

magazine for international information management

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APRIL 2017

Artificial Intelligence: The new face of technical communication?

Are bots and robots threatening our jobs?



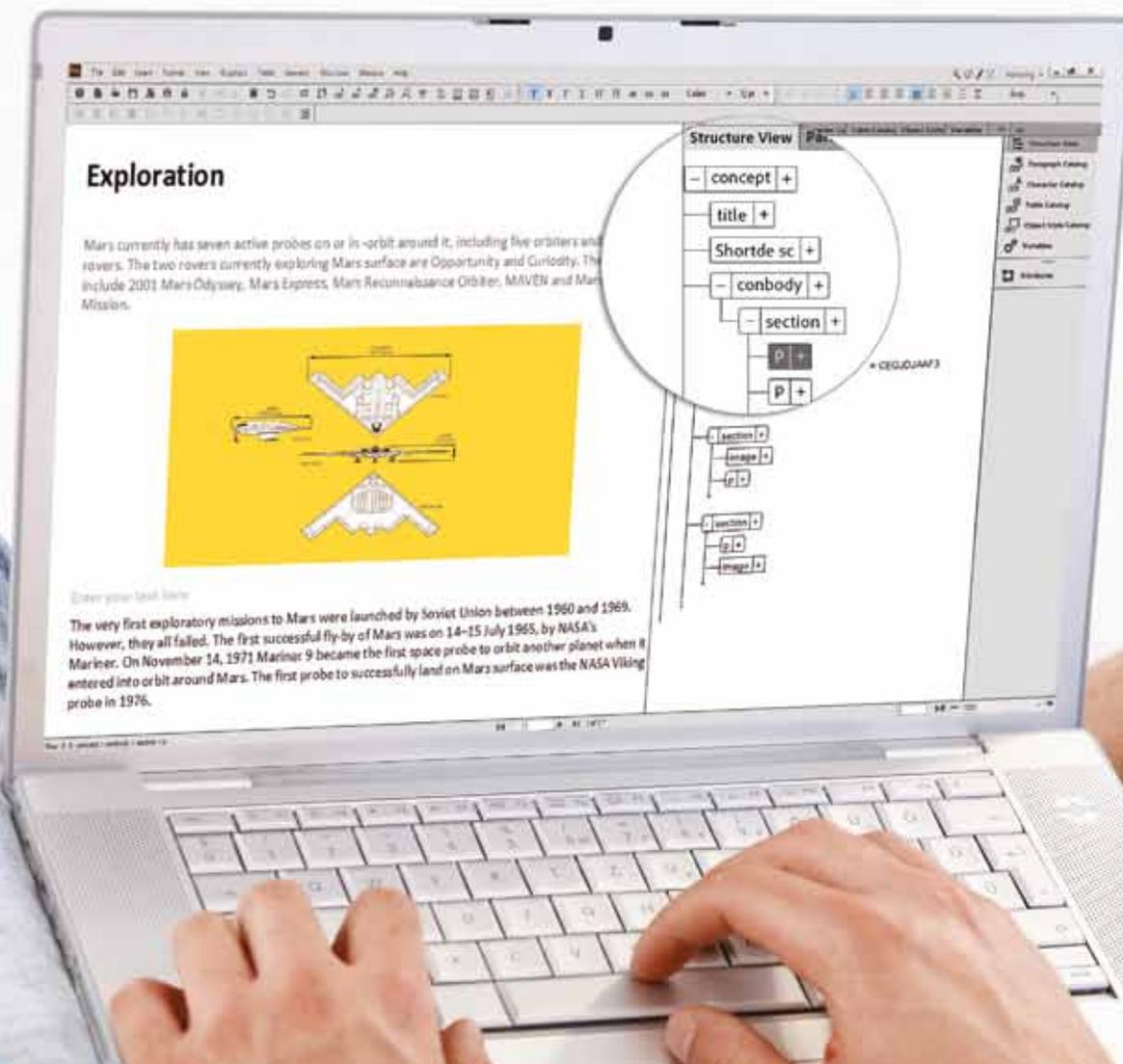
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From the editor

The next industrial revolution

Back in late 2015, chatbots were predicted to become the Next Big Thing for 2016 – a prophecy that has certainly been fulfilled. Over the year, many major brands ranging from Facebook and Skype to the Washington Post and Barbie brought out whole sets of bots. Chatbots mimic human conversation using Artificial Intelligence and thus enable customers to make a purchase or solve a problem with just a few messages.

The broad adoption of chatbots is greatly owed to advances in machine learning capabilities. Voice recognition – the transcribing of the spoken word into text – and natural language processing – a computer's ability to derive commands from a piece of information – has seen

error rates drop from over 30 to below five percent. This means that the technology is mature enough to be used and there are plenty of companies who have implemented it successfully to support customers.

But what about user assistance? Can we use voice recognition and natural language processing to help customers operate our products or fix malfunctions? It is agreed that voice recognition works best in a narrow and predictable domain. This means that we need to forecast what the user might ask. And users might need to know what they can ask for and in what manner. Could user assistance really ever become that predictable?

In this issue of our magazine, we shed light on these advancing technologies and their meaning for technical communication. And there are much wider implications, too, which is why we can expect Artificial Intelligence to dominate discussions right through society for many years to come. Only recently, the European Parliament released a resolution predicting that “humankind stands on the threshold of an era when ever more sophisticated robots, bots, androids and other manifestations of artificial intelligence (“AI”) seem to be poised to unleash a new industrial revolution, which is likely to leave no stratum of society untouched [...]”

Corinna Melville



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Artificial intelligence: The new face of technical communication

Bots and robots are getting smarter every day. But how good are they at assisting customers? Are they ready to become the next generation of technical communicators?

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How tech teams can help their companies turn to content automation

With their thorough insight into using modular, reusable content, tech teams are well-suited to advocate content automation right across their organization.

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Three collaboration tools for technical communicators

How GitHub, Slack and Mural can facilitate teamwork and make your job easier.

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THE ROI OF STRUCTURED CONTENT

Language technology and services provider SDL has developed an infographic revealing the benefits of structured content to the creation and delivery of content. The graphic titled Discover the ROI of Structured Content looks at the effects of optimizing centralization, content reuse, findability, versioning, translation, and multichannel delivery.

www.sdl.com

LIONBRIDGE ACQUIRES EXEQUO

Lionbridge Technologies, Inc. has announced the acquisition of Exequo, a privately-held audio production, translation and localization company that specializes in global video game services. With this acquisition, Exequo will become part of Lionbridge Game Services, a rapidly-growing service of Lionbridge that provides a full suite of end-to-end localization and testing services for platform holders and game and entertainment studios.

www.lionbridge.com

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Adobe has unveiled its Experience Cloud, a comprehensive set of cloud services designed to enable enterprises to deliver exceptional customer experiences. Composed of Adobe Marketing Cloud, Adobe Advertising Cloud and Adobe Analytics Cloud, Experience Cloud is built on the Adobe Cloud Platform, Adobe's underlying, cross-cloud architecture that unifies content and data. Adobe and Microsoft also announced the availability of their first set of joint solutions focused on transforming customer experiences.

www.adobe.com

STRAKER ACQUIRES ELANEX

Straker Translations, a cloud-enabled translation services provider, has acquired Elanex, a San Francisco-based company specializing in technology, retail, energy, financial translations and over-the-phone interpretation services.

www.strakertranslations.com

REPORT ON NEURAL MT

Research firm Common Sense Advisory, Inc. has published the report *Neural MT: Sorting Fact from Fiction*. The brief looks at what neural machine translation (MT) is, how it works, and where it will fit in the language technology landscape.

www.commonseadvisory.com

Survey on the size and growth of the global language services and technology market

The market for outsourced language services and supporting technology grew 5.52 percent to US\$ 40.27 billion from 2015 to 2016, according to independent market research firm Common Sense Advisory (CSA Research). The firm predicts it will grow an average of 2.82 percent over the next four years, with a cumulative growth rate of 11.77 percent over that period. Regions will grow at different rates, affected by local conditions. These findings are a result of the firm's annual study, a comprehensive global survey of private and publicly-traded language service and technology companies.

The firm has also launched its 13th Annual Global Market Survey. In this independent, large-scale industry market survey, the firm will study and analyze the growth of the industry, providers, and services based on business results for 2016.

The findings, which are published mid-year and part of CSA Research's primary and original research offering, include rankings of the largest private and public language services and technology providers globally and regionally, market size estimates, the fastest-growing services in the industry, and a breakdown revealing market size estimates for on-site interpreting, translation technology, machine translation post-editing, video interpreting, mobile and game localization, and other in-demand services.

The survey is available through May 1, 2017 at <http://tinyurl.com/jhejkuw>

www.commonseadvisory.com



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Byte Level Research publishes its Web Globalization Report Card

Google emerged on top of the 2017 Web Globalization Report Card, published in February 2017 by Byte Level Research. "Google has long been a language pioneer, now supporting more than 100 languages via Google Translate and 725 languages for Gmail," said report author John Yunker. "But it's not just languages that make a website succeed globally. Companies need to support fast-loading mobile websites, locally relevant content, and user-friendly navigation."

For 2017, Byte Level Research studied 150 websites across 15 industry categories – and more than 80 percent of the Interbrand Best Global Brands. Websites were graded according to languages supported, global navigation, global and mobile website architecture, and localization.

Notable highlights include:

- Wikipedia is far and away the language leader, with content in more than 290 languages. The company also now supports a mobile-friendly layout that is considerably more effective than most Fortune 100 mobile websites.
- Consumer goods companies such as Pampers and Nestlé are good examples of non-tech

companies that are making positive strides in improving their website globalization skills.

- IKEA returned to the list this year after making a welcome change to its global strategy.
- Nissan made this top 25 list for the first time, having launched a new world-ready global design and improved global gateway.
- As a group, the top 25 websites support an average of 54 languages, up from 52 last year.
- NIVEA provides an excellent example of a company that localizes its models for local websites – one of a few companies to do so.
- The average number of languages supported by all 150 global brands is now 31.

Byte Level Research has been benchmarking websites based on their global effectiveness – including languages, depth of local content, global consistency, and usability – for more than a decade. The 2017 Web Globalization Report Card is the thirteenth edition of this report and has followed globalization trends since its inception.

www.bytelevel.com



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Algorithms are the heartbeat of Industry 4.0 projects

The German government-sponsored initiative Industry 4.0 has been underway for more than five years, and while many businesses have begun some promising projects, key challenges remain that are making algorithms the heartbeat of these projects, according to research firm Gartner, Inc. By 2020, Gartner predicts that at least 30 percent of Industry 4.0 projects will source their algorithms from leading algorithm marketplaces – a significant rise from less than five percent in 2016.

“Industry 4.0 projects are facing two significant challenges,” says Thomas Oestreich, managing vice president at Gartner. “First – in the connected world of cyber-physical systems – they need to deal with the sheer volume, real-time velocity and diversity of data. Second, in order to drive new value and differentiating innovations, new algorithms need to be developed. This is making algorithms the pulse of Industry 4.0 initiatives.”

Mr. Oestreich added that developing new algorithms requires skills and competencies that most companies do not have yet. To decrease time to market and speed up the development process, some organizations employ service providers and combine this with using algorithm marketplaces.

Analytics vendors have started creating marketplaces for software components, such as analytical algorithms, to bring greater flexibility and choice to end users. These marketplaces will bring the benefits of the app economy to software development. They will radically lower software distribution costs and improve access to thousands – if not millions – of available algorithms.

Algorithm marketplaces offer reusable algorithms, which help organizations speed up their development processes and cope with the transformational changes introduced with

digital business. “Reusing prebuilt algorithms and applying them to a specific use case can significantly reduce development time and will offer an important library, expanding the possibilities for in-house development teams,” said Mr. Oestreich.

Early adopters of Industry 4.0 are also renovating their enterprise resource planning (ERP) solutions. ERP systems are connected to Internet of Things (IoT) infrastructure that consists of sensors and actuators, middleware to collect and store data, and applications and analytics to make decisions and trigger actions.

“Many ERP solutions are old, and they cannot cope with the amount of data and transactions to be processed, and the level of granularity in business transactions,” said Christian Hestermann, research director at Gartner.

The music industry is a good example of how an industry has gone through transformation. Customers went from buying complete albums in a record store to streaming one individual song, which triggers an immediate invoice about the microamounts due. “ERP could fast become the bottleneck of digital business, not allowing a business to act quickly enough to grasp digital business opportunities in a fast-changing business world,” Mr. Hestermann added.

CIOs need to develop digital business moments to grow their business. Signals coming from sensors inside products or from external sources could be used to offer additional services to customers. “This will likely require the modernization of the ERP solutions involved, as older ones will not support the level of granularity and the volumes of microtransactions required,” said Mr. Hestermann.

Gartner says that, by 2020, 50 percent of the companies that have renovated their ERP core and migrated their IoT infrastructure to a standardized platform will increase customer interactions by over 20 percent.

“CIOs should determine where IoT and digital business play a role in their business scenarios, and develop Industry 4.0 value chains by modeling the business capabilities that their organizations need,” concluded Mr. Hestermann. “They also need to assess their current state and their needs for renovation on all layers of the IoT architecture and take the necessary measures to improve.”



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www.gartner.com

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- 📅 April 20-21, 2017
- 📍 Berlin, Germany
- 🌐 <http://euatc.org/conference>

TAUS Executive Forum

- 📅 April 25-26, 2017
- 📍 Tokyo, Japan
- 🌐 www.taus.net/events/conferences/taus-executive-forum-tokyo-2017

European Academic Colloquium on Technical Communication Studies

- 📅 April 28, 2017
- 📍 Antwerp, Belgium
- 🌐 www.teccom-frame.eu/the-colloquium

The Academic Colloquium is targeted at members of the European scientific community who are teaching and doing research in the area of technical communication or related fields, such as translation, multilingual communication, localization, terminology, information management.



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tcworld China

- 📅 May 8-9, 2017
- 📍 Shanghai, China
- 🌐 <http://conferences.tekom.de/tcworld-china-2017/tcworld-china-2017/>

Information Development World

- 📅 May 15-17, 2017
- 📍 San Jose, CA, USA
- 🌐 <http://informationdevelopmentworld.com> »

Information Development World is intended to help those who lead content operations such as technical, marketing, support and product information development management professionals to rethink content production processes and prepare companies for the coming Artificial Intelligence revolution.

Translation Technologies Roundtable

- 📅 May 16, 2017
- 📍 Bonn, Germany
- 🌐 www.localizationinstitute.com/event/t9n-technology-roundtable/

Information Energy 2017

- 📅 May 17-18, 2017
- 📍 Utrecht, The Netherlands
- 🌐 www.informationenergy.org

ETC 2017

- 📅 June 1-2, 2017
- 📍 Sofia, Bulgaria
- 🌐 <http://evolution-of-tc.com>

Evolution of TC is the only tc conference in Southeastern Europe, an annual gathering for all technical communicators in Bulgaria with a focus on innovations in software documentation. At Evolution of TC, all professionals in the industry come together – technical writers, information developers, technical editors and translators with a strong background in software.

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UA Europe 2017

- 📅 June 8-9, 2017
- 📍 Harrogate, United Kingdom
- 🌐 www.uaconference.eu/

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- 📅 June 14-16, 2017
- 📍 Barcelona, Spain
- 🌐 www.locworld.com

Content Marketing World 2017

- 📅 September 5-8, 2017
- 📍 Cleveland, OH, USA
- 🌐 <http://contentmarketinginstitute.com/events/>

NORDIC TechKomm

- 📅 September 12-13, 2017
- 📍 Copenhagen, Denmark
- 🌐 <http://conferences.tekom.de/nordic-techkomm>

tcworld conference 2017

- 📅 October 24-26, 2017
- 📍 Stuttgart, Germany
- 🌐 <http://conferences.tekom.de/tcworld17>

TAUS Annual Conference

- 📅 October 30-31, 2017
- 📍 San Jose, CA, USA
- 🌐 www.taus.net/events/conferences/taus-annual-conference-2017

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Facts and ethics in a post-truth era

Text by Leah Guren

There is an old Chinese saying that translates as, "May you live in interesting times." While you may think this is a nice thing to wish someone, it actually is a curse, because *interesting* in this context means chaos and unrest.

We are, indeed, living in some *interesting* times.

In the past few months, we have witnessed political upheavals in Great Britain with Brexit. We've seen populist initiatives or candidates on the ballot in France, Germany, the Netherlands, and Hungary (to name just a few). Most prominent is the situation in the United States, where an authoritarian administration has launched an all-out propaganda assault against the press, going so far as to ban the New York Times, the BBC, the Washington Post, CNN, and other venerable media journals from White House briefings.

The sight of a major world leader spouting blatant lies and attacking facts as "false" and reputable journalists as purveyors of "fake news" is shocking. In a world where many people do not read reliable, vetted news sources, but rely on biased sound bites or whatever pops up in their Facebook feed, defending facts has become more and more difficult.

For those of us in technical communication, the challenge creates an almost visceral cognitive dissonance. We carry on our shoulders the responsibility of providing clear, accurate information for users. We know that truth is important and facts matter.

It matters

Consumers have become accustomed to seeking information about products from public forums, through customer reviews and other rating sites. But once they buy the product, they expect the company to provide them with the best possible product information.

And it is more than just consumer expectations. There are multiple regional and industry-based regulations (for example, EU directives or FDA requirements) that address the quality and completeness of product documentation. A company that fails to provide critical information for users may face loss of compliance approval or even legal action.

Our clients, in turn, rely on us to produce clear and effective documentation. While the client's subject matter experts (SMEs) are the

experts on the products' details and facts, it is up to us to analyze, interpret, and communicate the right information in the right way. Documentation written by SMEs may be full of *truth*, and yet be fundamentally useless. It is our unique skill set that allows us to determine how to present the correct information in the most useful, accessible manner.

The role of the TC

The role of the professional TC is very much like that of an ethical journalist. For example:

- **Verify the truth.** An ethical journalist must be able to track down and verify facts. In the same way, a technical communicator must be able to question, pursue, and verify facts. This means that when we receive contradictory information from different SMEs, we must be willing to dig deeper and determine what the truth is. One SME says the maximum setting is x; another says it is y. We must ask the right questions to determine *why*. There are always reasons for these differences of opinion, and it is up to us to understand them and determine the correct truth for the user.
- **Focus on what is relevant.** An ethical journalist must draw the line at what is relevant to a story. Otherwise, the interconnected facts can make a story connect to everything (and therefore to nothing). Focus is essential to make the story clear and understandable. In the same way, a professional TC must be able to focus on what the user needs to know and do in any given scenario, and not get distracted by miscellaneous information (even if true). There is always a huge amount of truth related to a product that is completely irrelevant for the user. It is our job to take a firm stand and not allow the SMEs to clutter the documentation with irrelevant facts.

- **Identify the correct level of accuracy.**

An ethical journalist must use a level of accuracy that makes sense for the story. For example, in reporting on a case of bribery and corruption that involves tens of millions of euros, it makes sense to round the figures to the closest hundred thousand (or even million). Adding in the tiny detail adds nothing to the truth of the story. In the same way, a tech writer must know how to present the right level of accuracy in the product information. When presented with SMEs' excessively detailed facts, we must be able to rephrase the facts in a way that is meaningful for the user task.

- **Create a coherent story.** An ethical journalist must find a way to tell the story in a clear and compelling way. This is often in a recognized pattern or structure, such as following the natural chronology of events. In the same way, a professional TC must find the most logical and effective way to present the information, for example, based on user workflow. We are responsible for telling the story in a way that makes sense.

Our ethical responsibility

As technical communicators, we must always be advocates for truth and accuracy. For example, when a product manager instructs us to be vague about part of the instructions, perhaps for the convenience of marketing, it is our responsibility to verify that the lack of detail doesn't hurt usability. Sometimes this means conducting simple usability tests. We should never meekly produce weak or incomplete documentation just because our client thinks

it is OK. In doing our best for the user, we are ultimately doing the best for our client.

For each project, we should ask ourselves: Is there critical information about the product that we aren't telling the user?

- Is the information we are writing verifiable? Have we checked it ourselves? Did we play with the product, replicate the steps, and review the workflow, or did we become lazy and simply accept what the SMEs told us?
- Are we presenting the content in a clear and compelling way, or are we carelessly reproducing someone else's idea of how it should be structured and organized?
- Are there difficult questions we have not asked because they are awkward or uncomfortable?

The challenge ahead

I fear that in the coming months, we risk becoming numb from the avalanche of "alternative facts". The danger is that this blatant disregard for the truth, along with the rampant use of disinformation, will become normalized, leaving us unable to distinguish the truth from lies. To stay sane and preserve our ethics, each of us must accept the challenge to produce honest, truthful content in our documentation. We must also use our analytical skills to constantly evaluate information we read. If we as skilled, logical, analytical TCs cannot stand up for facts, science, data, and truth, then times will become a lot more *interesting* – and not in a good way.

ABOUT THE AUTHOR

Leah Guren

is the owner/operator of Cow TC. She has been active in the field of technical communication since 1980 as a writer, manager, Help author, and usability consultant. She now devotes her time to consulting and teaching courses and seminars in technical communication, primarily in Israel and Europe.



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A close-up photograph of a white robot's face. The robot has large, expressive blue eyes with black pupils and a slight smile. It has a blue top. The background is a plain, light-colored wall.

Is this the new face of technical communication?

How intelligent is artificial intelligence?

Will it eliminate our jobs or help to create new ones?

Rebooting with bots: The future of (assisted) technical documentation

In recent years, bots have come a long way and many organizations are using them successfully to assist customers. But how will they change the landscape of technical communication?

Text by Alberto Ferreira

The fear of robots taking over the world, or at least our jobs, is an ongoing concern in the media. Business magnate Elon Musk recently suggested in a CNBC interview that robots can and will take away jobs from their human creators, and that governments will have to subsidize the unemployed population. In 2013, an Oxford University study set the number of U.S. jobs to be replaced by automated technology in the next decade or two at 47 percent.

This might seem a distant vision, but the fact is that Artificial Intelligence (AI) is already a reality. A number of industries actively use AI to complement their activities: Medical services, for example, use it to interpret medical images, thus reducing the error margin and biases in human diagnosis. Banks routinely utilize algorithms to detect fraudulent claims and operations, which are then analyzed by human counterparts. Travel companies employ AI to predict fare trends and air control requirements. But can AI be leveraged for simple communication at a human level? And, more importantly, can we use it to satisfy our increasing hunger for information?

From human conversation to bots

Australia-based technology company FastBrick developed Hadrian X, a bricklaying solution that can deploy up to 1000 bricks in one hour without human intervention.

In Japan – a hotbed of robotic technology – over a hundred SoftBank Mobile stores use an endearing robot named Pepper to welcome customers. The robot is able to read facial expressions and engage in conversation, actively learning traits and responses with each interaction.

The use of AI to replace human contact has also spread to the online world, with conversational interfaces. These types of interfaces are termed “naturalistic”, as they emulate the way that humans communicate most frequently: verbally. Direct verbal dialogs remain the easiest way to get intents or wishes across. But in the age of instant messaging and social media, written conversation, transmitted at the speed of light via a growing number of platforms and services, is becoming more and more important. According to a Radicati Group study from 2015, more than 3.2 billion instant messaging accounts existed worldwide, not including mobile messaging. The number of messages that get exchanged every day is certainly mind-boggling. These figures lead to differing customer expectations when it comes to communicating with services: Consumers expect companies to be available and reachable through instant messaging – a changing paradigm that becomes evident when we look at the usage of social media products like Skype, Facebook, and WhatsApp. And that’s where the little “digital helpers” called bots come in: They provide chitchat and quick information regarding product updates, technical

assistance, and support, acting as colorful characters in the product’s ecosystems.

Bots are also useful in attending to purchasing decisions, a method Asian businesses have already used for years. Ninety-two percent of luxury brands use WeChat for marketing in China, and luxury handbag giants like Prada and Versace are already preparing to sell their items on WhatsApp, making it possible for customers to buy products with only a few messages. For years, companies like Alibaba have successfully combined bots and humans in customer support.

These interfaces have also started to become ubiquitous in the West. Facebook Messenger has a canopy of bots integrated by default, ranging from pearls like MeditationBot – a personal coach for your zen needs, to Hipmunk – a travel and flight personal agent. Skype is following suit with a variety of help bots that provide anything from healthcare advice (Baymax) to an accurate description of your face (Your Face). These bots are only available in selected countries, but will soon expand to other regions.

Virtual assistance for real-world problems

Apart from these novelty applications, conversational bots called chatbots are experiencing broader adoption in various commercial applications. Their potential is still being untapped,



Figure 1: Pepper, the robot, greets customers with a literal plastic smile.

Source: © Jake Curtis/Softbank Robotics

and the future holds few restrictions, but the present already offers companies some alluring solutions. Chatbots are most commonly used in customer support. Automated online assistants can take on the roles of customer care representatives in order to respond directly to customer queries in a chat box.

Personal assistant bots like Amy (<https://x.ai/>), Viv.ai, and Kasisto Kai are also evolving. They can automatically schedule meetings and manage personal schedules. With the rise of mobiles, the IoT, and messaging platforms, PA bots are becoming ubiquitous.

Chatbots and PA bots are usually either text-based or voice-based. Both types of assistants rely on natural language for communication, but use different means. They use complex natural language processing (NLP) engines designed to analyze the input and interpret it depending on its structure, tone, language, and context. This technology is not the exclusive property of industry tech giants. The consumer digital industry has already implemented multiple variations of it, in the form of completely artificial voice interfaces like Apple Siri in the Mac ecosystem and Microsoft Cortana in Windows.

These systems generally consist of a combination of voice recognition and speech-to-text layers: a single system recognizes the vocal patterns of the user and transcribes the words spoken into information for the interaction layer. Although commercially available NLP engines are on the rise, AI

research is expensive and slow, and only a few companies are able to develop frameworks to use it. The biggest proponents in the field are arguably the usual suspects:

- IBM, with its Watson engine, which encompasses NLP and artificial learning solutions

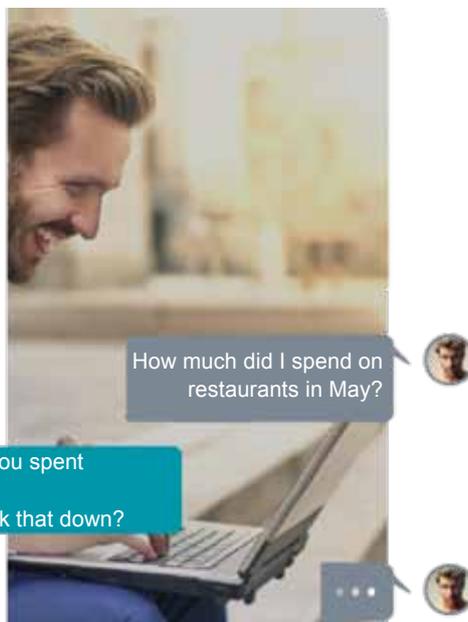
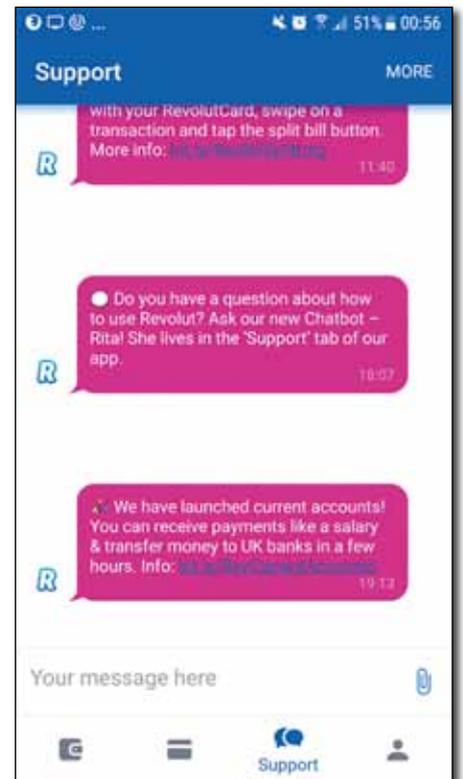


Figure 2: Kasisto Kai and Revolut are two of several new services in personalized banking, which rely on a text interface to fulfill simple user requests.

in one cognitive technology platform. It includes products like Watson Virtual Agent for customer support chatbots, and Watson Explorer, which can analyze any type of data to find trends and relevant information for any customer query.

- Google Natural Language API applies machine-learning capabilities by extracting relevant information from any type of text document, including sentiment analysis, to understand how customers feel about your company.
- Microsoft's Language Understanding Intelligence Service is a component of Microsoft Cognitive Services, and can be integrated in the Bot Framework also offered by the company.
- Facebook uses its Wit.ai framework, acquired in 2015, to augment its bot technology. The framework is freely available and allegedly used by over 65,000 developers.

Beyond these systems, AI engines like Amazon Alexa and Viv.ai also purport to enable access to several devices by voice command alone, and



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use sensors to react to your presence, tone of voice (or writing), the time of day, and other variables. Fancy telling your smart kettle to make a cup of tea while driving home? The Internet of Things (IoT) makes it possible. However, chatbots are usually much simpler than these large implementations and require much less technical expertise to set up.

Assisted self-service customer support

Chatbots can be exclusively dedicated to a set of "skills", e.g. the service or resources that the assistant can have access to. The assistant can have just one skill, such as interacting with a specific device in a simple bilateral relationship, or be "multi-skilled", meaning it can work with various devices in a complex environment. For example, personal banking assistants like Kasisto Kai can assist in simple banking operations like checking your balance or transferring money, whereas Amazon's Alexa is the touchpoint to command numerous devices at will.

Companies can use chatbots to specialize in a specific area of customer care. Consider the volume of request calls coming to your company. Busy phone lines, messy case management, a 24-hour brand-bashing hotline. And consider the implications: According to Lee Resources International, for every logged complaint, there are 26 angry customers that never reported

back to the company. This is due to the fact that many customers feel that the time invested in calling is not worth the resolution. A big reason for this level of discontent is the response rate: According to an American Express Survey from 2011, 67 percent of customers gave up on a support call because they were put on hold – steeply decreasing the level of satisfaction with the service.

In the age of instant messaging, where live chat generates a higher level of satisfaction than any other form of customer support (73 percent according to Happyfoxchat), having an accessible chat box for quick inquiries and clarifications is a boon for providing an immediate low-friction channel. For simple matters and operations live chat is an appealing method to increase satisfaction and tackle most basic customer queries. Companies like Nuance provide full-blown chatbots ready for activation.

Creating your chatbot

The following steps will assist you in developing a bot to suit your needs:

1. Check your actual needs.

Implementing a customer care bot is not an easy undertaking, technically. Embedding such systems in websites and apps has technical implications on the user experience and

information architecture that you must take into account. It is important that your business strategy is aligned with the implementation of a bot. Bots hold a number of opportunities, but also some dead ends. Useful questions include:

- What is the conversational interface meant to complement – customer support or technical documentation?
- What support scenarios should it support?
- What is the back-up plan in case the request escalates?
- Or should the bot only support information retrieval scenarios, which are typical in technical documentation?
- What sort of information would then be relevant and how should it be fetched and presented to the customer?

Chatbots are able to respond meaningfully and even resolve most basic questions posed by customers.

2. Define where the chatbot will be used.

On which channels should this chatbot be presented? On the website (mobile version) or desktop, and on which pages? What about your social media channels such as WhatsApp, WeChat, Facebook Messenger, or Telegram? A good rule of thumb is to use the channels that play the biggest role in conversion. If bots are meant to support customer care, start making the bots available during after-work hours, after having an initial period in which it can

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overlap with your actual support hours to avoid potential support issues in case the chatbot malfunctions.

3. Train your bot.

Conversational user interfaces have come a long way in recent years, but they still require constant maintenance and a dedicated training period. The good news is that very little coding experience is necessary in some cases, and conversations can be structured using standard flowcharts and UML or AIML models. You can use decision trees to explore interaction scenarios, e.g. by having the bot reply with a specific response if certain keywords are detected in the user's input. Alternatively, you can use services like Twyla to train your chatbot for a specific industry or to respond with a specific tone of voice.

4. Iterate the output.

Even after being released, bots should continue to be perfected and improved. New user queries and more experience can lead to new use cases or requests. You can add or improve an-

swers accordingly in order to continuously attend to advanced queries.

Are chatbots the new technical communicators?

While bot technology is usually not able to resolve complex matters – particularly those involving mediation and compromise – chatbots are able to respond meaningfully and even resolve most basic questions posed by customers. Conversational interfaces are able to supply basic information for customer queries or give information in accordance with the frequent searches and FAQ. Bots can be programmed to reply to standard questions like “When are you open?” or “What is your warranty policy?” with direct links to pages or supply information directly during the interaction.

This makes particular sense for retail and e-commerce websites, where the search box is one of the first points of contact. Users can simply type in a question instead of searching for an answer,

making the process more akin to an actual conversation and more comfortable for the user.

Bots can also assist in providing on-demand reference material. Questions like “Where is the specifications list for refrigerator Beraton XM-125?” can be interpreted accurately by most chatbot engines, and the relevant document (in PDF format or a webpage) can be fetched on demand. The more specific the use case, the more efficient chatbots can be. They are not a one-size-fits-all solution but their purpose is inherently fit for users who ask specific questions and want concrete solutions.

Despite the buzz that these systems are generating in the market, current applications of bots are actually more limited than they seem. They can support customers in-context on websites, assisting them through an e-commerce funnel or support journey, and be integrated in your company's app in order to supply a chat box for customers to submit feedback or suggestions. They can be multilingual and permanently switched on. However, customers still require the adaptability and flexibility of a human with the creativity to improvise solutions and the rationale to break down complex problems. In addition, users are wary of new automated technology. As the uncanny valley hypothesis predicts, human-like robots can elicit feelings of revulsion. The technology behind virtual agents is improving every day, and they are here to stay, but mass job migration is still some way off.

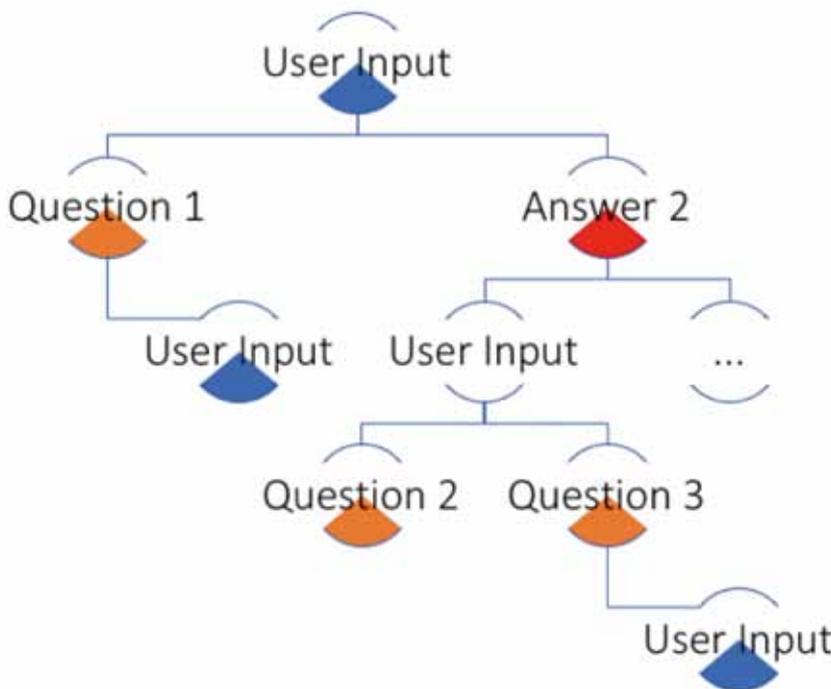


Figure 4: A decision tree can be as simple or as complex as the goal of the bot demands. It is infinitely customizable and provides a good tool for constant improvement.

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Of humans and robots – Communication challenges in Industry 4.0

We have long succumbed to the fact that Artificial Intelligent (AI) beats our humble human brains at many kinds of activities – not just in a game of online chess. But we're still in control, right? While we cannot fight the rise of AI, we need to learn to communicate and interact with our hyper-digital, interconnected environment in a way that goes well beyond human interactions.

Text by Ray Gallon, Neus Lorenzo and Michael Josefowicz



Image 1: One of the most advanced robots, Asimo, shakes hands with His Highness Sheikh Mohammed Bin Rachid Al Maktoum UAE Vice President, Prime Minister and Ruler of Dubai. © asimo.honda.com

As interconnected media platforms became more and more diverse in the early 1990s, a new concept was introduced: “Transmedia,” a term first used by Marsha Kinder in 1991, describes a new media supersystem, using intertextuality and diverse sources with different levels of interaction. The concept is open enough to incorporate media that had not been invented then, such as wearables, bionic implants, or Augmented Reality. Industry 4.0, a term coined by the German government, extends this idea beyond media into the realm of hybrid communications in a world of autonomous, interconnected objects mediated by artificial intelligence.

Back in the 1960s, media theorist Marshall McLuhan identified the fragmentation of content as a characteristic of mass media. Four decades later, social media added to its complexity with what has been described as the “transmedia narrative”: Content was now spread across many platforms with varying degrees of interaction among multiple authors and multiple audiences. When machines are added into the mix as intelligent agents in these dynamic interactions, we add another layer of complexity: Part of the cross-media content is now not directly readable by humans. Eventually, much of these connections and messages will be unknown, untracked, and invisible to human beings.

So how can we function in this hybrid communication environment? What skills will we need to work in Industry 4.0? Models based on the “Nematic” system are useful to analyze, track, and represent hybrid interactions in extremely digitalized environments. But first, let’s take a look at this new communication environment.

For people to function in Industry 4.0, they will need skills well beyond traditional listening and reading, and even beyond the new skill of “transliteracy”, understood as the ability to communicate across a range of platforms, tools and media. They will need to be able to determine appropriate modalities and strategies for coding and decoding different types of discourse:

- Human-human
- Human-machine/machine-human
- Machine-machine

Our new hybrid ecosystem

In 2003, Henry Jenkins described “transmedia storytelling” as a collection of fragments in which each medium does what it does best, so that a story might be introduced in a film, expanded through

television, novels, and comics, and its world might be explored and experienced through game play.” And this multiplatform narrative is now expanding to include human/machine communication, in all present and future configurations. These hybrid communications introduce not only new codes, but new behaviors that emerge from the new ecosystem.

But what is this new ecosystem we live in? We understand it as a complex network of networks that integrates Industry 4.0 and is powered by Artificial Intelligence (AI) and the new relationships that humans and machines will develop. In this landscape, objects interact continuously, exchanging data they have picked up via sensors, and adding them to the global pool of Big Data. The future vision is an extremely complex hybrid reality where humans and machines develop communities and networks in dynamic clusters of interests, acting both individually and collectively, embedding their experiences in a constantly changing communicative context.

To understand the complexity of this ecosystem, we can no longer merely depend on traditional scientific disciplines for analyzing language, communication and conduct. Our existing institutional structures outlining legal rights and duties are not sufficient for defining ethical behaviors and interactions. What we will need in the future are models that take into account the superposition of three main levels of complexity:

1. Data and information – Dealing with Artificial Intelligence agents

Software agents work with data and metadata they extract from databases, human agents, context sensors, and other devices to produce adaptive information exchanges that function like a personal assistant. They have some capacity to learn as they acquire more data and compile it into information, and use written or spoken natural language interfaces. Current examples include chatbots, SIRI, Google Assist, or Amazon Echo. Linked together in the Internet of Things, these agents will aggregate Big Data to determine hierarchies of content, context states, and visualization tools. They will also create priority protocols for network access based on the importance of different communications.

2. Interaction and singularity – Recognizing Artificial Intelligence personas

More than agents, these are real robots – software only or a combination of hardware and software. They are powered by deep learning engines such as IBM’s Watson or Google’s DeepMind. These robots

are capable of making independent decisions and learning from their environment and context. This means that each robot is an individual with different characteristics that can be likened to a personality. The logic of this leads to the notion that such robots have a status in society with duties and rights. They form relationships and participate almost as what we could call “robot citizens”. This was echoed in a resolution of the European Parliament, which suggested

creating a specific legal status for robots, so that at least the most sophisticated autonomous robots could be established as having the status of electronic persons with specific rights and obligations, including that of making good any damage they may cause, and applying electronic personality to cases where robots make smart autonomous decisions or otherwise interact with third parties independently.

European Parliament, 2017, resolution of 16 February 2017 article 59(f)

The resolution did not include a recommendation that robots pay taxes and social charges. These robots acquire social knowledge, and exist as parts of a variety of communities that include human and non-human members. Their decision-making power implies that machines and networks must also respond to, and be responsible for, ethical principles. The “Charter on Robotics” proposed in the 2017 European Parliament resolution defines a code of ethical conduct in the field:

The framework must be designed in a reflective manner that allows individual adjustments to be made on a case-by-case basis in order to assess whether a given behaviour is right or wrong in a given situation and to take decisions in accordance with a pre-set hierarchy of values...

Special emphasis should be placed on the research and development phases of the relevant technological trajectory (design process, ethics review, audit controls, etc.). It should aim to address the need for compliance by researchers, practitioners, users and designers with ethical standards, but also introduce a procedure for devising a way to resolve the relevant ethical dilemmas and to allow these

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systems to function in an ethically responsible manner.

European Parliament (2017), Annex to the Resolution

3. Accepting Artificial Intelligence collectivities

The hybrid-connected networks of intelligent objects in Industry 4.0 are weaving interconnections with people, whether or not they are connected via mobile terminals, wearables, implants, or prostheses. These networks will cluster together to form very complex networks of networks that make today's Internet seem simple. These clusters will be highly dynamic with continuously emerging information that is shaped and reshaped every moment as a function of the person, object, or situation it is addressing. Responses and responsibility will be determined by the environment and context, according to the ethical, social, economic, and personality strategies that different entities have acquired through programming or learning. In their article for *tcworld* magazine Issue 4/16, Ray Gallon and Andy McDonald provided an example of how this can work involving a jogger in a shopping center:

You pass a shoe store (part of a national chain) in a shopping center – Sam's Shoes. Your terminal knows that you bought your running shoes six months ago and, based on your time spent running and wear calculation, deduces you could buy a new pair. Correlating with the store, it finds your brand and model on sale there, and alerts you. If you are jogging, it will have the store send an email, and the store decides to include a voucher.

It's not going to alert you about Sam's Shoes national sale. It triggers THIS Sam's Shoes to suggest you buy the SAME shoes, on sale NOW, because your phone deduced YOUR CURRENT SHOES ARE ABOUT TO WEAR OUT.

This level of personalization makes marketers salivate – but it will be a reality before we notice.

This kind of collaboration can, on a small scale, provide a great deal of convenience, and on a large scale, help us manage large, complex, “wicked” problems. But it can also violate our privacy, be used to spy on us, or simply provide an isolating bubble in which we know a lot of mass data but nothing about our specific situations.

To illustrate, Big Data connections could give you not only large amounts of raw data about the performance of 15-year-olds around the world in the PISA school assessments, but also intelligent analysis that explains why, in one country or situation, kids do better than in others. But you won't learn why *your* 15-year-old is doing well or poorly from that information. You would need your own set of parameters, programmed just for you, to extract that information. It would also require a human to merge the emotional support your kid might need in a particular moment with the interpretation of unexpected data or occurrences that describe the particular needs of your child.

From transliteracy to global competences for Industry 4.0

Transliteracy – the ability to communicate across this complex range of platforms, tools and media – requires evolving beyond individual, linear human skills such as reading, writing, listening, speaking, or interacting. Complex hybrid communication demands intertextual abilities: from translation, correlation, or mental association to analogy, context awareness, synthesis, or connotational association. Emotional skills such as empathy and engagement are also required to add enriched contextual interpretation to the matrix.

Each analysis at any given moment is recursive, and we can analyze interactions at various levels of granularity. In Industry 4.0, the imperative is to produce real results and actions from this complexity. Software developers working with Agile methodologies are already familiar with this way of thinking. Priorities can change at any moment, and definitions of quality or completeness are dependent on immediate contingent needs that also evolve.

Like Agile development, hybrid transliteracy requires compound, intangible projective skills, which are strategically oriented. Problems are solved collectively, and social mediation skills such as negotiating, conciliating, or social media abilities are the added value that humans bring to the table.

We need new, specialized analytical tools to engage with this high level of complexity. Fractal models such as the Nematic system offer a transversal approach that helps us understand the fragmentation.

Nemetics and hyper-connected networks

Complexity, understood as a collection of elements and processes in dynamic relationships, can be better understood when seen as a series of recursive patterns that can be modeled. The system known as Nemetics provides models that can help express co-creation in complex adaptive/creative environments, among humans and machines.

The Nematic model provides quanta that help identify and analyze communicative routines. It includes dimensions of individual reflection, professional development, and organizational transformation. The analyses derived from it contribute to leadership and resource management, focus on integrated learning, and promote complex problem-solving.

Nemetics functions as a fractal meta-language that facilitates communication among researchers in different disciplines to debate about complexity.

The essentials of Nemetics can be summarized in a simple mnemonic acrostic, which describes learning in any context at any level. At its most effective it is:

- Notice without preconceptions (N).
- Engage without judgment (E).
- Mull before communicating or acting (M).
- Exchange in the appropriate way and time (E).

This basic path retrieves four action levels that may or may not be performed during interactions (after each verb, add the option, "or not"). The whole conversation is then conceptualized as a single identified process, a NEME that can be seen as a coherent unit, represented visually by the interactions that took place during the debate. The analysis of these NEMEs shows patterns and waves of exchange that offer extremely rich information (Big Data), about both the media environment and the participants.

In other words, the NEME is both a process and a communicative quantum – a unit of exchange that can be studied on its own. The recursive, self-similar nature of a NEME means that a NEME for communication between two agents can be nested inside a NEME for a network-wide communication, and so on, like a Russian doll.

The simplicity of the fractal Nematic process makes it useful for developing Agile models

that can be generalized to help bridge the human-machine communication gap, and to design strategies for complex communication at all levels in the Internet of Things.

Nemetics and Artificial Intelligence

In this article, we have shown that Artificial Intelligence (AI) is going to be driving many processes and making autonomous decisions that will affect us. If we humans want to maintain control over our own lives, and be good stewards of how AI interacts with us, we need ways to understand it that do not involve digging deep into digital code and trying to crack messages that are intrinsically unreadable to us. It will not serve for us to try and duplicate functions that AI will always do better than we can. Our role is to add value that only humans can provide.

Analyzing the NEMEs at different levels of granularity can help us do that. In the example we have given about Big Data, using the PISA results, we referred to the difficulty of extrapolating reasons for the results of one single child from the great mass of accumulated data.

If we look at the NEME for the global results, and examine it iteratively as an Agile software developer might do, we can begin to see patterns that emerge. We can see how the NEME for our country contributes to the global NEME. Our regional NEME, in turn, is part of, and also reflects, the country NEME. The local NEME carries characteristics of the region, and of the individuals in it, and finally, the NEME for your daughter or son relates to the local NEME, and their school's NEME. The school's NEME should provide enough information for you to understand the evolution of your child.

If we simply look at global or country results, we can't know anything about one child. If we only look at our child's performance and environment, we are unable to generalize even to our local neighborhood. The recursive, fractal Nematic view of data allows us to monitor both, and by drilling down or up, make relationships, deduce trends, and understand consequences that take into account the unexpected, and allow for creative variance. These are the added-value human elements that AI cannot provide.

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Get ready for multilingual wearables!

Approximately 325 million wearable devices are connected to the Internet, with more added every day. While the iPhone and Android platforms were designed as multilingual from the start, that isn't always the case for wearables. This gives localization teams the opportunity to offer their multilingual expertise early in the design and development phases for these products.

Text by Rebecca Ray





Wearables are articles of clothing, footwear, or accessories that incorporate sensors to enable the items to monitor and respond to the environment or the wearer. They also send and receive data from other devices such as smartphones. The wearables sector is still in its infancy – not even futurists or designers of the current generation of wearable technology can predict what product or use case may eventually allow this sector to become as ubiquitous as smartphones – or if this will ever happen. Even so, localization teams should anticipate the day when product managers start requesting support for wearables apps and devices. They will have to deal with new formats and use cases:

- **Form factors.** Examples of products that fit on the wrist, or that can be clipped on, include fitness trackers from companies such as Fitbit, Garmin, Jawbone, Misfit, and Withings, and smartwatches such as Apple Watch, Huawei Watch, and Samsung Gear. Other manufacturers like Bellabeat, Intel, and Ringly produce smart jewelry that handles notifications, checks email, and monitors calls. Healthcare wearables include bands to reduce chronic pain (Quell), devices that deliver back therapy (Valedo), and glucose monitors (FreeStyle Libre). Translation wearables include WordLens for Google Glass. Expect to see new form factors that take advantage of skin, fingers, toes, and ears, as a plethora of products vie for limited real estate on just two wrists.
- **Sample use cases.** Though current wearables principally serve as personal assistants to smartphones, applications continue to evolve to encompass more tasks. As people become more comfortable with blending offline and online worlds, wearables will gain in functionality, for example, in manufacturing environments to access data without having to put down a tool or stop a machine. You can already flash fitness tracker wristbands to make payments through American Express. And, developers are reviewing heart rate monitors as key-swipes for building entry authentication.

Wearables plug into the Internet of Things

Wearable items don't exist in a vacuum. Regardless of the category – fitness trackers, clothes, jewelry, and the many form factors yet to be invented – they all have sensors that tether them through software to smartphones or directly to Wi-Fi. So far, the vast majority of them depend on a smartphone for connectivity. These sensors – activated by touch, movement, sound, or vision – all receive and process data through the network. They join sensors from smart cars, smart houses, smart appliances, and smart machinery to create an environment that interconnects humans, equipment, digital devices, and software – a digital ecosystem now referred to as the Internet of Things or Internet of Everything. Cisco estimates that there will be around 26.3

billion interconnected devices by 2020, which translates to more than 3.5 devices per person on the planet.

Just as smartphone adoption was driven by markets outside of the United States, wearable technology is also a global phenomenon. This means that huge volumes of data spit out by digitally enhanced watches, fitness bands, and jewelry must be rendered to enable users to interact intelligently with them. Part of this intelligence includes being multilingual. Unfortunately, just as with the first websites, standards for the IoT and for wearables are being established without guidance from experts within the localization community.

Enabling wearables multilingually

CSA Research recommends that localizers concentrate on three areas when integrating multilingual content for wearable technology into their workflows: 1) wearable design, 2) testing, and 3) sharing their expertise inside and outside of their companies.

1. Wearable designers need you

Global launch schedules no longer allow a cleanup phase for reactive fixes during localization. Therefore, the wearable experience must be world-ready. It represents one more “screen” in your customers’ multi-screen experience, even if the form factor includes no screen. Your designers need all the help they can get as they learn how to transpose – not transfer – a satisfying user experience to a large variety of form factors that differ substantially from desktop and mobile screens. The design challenge for technology-enhanced clothing and medical sensors includes playing well with streaming data from another device connected to the Internet. Designers talk about “contextual information,” in the sense that what users do or output on the desktop, phone, or tablet should be available when they switch over to a wearable to continue what they started. It may be up to your team, in collaboration with product managers and international marketers, to define what’s required throughout the customer experience to win local user acceptance. Here’s what to watch out for as your team ramps up to support product designers:

- **Wearables are about a lot more than technology.** Partnerships will grow as technology companies recognize the need for design input from people who can already interpret trends for clothing, shoes, and jewelry. Because connected clothing and accessories are intended to complement the rest of what a person wears, the device's style is just as important as – if not more important than – how well the technology performs. For example, high-tech companies are learning that women prefer jewelry to be stylish and unobtrusive, even when digitally inspired.
- **Tighten your seatbelts for rapid iteration and innovation cycles.** Because the wearables space is in its earliest stage, your designers and developers will experiment a lot. The same applies to the devices and apps that wearables will integrate with. Don't be surprised as form factors converge. For example, wearables and payment systems will enable users to pay for Uber rides with fitness bands or connected cocktail rings.
- **Automate and Agile-ize localization processes.** If you haven't already done so, optimize workflow and address technology gaps. Roles for some of your team members and your LSP may evolve. Make sure that design and development schedules allow for international markets to get their hands on early versions.
- **Educate colleagues to create minimal content in small, logical pieces.** Teach product managers, marketers, designers, and content creators to use the fewest number of characters, images, and audio clips possible when building a wearable and the user experience surrounding it.
- **Prepare for vocal users in more places.** Wearable apps will bring out the social in your customers. Support developers in embedding analytics capabilities and easy feedback mechanisms into wearable technology. Your company will probably need to engage via more social platforms and start monitoring product feedback on domestic and international retail and social sites. That's because people who buy wearable technology usually take advantage of more outlets to express their opinions, including sites such as Amazon and Walmart. The list will mushroom as more brands embed sensors in their products.
- **Monitor developments for improved integration of voice and wearables.** Work

is progressing in the “earables” or “hearables” category to build small, independent devices for use in our ears, as well as to integrate enhanced voice capabilities in other form factors. Applications such as Google Voice, Apple Siri, and Microsoft Cortana are already available in numerous languages, so earables will be multilingual from day one. The time is approaching when it will be possible to translate spoken language through these earables or through built-in speakers in smartglasses. If you have never localized audio before, your team will need to prepare.

2. Testing for localized wearables requires creativity

Localization teams that have experience supporting Agile and mobile projects will face new challenges as they integrate testing for wearable technology. You must focus more on interoperability testing and what real users will do with your wearable devices and apps.

- **Test with real users in the real world.** Aim for common and extreme locations in your most important markets. Have people test real-life battery usage while running multiple apps and services at once under different networks. Try out competitor apps and de-

vices in parallel, and test with older, localized operating systems. Vary the environments: for example, test in low-bandwidth areas and cold versus hot weather, if applicable. Find out what happens when your product is in one language but the smartphone or a companion app is in another. Test security and personalization settings in as many markets as possible.

- **Push the limits of interoperability testing.** Wearable technology depends on an ecosystem that may vary in subtle ways across international markets. Users won't notice that a failure is due to a smartphone or network issue outside of your control – they will blame your product. Test with localized versions of phones, browsers, operating systems, Wi-Fi, and companion apps if your wearable is intended to interact with them. Customers will invariably try to use your product with devices and applications that you list as non-compatible, or local ones you may not be aware of. Uncover and document as many of these cases as possible to be ready to respond in social media and on support forums.
- **Integrate disconnection as part of the user experience.** Work with designers and developers up front to ensure that your wear-

Testing coverage for localized wearables	
Test area	What to test
Interoperability	<ul style="list-style-type: none"> • Localized operating systems, smartphones, browsers, Wi-Fi, and companion apps, including legacy versions that are still popular • Wearable behavior when used with non-compatible devices or apps • Wearable in one language and smartphone in another • Crashes
Low or no connectivity	<ul style="list-style-type: none"> • Switching carriers or cell towers • Jumping from Wi-Fi to mobile networks • Data corruption • Intuitiveness of user interface when the device or app fails
Battery life	<ul style="list-style-type: none"> • Real-life battery usage, including what happens when the battery goes dead • Conflicts with other apps that drain the battery • Using many apps and services at the same time
Security and personalization settings	<ul style="list-style-type: none"> • User expectations in local markets • Adherence to local standards

Table 1: Localization testing for wearables extends beyond what you do for mobile
Source: Common Sense Advisory, Inc.

able, when it suddenly disconnects, fails in a friendly way. Run it through its paces under no network and poor connectivity conditions in local markets to verify that no data is lost.

- **Apply test automation, but in small doses.** Keep it simple and focus on the most common use cases. As wearable technology is so new, you will benefit more from people in local markets using your product in ways and under conditions that you never could have imagined.

3. Reserve your seat at the decision-maker's table now

Unlike the controlled development environments fostered by mobile platform providers, the Internet of Things is a broad frontier without a unifying set of laws. Standards for interoperability in the wearables space are still being defined. Language or locale support is one of the gray areas for many wearable development projects. All too often, developers fail to adequately address multilingual and cross-cultural requirements. Your own

company, as well as the many standards bodies claiming to be working in this area, can benefit from localization expertise.

If you're not already a part of the wearable design process within your organization, find out how to join by reaching out to product designers or your executive sponsor. For those who want to help build a global IoT that seamlessly handles not only data but also multilingual data, contact the W3C or the LIDER project.

Conclusion

In summary, it is too early for even the experts to envision clearly where users will lead wearable technology. However, all the sophisticated data analytics in the world have little value if the technology it refers to is not available in the language of the people who use it. Therefore, the sector will benefit greatly from localization expertise. It's time for localization managers to prepare their teams for the wearable future and to share expertise with product groups early and often.

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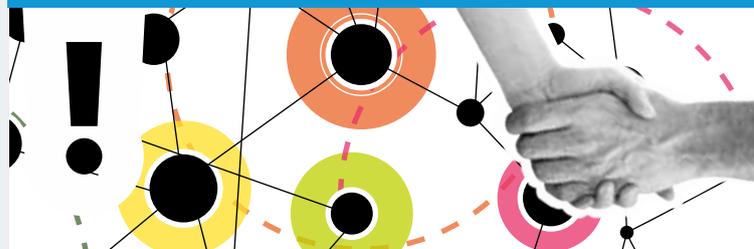
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WORDS MATTER



ISO/IEC/IEEE Standard 26513 calls for early testing of user documentation

For every product or service launched, thousands of words are written for technical manuals, product guides, marketing documentation, software help, websites, blogs, articles, health and safety warnings, and more. Taking a few steps to incorporate usability, accessibility, and localization early in the documentation process can save time, resources and money.

Text by Sandy Bartell and Brian Traynor



Image: © Ian Allenden/123rf.com

The “ISO/IEC/IEEE Standard 26513, Systems and software engineering – Requirements for testers and reviewers of user documentation” assists those who are involved in the testing and reviewing of information for users in the context of software and systems development. The standard reinforces the need for end users to receive information about software and systems that is usable, complete, consistent, and accurate. A strong emphasis is placed on the need for testing information products with real users during the development cycle.

Originally published in 2011, the standard has been revised to include a stronger focus on document evaluation strategy, usability testing, accessibility testing of user information, reviewing and testing of translation and localization, a new annex with user-centered testing and reviewing guidelines, and an extended bibliography. Publication of this new revision is expected in 2017.

Content

This standard provides specific guidance regarding the processes for testing and reviewing end-user information. However, it is not concerned with evaluating the software or systems themselves. While the standard primarily focuses on the testing and reviewing stages of the software or system lifecycle, it covers all of the activities of the information management and documentation management process.

The standard applies to printed and online information developed for:

- Systems (operating, integrated)
- Applications (user-driven, role-based, task-based)
- Hardware (machine instructions, embedded content)

- Documentation created for users who are not end users such as computer operators, system administrators, and installers
- Maintenance information for systems software internal operation

Target group

While the standard mainly applies to testers, reviewers, and related roles, others may also be involved, for example:

- Information developers and architects
- Usability and business analysts
- Test participants
- Managers of the software development process
- Project managers

- Computer operators, installers, or system administrators
- Customer support professionals including help desks, repair, return, and training

What's new?

Testing and reviewing user information (including the user interface, navigation, organization and labeling systems) should be part of the product development lifecycle and should be performed in conjunction with the development of the software and systems. The testing of all documentation should be a part of the product development and not a separate exercise. Although accurate user documentation cannot be completed until the software product has been fully developed, the user documentation and the product both benefit from concurrent development and testing. Exposure to end-user feedback can identify design and comprehension issues early, demonstrate performance expectations, provide guidance on learnability, and assess user satisfaction/experience.

The updated areas of this standard are listed and described in Table 1.

Documentation review	Planning for reviews, defining criteria, resources needed, administration of reviews; issue identification and record-keeping expectations
System test of documentation	Establishing elements for system test, planning, designing and execution of tests, defining entrance and exit criteria. Tracking problem severity and resolution should align to normal project change control processes. Note: While testing of the information for users may uncover issues with the software or system being developed, this standard does not cover the resolution of these problems.
Accessibility testing of documentation	The scope and importance of accessibility testing is covered. This is particularly important for integrated product content. Assistive technologies and automated validation tools can provide confirmation of appropriate standards being achieved.
Review and testing of translation and localization	Translation may require additional resources and time in order to achieve coordinated release. Some key areas for review and testing are identified.
Annex A - User-centered test and review guidelines	These guidelines suggest user-centric approaches to test activities that will allow information products to be developed so they satisfy the primary user: <ul style="list-style-type: none"> • Support for an action-oriented approach • Support for real tasks • Support for error recognition and recovery • Support for information access • Content for translation
Bibliography	A comprehensive list of related ISO standards as well as selected references to support information developers with their test and verification processes.

Table 1: Updated sections in the ISO /IEC/IEEE Standard 26513

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How tech teams can help their companies adopt content automation

Tech doc teams have long known the benefits of modular, reusable content. But content development processes outside their team might not run as smoothly and efficiently. It is time we step up to advocate content automation across the organization.



Image: [alphaspirit / 123rf.com](https://www.alphaspirit.com/)

Text by [Gavin Drake](#)

The demand for high-value, multi-channel content has risen quickly over the past 20 years, and technical communicators have been at the apex of this movement. Using standards such as DITA – an XML model for authoring and publishing technical information – technical documentation professionals have used a componentized approach to content that is significantly more effective than creating standalone, static documents in unsearchable silos.

The problem is, however, that much of today's business-critical content is created outside the tech docs teams by subject matter experts who are confined to using manual, ad hoc approaches that are error-prone, inefficient, disjointed, and deliver subpar customer experiences. This group of authors produces multiple times more content than technical writing teams but have the least mature technologies and processes for doing so.

For years, software vendors have tried to bridge this gap by offering subject matter experts solutions for creating structured content. These tools fall short

because they remain too complex, often trying to use technical standards – such as DITA – for content they are not apt for. A subject matter expert must focus on the content and doesn't need to see the technical details behind it – such as XML markup languages.

To really bridge the gap, non-technical authors need content automation solutions. These easy-to-use, intuitive solutions help to create componentized content that leverages all the best practices tech docs and information management teams have built over the years. There is a tremendous opportunity for tech doc experts to champion content automation across their organizations to lower costs, increase efficiency, improve consistency, and meet consumer demand for content.

Customers demand more content

Gaining and retaining customers in the digital world is complex. Customers are no longer satisfied with static print and PDFs – they want access to information on a range of touchpoints from smartphones and tablets to smart TVs. What's more, they expect content to be consistent, engaging, and interactive. This is a challenge for all organizations across industries – from financial services and manufacturing to government, energy, and healthcare. In many cases, organizations have additional challenges driving digital transformation. The volume of marketing content is increasing exponentially, as it often includes multimedia assets such as video and animations or complex data and charts from multiple data sources. Additionally, across many industries, regulations and compliance requirements are growing, which adds a significant level of complexity to managing and delivering omni-channel content.

The content problem

In a nutshell, current content tools and processes outside of tech doc and information management teams get in the way of driving digital transformation. They simply do not solve the challenges presented to content teams today. Here are just a few examples of how current tools fall short:

- No single source of truth to find latest content
- Huge effort to simply keep materials in sync

- Time-consuming updates of content
- Endless copy/paste of content
- Multiple handoffs and dependencies between individuals, departments, and systems
- Reviewing duplicate content
- Difficult to adapt and customize content
- Manual delivery of content to multiple distribution locations

An evolved approach to content

What worked 20 years ago in a print-only world does not work today. There is a need to create more, faster, and with fewer resources. Content automation is an emerging technology that is helping leading companies modernize and streamline their systems and processes for content.

As the term "content automation" suggests, it's about removing manual human touches from the content lifecycle. It's about enabling each individual to focus on what they do best. One of the most important aspects of content automation involves how content is authored. This probably isn't surprising when you consider some of the challenges outlined above. In order to automate any process, it's necessary to start with the inputs. The aim is to avoid GIGO (Garbage In, Garbage Out). Many companies today create content as they have done for decades. They start in a word processing document like Microsoft Word and adopt a document-centric view of the world. Authors can waste as much as 50 percent of their time on non-value added tasks such as styling content, copying and pasting content and recreating content that already exists. What's more, content is locked into a document, which means to reuse it in a different document requires copy/paste, reusing the content for the Web requires copy/paste, and reusing the content in a mobile app requires... you guessed it... copy/paste. Content automation changes this by allowing subject matter experts (authors) to create reusable content components. Content components can be dynamically assembled for each audience and media type with no duplication of effort.

This move from creating documents to creating reusable content components means you now have a single source of truth, copy/

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paste is virtually eliminated, content only has to be reviewed and approved once, and updates can be automated across every document that uses the same content component. The same content can be reused across different documents for the same product, service, and campaign as well as for similar products, services, and campaigns. This provides cost savings for authoring, translation, and localization, and reduces other costs inherent in legacy content strategies.

Reducing costs and complexity

If you're operating internationally, chances are you are localizing content into many languages and variations. This involves the actual, hard translation costs as well as the soft costs to produce the localized materials that can impact speed-to-market and even the financial viability of entering a new market. By authoring content as reusable content components, each content component only gets translated once, irrespective of how many places that component will be used. If content is updated, only the changed content component needs to be re-translated and the updated translation is automatically fed into every document that uses that content component.

Companies can save more than 25 percent of their translation costs through this approach.

Expected results

Moving from manual processes to a content automation platform is enabling global companies to do more with fewer resources, to drive standardization, increase speed-to-market, reduce compliance risks, ensure brand consistency and drive outstanding customer experiences. Information professionals and those involved in the technical documentation area are well-placed to lend their experience and expertise to drive content automation across the enterprise into areas such as standard operating procedures, investment research, datasheets, training and more.

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To certify or not: Staying competitive as a small LSP

Is being part of the national certification association paramount to success?

Will ISO certification guarantee business growth?

Here is what you should consider before investing time and money in standard certification.

Text by Daniel Malament and Afaf Steiert

Language service providers (LSP) today operate in a self-regulated market that is structured through regional, national and international standards. Adhering to these standards is awarded with a set of certifications that remain pivotal to the business development of an LSP as it aims to either grow or retain a portfolio of

clientele. This certification system originates from Europe and the U.S., where standards were first developed as these large economies worked hard in order to realize their vision of a global economy. To remain profitable in a globalized world, LSPs today need to meet not only national but also internationalized standards.

Driving factors

To understand how standardization became a pervasive reality across all industries, we must remember two historic developments: the industrial revolution and the European project.

First, the industrial revolution paved the way for organizations to grow beyond their regional locales,



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which in turn sparked the need for a common system to adhere to. Consumers rallied for a system that ensured accountability and their own safety from products they consumed and used. Certifications were developed to divide producers into recognizable groups for consumers. This development reached right across various industries such as transportation, communication, and production. Second, as Europe rose from the ashes of WWII, political leaders attempted to avoid a future conflict by blending national interests with economic integration. This led to the second wave of standardization. As European economic hegemony grew, institutions such as the International Organization for Standardization (ISO) gained power, and businesses across various sectors achieved certification for their operations through a controlled, six-stage process. This system of certification fit well into a globalizing world and was thus adopted across markets and industries.

Weighing up the pros and cons

For small businesses, the benefits of acquiring domestic or international certification might appear vague and negligible in the short term. Smaller LSPs may be highly qualified for a certification but lack the funds to fulfill the requirements. There is an evident need within the LSP market for more resources dedicated to business development. When these LSPs do choose to get certified, they might find it difficult to select the most appropriate certification body in this saturated market. To illustrate the challenges, let's take a closer look at the ISO certification.

ISO is a great example to demonstrate the prevalence and penetration of standardization. The organization does not actually offer certification – this is left to external agencies that certify businesses at a charge. ISO has sparked an entire market of businesses that don't sell anything beyond a certification associated with a reputable brand. ISO standards and certification can be found across every possible industry. It is the first choice for LSPs when it comes to international certification. The most relevant to LSPs is the ISO 9001 or ISO 17100, a certificate that focuses primarily upon quality management systems.

The benefit of gaining ISO certification lies in the accreditation value that will be recognized by prospective clients globally. However, there are two major drawbacks: First, ISO 9001 requires human and/or financial capital. If you're a small business, creating the necessary documentation in order to gain certification can cost around US\$ 1,000 and an estimated 461 hours of your employees' time. If your company opts to have a consultant organize and arrange all the materials and information, costs range from US\$ 2,000 to 50,000 depending on the size of your company and the level of inclusion that the consultant will have in the process. Second, internal audits show that retaining ISO certification requires added capital in the long run.

ISO certification has become increasingly common among LSPs, but does this prove its efficacy in promoting business? Does ISO certification have any influence on an LSP's growth? According to data that was taken indiscriminately for the ISO 9000 family of standards by the University of Kent, the answer is no, there is no causal relation between certification and business growth. There is no notable difference in profit after certification. Instead, it is presumed that companies that pursue ISO tend to perform better than their non-ISO certified counterparts prior to and after certification. However, this finding must be treated with caution, as it applies to the ISO 9000 family of standards in general and may not hold true for ISO 9001 in particular. Still, we can assume that for well-performing LSPs, ISO certification doesn't really make a difference. It is not a requirement for small LSPs to gain certification, especially when they do business with larger LSPs that have this certification. Growth will only be driven by the LSP's internal strategy, which can include ISO but should not be based upon it.

Regional certifications play out a bit differently. Institutions that accredit regional standards often borrow from international standardizations, although they tend to have the added benefit of lower costs, more lenient adherence policies, and a smaller pool of competition. This makes it easier for LSPs, but also results in the certification being taken less seriously. In Europe, there are limited options for regional certification institutions such as, for example, the German Federal Association of Interpreters and Translators, or the Institute of

Translation and Interpreting in England. Regional certification associations in the EU answer to the European Union of Associations of Translation Companies (EUATC). The EUATC allows all these regional institutions to come together to form a Europe-wide network.

In the U.S., certain associations have made similar attempts, but have so far fallen short or were drowned in the mix of different certification options. Here, the Small Business Administration (SBA) consults small businesses on what paths they should take in order to gain business expansion while providing them with certifications that can increase their chances against larger competitors. SBA often guides companies through local county certifications, city-wide certifications in relevant economic hubs, and statewide General Services Administration (GSA) certification. The GSA allows any company that holds their certification – regardless of size – to bid on federal contracts. As the GSA deals with one client and multiple vendors, a price war often occurs to outbid the competition. But quite often, small businesses manage to benefit from smaller scale contracts and are able to gain an immediate return upon the certification investment. Because the certificate provides access to a closed market, growth is easy to attain through the bidding process. If it becomes lucrative enough, LSPs seeking growth might even hire someone specifically to respond to the requests for quotes. Of course, there is a limit regarding the amount of profit that can be derived from certification. Certifying through GSA means that there is only one client, so if you're an LSP providing a poor diversity of languages, your services might not be required once translation into a particular language is finalized. Engaging in such a federal contract is only advisable for LSPs that can handle diverse languages and a fluctuating workload. Demographic-specific certifications such as the Women's Business Enterprise National Council (WBENC – a part of the Small Business Administration) or the Minority Business Enterprise (MBE) provide the advantage of a broader network and increased prestige in contrast to businesses that do not hold the certifications. However, considering application and membership fees, there is no easy answer as to whether the investment will pay off. For some, these certifications have proven to help with business, but as these certifications are subdivided into regional chapters, the subse-

quent division of networks of both LSPs and prospective clients creates a cost barrier to access them effectively. The WBENC attempts to tie these networks together through summits, meetings and workshops; yet again, capital is required to engage with these efforts. To further complicate things, certain vendors within WBENC will often require additional local certifications. LSPs must take all these variables into account and thoroughly research the demographic that a certification grants access to.

So should I get certified?

Standards are a phenomenon of social, technical, economic, and legal activity that have a dramatic effect on business, society, and culture. Certification for these standards, however, does not hold the same importance as it may have in the 1990s, when the world saw new heights in interconnectivity. Successful companies often already adhere to the standards that are required

for certification. It would be best for a company to evaluate the need for certification upon a simple set of assessments. First, does the certificate provide exclusive access to a market? Second, does the certification add value to the brand and reputation of my company? And finally, does the certification allow me to attain something that my peers already have? Answering yes to these questions after thorough analysis will show you which is the best certification for you.

The last question is perhaps the most important one because, in some cases, adhering to standardization is paramount to staying competitive. If all your competitors have certification, gaining this certification is merely a requirement of competition. However, to really stand out from your competition, the quality of your services remains the most important factor, regardless of certification. While we're accustomed to proving our status through memberships and accolades, the most important element will always be the quality of the work we produce, which is a standard all its own.

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What Big Data can tell us about the translation industry

The rapid adoption of cloud-based translation tools, which aggregate usage statistics across thousands of organizations and translators, is producing Big Data for the translation industry. With the help of this Big Data, we can benchmark productivity, identify industry trends, and train machine intelligence.

Text by Konstantin Dranch



% increase	Language	Volume	% increase	Language	Volume
67,481.6	Marathi	*	331.3	Estonian	*
3,087.7	Hindi	*	319.2	Polish	**
1,006.0	Latvian	**	318.5	Norwegian Bokmål	*
784.3	Kazakh	*	307.8	German	***
689.1	Serbian	*	306.9	Thai	*
659.5	Finnish	**	299.7	Overall increase in volume	
657.5	Romanian	*	295.8	Korean	**
613.9	Vietnamese	*	269.4	Czech	**
592.5	Indonesian	*	268.3	Russian	****
585.7	Turkish	**	245.5	French	****
543.6	Hungarian	*	241.4	Slovak	*
467.4	Italian	***	237.8	Portuguese	***
457.2	Ukrainian	*	237.4	Bulgarian	*
448.9	Chinese	****	230.0	Arabic	*
440.7	Swedish	**	200.9	Japanese	****
428.8	Dutch	**	194.8	Spanish	****
390.0	Norwegian	*	137.8	Bulgarian	*
378.9	English	*****	121.4	Greek	***
335.2	Danish	**	-	-	-

Volume:

- * low millions
- ** above 5 million words
- *** above 10 million words
- **** above 20 million words
- ***** above 100 million words

Figure 1: Annual growth of the number of words translated into

Only five years ago, translation data was mostly isolated and siloed. Companies employed on-premises translation software that kept data locked away within the company, perhaps only shared at conferences. Moreover, comparing statistics such as translation speed and quality was difficult because globalization teams developed custom metrics and tracked performance in their own unique ways.

Cloud computing leads to Big Data

By the early 2010s, cloud translation tools started to gain prominence and user communities grew. Unlike their predecessors, cloud tools had central storage and aggregated data from many organizations and individual translators. They offered the same standard metrics to everyone, solving the problem of data inhomogeneity.

Initially, the cloud approach encountered severe resistance. Enterprises with secrets to protect and translation companies working with confidential materials were reluctant to upload their translations onto third-party servers. Germany's market was particularly hard for cloud platforms to penetrate. By 2017, however, cloud platforms have overcome this resistance and gained widespread adoption. Major European platforms currently have tens of thousands or even hundreds of thousands of registered users. Memsourse exceeded 100,000 accounts by 2017. SmartCAT boasts

more than 70,000 translators available via the platform. The crowdsourcing platform Crowdin claims to have 900,000 registered users.

Each of these platforms has the capability to collect the data from all their users under one roof, eventually arriving at billions of translated words, thousands of working hours done – the Big Data.

Machine learning

Big Data has the potential to dramatically shake up the translation industry. Its most promising long-term use is machine learning. Stored editing, proofreading and terminology work in hundreds of language combinations means platforms have a lot of material to train translation engines and spell-checkers. Translation data is usually copyrighted to users and not accessible to software engineers. However, under some circumstances users agree to share their non-confidential content. For example, the Microsoft Translator comes with a free feedback engine that provides and collects reusable translations to train the engine further. There are a few use cases of machine learning implementation in translation systems. Matecat, for instance, used their material to automate tag placement during translation. SmartCAT analyzed patterns in translator behavior to machine-“guess” whether the selected translator could accomplish the task within the deadline. Lilt.com and SDL are experimenting with adaptive MT, which learns from users as they work within the system. None of these experiments have evolved into “killer features” allowing the platforms to take control of

the market. But tool providers around the world keep experimenting.

Productivity benchmarking

A more evolved use for Big Data is to get a bird's-eye view on the translation industry. This can already be achieved.

In Memsourse, we were able to set up a business intelligence feature that helped gather and analyze metadata from translation jobs, including:

- volume of words
- language combinations
- leverage of technology

Information has been anonymized and analyzed in bulk, irrespective of the user. After a few weeks of cleaning the data, we were able to extract some relevant findings that indicate market trends.

Finding 1: Languages of India, Asia and Eastern Europe are growing in prominence

For the chart shown in Figure 1, we compared the number of words translated into in Memsourse in the second quarter of 2015 and second quarter of 2016. The overall volume grew by 300 percent from about 150 million words to 450 million words. Those languages that exceeded this overall growth rate show a particularly steep rise in demand. We used only target languages with more than one million words translated over the second quarter of 2016.

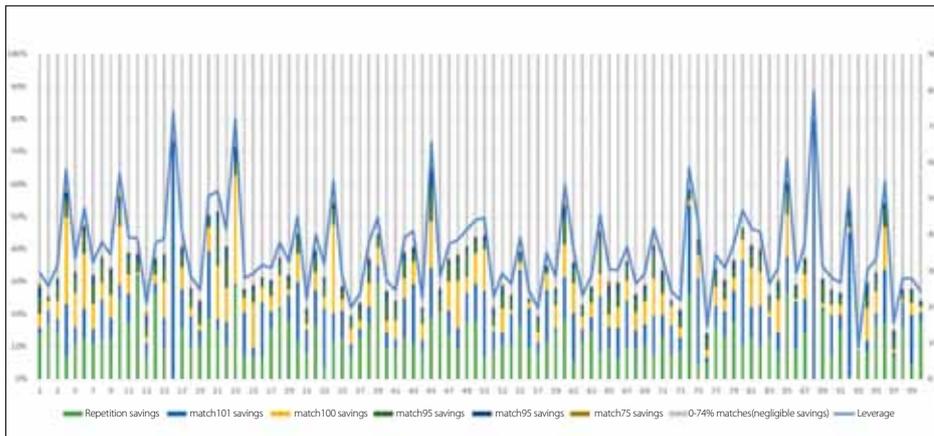


Figure 2: Translation memory savings across the top 100 Memsorce users

Here are the findings:

1. Marathi and Hindi lead the table with incredible growth stemming from low base value. This signifies that some brands are now starting to translate into languages of India and target consumers there.
2. The growth of Latvian, Serbian, Romanian and Hungarian signifies the rising business interest in less saturated but smaller markets in Eastern Europe.
3. Finnish, Swedish, Dutch, Norwegian and Norwegian Bokmål show the continuing growth of business interest in Nordic countries. The community of Memsorce users in these countries is strong and gets even stronger every year, which might influence the data.
4. Chinese, Vietnamese and Indonesian represent the rise of the Asian languages. Japanese is not part of this trend, perhaps because Memsorce already has a stable

community of users in Japan that led to a high base volume, making it harder to achieve 300 percent of growth or more.

Finding 2: Implementing translation memory saves 36 percent of the translation budget

Using a large sample of 516.5 million words translated in Memsorce, we were able to pinpoint the average increase in productivity and the budget savings from translation memory. For this sample, we looked at the last six months' worth of translations from our top 100 users. These are mostly large translation companies and in-house translation departments of software and manufacturing enterprises. Translation memory is the basic technology in professional language services, as it allows the reuse of previous translations. Depending on content type and volume, this speeds up work considerably. Translation memory works by

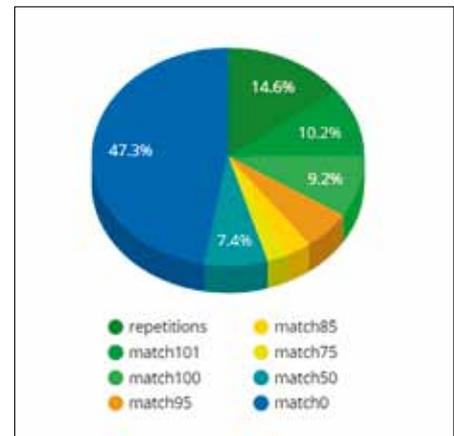


Figure 3: Sample translation memory matches

checking how similar a new text segment is to the best available match in the database of the translation memory. It classifies the segments into the eight categories shown in Table 1. In our sample, out of the 516 million words translated, 38 percent had a match of some kind in the translation memory, and 14.6 percent more were repetitions. Translators save time only with repetitions and good quality matches. To calculate savings, we applied a discount to matches: 80 percent for exact matches, 75 percent for good quality matches and 25 percent for fuzzy matches. The resulting cost savings differed from organization to organization and ranged from 14 to 90 percent. The average value for the whole volume was 36 percent.

Finding 3: Professional human translators can leverage generic MT to gain a 5–20 percent boost in productivity

We used a similar method to find out how post-edited machine translation can improve the productivity of professional translators. Measuring how closely MT suggestions resembled actual human translations performed in Memsorce, we were able to draw conclusions about MT relevancy for translators. In Figure 4:

- Match 100: segments where the professional human translation is identical to the MT suggestion
- Match 85–95: MT suggestions are close enough to use after edits
- Match 50–75: MT is useful for auto-completion of individual words, but not whole segments
- Match 0 represent segments with 0–49 correlation to human translation

Classification	Words belong to...
Repetitions	A segment that is repeated within the translated document
match101	A context match: 100% match preceded and followed by other 100% matches
match100	A segment is identical to a segment in the TM
match95	99-95% similarity
match85	85-94% similarity
match75	75-84% similarity
match50	50-74% similarity
match0	0-50% similarity

Table 1: Translation memories classify text segments into different categories.

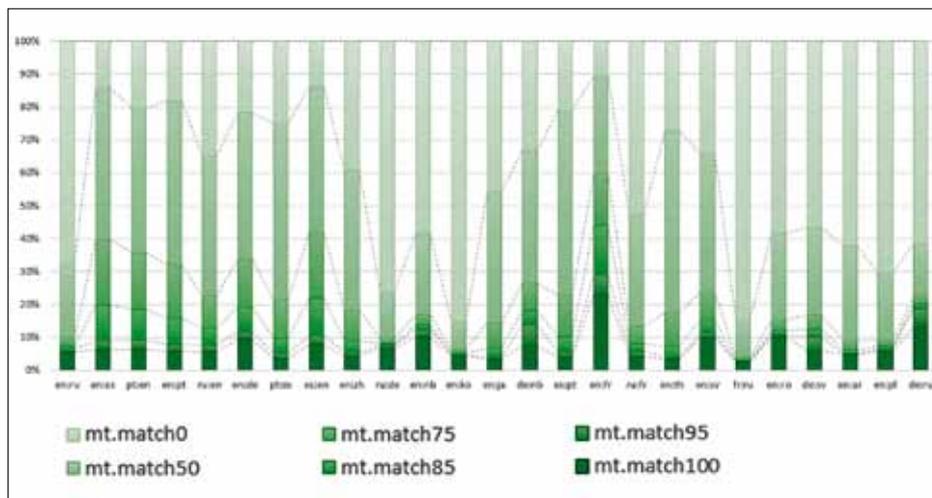


Figure 4: Machine translation leverage by language pair

For the chart shown in Figure 4, we could only track projects where users first enabled machine translation.

For this experiment, we measured the performance of generic, non-customized MT engines, and used a sample of 38 million words.

Overall, only 5–20 percent of the suggestions from MT were good enough to simply use as final translation without any edits. Up to 40 percent of the suggestions were usable after editing.

French, Portuguese, Spanish and English machine translation engines had the highest rates of MT leverage. English to French stood out

with more than 20 percent of the translations a complete match to MT suggestions, and almost 90 percent of segments having at least some coherence with the MT. In comparison, Russian, Polish and Korean had much lower leverage rates: below five percent of exact matches. The difference is probably due to the morphological typology of the languages. French, Portuguese, Spanish and English are analytic languages which rely on word order and auxiliary words such as “are” or “will” to convey meaning. Russian, Polish and Korean are synthetic, which means they use many more inflections. MT is still struggling with inflections.

To conclude

As the above examples demonstrate, Big Data can deliver some interesting findings for machine translation. Hard data of this kind is new and was not available before. There is a big potential for utilizing such findings in the future for data-driven decision-making. And when companies learn to harness the power of Big Data, it might have a profound impact on the industry.

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Three collaboration tools for technical communicators

Are you working in a distributed documentation team?
Then consider these software solutions that will make your job easier and facilitate teamwork.

Text by Nicky Bleiel



Ten years ago, I gave a talk at the STC Summit called "Cool Tools for Tech Writers for \$100 or Less" that featured tools that could be used to automate file backup, create and edit icons, create characters, edit images, take screen captures, remove document metadata, and more. Most of those tools were useful for performing the "solo" tasks of technical communication. But times are different now, and while we still need the tools I talked about then, in 2017 "cool tools" must include collaboration features for the entire development team, because so many of us work in global teams that are using Agile software development methodologies. Collaboration tools...

- can be accessed from anywhere via the Web,
- allow synchronous communication, and
- include social features.

There are a number of collaboration tools for software development teams that can be used separately or in tandem. Among them are GitHub, Slack, and Mural.

- **GitHub** is designed for software project management – It is a web-based repository for software projects that includes source control, issue tracking, notifications, documentation, and social features.
- **Slack** is used for chat communication – It is used for individual and group messaging.
- **Mural** is intended for planning and organizing – It lets team members from around the world collaborate on a virtual whiteboard.

Some of these tools integrate with each other, for example, GitHub and Slack. When researching collaboration tools for your teams, you may want to include the ability to integrate with other tools on your list of requirements.

GitHub

GitHub (<https://github.com/>) is a web-based repository for managing software projects and the version control of code. Public GitHub is reportedly the world's largest open-source community, hosting over 35 million repositories that include both code and the documentation for that code. In addition to public projects, GitHub projects can also be private or hosted internally behind your company firewall on GitHub Enterprise.

GitHub could be considered a "one-stop development shop" because it includes version control, project management, and social features. Technical communicators can manage documentation issues (bugs and feature requests) using GitHub's issue tracking. It makes sense to use GitHub for the version control of your documentation files, as storing documentation files along with code and other project artifacts means that documentation is not siloed; it can follow the same workflow as code, and the project's collaborators can review and contribute to the documentation. This is especially important when your team is using an Agile software process, where docs are part of the "definition of done".

There are three documentation options in GitHub: READMEs, GitHub Pages, and a Wiki. These options can be used strictly to document your team's GitHub projects, or you can use them for team collaboration, information gathering, planning, or whatever your team deems necessary.

GitHub has several social features that make it easy to keep track of other team members and projects. You can "follow" other contributors and GitHub will automatically alert you of their activities. You can also "watch" specific projects, i.e. you will receive notices about these. If you prefer to tag a repository, but skip the notifications, you can "star" (favorite) it. You can then go to your "stars page" to catch up on those projects, as well as take a look at the "stars" of your friends.

Over 100 productivity tools can be integrated with GitHub, which provide additional opportunities for collaboration. You can see the complete list at <https://github.com/integrations>, but here are a few you and your team might find useful:

- **Atom** is an open-source, cross-platform text editor that has GitHub version control built in. You can use it to author documentation in Markdown and AsciiDoc, or to write code.
- **ZenHub** lets you view and manage your GitHub issues on a virtual task board, which is great for both Agile and virtual teams.
- **Slack** is a team messaging application. GitHub commits, pull requests, and merges can be automatically posted to Slack messaging channels.
- **GitHub Desktop** lets you contribute to GitHub projects with a GUI, instead of using command-line Git.

- **GitHub** can be used to host, write, and publish documentation collaboratively. Outputs include PDF, ePub, mobile or a website, and you can author in Markdown or AsciiDoc.

Slack

Slack (<https://slack.com>) is an instant messaging tool that facilitates team communication by combining group chat with useful tools. Slack is built around the concept of channels. Channels are group chats that anyone can set up and then invite team members to join the conversation. Anyone can read or join any Public channel on your company's Slack, while Private channels are confidential and by invitation only. Because anyone can start a Slack channel, it is easy to start a conversation about any project or topic, which encourages collaboration. And when a channel is no longer needed, it is just as easy to archive it. Traditional chat functions are also available in Slack. You can create small group chats or contact team members via direct message.

In addition to text chat, you can communicate with others on your team by using voice or video call. You can start group calls with the entire team (useful for daily standups) or hold one-on-one calls. Speaking of standups, Agile teams can configure Slackbot, a built-in bot, to remind everyone that it is time for the daily standup. Slackbot will also answer your "how do I?" questions about Slack features with a link to the appropriate topic in the Slack Help Center.

On the practical side, you can share files on Slack, as well as pin and "star" (favorite) messages. Slack messages are archived and searchable (although archiving is limited on the free version), and you can quickly ping a team member on any channel by using an @mention (GitHub also has this feature). Using @channel will ping everyone on that Slack channel as well as via email, while @here will just alert those on the Slack channel. On the fun side, you can include emojis within messages, as well as use them as reactions to messages. And you and your team can create custom emojis. Emojis are one way to make Slack chats more "conversational," but you can also add animated GIFs and video. Giphy, a GIF search engine popular on Twitter and Facebook, can be integrated with Slack.

Additional resources

- GitHub Guides: <https://guides.github.com>
- Video GitHub Training and Guides: www.youtube.com/c/githubguides
- Slack Guides: <https://get.slack.help/hc/en-us/categories/202622877-Slack-Guides>
- 13 cool Slack features and integrations you might not know about: <https://thenextweb.com/apps/2015/02/05/13-cool-things-might-not-know-can-slack>
- The Ultimate Guide to Using Slack for Team Communication: www.huffingtonpost.com/james-carbary/the-ultimate-guide-to-usi_b_7574232.html
- Things You Should Know: 5 Skills for Getting Started with MURAL: <https://blog.mural.co/2016/01/5-essential-skills-get-started-mural>
- Mural.ly: A whiteboard on steroids for visual collaboration and brainstorming: <http://mindmappingsoftwareblog.com/murally-review>
- Best Productivity Tools for Software Development teams in 2016: <https://toggl.com/best-software-development-management-tools-2016>
- 8 of the Best Free Collaborative Tools For Programmers: www.makeuseof.com/tag/8-best-free-collaborative-tools-programmers



Slack integrates with over 100 apps in a variety of categories (see <https://slack.com/apps/>), including GitHub, Twitter, Skype, Kayak, and more. You can also build your own custom integrations using the Slack API. Slack offers both free and paid plans.

Mural

Mural (<https://mural.co/>) is best described as an online whiteboard that can be used for synchronous team planning. With Mural, teams can add and arrange sticky notes to boards (called "murals") together in real time.

For distributed Agile teams, Mural is a great way to create a Kanban or Scrum board that the entire team can contribute to and reference during daily standups. You could also create a mural for team retrospectives, and have everyone add sticky notes under the three common Agile retrospective questions – "what went well", "what went wrong", "what to improve", and "kudos" – then group the notes and vote on what issues to discuss.

Mural can also be used to develop workflows, personas, or mind maps, and plan projects and organize events or any kind of brainstorming session.

When working synchronously in a mural, team members can chat, add comments on any part of the mural, and vote anonymously to reach group consensus. "Following" a team member while you are working will show you in real time exactly where their focus is in the mural. As not all changes are made with the entire group present, any changes made asynchronously between team meetings can be viewed in the "Activities" sidebar.

You can add images and videos (including YouTube videos) to your murals, as well as links and documents, so your murals can become quite robust and detailed. Mural has a free 30-day trial.

Collaboration beyond tools

GitHub, Slack, and Mural are just three of the many collaboration tools you can evaluate for your team. But no matter which ones you choose, there will still be work to do after the tools are set up. For truly effective collaboration, you need to develop guidelines and best practices to ensure tools are used effectively.

In GitHub, you should consider creating a standard structure for both bug reports and feature requests. You can also create guidelines for the creation of issue labels (note: GitHub includes issue labels for "bugs", "enhancements", and "questions", but not "documentation" – so add that label first).

Slack makes communication easy and fun, but you need to separate the work communication from casual chatting. Many teams will create a "water cooler" channel for informal conversations.

In Mural, a good best practice is to create a "legend" for planning and workflow boards – for example, the sticky note shapes and colors to use for each category – that everyone can follow when working together.

Of course, the best way to ensure team productivity and success is for the entire project team to work together when evaluating, choosing, and developing best practices for collaboration tools. That will take any tool from useful to "cool".

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The Language of Technical Communication, ed. Ray Gallon

Review by Natalia Lincoln

Although technical communication is well-suited to those with a comprehensive knowledge of many subjects, the rate at which information doubles by now can race past even the most encyclopedic of minds. In the deceptively slim volume titled *The Language of Technical Communication*, a wide-ranging lexicon of terms both familiar and new is presented by 52 separate experts in the field, distilling a great deal of information down by topic into brief, pithy chapters. The uniformity of these bite-sized chapters bears out editor Ray Gallon's intention to "practice what we preach," i.e. make use of technical communication techniques to illustrate technical communication topics.

Beyond providing a welcome consistency, these techniques make it easy to find and absorb information. *The Language of Technical Communication* itself, neither a textbook nor a reference, can be read through in its entirety or consulted on individual topics. As trainer/consultant Mark Baker explains under "Topic-Based Authoring": "Readers are increasingly information-snacking on small pieces of content [...] rather than gulping down entire books or manuals. Technical communication over the last decades has therefore aimed to help searchers zero in on the precise bits of information that provide a solution to an immediate issue. The art of doing so is not only explained here, but applied in the text itself.

Thus, readers of all levels of experience with technical communication can choose from chapters explaining a wide array of terms and subject matter areas, from newer concepts such

as metadata and transclusion to more familiar terms such as user experience and localization. Each chapter answers three questions:

- What is it?
- Why is it important?
- Why does a technical communicator need to know this?

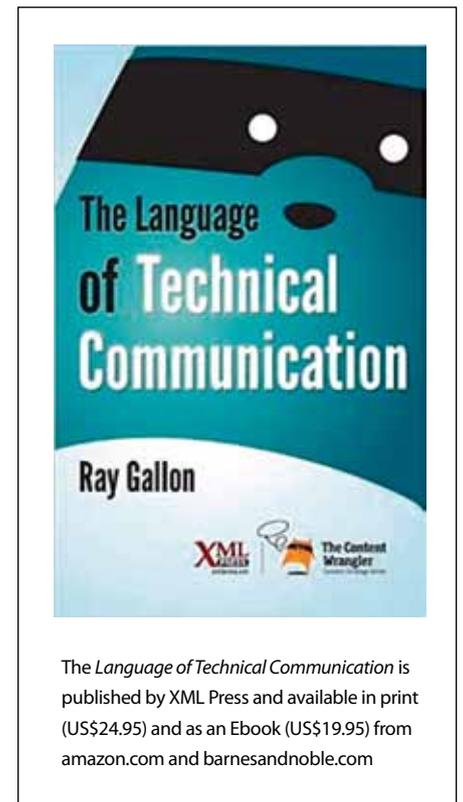
These chapters in turn are structured into five main sections including Core Concepts, Technical Concepts, Standards and Conventions, Deliverable Presentations, and Future Directions. The Core Concepts section in particular seems

to contain many familiar terms, at first seeming not quite specific to technical communication. However, these terms

are then explained from a technical communicator's vantage point. For example, Christopher Ward's section on "Business Analysis" not only includes the definition "A research discipline that provides strategic solutions to business needs by analyzing changing markets and industry trends," but also, what this represents for a technical communicator – that is, the essential business of knowing the audience (consumer base) they are writing for, or market trends that will shape the future of documentation needs. Likewise, Ann Rockley's entry on intelligent content makes clear that the meaning here is not just "content that's intelligent." Rather, intelligent content is flexible enough not only to withstand the transitions from one format or structure to another, but to be reconfigured in modular components and reused in a variety of deliverables.

Other concepts such as the "governance model" are explored, the necessity of which might elude someone without experience in technical communication. Readers who are curious about technical communication as a career might experience the sudden realization that someone must have the "authority to make [...] decisions about content," which goes a long way towards ensuring a seamless workflow.

The subsequent Technical Concepts section is more recognizably focused on specific tech-



nical communication concepts such as single sourcing and dynamic delivery. Here, the depth and variety of the authors' specializations are noticeable. From expertise in DITA, documenting software systems and coding experience to implementing publishing tools and content architecture, it is obvious how deeply this Who's Who of authors in technical communication inhabits the intersection between content and computing.

The third section, Standards and Conventions, explores the interface of law, industry standards, and technical communication. Both sides of the Atlantic are represented here, as can be seen from the inclusion of the European Machinery Directive. XML document editing standards are explained in general and short descriptions given for DITA, DocBook, oManual and S1000D. We catch a glimpse of the future under "Media Standards for XML": "While yet to become mainstream, taste and smell have markup languages under development, but consistent delivery of taste and smell content will require overcoming technical hurdles." We are also given a fleeting look into the history of eLearning, which was originally developed to link computer-based learning materials with electronic reporting systems and is now a set of standards making cross-platform sharing feasible across different learning management systems.

Deliverable Presentations, the fourth section, covers the variety of presentation vehicles used by technical communicators to deliver content, with a view to helping readers understand the pros and cons of each for the most effective delivery. Starting with HTML5 and rich media, including not just video and audio, but interactive 3D models and simulations as the bearers of multimedia communication, the list works its way down through infographics and animation to print as the last alternative, stating concisely the types of each as well as the advantages and disadvantages of their use.

For those with an eye towards the future, the last section, though the shortest, is the most fascinating: Future Directions. Including entries on Augmented Reality, the Internet of Things, Artificial Intelligence, wearables, and context sensing, this section sets the scene for things just visible now on the horizon, objects and systems not yet widely available. The common characteristic seems to be lending inanimate objects a set of senses, or at least imitating these – *smart*-ness.

. We as a society may have already experienced a sea change in our attitude towards smart machines: eagerness for, rather than suspicion at, the thought of a rival intelligence, or even at the gradual merging of circuits and human beings kicked off by wearables.

According to the editor, the objective of *The Language of Technical Communication* is to define technical communication as it is today, using current key terms and concepts, and how it might be in the future, using the terms and concepts predicted as things that will become important or even essential as they develop. The book's unspoken theme is, again, consistency with its own message of delivering only the right information at the right time to the right audience – in the right medium: by making that information easy to find and easy to understand.

The Language of Technical Communication will greatly benefit students and others interested in, or lateral entrants to, a career in technical communication; management staff who would like to understand the procedures, concepts, and potential inherent in technical communication; previous technical communicators looking to re-enter the field; or current technical communicators hoping to keep up with new terms, trends and technologies. Compact, elegantly simple, and direct, with the overarching discipline of form provided by editor Ray Gallon, this book assembles much sought-after information in one place.

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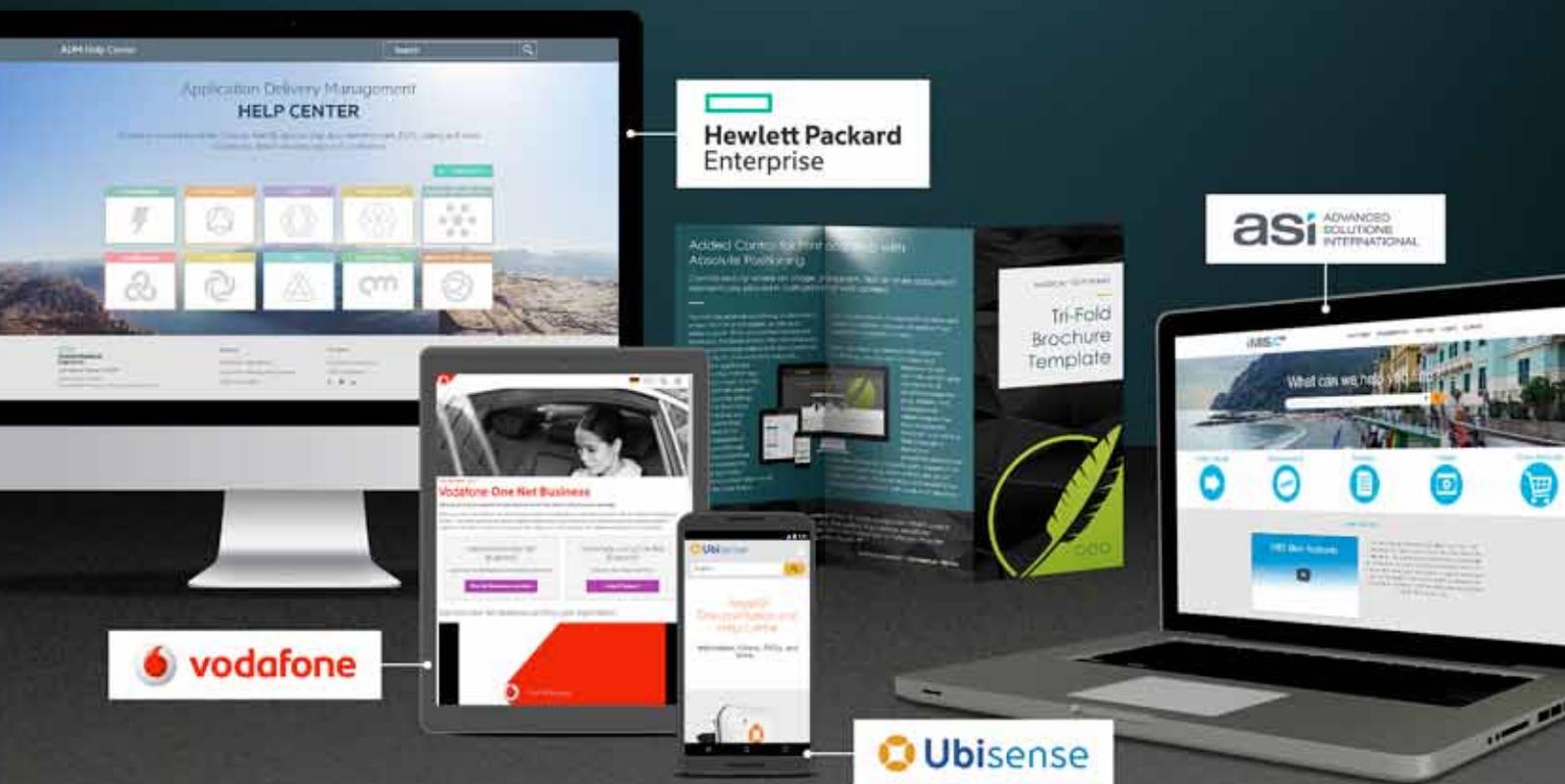
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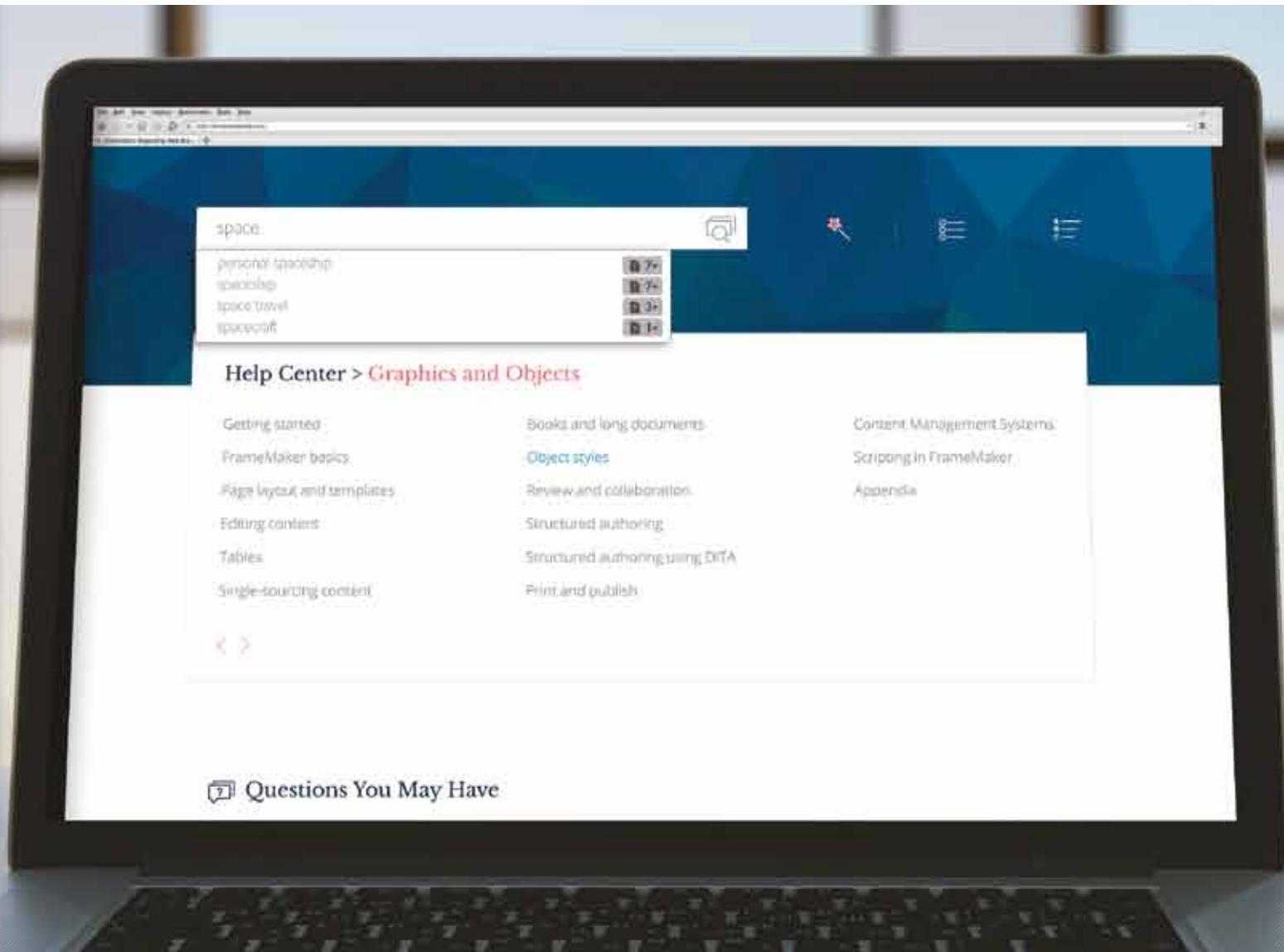
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