2000: Authored: *Early Years in Machine Translation* (author/editor)
- 2015: Authored: "History of Research and Applications" in *The Routledge Encyclopedia of Translation Technology*
Developed *MT Compendium of Translation Software*

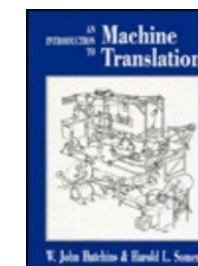
Ending in 2014? No prototypes or short-lived products

Donated his extensive library to the MT community (John W. Hutchins Machine Translation Archive)

Somers: "What perhaps many did not realize is that John's work on MT was entirely a labor of love, a kind of hobby, all completed in his own spare time: his job as a librarian did not include working on the MT Archive, nor I think did his employers properly realize and reward his fantastic contribution to the field. We were extremely fortunate to benefit from his skills: from a scientific viewpoint he was an informed observer free of any of the prejudices of the developer or researcher with his own theories and approaches to push."

Summary: Dedicated, detailed, objective librarianship

But ending around 2014; software compendium not covering prototypes and short-lived products; British focus



A Small Sample of Other Historians

- Harold Somers
 - 1915 - 2001
 - Hutchins, W. J., & Somer, H. L. (1992). An Introduction to Machine Translation
 - 1978 Retired
- Andy Way
- Chris Wendt
- Steve Richardson
- Mike Dillinger
- Jay Marciano
- Kathleen Egan (retired)
- DARPA and CAMT Program Managers
- Others in U.S. Government, but constrained in what they can say

Summary:

More U.S. involvement

Many teaching courses and/or providing tutorials on Intro to MT

Little in U.S. Government operations

The Tenth Biennial Conference of the
Association for Machine Translation in the Americas

Introduction to MT



Mike Dillinger
Ebay
Jay Marciano
Lionbridge
Technologies

SAN DIEGO, CA
OCTOBER 28 - NOVEMBER 1, 2012

A Selection of Other Histories

- Timelines
 - Wikipedia
 - TAUS



- 2022
 - TAUS launches Data-Enhanced Machine Translation
- 2021
 - TAUS Named as a Representative Vendor in Gartner Market Guide for AI Enabled Translation Services
 - TAUS and SYSTRAN Form a Strategic Alliance to Address Domain-specific Machine Translation
 - TAUS and Interto Partner for Enhanced Language Data Solutions
- 2020
 - TAUS launches the Data Marketplace
 - TAUS and Baker McKenzie Publish White Paper on 'Who Owns My Language Data'
 - TAUS hosts virtual conference to discuss the reinvention of the translation industry
- 2019
 - TAUS launches Matching Data
 - TAUS Partners with SYSTRAN to Provide Users with Stellar Training Data
 - TAUS Forms New Partner Foundation Board
- 2018
 - TAUS publishes manifesto for Fixing the Translation Ecosystem
 - TAUS launches eLearning Platform
 - Paula Shannon becomes TAUS spokeswoman

- Short histories
 - Wikipedia
 - IBM
 - Systran
 - AMTA
 - Many others

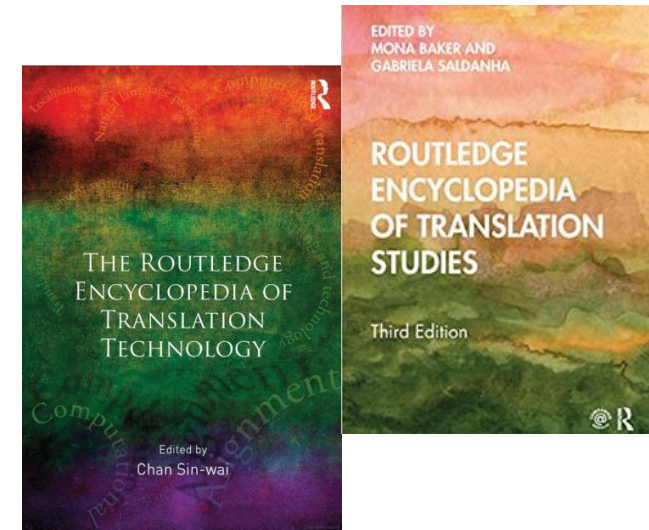
Year	Month and date (if available)	Event type	Event
1924	February	Proposal	The first known machine translation proposal was made in Estonia and involved a typewriter-translation.
1933	July 5	Proposal	Georges Aronson patents a general-purpose device with many potential applications in France. He seems to have been working on the device since 1929. ^[1]
1933	September 5	Proposal	Peter Petrovich Troyanski is awarded an author's certificate (patent) for a proposal to use a mechanized dictionary for translation between languages. ^{[1][2]}
1930-1944		Proposal	Troyanski approaches the Academy of Sciences in Russia with his proposal for machine translation, seeking to work with linguists. Discussions continue till 1944, but not much comes out of it. ^[2]
1949	July	Proposal	Warren Weaver, working for the Rockefeller Foundation in the United States, puts forward a proposal for machine translation based on information theory, successes of code breaking during the second world war and speculation about universal underlying principles of natural language. ^[1]
1954	January 7	Demonstration	The Georgetown-IBM experiment, held at the IBM head office in New York City in the United States, offers the first public demonstration of machine translation. The system itself, however, is no more than what today would be called a "toy" system, having just 250 words and translating just 49 carefully selected Russian sentences into English — mainly in the field of chemistry. Nevertheless, it encourages the view that machine translation was imminent — and in particular stimulates the financing of the research, not just in the US but worldwide. ^[4]
1958-1960		Report	In 1958, linguist Yefimovskiy Ilya-Hiliet travels around the world visiting machine translation centers to better understand the work they were doing. In 1959, he writes up a report (intended primarily for the US government) pointing out some key difficulties with machine translation that he believed might doom the efforts then underway. An expanded version of the report is published in 1960 in the annual review journal <i>Advances in Computers</i> . ^[3] His main argument was that existing methods offered no way of

Summary: Documentation by companies (some—like IBM and SYSTRAN—focusing only on their own contributions), professional organizations, blogs, and Wikipedia

A Selection of Other Resources

- Publications (e.g., Routledge)
- Conference tutorials and presentations
- The W. John Hutchins MT Archive
- The EAMT Software Compendium
- AMTA Resources
- ACL Archives

Summary: Massive information but little curation, except in history-focused publications, tutorials and presentations



Reality Check: Xerox

- From: *An Introduction to Machine Translation* (Hutchins and Somers 1992)
 - Also checked Hutchins' *Machine Translation Past, Present, and Future (1986)* and *Early Years in Machine Translation (2000)*
- “Xerox installed Systran in 1982 for technical manuals,” using “Multinational Customized English (MCE),” which had about 3000 words and “rules for unambiguous English”
- “At Xerox, texts for translation by Systran are composed in a controlled English vocabulary and syntax; and a major feature of the SMART systems is the pre-translation editor of English input.”
 - **Not mentioned:**
 - Areas in source document would be highlighted for editing
 - Corresponding output would be highlighted to alert post-editors
- “The texts that their writers produce are clearer and more understandable”
 - **Not mentioned:**
 - The MT output had more consistent terminology
 - Some technical writers refused to use the pre-editor
- “Output from the system needs little or no post-editing”
 - **Not mentioned:**
 - The system reduced the highly valuable time at the end of the production cycle, when companies would start waiting on purchases until the new version came out
 - The system also reduced the time to produce last-minute revisions and post-shipment revisions.
- No discussion of Xerox DocuTrans
 - In 1989, Xerox provided MT from multiple engines with pre-editing and post editing, including confidence measures
 - Combination of SMART, SYSTRANn, and METAL (Mechanical Translation and Analysis of Languages, started by the Air Force)

Summary: No mention of key applications, confidence measures, post-editing tools, or multi-engine configurations
No mention of refusal by some technical writers to use pre-editor

Gaps

- **Time**, particularly before 1980 and after 2014
 - Due to lack of digitized resources and loss of key librarians
- **Efforts by the U.S. Government**, except for DARPA, IARPA, Wright Patterson Air Force Base, and occasionally a few general papers
 - Due to constraints on what could be publicly released
- **Efforts by LDS Church and other religious organizations**
 - Due to constraints on the quantity of data that could be handled
- **Lack of detail** (e.g., Xerox example)
 - Due to constraints on the quantity of data that could be handled
- **Lack of larger context** (e.g., histories of translation theory and practice, innovation, computer technology, popular culture, etc.)
 - Due to the constraints on the quantity of data that could be handled
- **Lack of information on how practices and decisions turned out** (e.g., Xerox pre-editing interface led to some groups not using the system)
 - Due to lack of time and/or focus
 - Maybe due to Hutchins waiting to see if the system had longevity

Why Try to Fill These Gaps and Provide Analysis?

- Identify best practices (e.g., responding to user feedback)
- Identify requirements and motivations that may have been forgotten (e.g., user interfaces)
- Analyze trends and identify areas of high potential
- Provide long term evaluation of processes and products (e.g., pre-translation editing)
- Improve planning through understanding the accuracy of past projections and forecasts
- Recognize outstanding work
- Protect and celebrate our remarkable history of MT, that helps to build our sense of community

Recommendations

- Address underrepresented areas (e.g., through AMTA panels)
 - Before 1980
 - After 2014
 - Efforts by the U.S. Government
 - Efforts by the LDS Church and other religious groups
 - Long-term results
- Plan AMTA panel on U.S. Government work in MT
 - Obtain more detail on work
 - Obtain official government disclosure and perhaps push the bar on what can be disclosed
- Plan cross-government panel at IAMT
 - Obtain more detail on work
 - Obtain more insights and ideas
- Encourage historical analysis as a field of research in MT/NLP
- Review and encourage expansion histories, timelines, and databases
 - AMTA site
 - EAMT site
 - Wikipedia
 - Publications
 - Company sites

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