

magazine for international information management

tcworld

November 2018

User assistance 4.0

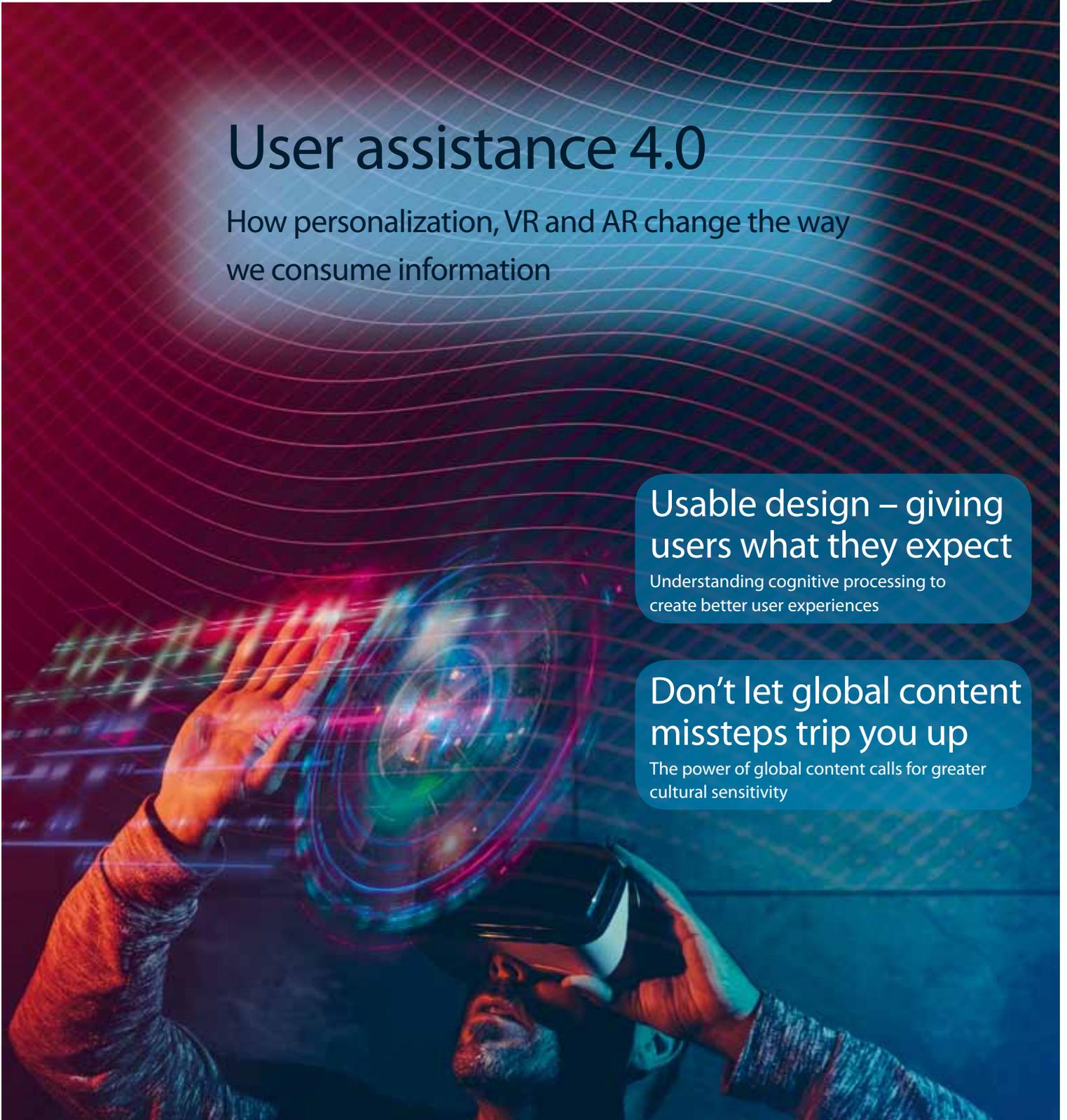
How personalization, VR and AR change the way we consume information

Usable design – giving users what they expect

Understanding cognitive processing to create better user experiences

Don't let global content missteps trip you up

The power of global content calls for greater cultural sensitivity



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From the editor

Browsing through the brain

Virtual Reality (VR) has come a long way from being a futuristic technology restricted to the gaming world and science fiction scenarios. Just like video gamers flying their avatar through sophisticated virtual environments, doctors today are using VR to scan patients' brains. At the University of California, researchers are now combining scans from computer tomography (CT) and magnetic resonance imaging (MRI) to create three-dimensional models of the brain. Navigating through these VR images, physicians can not only identify blood vessels and nerve tracts but can also track down tumors and aneurysms. This offers a whole new insight into the brain and opens the door to much more precise treatments and surgeries. Other use scenarios of Virtual and Augmented Reality that could potentially save lives are so-called head-up displays – or HUDs. These transparent displays project essential information into the field of vision of a pilot or driver. This means that the pilot or driver doesn't have to avert his or her gaze in a critical situation such as a takeoff or landing. In addition, the HUD will only display information relevant to

the actual situation, preventing information overload.

While these use scenarios are without a doubt highly valuable to our society, VR and AR technology has also spread into the user assistance of everyday products. Today, it helps users to operate machines and consumer products as basic as TVs and coffee machines. While Virtual Reality and Augmented Reality have the potential to revolutionize user assistance, they are also causing fear and uncertainty among technical communicators and creating new challenges.

In our present focus theme, author Ralf Heindoerfer investigates what might be in store for our industry in the near future (page 12).

Integrating VR and AR into user assistance will also be a hot topic at this year's tcworld conference. If you would like to learn more about this leading-edge subject, take a closer look at the tracks "Intelligent Information", "User Experience", and "Information Energy".

We look forward to seeing you in Stuttgart!

Corinna Melville

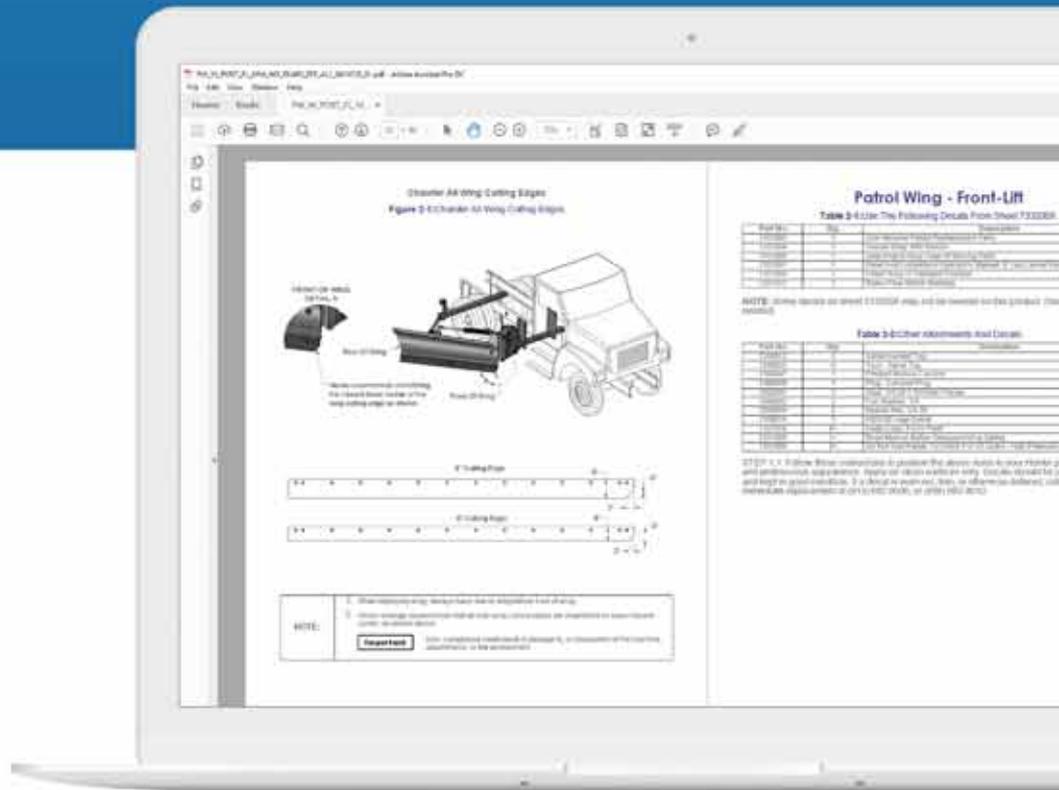
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User assistance 4.0

Technical communication has come a long way from the traditional user manual. Today assistants using Virtual and Augmented Reality teach us how to operate our devices and navigate through our daily lives. We have entered the age of immersive user assistance. page 12

Usable design – giving users what they expect

Cognition is the term scientists use to describe how the mind identifies, organizes and responds to information. Understanding this cognitive processing can lead to better, more usable designs. page 25



Don't let global content missteps trip you up

Global products and content are more prone to PR blunders: What may appear funny in one culture might be downright offensive in another. Products aimed at the global market need to be assessed with great cultural sensitivity. page 32



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THE FUTURE OF GLOBAL INTELLIGENT CONTENT

Market research firm Common Sense Advisory has published the report “Four Futures for Global Intelligent Content.” It analyzes four content trends that promise to add value to the masses of information generated every second: how semantically enriched content is adding knowledge to content; why machine-generated material is exploding content volumes and changing the nature of text; how conversational interactions are transforming content requirements and building demand for new ways to record information about users and their relationship to content; and why the rise of speech-enabled and headless devices will require content intelligence. The report also offers recommendations for how to prepare for the rise of intelligent content.

www.commonsenseadvisory.com

INTERNATIONALIZATION PLANNING GUIDE

Lingoport, Inc., a provider of software internationalization tools and services, has published the “i18n Quick Planning Guide” to help companies understand the process of preparing software to support local languages and cultural settings. The guide can be downloaded for free upon entering your details on the Lingoport website.

<https://lingoport.com>

NEW WHITE PAPER ON CUSTOMER JOURNEY CONTINUITY

Each touchpoint with customers can build or break the brand experience. And content is at the center of the customer journey. SDL’s recently published white paper “The 6 Dimensions of Customer Journey Continuity” explores the vital role of content in each of the six dimensions of the customer experience: your market presence, organizational structure, product release cycles, content governance, process automation, and customer relevance. The white paper can be downloaded free of charge.

www.sdl.com

Preparing children for the age of superintelligence

In nearly every industry, smart machines have edged their way into our lives. Whether their longer-term impact will be beneficial to our lives (curing diseases, reversing climate change, eradicating food shortages) or whether their impact will shatter our lives (automate our jobs, threaten our personal security, increase inequality), we can be pretty sure that we are dealing with an intelligence that is radically different. If we are to flourish as a species based on what we know now of the superintelligence (intellect much smarter than the human brains in all fields) still in development, we’re going to need a good dose of humility and great deal of preparation. What can our education systems do now?

Swedish philosopher Nick Bostrom is a Professor at Oxford University and a founding Director of the Future of Humanity Institute. He emphasizes that “superintelligent AI should be developed only for the benefit of all of humanity and in the service of widely shared ethical ideals.”

He recently shared his insight in an interview posted on CMRubinWorld.

C.M. Rubin: What role do you think AI should play in future schools in terms of the learning process as well as curriculum offerings?

N. Bostrom: If we are talking primary school, AI is probably moving too fast currently for it to make sense to try to integrate specific hot new ideas into the curriculum. But providing a broader base of computer science education and some opportunity to try programming sounds like a good idea. From the point of view of teaching general problem-solving skills to kids, basic concepts from programming and some good old-fashioned AI techniques offer more value than the latest neural network stuff.

AI could also contribute to the learning process by making it possible to fine-tune teaching materials and exercises to the attributes of the learner. However, I think there is much unpicked low-hanging fruit (in, say, online learning) that doesn’t require fancy machine

learning to implement; so I don’t expect current-level AI capabilities to make much difference there.

C.M. Rubin: What do you think will be the biggest differences for students graduating from school in 2050 to those who graduated this year? How much will the world their older peers lived in have changed, including the kinds of work opportunities they might be looking at?

N. Bostrom: Things in 2050 are difficult to predict because we don’t know whether machine superintelligence will have happened by then. If it has, then the world could have been very profoundly transformed indeed. If not, then maybe as a baseline we should expect about the same amount of change that has taken place between 1986 and 2018.

C.M. Rubin: Given all the changes that AI is bringing to our world, what other kinds of things do you believe parents and teachers should be focusing on to ensure kids can flourish in their new world?

N. Bostrom: Maybe having fun and being able to have meaningful, fulfilling leisure? As the world gets richer, it seems we should focus less on making money and more on using our historically unprecedented wealth in ways that create value. This could change if the technological frontier moves in ways that increase the marginal utility of money, for example if expensive but effective forms of life extension became available.

C.M. Rubin: Your research has also focused on ethics and policy. What do you believe are the top ethical issues in AI that humanity needs to focus on?

N. Bostrom: The common good principle, that superintelligent AI should be developed only for the benefit of all of humanity and in the service of widely shared ethical ideals, is worth emphasizing.

Read the full interview on

www.cmrubinworld.com

AR headset prevalence still a few years out

Global shipments of standalone and tethered Augmented Reality (AR) and Virtual Reality (VR) headsets are expected to total 4.2 million units in 2018, up 31 percent from 2017. Looking ahead to 2022, shipments for these headsets are expected to rise to 53.1 million units, according to the International Data Corporation (IDC) Worldwide Quarterly Augmented and Virtual Reality Headset Tracker. Although screenless viewers have accounted for a significant portion of the market to date, these headsets will continue to lose relevance as volumes decline and growth drops to a CAGR of -1 percent over the 2018-2022 period.

"IDC has updated its forecast to push growth for AR headsets out further as AR progress on smartphones and tablets continues to outpace that of

headsets," said Jitesh Ubrani, senior research analyst for IDC Mobile Device Trackers. "Apple's ARKit has continued to improve the fidelity of AR experiences on iOS devices, Google's ARCore is becoming available on more Android devices, and third-party SDK vendors such as 8th Wall and PTC continue to drive innovation in the space."

While most consumer-centric AR apps are focused on smartphones and tablets, commercial AR is driving shipments for standalone and tethered AR headsets. IDC expects the category to surpass the 1 million mark by 2020, after which the growth will dramatically increase. As more vendors enter the market, additional use cases come to fruition, and prices decline, we expect total shipments in this category to reach 21.6 million by the end of 2022.

"AR headset growth may seem muted, but it's still very early days in this market," said Tom Mainelli, vice president of Devices & AR/VR at IDC. "Things will get very interesting from a volume and capability perspective in the months to come."

Despite the recent downturn in the VR headset market, growth in this market will return in 2019 as global shipment volume jumps to 8.6 million headsets. Much of this growth will be due to the increasing adoption of tethered and standalone devices – particularly in the commercial segment – combined with the decline in screenless VR headset shipments.

www.idc.com



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Survey finds consumers would use AI to save time and money

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A recent survey by research firm Gartner, Inc. reveals that saving time and money are the top reasons why consumers would use Artificial Intelligence (AI). "AI is among the technologies that consumers consider using for tangible and more 'serious' benefits, as opposed to socializing, projecting self-image and having fun – three common reasons for using other personal technologies," said Stephanie Baghdassarian, research director at Gartner. Fifty-eight percent of respondents said they would use AI if it helped them save time (see Figure 1). Fifty-three percent said they would use AI if it helped them save money. "We can think of AI being able to look for the best deal for a specific purchase, or find the best route to a particular destination, enabling to save money on toll payments and fuel," said Ms. Baghdassarian. Forty-seven percent would use AI if it gave them easier access to information, such as travel and transportation directions and details of their everyday consumption of goods.

Consumers are uncomfortable with emotion AI

"Consumers are ready for a new relationship with AI technologies, but have clear preferences about how they want that relationship to occur," said Anthony Mullen, research director at Gartner. The survey also found that more than 70 percent of respondents feel comfortable with AI analyzing their vital signs, and with AI identification of voice and facial features to keep transactions secure. Nevertheless, when it comes to AI examining emotion in voices or facial expressions, 52 percent of respondents do not want AI to analyze their facial expressions to understand how they feel. Furthermore, 63 percent do not want AI to take an always-on listening approach to get to know them better. "Not all consumers are driven by the same motives for letting AI observe them," said Ms. Baghdassarian. "Millennials care about AI

understanding them better and adapting interactions based on what they do, feel and need. Baby boomers seek safety and security when they let AI observe them. Generation Xers are close to millennials in terms of attitude toward

AI understanding their needs, and close to baby boomers when it comes to safety and security."

Privacy is a concern

When it comes to privacy, consumers are skeptical about the use of AI and are concerned about what it may mean. "Sixty-five percent of respondents believe that AI will destroy their privacy, rather than improve it," said Mr. Mullen. "As the shift to communicate with systems from humans to machines will accelerate, IT leaders must tailor AI's approaches to customer engagement by persona to persona in order to cater for varying views and preferences. In addition, they need to respect user privacy as well as use AI tools to support privacy and transparency goals."

www.gartner.com

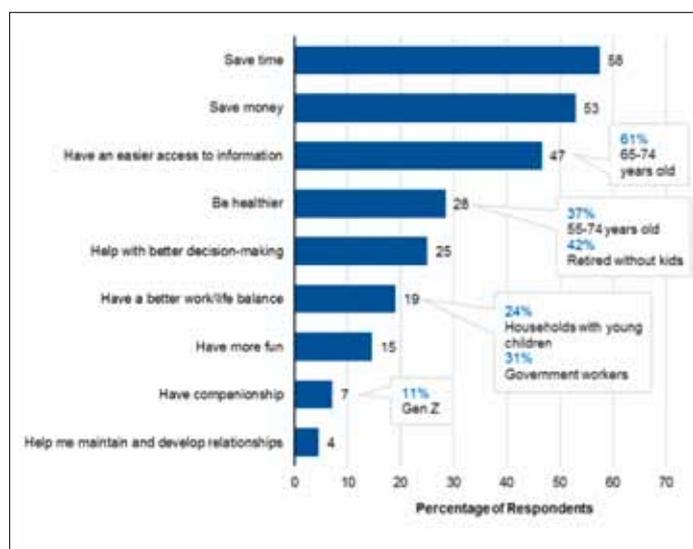


Figure 1: Reasons why consumers would use AI

Source: Gartner (September 2018)

CX training and certification program



Image: © atakan/istockphoto.com

Research firm Forrester has announced the launch of its CX Certification product, a training program that builds the skills companies need to create better customer experiences. The program offers a blend of hands-on learning and self-paced lessons in a digital learning platform, taught by Forrester experts drawing on more than 20 years of customer experience (CX) thought leadership. While 73 percent of companies aim to be CX leaders, only 25 percent say their CX programs actually improve customer experiences. Companies with highly rated customer experiences increase revenue at twice the rate of those with poorly rated experiences, so brands that prioritize CX gain a clear financial upside. The value CX provides has created a tight talent market, and comprehensive CX training options are few. Forrester's product matches the need of companies looking to train new or existing CX teams as well as individuals interested in moving into the burgeoning CX profession.

"Customer experience is a key differentiator across all industries, but most companies fail to provide quality experiences," Forrester chief research and product officer Cliff Condon said. "Our 2018 CX Index data reveals that CX improvement is stagnant for the third year in a row." Forrester's three-part CX Certification begins with a six-week online course in CX Foundations, which features six lessons focusing on topics such as journey mapping, CX measurement, and ROI modeling. Working in a collaborative and social learning environment, participants create real-world deliverables through interactive activities and short video lessons that are available on demand. Successful completion awards participants a signed certificate and badge to promote their certification.

The next Foundation Course is scheduled to start on November 13, 2018. More information and registration are available at

<http://forr.com/cxert>.



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Is there a place for compassion in TC?

Text by Leah Guren

Data-driven business cases. Analytics. Standards. Methodologies. Certification. Open any TC-related magazine or journal and you will discover a strong focus on the business side of our industry. As professional practitioners, we are urged to think of the cost of the content we create. At every conference, we see presentations urging us to talk about the “bottom line” and talk to managers about the monetary value of our services, rather than the value we bring to their customers.

On a certain level, it makes sense to think of our work in terms of analytics. We are the purveyors of technical information, which is the dry statement of facts about our company’s products and services. So why not look at us as just another cost center that must earn its keep within the company? What we tend to overlook is that there are people on the receiving end of our work: Users are simply people who rely heavily on our content to be able to use the products they have purchased. And once people enter the equation, mere dollars, euros, or pounds cannot quantify the true cost and value of our work.

A lesson in compassion

Recently, I put my work on hold, left my dog with the babysitter, and flew across the world to help my mother recover from major surgery. She had undergone a complex and potentially dangerous spinal surgery, and her post-surgery care involved an extensive team of medical experts, specific equipment, and assistance from family members. I was therefore involved in reviewing a huge amount of information that came from different sources:

- Medical instructions provided verbally at the time of discharge from the hospital
- Printed instructions provided by the medical team prior to surgery
- Different instructions provided by the hospital for pre-surgery protocol

- Printed instructions provided by the insurance fund regarding patient rights and coverage
- Verbal and hands-on instructions for the equipment (neck brace), from the nursing staff
- Manufacturer’s instructions (downloaded and printed later) for the neck brace
- Verbal instructions from the visiting nurse, the physical therapist, and the occupational therapist

We quickly discovered that:

- There was a great deal of conflicting information. For example, we received three different sets of instructions about pain medications.
- With regards to the neck brace, the manufacturer’s instructions did not match the surgeon’s instructions, plus they included information about another model, making them even more confusing.
- We spent a lot of time repeating information for different members of the medical team, despite their access to the same online records.
- Critical bits of information were given only verbally, leading to misunderstandings.
- Completely irrelevant and unnecessary information was given, leading to misunderstandings.

While none of the information was hard to understand on its own, the confusion and lack of coordination led to very poor communication. And because we are not talking about the instructions for a casual mobile app, but critical information necessary for the health and safety of a patient, this was very distressing. I found myself constantly switching modes between “care-giving family member” and “professional TC”. As a concerned daughter, I felt frustrated. As a professional TC, I was appalled and angry.

Consider my family’s situation: two otherwise healthy, highly intelligent, well-educated adults who have always taken an active and responsible role in their own health. They are fully capable of reading and understanding complex text, of finding logic errors, of critically assessing information, and in all respects performing at



Image: Santana Sangboowattana/123rf.com

the extreme high end of what we would expect of a normal “general public” user group.

Based on the writing level of most of the printed information, there was an effort to write in clear, simple language. This means that the TCs had thought about the education of their target audience. So that is good, right?

But all of this fell apart in the face of the actual user scenarios. In other words, these educated, intelligent people were now dealing with pain, medication (which definitely clouded cognitive function), anxiety over the outcomes, and uncertainty about the future – all of which added up to extremely high levels of stress.

Those nice, clear product instructions would have functioned well in a controlled lab situation. In our situation, however, they had become confusing and stressful. But from the manufacturer’s perspective, these instructions were just fine: They were good enough to satisfy the Food and Drug Administration (or other compliance organizations) and the insurance company that approved the use of the device, and to give the medical professionals some idea of usage. The manufacturer does not rely on patient feedback or satisfaction with the device, as the patient has no choice (the device is dictated by the medical team, insurance, hospital, etc.). So why worry about writing clear patient instructions?

I was further angered that the health care organizations involved did not have professional TCs on their team. Clearly, no one had taken the responsibility to collect, analyze, coordinate, and filter information, either before, during, or after the procedure.

Tips for compassionate content

What more TCs need to realize is that traditional user analysis and needs analysis do not go far enough if they do not take into consideration stress levels of typical user scenarios. For example, think about the documentation or support that goes with most webinar or web-based conferencing platforms: When things go wrong, it is almost always when someone is trying to log in to a critical meeting. The user can be very stressed and anxious, yet most user assistance for these applications is written as if the user was sitting in their office, casually reading about the features, rather than feeling mounting panic over their inability to access a meeting. Here are a few tips for building more compassion into your TC content:

- When performing your audience needs analysis, always look at usage scenarios. Understanding the urgency of information can help you make better editorial choices regarding volume, tone, detail, etc.
- Inconsistency is always stressful. ALWAYS. Users in stressful situations are never amused, entertained, or diverted by variations of terminology or nuances in instructions.
- There is a time and place for certain details. When someone is trying to get through the first week after surgery, you don't need to tell them about what might or might not occur in an appointment 18 months away. Consider different content for different purposes, so that you can direct users to urgent solutions for stressful situations and more high-level and in-depth content for other times.
- Even if you don't write all the content, you have to curate it. You need to use all of your professional TC skills to coordinate information, organize it, avoid unnecessary repetition, make it consistent, etc. Don't leave it up to the already stressed user to determine how to resolve content conflicts!

- Get user feedback. When manufacturers market their products to someone other than the end user, they tend not to care about feedback from users. But it is important, and a little input can lead to great insights and improvements in the documentation.
- Of course you must meet regulatory requirements, but you can go much further than that.
- Always be an advocate for the user! One day, it may be someone you love in the role of a stressed user.

Conclusion

Not every TC writes documentation for products or services where compassion is critical. But you may be surprised to discover the amount of stress that can occur with even the simplest products. (Try using a parking app when a traffic warden is approaching!) But by thinking about potentially stressful scenarios and advocating for better, clearer, more consistent content, we can help our users through difficult and scary situations.

And, by the way, my mom is making an excellent recovery.

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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User assistance 4.0

How personalization, VR and AR change the way we consume information





Virtual and Augmented Reality can teach us how to use, operate and navigate the physical world like no user instructions ever could. These new technologies are on their way to revolutionize the way we absorb content.

Text by Ralf Heindoerfer

Since its earliest days, it has been the ultimate dream of the user assistance profession to provide a help system that allows users to learn how to use a product right at the time and place when they need it.

An iconic scene in the 1999 sci-fi movie *The Matrix* extrapolates this vision when the two protagonists Neo and Trinity, on a chase, end up on a building's rooftop with an abandoned helicopter as the only escape. Unable to fly this machine, Trinity instantly has the helicopter's flight manual uploaded to her brain, learning to operate the aircraft and taking off just seconds later.

The evolution of user assistance

While this is an admittedly dystopian vision, user assistance for software products has come a long way towards providing users with techniques and systems to help them operate and navigate software "on the fly". Starting with printed manuals, user assistance evolved through help systems embedded in software and increasingly contextual and interactive support into an assistant-based mechanism that guides users from screen to screen to complete a task at hand. However, this evolution applied to software products only. But where did that leave user

assistance for physical products such as cars, coffee machines, or industrial goods such as air compressors, cranes or jet engines? Here, we were often restricted to the classic printed user or operations manuals or perhaps, more recently, we moved on to how-to videos and tutorials – often provided by end customers on online platforms such as YouTube.

From text and images to immersive technologies

So far, these types of user assistance have fallen short of helping users to effectively learn to use a product. Back in 1969, Edgar Dale described in his *Cone of Experience* how well different types of audio-visual media can support a person in understanding and learning a given topic or operation (see Figure 1). And here, reading a text or viewing pictures and video material – the classic media for user assistance as of today – rank at the lower end of the scale. On the upper end of the scale are interactive demonstrations and direct, hands-on experiences that let the user have a try. But how do you get the direct experience of, say, disassembling and maintaining an aircraft engine? Access to both a real engine and an expert tutor or trainer might be difficult, expensive and hard to scale. But what if the user could learn how to use a product or maintain a machine instantly, at the exact time and place he needs to? New immersive technologies such as Virtual Reality (VR) and Augmented Reality (AR) might come to the rescue here.

Virtual Reality (VR) is a technology that can enable direct experiences of things, situations and places even if the user is not physically present in the environment. Virtual Reality allows the user to completely immerse himself in a three-dimensional simulated world. With a tracked headset that covers the user's field of view and hand controllers that allow the user to reach out into and interact with the virtual world, VR creates a fully computer-generated, spatial environment that the brain accepts as physically real and present. And similar to how trainee pilots learn to fly and operate an airplane in many hours of training in multimillion-dollar flight simulators, Virtual

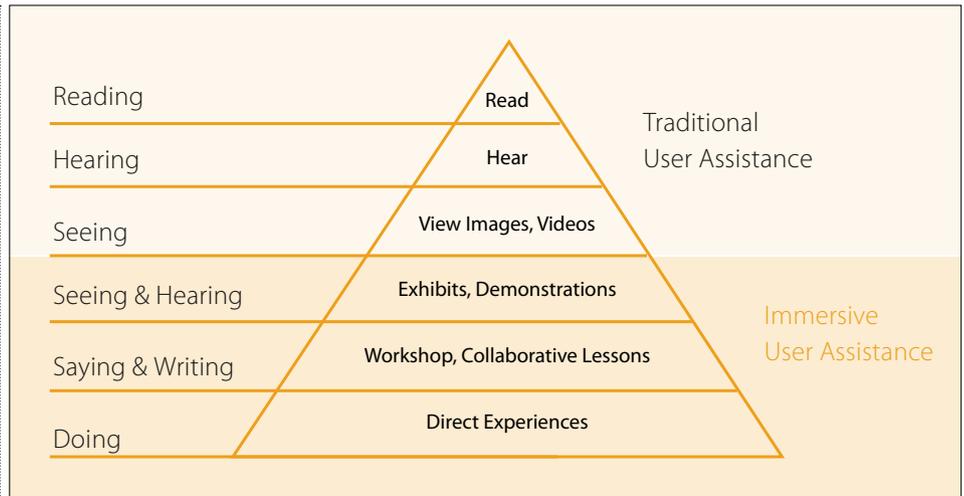


Figure 1: Effectiveness of user assistance approaches based on Edgar Dale's "Cone of Experience" from 1969

Reality can help users learn to use, operate and maintain industrial machines as well as consumer products – at just a fraction of the cost. And the virtual training is so immersive that it even builds up the user's muscle memory when repeatedly exercising the interaction in the virtual environment.

Augmented Reality (AR) – sometimes also called "Mixed Reality" (MR) – on the other hand uses headsets with transparent displays (like the Microsoft HoloLens) or smartphones and tablets with pass-through cameras that allow the user to experience virtual objects placed and projected onto their physical environment, like the office or workspace they are currently located in. With this, AR targets a different set of scenarios than VR – even though it uses similar technological components. Seeing the real world around the user through those transparent displays, Augmented Reality can "decorate" and annotate the real world with digital information and additional virtual objects, thus giving the user an extended, "superhuman" vision of his physical environment. Using a technique called SLAM (Simultaneous Localization and Mapping), AR constantly scans the environment and creates an invisible 3D model of the place the user is located in. With that, AR can place and anchor virtual objects in the physical environment and keep them physically stable in that place even if the user walks around them. This gives the user the perception that these virtual

objects really exist in the physical space next to him. Here you can see how this works: <https://youtu.be/y70yStPCBHA>

VR & AR and the digital twin for immersive user assistance

Digital twins allow us to bring these physical assets into the virtual world and interact with them. A digital twin is a digital representation or replica of a physical asset that represents the properties, the state and the dynamic behavior of this asset, stored in an IT system like a database or, e.g., an SAP backend system. For example, any car or other industrial machine that is custom-built might have a digital twin that describes the exact configuration of the individual product, exactly as it was built and delivered. And the digital twin also reflects information such as which part was maintained, replaced or extended, including the date on which it was exchanged. Digital twins typically reflect the exact current state of their physical counterpart, for example, by using various sensors across the machine that update the current values for oil pressure, temperature, fuel level or power consumption in the IT system on a regular basis. Often, they also contain a 3D model of the physical asset for visualization, originating from the engineer's CAD drawings. In this way, digital twins are the perfect basis for simulating and visualizing it in a virtual world.

Use cases for immersive user assistance

Virtual and Augmented Reality are still an emerging technology with first generation headsets present in the market today, including the HTC Vive and Oculus Rift for VR and the Microsoft HoloLens or the Magic Leap One for AR. And while these are still bulky devices with narrow use cases, we can expect the next generation of headsets to become cheaper and increasingly smaller, until at some point they might have a form factor of regular sunglasses that we can wear for extended periods of time. And with mass adoption expected in the consumer space, additional usage scenarios might be developed that could partly replace smartphones as our main information device.

Already today, VR and AR increasingly find adoption in the enterprise space in areas such as manufacturing, training, real estate, construction, healthcare and medical, and other industries. Many of these applications enable new scenarios that could not have been reasonably addressed before without Virtual or Augmented Reality. And a lot of these scenarios require the user to be provided with information about the product or the situation that he is currently dealing with to help him understand, operate, maintain, navigate or execute his daily business tasks at hand, right where he is. This is the field of immersive user assistance.

While the whole domain of Virtual and Augmented Reality applications is fairly new, there are no clear established standards yet as to what the user experience and user interaction in these immersive technologies look like and what kind of user assistance works well in a given scenario. However, we can already see some repeating patterns for immersive user assistance emerging from this broad spectrum of applications. These include the following concepts:

Immersive annotations

Immersive annotations describe a scenario for physical objects using AR that most closely resembles what context-sensitive help or tooltips provide for software products. The car manufacturer Daimler implemented the "Ask Mercedes" app for smartphones (see here:

<https://youtu.be/YKSYWrXsLyE>) annotating all the buttons and controls in your Mercedes cockpit with interactive virtual beacons, allowing you to identify and get detailed information on the purpose and function of the various controls in front of you. For that, you only need to point your smartphone's camera at the part of the cockpit you want to explore, and the app uses a virtual 3D model of the car's interior to exactly map these interactive buttons onto their physical counterpart in the smartphone's video feed. From here, you get detailed descriptions or instructional videos on what these controls do and how they work.

Guided procedures

Thyssen Krupp, a manufacturer of elevator lifts, goes one step further in supporting their maintenance workers with Augmented Reality, not only by marking up spare parts on the elevators but even providing guided procedures, i.e., giving step-by-step instructions on how to disassemble and replace parts, animating the digital twin's 3D representation superimposed on the actual elevator's engine. It will interactively show which parts need to be unbolted and removed, and in what order, to successfully access and replace a spare part. (see (<https://youtube/8OWhGiyR4Ns>) If a field technician is out on a maintenance job in a remote location, the guided procedures will enable him to fix even older, non-standard or custom machines, as he might have online access with his AR headset to a large database of those technical twins. This might even include machines from decades ago. And as all the information is displayed through AR goggles, the field technician can work hands-free without the need to hold another mobile device or handbook, allowing him to have all relevant product information right in sight.

Remote access to experts

However, there is always the risk that a specific problem or malfunction occurs that the field technician at the remote site can't handle, which requires an expert to fly in and investigate. Augmented Reality allows

"Remote Access to Experts" without requiring this expert to be physically present at the remote site.

Microsoft has shipped an application called "Remote assist" for its HoloLens AR device (<https://youtube/UpmolMrf5HQ>). With this, the remote field technician can initiate a Skype call via his HoloLens to the expert that might be back at the company's headquarters. While the remote technician wears the headset, the expert joins the Skype call via a tablet or PC. The video feed from the camera built into the technician's AR device is transmitted to the expert so he can see what the technician sees. The expert can then analyze the situation and mark up and highlight parts of the inspected machine on his screen by drawing lines or placing arrows on the screen, which will be visible by the remote technician as virtual 3D annotations right in front of him, anchored to the machine parts that the expert has highlighted. In this way, the expert can enable even less experienced workers to visit remote places and get the maintenance job done without the need for the expert to travel.

Guided tours and indoor navigation

In some scenarios, users do not require guidance on how to operate a product or machine, but rather on how to navigate a place or site such as a museum or a large retail store. Media Markt Saturn, one of Europe's largest consumer electronics retailers, has implemented a guided tour through its retail stores using the Microsoft HoloLens AR headset. Customers are guided through the store's aisles by a small virtual avatar named Paula, who leads the customer to selected product offerings across the store based on the customer's interest. Once the customer arrives at the respective offer, Paula highlights and explains various key features of the product offered, just as a staff member would do. Other scenarios, some of them even life-saving, are enabled when combining computer-generated virtual images in an AR headset with images from cameras that capture information beyond the visible light spectrum. San Francisco-based company Qwake-Tech has developed a firefighter helmet with integrated AR glasses named "C-Thru". These glasses combine thermal image camera technology with visual edge-

detection algorithms in AR to enable firefighters to see in smoke-filled, zero-visibility environments, assisting these first responders to better and faster detect victims and fellow firefighters, thus saving crucial minutes and, ultimately, lives. Future versions of the helmet may also include the building's floor plan to provide firefighters with indoor navigation, guiding them to the next door in the room and the quickest escape path out of the hazardous situation.

Superhuman vision

A similar kind of "superhuman vision" enabled by Augmented Reality is also used in medical scenarios. Doctors use AR headsets projecting 3D imaging from X-ray or MRI scans onto the patient's body in real time during surgery, improving their spatial location of tumors or critical blood vessels or displaying additional data from the life-monitoring system. And, most importantly, all of this information is available hands-free. With the help of Virtual Reality headsets, doctors can also use the body scan data of patients, and the resulting 3D imagery, to plan and practice the operation ahead of time. Similarly, it can be used to teach medical students, allowing them to receive guided assistance and training on medical procedures before practicing on a real body for the first time.

Virtual training

In contrast to Augmented Reality, which supports users by annotating the real world with contextual digital information and images, Virtual Reality creates lifelike experiences of physical assets, places or situations that may be too expensive, too dangerous or too hard to recreate and practice in real life. That's why one of the main use cases for Virtual Reality today is in virtual training. Using digital twins to simulate the exact look, size, and behavior of a physical object, the trainee gets immersive user assistance that enables him not only to understand and learn the subject but to actually create muscle memory from it. The movements and actions needed to perform a given task or procedure are naturally recognized and help the user to apply them when working with the real thing later. However, this is not only valuable for training medical students or pilots. It can also enable maintenance workers to practice a repair procedure for a remote oil

rig, or a crane operator to learn the delicate handling of heavyweight construction material at a hundred-foot altitude.

The company ITI (Industrial Training International), for example, offers VR Training simulators for a lot of different crane types and brands (www.iti.com/vr). They offer the experience of operating a life-size crane from the safety of your office or home, providing the crane's virtual control booth high up in the air as well as the many buttons of the crane's dashboard and the actual levers to control and move it. For this, the simulator even provides a physical replica of the real crane's controls to give the trainee the proper haptic feedback when maneuvering the virtual crane.

Content creation for VR & AR user assistance

So how do you create content for immersive user assistance? What tools and workflows can you use? Virtual and Augmented Reality are new media that come with new possibilities but also new affordances that will require new content creation tools and workflows to leverage their potential. While you can embed classic content such as text and video material into VR or AR experiences, virtual worlds and objects are inherently three-dimensional and spatial, so content creation for these media often requires the additional aspect of spatial modeling of objects, places and info tags. So far there are only a few specialized 3D modeling tools available on the market, including CAD tools such as AutoCAD used in engineering or 3D modeling tools such as 3Ds Max or Maya from Autodesk used in industrial design, movie or game development. These are highly specialized expert tools that are very comprehensive but hard to master. Additionally, so far, the content created from these tools must typically be integrated programmatically into VR and AR applications, thus providing a relatively high entry barrier for content creators in this new medium.

However, VR & AR are still emerging technologies, and tools and workflows for content creation for these scenarios are still in evolution. There is an increasing number of tools, like Google Tiltbrush or Google Blocks, that are simplifying the content creation process by allowing the creation of VR content directly in VR, or AR content directly in AR. Content creators can model or paint content in a 3D space right inside the headset without

the need to abstract from a 2D screen representation in classical PC-based modeling tools when creating 3D models. This means that they can create content in the same medium in which it is consumed. And while the user can directly interact with his hands and fingers within the virtual world instead of using a mouse and keyboard to create 3D objects, the content creation process becomes intuitive, like working with clay or using a brush in real life. This will lower the entry barrier and democratize content creation for a broader user community that will no longer require expert engineering or programming skills.

Conclusion

VR and AR are still emerging technologies, but they already show the potential for how they may change our perception of and interaction with reality; a reality enhanced with digital annotations and virtual objects mapped on the things and places around us. With the increasing convergence of the real and the digital world, user assistance will open up entire new fields of applications in the real world, and with this, evolve from a side product to a core ubiquitous capability offered by these new technologies that we will come to expect and rely on in our daily lives.

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One size does not fit all: Personalizing content and e-commerce experiences

Personalization is a key word in the modern consumer market. Presenting users with information, services or products that might be interesting to them at a particular moment and in a particular place can greatly increase your revenue. And you might be surprised how even small initiatives can have a big impact.

Text by Alberto Ferreira



Image: © SARINYAPINNGAM/istockphoto.com

The age of the “mass market” as a consumerist concept is over. The old absolute has given way to the rise of the personal, the relative, and the intimate. The 19th and 20th centuries saw the rise of a middle class and the breaking down of old barriers to social emancipation. Old prejudices and misconceptions were slowly broken down, and as a result, women and minorities became vital cornerstones of the economic *zeitgeist*. By the 1950s, children and teenagers entered the consumerist mainstream. Later, the expansion of mobile technology allowed billions of people to become “potential customers” for global brands.

But, for all of its social impact, the concept of a “mass market” was lost along the way. The idea of “one product for all” was discredited when consumers became so varied, international, multicultural, and differentiated by their beliefs and buying power. This became an intrinsic part of the new wave of design and communication: Today, we know that a “well-designed” product will never befit the variety of preferences, applications, use cases, and contexts it will be exposed to. From pumpkin-spice latte drinking millennials to Gen-Xers, vloggers, vegans, and carnists: We live in fractured societies where each group represents an established market with its own targeted needs. As writer Chris Anderson (*The Long Tail*) stated, “Our economy and culture are shifting from mass markets to millions of niches”.

However, the story doesn’t end here. There is a deeper phenomenon on the rise, guided by digital technology. The looming challenge ahead of us is not about targeting a group, but targeting the individual. This is the next logical step: Once a brand knows enough about you, it can show you – and only you – what you need and want. This phenomenon is deemed personalization, and its implications are profound for e-commerce and technical communication alike.

The new wave of personalization

The brand experience has become fluid and continuous, and several companies already have a business model based on anticipating users’ needs and requirements using their own data. This is the model that enables content delivery services like Spotify to produce a “Discover Weekly” bespoke playlist based on

the songs you listened to. Other services like YouTube and Netflix analyze what users watch and make recommendations based on content similarity and popularity. The comedies you watch, the cooking shows you follow almost religiously – all of this data is used to profile you against the wide variety of the service’s user base.

On a basic level, user information can be collected using session IDs and assorted browser information. Even when users are not logged into a website, each action they take on the website is tracked and identified uniquely. As

long as users do not clear their cookies or start a new session from a different IP, analytics behind the website will be able to identify who accessed the website and what they did during the session, and leverage this data to present suitable content and recommendations.

There are three fundamental types of personalization:

- **Explicit:** Personalization based on user settings and preferences, which is generally used to customize a website or service to the specific user preference. This is the most common form of personalization, and is some-

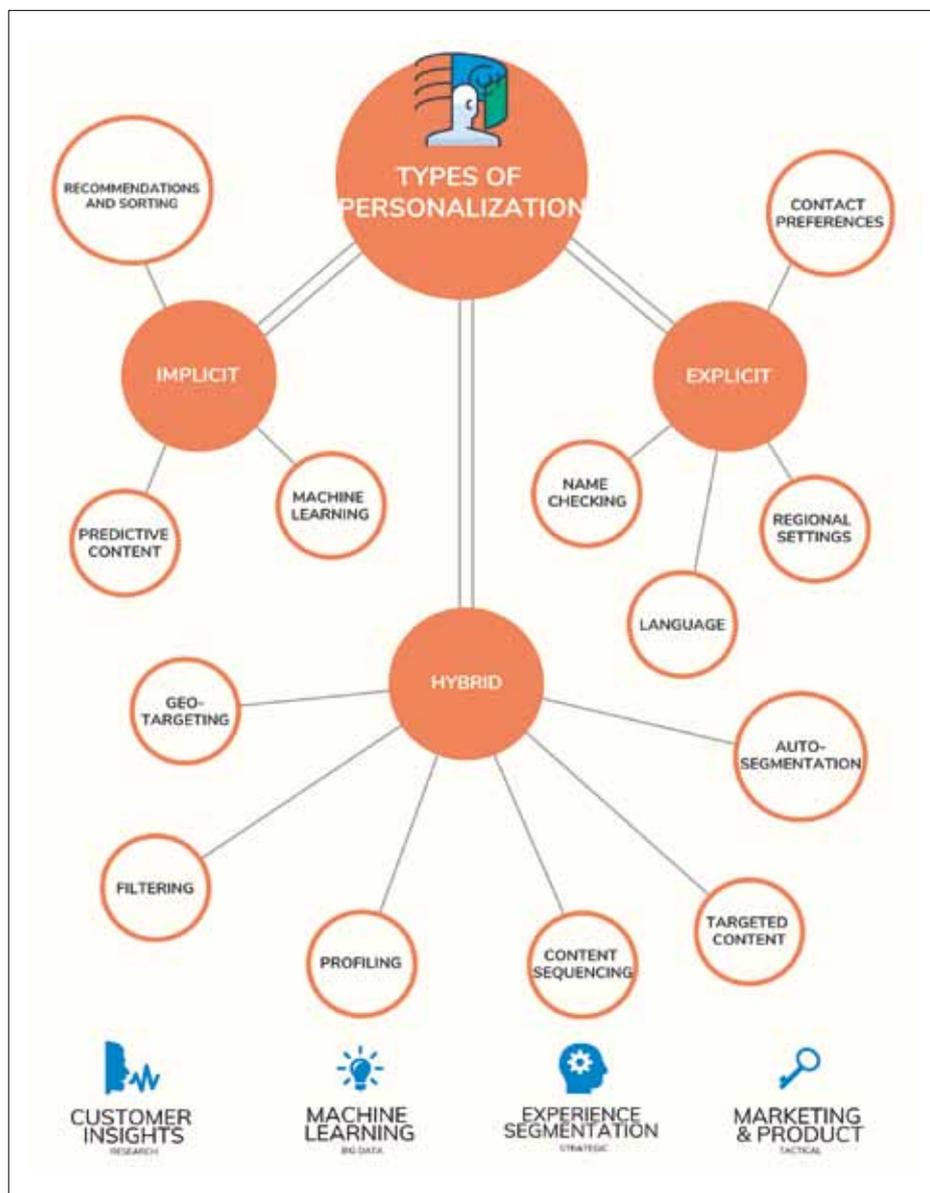


Figure 1: Different personalization scenarios can be applied to your customer experience. Strategize your methods according to business value and user satisfaction.

times called customization. Common applications include app and website settings set by the user, like profile preferences, content visibility, and preferred products.

- **Implicit:** Personalization based on an app's or website's user data to guide the user to products, content, and other elements.
- **Hybrid:** Personalization based on a mix of elements such as time, position, and IP address to understand the use case. Geotargeting is the simplest form of gathering information, as it can automatically redirect users to the right regional websites when accessing your platform, or change the language automatically based on browser and operating system settings. Geotargeting can also be used for recommendation engines. Airbnb and Four-Square use geotargeting to present activity guides and recommend places to stay based on nearby areas.

Some services can leverage a combination of or all of these types of personalization into one combined solution.

Personalization tools

Personalization is usually dependent on a dedicated technical infrastructure, which means it can be costly and it carries an implementation effort. Most tools available on the market are based on site behavior and user profiling, depending on the type of personalization required. Some of the tools available are complex hybrids between analytics, CRM, and delivery systems. These tools support the ability to deploy A/B testing in addition to email, mobile, or in-page survey tools.

Such tools include Evergage, Monetate, and Adobe Target, among others. These platforms can be embedded in your CMS or sit on top of your front-end delivery layer. For websites and apps alike, these tools should be able to add or change elements in pages and screens depending on how the user behaves or his profile. They can focus on specific scenarios, such as cart abandonment or CX optimization, or be more general.

CRM features are also common, as they can sometimes also manage communication elements such as e-mails and notifications. A case in point is an email sent to a user who did not complete a purchase. If one reminder email is not enough to entice the user, triggers such as offering a discount can be added.

Other personalization engines such as Qubit and Dynamic Yield tend to have a marketing side, based on conversion. However, the most interesting aspects of personalization deal with the ability to offer the user the most relevant or useful product or proposition.

In technical communication this implies delivering just-in-time documentation, adjusted to the user's needs. Some of the current solutions include a combination of topic-based technical writing and structured content. Combining these with actual user-centered content can greatly improve the overall user experience.

Promoting relevance

Despite their promise, personalization and customization are not universal yet, even as devices like Alexa and Google Home start to pervade every single nuance of our life. But you don't need to develop a talking orb or acquire an expensive software solution in order to dive head first into personalization.

The key principles in personalization are relevance and empathy. According to a 2013 Janrain study, up to 74 percent of users are frustrated when they are confronted with irrelevant content. In the years since this study, the attention span has shortened further and the web has become an even more convoluted and distracting place.

Therefore, if you are showing different content to different audiences, this content should be as particular to the audience as possible. Despite the fact that personalization is an extensive concept, some of the possible applications tend to fall into one of the following categories:

Recommendations and sorting: According to a McKinsey study, 35 percent of Amazon's revenue is generated by its recommendation engine. This clearly illustrates the benefits of having a personalized set of recommendations. But it is not just about the bottom line. Users feel more engaged and more taken care of when digital touchpoints provide relevant choices during their interactions. These are usually algorithm-based and thus require a hefty infrastructure. Implementation patterns include:

- Suggest related content based on similarity and popularity. Keep relevance in mind, as most users will not be happy to get the same recommendations over and over again.
- Propose new products that are shopped for by other users with a similar profile.
- Automatically set sorting preferences.

- Suggest items for repurchase based on previous shopping behavior.

Content: Content filtering has been around for years, from DITA's structured content approach to role-based content. Ideally, for documentation and technical communication, a structured approach can help to distinguish between audiences and thus deliver the appropriate content to the right user. With the help of these content tools and a thorough understanding of the segments' attributes and values, you can use different content to establish a relationship. Simple tricks include using the user's first name in an email subject or addressing an action after a CTA call has been triggered in a playful manner.

Getting closer to the customer

There are a lot of statistics floating around on the Internet regarding personalization, and we should study them with an appropriate amount of skepticism. Any personalization effort starts with segmentation, and skipping this is sure to wreak havoc on the entire project. Start by asking questions:

Do you have different audiences that you are trying to reach? Do they respond differently to different content? If you are working in e-commerce, which areas are most critical to personalize first and which could be of greatest use to the company as a whole? There are a number of steps that you can take to address this as an integrated project before even beginning to determine how to differentiate experiences offered to different users.

1. Start by identifying the value and feasibility of personalization.

Look at analytics data across your various channels. Identify the key areas where the user can be served different content. Is your CMS even capable of serving differing content? A simple way of analyzing this is by small A/B tests where you experiment with differences in the content served. Think about personalization in view of the entire journey, not just one or two pages. Collect any hypotheses and questions that may arise in this process.

2. Strategize your cross-channel approach.

For example, Android phones natively provide recommendations to their users for improved commutes, nearby restaurants, and other offers. iOS users, on the other hand, rarely open these, so a different approach is needed.

3. Understand the customer and his actions.

a. Establish user scenarios across those multiple

segments where personalization would have a real impact. Research is very valuable here. Hold interviews with users, send out a survey to the customer base, use in-page surveys to ask about specific behaviors while the user is going through different stages.

b. Cross-check the high-level findings with your own priorities. For example, a scenario could be “A field engineer with an entry-level profile is logging into the knowledge base.” From the analytics on most often checked articles, and the results of your own research, you should be able to determine what type of content would be most useful in this case.

4. Understand the user journey to obtain a specific outcome. Analyze user expectations carefully in each stage.

5. Map these scenarios to actual content in each journey. Think about the information architecture of your site. How you present something is as important as what you present.

6. Once you understand the key targets for receiving personalized content, you need to **map the type of content they should receive.** Will you show a warning to one segment and a cross-sell opportunity to another? Personalized content can be as granular as one short string or a full content panel of text. Target users based on their expectations as much as on their needs. Personalized content is not just about selling, but supporting the user’s journey with actual worthwhile content.

7. Remember to only specify content for audiences that contains actual value. It’s easy to start building micro-content with 20 different versions of the same string. This will not help you in the long run and, most importantly, it will not help you to focus on the scenarios that will best serve the needs of the user. Small changes in tone will never be as impactful as an overall content strategy.

8. Experiment and measure iteratively. Conversion is not the only valid metric. Engagement, time on page, and even satisfaction ratings can help you to track how effective your changes are. Adjust your metrics accordingly.

Personalization is not a straightforward process and it demands a hefty investment in both planning and overall effort. But when even a simple type of personalization like “visitors who viewed this also viewed” can deliver up to 68 percent extra revenue (according to Smart Insights), it is hard to dispute its importance.

Regarding investments in email personalization, there is evidence that dynamic content, incorporating contextual information like weather or nearby locations, is attractive to users. Similarly, personalized product recommendations in key sections of the user journey have a huge impact on the uptake. Don’t stop at addressing your users by their names. Leverage their needs to present them with things they would be interested in regardless of context. Even pages based on static templates may have

room for minor changes in CTAs and informational text with genuine and measurable impact. Regardless of the technical infrastructure, and the extent of your personalization strategy, everything starts and ends with the user. Demonstrate value in exchange for the users’ personal information and always promote tangible benefits, and the long journey to the purchase will become much more pleasant – and engaging.

Are there risks?

We live in an era of repercussions and reverberations. Overfiltering is a risk for users who might never get exposed to anything outside their comfort zone. Twitter is one such example of hyper-personalization, where users are continually exposed to content that they at one point considered relevant and interesting. It is the responsibility of brands and technical communicators to leverage personalization in a way that augments the user experience, rather than limiting it artificially. Personalization doesn’t only build loyalty and re-inforce the relationship between brand and user, it can also ensure that a digital touchpoint becomes recognizable, approachable, and relatable.

Content managers and communicators have long been tasked with understanding users and their needs. As personalization pushes interaction and content to the fore, the technical communicator becomes a key part of this new wave of digital experience. And in these first few tentative steps of connecting big data, user experience, and technical communication, we are merely hinting at the potential of what is to come.



Figure 2: Personalization can be embedded in every single aspect of the business, Metrics from user research are vital to finding the best approach.

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Don't instruct, converse!

Conversational user interfaces such as chatbots or digital assistants change the way we seek and perceive information.

What we are looking for is an interaction that most naturally resembles a human conversation.

Text by Nithya Krishnan



Technology has rapidly and radically changed the way we consume applications. Since the advent of Graphical User Interfaces (GUIs), we have become very accustomed to visual icons such as clicking a file, dragging and dropping a file to a location, selecting a button, choosing a menu option and many other ways to accomplish a certain task.

Conversational User Interfaces (CUIs), on the other hand, dispense with all these actions associated with clicking, dragging and dropping, selecting, choosing and so on. We can now interact with the software by the simple use of text or voice (which is then converted into text). Such conversational interfaces, containing either voice or text or both, make the experience more natural to us, transcending the part where a user needs to learn to use an application. Everything works seamlessly through natural language.

By leveraging the conventions of natural conversation, CUIs can be made so that people intuitively know how to use them and feel comfortable with them.

Conversation design for CUIs

CUIs in the current digital setup allow conversations between humans and computers. This happens through what we commonly call chatbots or digital assistants.

In the context of an enterprise or a business, a CUI must have the ability to respond to questions initiated both by the user and by itself. It should not have one-way conversations, but must be able to fully understand the business data at hand. In this

way, a CUI not only provides the data for the request initiated, but also provides information for a suitable course of action. Additionally, a CUI must remember past conversations, so that it can pick up from where it left off (past interactions and preferences). The simplification of getting a service done through a regular conversation makes it easier for consumption. Less training is required to use the CUI. This is true even for inexperienced or occasional users.

Here are some basic conversation design steps that you can follow, once you decide to build a CUI to cater to your user's needs.

Set the goals and define a persona

Understand the service that your CUI needs to offer to the user and set the desired goals to construct your CUI. We build relations not just by the information we exchange with one another, but by emotions as well. A CUI must represent a personality of trust and emotion. Therefore, it is crucial to define the persona of your CUI by introducing an identity that reflects your brand. Instead of delivering information to users in an automated format, the CUI must aim to be natural and support the service it is created for.

Structure and flow

Structured conversational flow is the core to building effective and engaging conversational interfaces. Any breaks in conversation are generally very disturbing, interrupting the flow. Your CUI must be intelligent enough to transcend these breaks to make the experience more fruitful. It should drive the conversation forward. For instance, the CUI should suggest

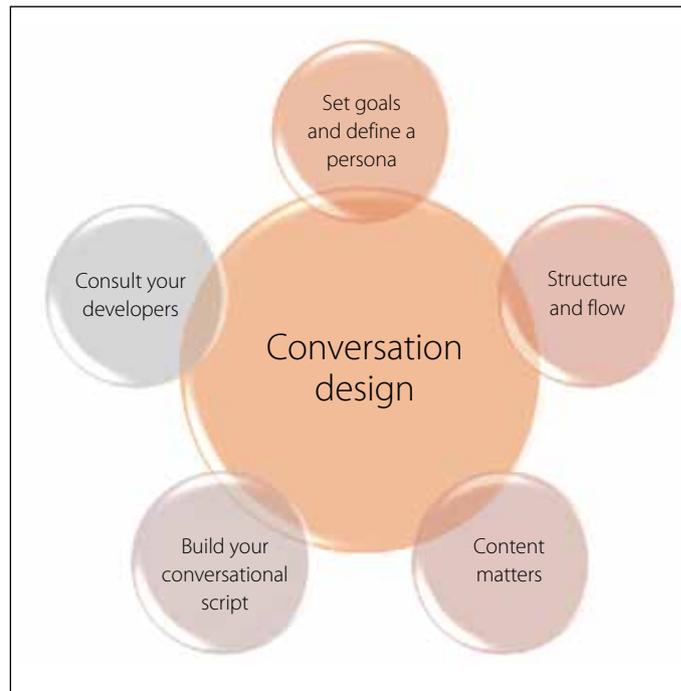


Figure 1: The conversation design process

things to help users discover additional functions or contain actionable phrases or buttons to redirect them to a place that might solve their issue. Giving the user the freedom to speak or write helps to keep the conversations more natural.

Content matters

The foundation for every CUI is content. Content cannot be an afterthought. Keep in mind that you don't want your users to feel like they're talking to a machine. The key is to use friendly, inclusive language. Attaching a context to the conversation helps. This gives a more personal touch and a whole new dimension to the conversation. You must determine the various entry points to the CUI, situations based on the mood of the user, less likely questions, and so on.

The intent of using a CUI is that it saves time and helps navigate to the right sources to get the task done. Otherwise, it's not much

better than any website or app. While designing content, you can create boundaries for the conversation, by giving your user buttons to select or actionable commands to use, or by asking the right questions. Sometimes, it is also a good practice to repeat information, so the users feel more comfortable knowing you got it right.

Build your conversational script

With the flow and content in hand, you can create chat clusters and determine (on paper) what the overall conversation is expected to look like.

Consulting with developers and deciding on the platform

Understand how you can digitize your overall script with the help of your development colleagues. Upon completing the coding of your CUI, you can decide which platform best suits your business needs, e.g., Facebook Messenger,

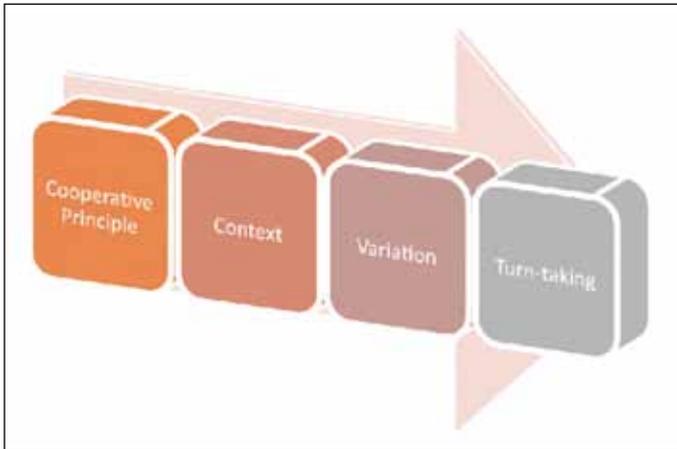


Figure 2: Conversational principles

Slack, Telegram, WeChat, and so on. Select the platform based on your target audience and the user experience it offers.

Key conversational aspects and principles

The integration of conversational UI capabilities into digital assistants humanizes the way we interact with computers. These digital assistants make conversations more context-based and intent-based by taking advantage of technologies such as Artificial Intelligence and machine learning, thus providing a more human-like interaction.

Context, variation, turn-taking, and threading are all part of a cooperative conversation, an idea popularized by the British philosopher of language, Paul Grice. Grice called this the Cooperative Principle.

Cooperative principle

Grice developed *Grice's Maxims* to define the essential conversational rules he observed – namely, that people should be as truthful, informative, relevant, and clear as possible when

talking with each other. A UI should try to follow these inherent rules of cooperation as well:

- Quality – the speaker conveys only truthful information
- Quantity – the speaker provides as much information as he can
- Relation – the speaker provides relevant information that is pertinent to the topic being discussed
- Manner – the speaker organizes the information and avoids ambiguity and obscurity

Context

In any conversation, understanding the context is crucial. This helps to create a dialogue. The persona that you define must keep track of the context to understand what the user says. For example, imagine a user asks a chatbot to check for tickets to a movie. The chatbot can prompt options based on the movie requested and by reading the location of the user, so that the optimal choice can be made. The context here corresponds to the tickets for the specified movie and the location.

Variation

Bringing variation to the conversation can help keep it from becoming

overly monotonous. Responses can be made to vary each time to maintain the user's involvement. For example, imagine a user who asks about the weather each day. This can be responded to differently each time to avoid the response being repetitive. Variety brings a sense of interest, something that is of paramount importance in a conversation.

Turn-taking

It's important to give everyone the chance to speak during a conversation. When you interact with a chatbot, turn-taking is important to ensure that the conversation isn't a monologue. It must be clear to a user when it is their turn to say something. Designing and giving such cues is crucial in a conversational interface. For example, think of a case where the user has asked for the available routes to a conference. The chatbot must prompt some questions, making it clear to the user that it is their turn to respond. It's important to constantly involve the user in the conversation.

Narrative and conversational design using copy

In the field of design, any content that is written in text – however big or small – is commonly called copy. As we move into a more conversational trend in the applications that we consume, we as designers and writers must understand narrative and conversational design aspects to be able to convert product requirements into a clear and engaging user story. There must be an inventor's

spirit, highly refined aesthetic sensibilities, and a fine-tuned ability to contextually communicate the right message in the right place at the right time to customers. Copy needs to be clear, consistent, and simple, so that people can interact with the product intuitively. You know that the content has been written well when users don't even notice that they are being guided.

When people read content written in a conversational tone, it gives them a feeling that they're directly involved. Rather than talking to your audience, you'll be conversing with them. Unfortunately, most of us have authored content following rigid and boundary-driven rules. It does take an effort to break this habit and try to communicate effectively and colloquially. It is important to note that writing in a conversational tone does not mean writing sloppily or using poor vocabulary.

The crucial step is addressing the reader directly. An easy way to do this is to pretend you're writing to a close friend. The second is to forget formalities when writing. It is perfectly fine to break some grammar rules so that your writing is less arduous for your readers. Also, stripping away all the visual clutter can help you focus on the core message you are trying to communicate. The final tip is that you read out loud what you've written. When reading out loud, we tend to spot errors more easily. The essence of good copy is to turn every message in your digital product into a valuable conversation.

As a general tip, here are some do's and don'ts:

- Copy must contain useful data, but must not be poorly presented.

- Copy must be presented in a visually amazing way, but must not demonstrate a lack of meaning or purpose.

It is always good to keep the balance between words and graphics. You must make meaning and appearance support each other, and both aspects then become more powerful in terms of user experience. Recalling the words of the famous American author, Dr. Seuss: “Words and pictures are yin and yang. Married, they produce a progeny more interesting than either parent.”

Creating content in a conversational tone

A conversational style of writing might break some grammatical rules. Conversational writing is aimed at the target audience and addresses them directly. Sentences may begin with pronouns and end with verbs. Sentences may even begin with “and”, “but”, and “yet”. Simply put, writing in a conversational tone should make the content sound like a conversation between two persons rather than a textbook. Here are some design tips and tools to create a more conversational tone while designing CUIs:

Introduce yourself

As with any conversation that you have with a person for the first time, you need to introduce yourself. It helps to set the context for future conversations. This is where defining the right persona becomes crucial for your CUI. Explain in a few words what the users can do. Keep the introduction clear and engaging. The user must want to come back again to use the CUI.

Create an active connection

Make your content sound genuine and direct. Remove the passive in your writing. The key is to use an active voice. It makes users feel like they know you and have your attention. For example, instead of responding “Your feedback will be conveyed to our team for further action,” you can say “I’ll take your feedback to my team for further action.”

Use simple words

Writing in a conversational tone is sometimes defeated by using heavy vocabulary. Don’t

make it hard for a user to understand what you’re saying. Use natural and easy words – words that you typically use in everyday conversations. To ensure better reader engagement, use words that your users can understand.

Use contractions

We all know how we’ve always had to remove contractions from our routine and formal documentation artifacts. However, conversations are all about contractions. Stay natural. Don’t, can’t, doesn’t, I’ll – you’re free to use all these at your will, but ensure you don’t go overboard either.

Keep sentences short

Your users need some breathing room to understand what is being said. It is always a good practice to keep your responses short. Even if it means that there’s a lot to convey, breaking it down into smaller sentences makes it easier to follow the dialogue.

Always address your user

What do a good salesman and a conversationalist have in common? They talk less about themselves and more about their listeners. This is precisely what you must advocate with your CUI as well. To make your content engaging, remember to always address your user. This is not the place to brag about yourself. Engage the user by addressing him or her as “you”. This makes it more personal.

Ask questions

Questions are the best way to keep your users engaged. This way, you keep them involved and always focus on what they want. Based on the type of CUI you design, your questions can have static answers (based on the response choices you provide your users with) or dynamic ones, keeping the conversation more real.

Appropriate endings

Providing closure to a conversation demonstrates social intelligence. Your CUI must end conversations in an appropriate manner. Whether the user completes the task, abandons the task, or runs into an error, your CUI must adapt the responses in an appropriate manner.

Moving towards content design and strategy

Based on your company’s goals and products envisioned, it is crucial to have a content design and strategy that best reflects these objectives. With CUIs gaining more traction in the market, there is a large scope to design content. As a content strategist, you become an advocate for your company’s design, where you work towards shaping experiences by formulating guidelines, standards, and taxonomy that helps users complete the task at hand. You help set the vision for content and drive cohesive product narratives across multiple platforms and touchpoints. You become the go-to person to decide product goals and, most importantly, the voice and tone of your CUI.

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Usable design – giving users what they expect

Usability is determined by how quickly our users can identify a certain function of our product and use it – a process strongly linked to our users' experiences and expectations.

Here is how understanding cognitive processing can lead to better, more usable designs.

Text by Kirk St.Amant



Image: © sturti /istockphoto.com

Nothing is inherently usable. Rather, usability reflects how our minds process sensory input to identify and categorize objects. If we understand such processes, we can create materials that match them and develop more usable designs. Doing so involves learning how the brain organizes information and designing materials that address these processes.

Cognition and data processing

Cognition describes how the mind identifies, organizes, and responds to information. While our brains operate with amazing speed, there are limits on how much information we can process at once. This is often referred to as *cognitive load*, which is connected to short-term memory.

When we encounter something, our brains must

- Identify what that item is (e.g., a pen)
- Classify what it does (e.g., allows us to write words on a page)
- Determine what to do with it in a particular context (e.g., take notes for a business meeting)

This process begins in our short-term memory, where the brain holds initial sensory input to identify and categorize it. Our short-term memories, however, are limited in the amount of information they can hold at one time. This limit is 7 +/- 2 units of information or 5 – 9 units total. How those units are defined depends on the individual's prior experiences. Understanding how the brain forms such units is central to design and usability.

Chunking and organizing information

Our senses continually take in large amounts of information – seemingly more than we can process at one time. This situation creates challenges for our short-term memory and cognitive load. For this reason, our brains need to minimize this data. If they don't, we experience information overload – the paralysis of encountering too much information at once. To manage input, our brains use a specific strategy.

We don't perceive all sensory input as individual items for processing. Rather, our brains combine smaller bits of sensory data into larger units – or "chunks" – of information. This chunking reduces how much information our brains need to process at one time. It is what allows us to engage in a variety of complex tasks without feeling overwhelmed.

The process works as follows: When we look at a pen, we don't view it as its separate parts – cylindrical tube that holds ink, tip for writing, clip for attaching it to a pocket, etc. Instead, our minds combine these parts into one unit or chunk of information we process as "pen". This

chunked concept of "pen" occupies less mental space and is easier to process than thinking of a "pen" in terms of its individual parts. It allows the brain to manage sensory input.

Chunking and usability factors

This chunking of information has important implications for usability. Designs that organize information into a limited number of easily identifiable units allow our minds to process them more easily. Such designs reduce cognitive

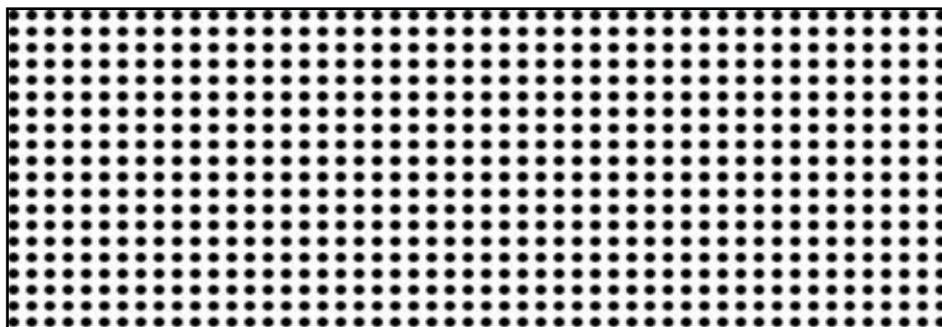


Figure 1: An example of too much information for our minds to easily process

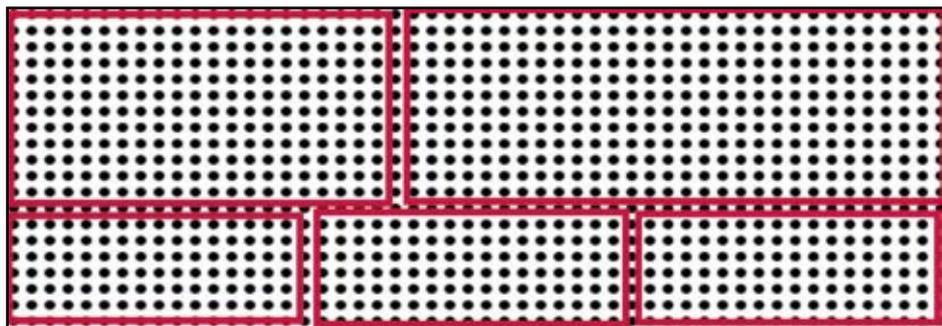


Figure 2: Large amounts of data organized into a limited number of units or chunks

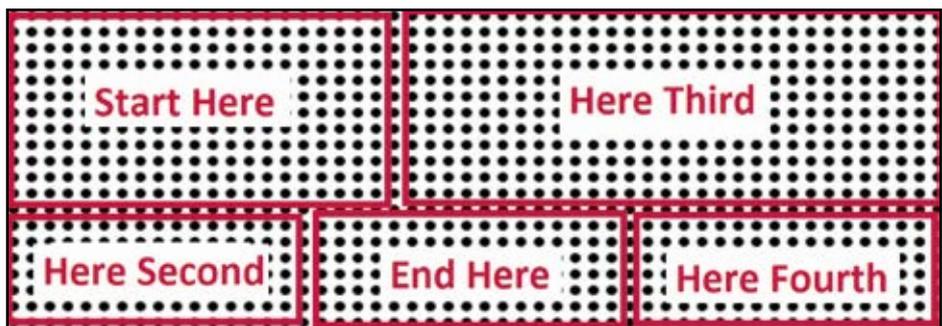


Figure 3: Information organized into units and units organized into steps in one overall process

load and seem easier to understand and use. An interface containing only five distinct elements (five chunks of information), for example, addresses the limitations of how our minds organize information and will be easier to use. Note: This does not mean the interface can only contain five items in total. Rather, it involves having the text, images, and other features on a site organized into five readily identifiable, self-contained elements – such as the number of menu bars, grouping of icons, and separate blocks of text that appear on a site.

To illustrate this, take a look at Figure 1. The image appears overwhelming. This is because it presents too many separate units of visual information – more than our minds can effectively process at one time.

However, if we use design features to clearly organize that same information into a limited number of units, we can more easily process it, and we feel less overwhelmed, as you can see in Figure 2.

If we provide prompts that help contextualize and clarify the order in which to use data, our ability to process that information increases even further (see Figure 3). Such features help our minds organize the information for processing vs. spending cognitive energy to determine how to assemble the individual parts (the five elements with red borders) into one overall chunk for “interface to use.”

By limiting the information our minds need to process, we can transform a seemingly overwhelming visual design into something relatively easy to use.

The role of experience

The brain does not chunk information randomly. It learns how to combine different kinds of information into certain chunks based on our experiences. The more we encounter a pen and observe that it consists of certain parts, the more our minds learn to chunk that information into one unit for processing. In this way, our experiences help our minds develop design expectations.

This is why we expect items to look a certain way in order to identify them. We expect pens to have a certain shape and have certain features, because our experiences have taught our minds to look for specific input (features we associate with a pen) and chunk this input into a unit for “pen”. When we look for a “pen” or we hear the word “pen”, our

minds expect to encounter this information. If certain features (information) are missing, the brain will have a difficult time determining what the object is. This is because the sensory input the brain encounters does not match existing mental models it uses to identify objects. These experience-based relationships have important implications for design and usability.

Meeting design expectations

How the brain learns to chunk information helps explain why new designs can confuse users. With no pre-existing model for chunking input, new designs require us to view each element of a design as an individual unit of information for cognitive processing. This situation means our short-term memory needs to hold large amounts of information as we try to determine what this new item is and does. Doing so can lead to feelings of information overload where the design seems overwhelming or too complex to understand. This is because our short-term memory is struggling to accommodate all of the new information it needs to hold for our brains to process.

A similar situation occurs when we encounter revised or modified designs. If the revision of a product involves changing its features, the resulting design could affect how we chunk sensory input. In some cases, a revised design could involve adding, removing, or altering a certain feature. This can affect how our minds match the new design to prior models we used to chunk information in short-term memory. The results are similar to how the mind processes new designs: It views the item in terms of all of its different parts as it tries to chunk those parts into smaller units for cognitive processing. Again, this situation can result in feelings of information overload that could cause confusion or frustration.

To consider these cognitive factors for better usability, we need to research our users' expectations for design. The key is to categorize how individuals process sensory input when they identify items. If we can determine such factors, we can create designs that match the cognitive structures individuals associate with certain objects. The aim is to create a map of how users organize information and to use this map to guide the design process.

Mapping and cognitive expectations

Designing effective materials involves understanding how users chunk information to identify objects. Gaining such an understanding requires us to identify the design elements users expect when they encounter an object. In other words: What features make a “pen” a “pen”? The aim is to determine the features users associate with a certain thing. These are the features users expect to encounter when identifying objects.

Collecting data

Interviews or focus groups are an effective way to collect such design data from an intended audience. The goal is to “map out” or list the features that users associate with an item. This can involve

- Verbal mapping – asking the user what an item should look like, e.g. “Tell me what an email login screen looks like.”
- Visual mapping – asking the user to draw an example of what the item should look like, e.g. “Can you draw an email login screen for me?”

In each case, the user notes the features he or she combines to create the cognitive chunk used to identify an object – in this case, what features he or she expects from an email login screen. This approach isolates the specific features individuals actually use to identify an object vs. all of the possible features that the object could have.

Equally important is the placement of key elements within the item, for such placement represents how users organize the data into a recognizable chunk. So, as users note the features they associate with an item, they also need to explain where each feature is located on the object. This could involve asking questions such as, “You said an email login screen should have a prompt for ‘username’. Where on the email login screen does the username prompt appear?” This approach helps determine how individuals expect such features to be organized according to the way their brains chunk information. This process allows us to create a map of

- what information needs to be present in a design, and
 - how the information needs to be organized in a design
- so users can recognize and use items more easily.

Developing designs

We then need to compare responses from multiple users to determine what features seem most common. These common features establish the foundation – or prototype – for what these users expect to encounter on a particular object. We can use this prototype information to create an example object/design and test it with our audience. This testing involves users commenting on how well a prototype meets their design expectations.

In testing prototypes, we should ask users to:

- Identify the object (“What is this item?”)
- Note factors contributing to this process (“How do you know it is an email login screen?”)
- Mention needed revisions (“How would we need to revise this item so you would recognize it as an email login screen?”)

Other important questions to ask involve the positioning of features to confirm they meet design expectations. Doing so could include questions such as:

- “Is this where the ‘username’ prompt should appear on the email login interface?”
- “You noted the ‘password’ prompt was in the wrong place. Where should it be located on the email login interface?”

Again, the objective is to identify the features individuals include in the chunk of information

used to identify an item. We can use this testing to revise a prototype design to better meet user expectations. We can then retest this revised design to determine how well it meets user expectations. This iterative process can continue until we believe we have created an effective, usable design for the related audience.

Creating guides

The objective of this overall process is to create a *design map* comprising:

- A checklist of features a group associates with the design of an item
- A schematic identifying where users expect each feature to appear on the item

We can use this design map for modifying existing designs or designing new items that users can easily identify and use. Such design maps can also help the members of a team focus on common design elements when revising materials or creating new items. This can help avoid confusion or debate over what constitutes the most effective – or usable – design for an audience.

Conclusion

Usability is a matter of perception. The more readily we know what something is, the more effectively we know how to use it. Such factors are connected to how our brains process information

and perceive items. By understanding how cognitive aspects work, we can design materials to meet user expectations and enhance the usability of items.

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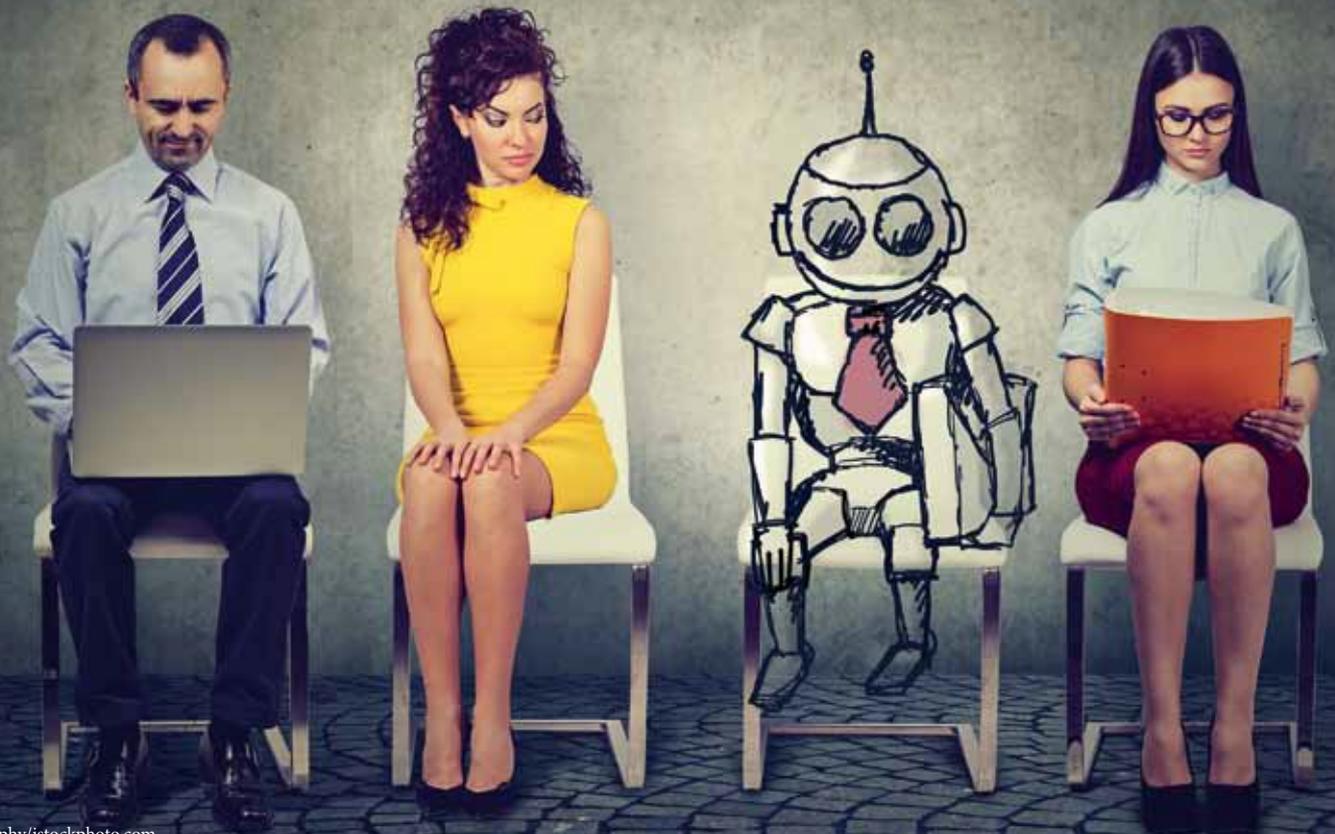
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Facing Artificial Intelligence as a small language service provider

The rise of Artificial Intelligence (AI) is threatening many freelance translators and small language service providers (LSPs). But worrying about declining prices is no solution. What is needed is a collective approach to protect small businesses and to use AI to secure their existence.

Text by Yasin Steiert



Artificial Intelligence (AI) is the buzzword you've probably heard enough of this year. General technological forecasting paints an ugly picture of an invaded labor space where man and machine coexist in an inharmonic fashion while businesses focus on hardware efficiency. At least, this is the regular journalistic conflation that is based on a phenomenon known as the "panic cycle". Figure 1 depicts this cyclical reactionary trend that has been witnessed in the face of new technologies.

This is not to say that concern and panic are unfounded. It is an economic fact that not all parties will benefit from new technological developments. In the U.S., factories have already been heavily impacted. This, along with indications of poor political economic management, has led to an increase in layoffs. Repetitive and rule-based labor roles are fast approaching their lowest point. This perception is so strong that some believe that Michigan, Wisconsin, and Pennsylvania would have swung towards electing Hillary Clinton if automation adoption had been two percent less prevalent in these states between 2012 and 2016. All around the globe, we have witnessed ruthless politicians stoking fears to take advantage of existing anxieties. These economic concerns are even more present in the language services industry. In an industry, where all input and output depend on a dual relationship, AI can naturally have a far deeper impact.

In its forecast for 2018, the language service industry research firm Common Sense Advisory highlighted the issues of stratification and consolidation, which are occurring globally as multinational providers seek to scale up in order

to meet declining price demands. As human resources in the translation market continue to be replaced by automated systems, it is vital for freelancers and smaller LSPs to learn what policies work, and to know the institutions that may serve as a platform for their voices.

Protecting freelancers in a global market

Over the past century, labor protection movements have seen adequate levels of convergence across different sectors at different periods. Yet, what is often neglected when talking about labor rights is what motivation lies behind this striving for convergence. The incentive to be part of the globalized market and to participate in it with prosperous economic powerhouses remains a primary motivation because, to do so, governments typically need to reinforce labor compliance or else remain vulnerable to consumer backlash and domestic instability.

The axis of Anglo-American and European values has provided two labor environments that will likely constitute the precedent for global freelancer protection. Looking at current trends, it appears the European market will be at an advantage, but just as migration to the "New World" increased wages in Europe and decreased them in the continental U.S., the same might occur on a global scale. Any nation that leads the push towards freelance labor protection will result in language service providers probing periphery nations for lower-cost, financially exploitable, unprotected labor.

Anecdotally, the market seems to be in consensus that due to the strong competition, the overall decline in pricing has become so fierce that award decisions are created on quotation differences that vary by a tenth of a cent. On a microeconomic scale, local governments have already shown initiatives to continue to provide

market power to smaller actors on the LSP market. When going through the contract award process with the city of San Francisco, it becomes clear that the city government advocates for small LSPs that can no longer compete adequately in the national market. The San Francisco Local Business Enterprise (LBE) makes sure that in the face of large companies, local businesses have a shot at the competition. In the current environment, the LBE removes the expensive barrier of entry that AI entails.

Is there room for fair-trade translation?

There is no moral justification for companies leveraging regions under economic and political oppression to find the lone language service contractor willing to accept the work because it is his only means of income. Unfortunately, there is little interest in the welfare of someone who is only known through an occasional email and is located thousands of miles away.

There is no fair-trade initiative in language services, and it is clear that the diverse, multidisciplinary foundation that made this industry flourish into what it is today is ultimately being consolidated without considering the impact. Another taxi driver without a car, another farmer without land, and another translator without words. This displacement is detrimental, both psychologically to the individual as well as to the communities. The aforementioned panic cycles further aggravate this situation by distorting the actual threat of AI without providing helpful solutions. It is clear that small to mid-sized LSPs are happy to accept cheaper rates for a good number of their highest volume languages. Margins are shrinking and the advantage of overhead costs will no longer matter for the smallest actors if AI software remains protected.

Unfortunately, apart from initiatives by local governments, protective developments for freelancers are lacking entirely. Common Sense Advisory recently named TRAVOD as the largest LSP in Europe. TRAVOD translation rates are around .035 Euro per word as an average starting price and only go down from here. There is no doubt that, as a company,

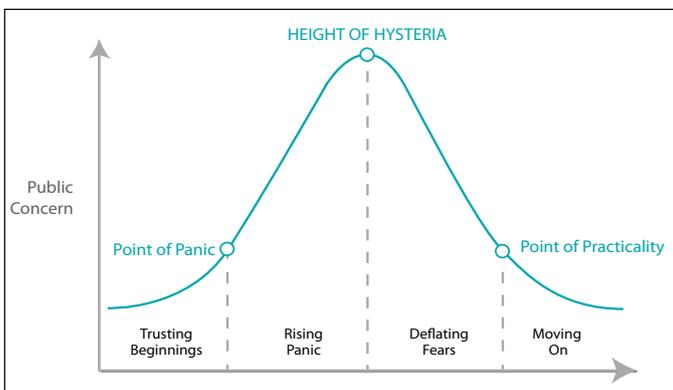


Figure 1: The technology panic cycle

Source: Information Technology & Innovation Foundation
<https://lhc.ca.gov>

TRAVOD is doing fine with its management and price target initiatives; that's what makes them the largest LSP in Europe. But this process of scaling is not merely the result of "technophobia", as certain AI commentators put it.

What makes a healthy global economy?

Scaling with technology that is not accessible to the average professional entity is going to result in consolidation. We've seen this as a common trend across almost all sectors in the U.S. And though this consolidation has been accompanied with increasing employment, average wages are at their lowest. Yes, on paper the global economy is healthy, but its environment is increasingly noncompetitive and unequal. Protections against corporate consolidation are failing and though the market is "healthy", consolidation will end this. The European Trade Union Confederation has already raised the issue of freelance worker protection, which extends from the typical freelancer to those "companies" that are merely sole proprietorships. This is a step in the right direction. Overall, it is more common for local governments in Europe to employ contract award practices that are similar to those of San Francisco's LBE. This is what ultimately should be done on a global scale. Addressing AI and understanding the changes to our modes of production is our first challenge.

The future of translation

It is necessary to talk about re-education programs that need to be dispensed in the LSP community. LSPs that are not capable of competing by scaling will have to direct investment towards shifting labor tasks and responsibilities. It is very likely that the future LSP environment will be more decentralized, and AI could act as a complementary tool in any translator's toolbox, allowing the independent worker to generate an output that equals that of major companies today. But in order to attain such an environment, small and medium-sized LSPs need to consolidate their own power. The top LSPs will most likely not share their wealth, as they

are trying to keep their edge over the competition, increase their market share and ultimately control the market price. LSPs need to find fellow translators from other fields, sole proprietorships and freelancers from all industries, and each individual must stand up in arms against the massive gig economy that will continue to grow. LSPs that are worried about the marginalization of project availability and declining prices will have no voice as constituents alone. But together, we have bargaining power, and together, we can overcome the precarious side effects of new technologies and use AI to secure our financial existence and collective wealth.

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Don't let global content missteps trip you up

C-level executives ignore the power of global content at their own risk – neglecting or mismanaging it can negatively impact brand value, the bottom line, and even their own career paths.

Text by Rebecca Ray



Companies still learn the hard way that almost all the content they publish – or that is created by their customers and prospects – is global. Whether or not content is translated or intended for a specific audience, all viewers have access to it and make their opinions heard at the global level – especially if they have negative feelings. As content plays a larger strategic role in business success, organizations are looking for ways to do a better job to world-proof the words, images, and audio that project their brand. In this article, we describe the challenge of global content missteps, provide examples, and offer advice on how to avoid becoming a bad localization meme.

Executives can pay a high price for content blunders

Firms generally recognize that content has value in supporting their brand worldwide and attracting and retaining customers. However, executives tend to over-invest in the creation of the original material while scrimping on the localized versions upon which they often depend for a hefty portion of their revenue. This disproportionate spending frequently results in a lack of oversight during the design phase, which can lead to embarrassing, if not disastrous, results in terms of PR. Worse yet, the missteps can cause a reduction in overall brand value and market cap numbers over the short term, as well as adversely impact the career path for C-level executives.

All organizations want to avoid being the poster child of global marketing missteps. Yet, examples unfortunately appear all too often:

- **H&M's catalog miscalculation.** Regardless of one's opinion of its appropriateness, you have to wonder how the original product and accompanying marketing content for a T-shirt ad in January 2018 survived internal review at fast-fashion retailer H&M. Even if its home base in Sweden was not offended by the product, H&M only had to ask personnel in top markets such as the United States, Germany, France, or the United Kingdom what they thought before proceeding with the design idea. As a result, H&M lost clothing line collaborators such as Weeknd and faced a high level of backlash from U.S. customers.
- **United Airlines' damage control goes awry.** Asia has always been a strategic market for United – long before the rise of China – so one would expect that its corporate behavior

is followed closely. However, the company's crisis response team failed to take that into account when news broke about an outsourced security team dragging a passenger off one of its planes under rather violent circumstances. It turned into an international incident as hundreds of millions (not thousands) of people commented on Weibo, with some even cutting up their United frequent flyer cards. Calls for boycotts spread throughout Asia – especially worrying since China is the second-largest market in the world for aviation and still growing. The company briefly lost almost US\$1 billion due to the incident.

- **Yelp's obliviousness in the face of Turkish history.** When the review forum Yelp announced via Twitter last year that it was entering the Turkish market, it rather oddly chose the image of a church for a country that is overwhelmingly Muslim – comparable to using a mosque graphic for an announcement targeted at North Americans. That being said, the church image didn't match what most Turks see in their country, as the construction of Christian Orthodox churches doesn't resemble the humble wood building depicted in the



Image 1: H&M advertises a product without thinking through its global implications

Source: H&M online offering in the United Kingdom



Image 2: Yelp selects a tone-deaf image to enter the Turkish market

Source: Yelp.com

image. But even more bothersome to many Turks was the mention of the Trojan Horse used to hide Greek soldiers for an ambush during the war for Troy.

Global content requires governance

The companies in the examples cited are certainly not the only global brands that have stumbled over global messaging and content. Yet it's impossible for even the most global-savvy person or team to recognize all possible cross-cultural reactions to a particular message, image, or video. So, what is a company to do?

- **Institute governance for all content types and delivery platforms.** Implement a process to quickly show executives what content is being published, how and where it's being consumed, and the reactions to it across various markets – whether localized or not. Local language services providers (LSPs) or marketing agencies can monitor in-language content for you. If United had followed this process, it would have recognized very quickly that the first statement made by its CEO had not only fallen flat in its highest-growth market and region, but was also causing a huge backlash to using its services. By paying a local LSP in Turkey – or even talking to one Turkish expatriate – Yelp could have introduced its service successfully, rather than appearing to be clueless about the history of the new market that it was entering.

- **Form a crisis management team – before anything blows up.** This is the number one rule for crisis management. The United incident is enough to cause any C-level executive to quake in his or her boots, but it's just as important for small companies. Why? Because you may only have one chance for correction and damage control if your brand is not already well-known – especially in markets with strong local, regional, and international competitors poised to take advantage of any misstep. This team should include international representation in addition to the standard PR, legal, financial, and executive members.
- **Move upstream to exert control over international product and service design.** Pay attention when content goes viral globally, in case ineptly conceived copy, creative designs, or products trigger a strong negative reaction, such as the aforementioned T-shirt from H&M. Implement or optimize a process that will ensure that the appropriate international input reaches the people responsible for design in time to

fully leverage international insights. There are several decision-making models that can work, depending on your corporate culture: cross-functional steering groups, executive committees, and global scorecards. Start your campaign now to establish or strengthen your content governance model.

The power of global content

C-level executives ignore the global power of content at their own risk. Preparing video, social commentary, product documentation, mobile ads, or user reviews for global primetime is a basic requirement these days – whether or not your executives consider it to be strategic. It's clear that people consume content locally, regardless of the language it's in. Your current and future customers around the world base their perceptions and propensity to do business with you on your cultural understanding of their market and needs. Don't allow your execu-

tives to go down the same path as United CEO Oscar Munoz did: being forced to learn the hard way how content neglect or mismanagement can impact brand value, the bottom line, and even one's own career path.

ABOUT THE AUTHOR

Rebecca Ray is a senior analyst at market research firm Common Sense Advisory (CSA Research). She focuses on enterprise globalization, social media, multilingual SEO, and global product development. Rebecca is fluent in English, French and Spanish, and proficient in Portuguese and Turkish.



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Turning technical documentation into intelligent information

Developed by a group of highly experienced technical communicators, the Intelligent Information Request and Delivery Standard (iIRDS) is the new content delivery standard for technical documentation. It aims to provide machines and users with relevant, context-specific content.

But how can your content become iIRDS content?

Text by Ulrike Parson



The Internet of Things and smart factories require us to rethink how we deliver user information. The classical document with hundreds of pages is no longer viable. Today, we must deliver small content modules that show only the content that users need at a particular moment in time in a particular context.

Content needs to be enriched with metadata to create context between the content modules. Metadata makes it possible to select the right content from a large pool of content modules. Therefore, metadata needs to be part of the delivery, along with the content.

Metadata is structured data that contains information about the characteristics of other data. With metadata, you can categorize large amounts of data in a clear and automated manner, for example, when describing videos, documents, or site-maps. Content modules enriched with metadata turn technical documentation into intelligent information.

Intelligent information dynamically adjusts to the context of the user and the usage. It provides target-oriented information for all product lifecycle phases and various search and filter options. Intelligent information is modular, structured, semantically enriched, and applications can evaluate it for specific usage scenarios.

Intelligent information enables, for example, content delivery in an Augmented Reality scenario, where information about a specific component is retrieved from a content pool based on the metadata.

Connecting devices and documentation

But why do we need a standard for that?

Consider a smart factory environment where devices and components are connected and communicate with each other. Their documentation also needs to be connected and aggregated to support queries and automated processing. We can only connect things, however, that speak the same language.

Another example: Manufacturer A calls the manual “maintenance manual”, but manufacturer B calls it “repair instructions”. The person who does the repairs could be called “service technician” or “mechanic”. How does an application that is supposed to retrieve the topics for the service technician display the correct information for the right person?

The answer is: We need to standardize the metadata. Only in this way can documentation content become exchangeable and usable for multiple manufacturers. That’s the fundamental concern of iiRDS.

Components of iiRDS

iiRDS consists of the following:

- A package format for the exchange of packages with intelligent information between different systems, for example, web portals or content delivery servers. The package format makes it possible to exchange documentation deliveries, regardless of the manufacturer. An iiRDS package is a bundle of information units that include the content and the metadata for the delivery.
- A standardized vocabulary for the metadata that enriches the content and for the relationships between the metadata. iiRDS provides the vocabulary as an RDF schema. The RDF schema contains the standardized vocabulary and docking points for proprietary extensions.

RDF (Resource Description Framework) is a standardized description language to express logical statements about arbitrary things (resources). These statements are defined as so-called triples, i.e., a subject and an object are related to each other. Example: John [subject] is the father [relation] of Mike [object].

See also www.w3.org/RDF.

The iiRDS metadata model

iiRDS is based on the PI-Class® method by Professor Ziegler. [1] For detailed information on all classes of the iiRDS model, refer to the iiRDS specification, which is freely available on the iiRDS website. [2] Register to get the latest iiRDS specifications. [3] iiRDS provides the following main classes:

1. InformationUnit: This is the metadata that is assigned to a content module. The module can be a document, a topic, or a fragment within a topic, such as a warning message. Most relationships to other metadata go out from InformationUnit.
2. InformationType: Contains classes that describe topic types (e.g. task and learning), document types (e.g. transport and repair instructions), and information subjects (e.g. safety or formality).

3. ProductMetadata: Contains classes for metadata that describe the product variant, product features, and product lifecycle phase that the information applies to, and the technical component that the intelligent information describes.
4. FunctionalMetadata: Describes events, such as error codes, required supplies and tools as well as planning and working times required for specific tasks.
5. AdministrativeMetadata: Describes the status regarding the content lifecycle and provides an identifier for the information unit.

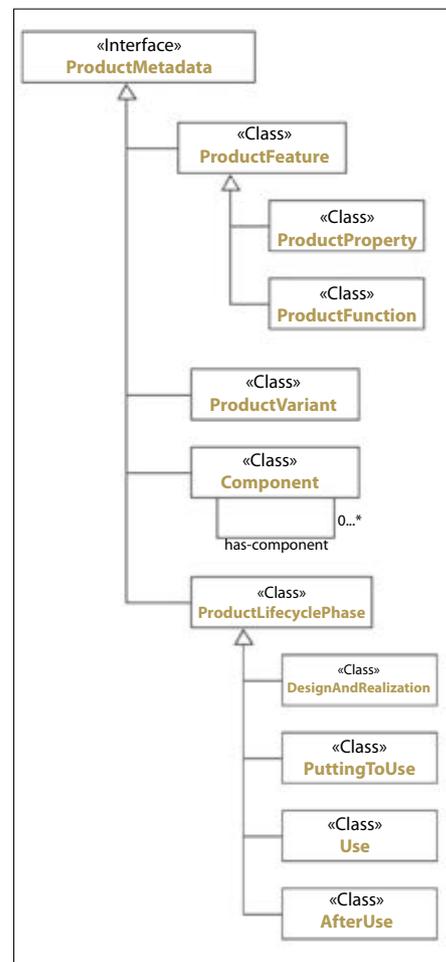


Figure 1: iiRDS ProductMetadata

The iiRDS package format

An iiRDS package is a bundle of information units including content and metadata for delivery from an iiRDS Generator, e.g. a content management

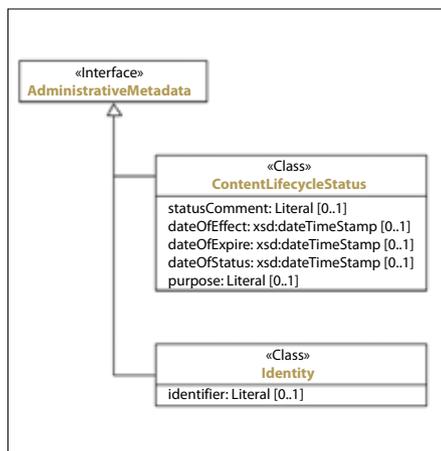


Figure 2: iiRDS AdministrativeMetadata

system, to an iiRDS Consumer, e.g. a content delivery portal.

The iiRDS specification contains rules regarding the directory structure and the names of files and directories within an iiRDS package.

No authoring standard

iiRDS enables the exchange of technical documentation across manufacturer and device boundaries. This does not mean, however, that technical authors write in iiRDS. All you need is an iiRDS-compliant documentation package when you deliver the documentation. It does not matter, for example, if the metadata for events has a different name in your content management system. If the applied output mechanism maps your company-specific metadata to iiRDS metadata and generates an iiRDS package, you are on the safe side.

Also, iiRDS does not control how content is rendered by the content delivery server or application. If you want the content of different manufacturers to look equally good, you need some processing on the server or the receiver side, which is an intelligent rendering application.

But how do technical communicators generate iiRDS packages from their content?

Usually, we use component content management systems (CCMS) to create and manage technical documentation. If the CCMS supports the iiRDS metadata schema, technical communicators can access the iiRDS taxonomy and classify documentation modules accordingly. This is the basis for the transfer of technical documentation via iiRDS to content delivery portals. The standardized metadata makes it possible that data from different management and authoring

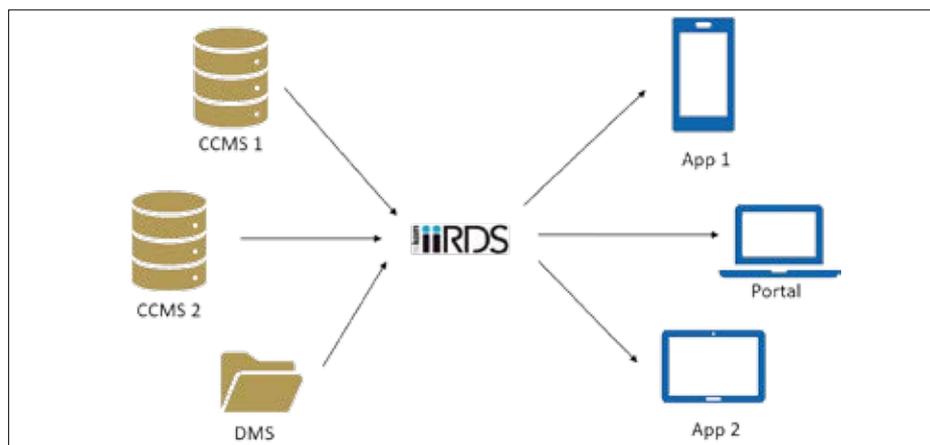


Figure 3: iiRDS serves as a hub for exchanging data between management and content delivery systems.

Source: © Empolis Information Management GmbH

(www.empolis.com/blog/digitale-transformation/content-delivery/)

systems can be aggregated and delivered to different content delivery portals.

Several companies are currently implementing iiRDS at their system interfaces or preparing for it. Empolis Information Management GmbH, for example, has already presented an iiRDS prototype implementation for the import interface of Empolis Content Express.

Do I need a CCMS to create iiRDS packages? Not really. But you should author structured content and be able to assign metadata to your content. This can be done without a CCMS, for example, in a DITA authoring environment. You will also need an iiRDS Generator to generate iiRDS packages from your structured content. parson and Empolis are working on DITA-OT plugins for this purpose.

How does my content become iiRDS content?

To make content iiRDS-compliant, you will have to perform these major tasks:

1. Develop a metadata concept for your structured content, including mapping to the iiRDS classes.
2. Implement the metadata concept in your authoring environment, e.g. a CCMS.
3. Assign the metadata to your content.
4. Use an iiRDS Generator to generate iiRDS packages from your content and metadata. The iiRDS Generator may be integrated in your CCMS or be a separate tool.
5. Use an iiRDS Consumer, e.g. a content delivery portal, to import the iiRDS packages and make content and metadata available to users.

Summary and outlook

iiRDS makes technical communication part of the connected industry. It enables you to use content management systems and content delivery portals from different vendors because it provides a standardized exchange format.

tekem released version 1.0 of iiRDS in April 2018. The working group that developed iiRDS has finished its work for now. Today, iiRDS is maintained and developed by the iiRDS Consortium, which consists of organizations, companies, and individual experts. You can be part of this development and become a member at <https://iirds.org/iirds-consortium/members>.

References

- [1] www.i4icm.de/en/research-transfer/pi-classification
- [2] <https://iirds.org>
- [3] <https://iirds.org/registration>

ABOUT THE AUTHOR

Ulrike Parson is the founder and CEO of parson AG. The company was founded in 2006 in Hamburg, Germany and specializes in technical communication, knowledge management and technical consulting. Ulrike Parson's areas of expertise are content strategy, intelligent content and developer documentation.



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Book review:

Standardizing API documentation

The market for application programming interfaces (API) is growing rapidly and software vendors are expanding their offerings of development platforms, tools and APIs. Professional API documentation plays a key role in the adoption of these offerings. The recently published book *Standards and Guidelines for API Documentation* by Anne Tarnoruder is a valuable source for both technical writers and developers producing API documentation.

Text by Anne Tarnoruder

Various companies and tool vendors define and maintain their own rules and best practices for documenting APIs, but so far there is no comprehensive, widely adopted industry standard in this area.

Furthermore, API documentation tends to fall between the cracks. It is often written by developers who don't have enough resources and professional writing skills, leading to lower quality in the documentation. Professional technical writers, on the other hand, do not always have the special knowledge and skills required for these topics. To address these gaps, SAP formed a group of API documentation experts in 2014 to produce a company-wide set of standards, guidelines and best practices. The team was led by myself. These Standards and Guidelines (S&G) aim to reach a higher level of quality and usability in the APIs published by the company, and thus increase customer satisfaction and acceptance of APIs.

The S&G have since been used across SAP as a source of guidance and education for both writers and developers producing API documentation.

The S&G cover both auto-generated and manually written API reference documentation, and apply to the major API languages and technologies, such as Java, JavaScript, MS.Net, REST and OData. The guidelines, based on the widely used industry standards for these languages and technologies, are more of a generic nature rather than specific to SAP and can be applied in any company. The *Standards and Guidelines for API Documentation* are published by tekomp Europe and available in print or as an eBook. Here is a brief summary of what you will find in our book.

Background information, terms and concepts

For technical writers who are new to or not very familiar with the subject of APIs, the S&G provide some background information and introduce the main concepts and terminology of APIs and API documentation in a short glossary.

An API package provided by a vendor will typically include the following documentation deliverables:

API reference

Contains structured reference information about all the elements of APIs.

An API reference can either be auto-generated from API descriptions (documentation comments written in source code or in separate files of a special format) or written manually in free style or using templates.

API descriptions for auto-generation are usually written by developers in or close to source code.

Developer guide

Contains all the information required to use the APIs, such as:

- Setup and access information.
- Concepts, subject domain background, architecture, workflows, diagrams.
- Tutorials, how-to's, code samples illustrating various use cases.

Developer guides are usually written by technical writers in a documentation system. In addition to these official deliverables, API vendors provide less formal community content,



such as blogs, videos, forum posts, articles, etc. via developer portals and/or social media.

Roles and responsibilities

API documentation is a joint venture of developers and technical writers, so their effective collaboration is crucial for the quality and usability of the APIs. To make sure that each role contributes to the completeness, clarity, consistency and overall professional look and feel of the API documentation, an organization needs to integrate best practices of this collaboration into its development processes. The S&G define the responsibilities of each role in the process, and suggest certain best collaboration practices, such as reviewing API naming and descriptions by tech writers early in an API development cycle to eliminate the need to fix the naming after the APIs are released.

The S&G don't define any specific tools to use in these processes. An API review can be performed in any format that is convenient for both technical writers and developers, and is available in their work environment. They can

use a code review tool such as Gerrit, or work on source code files or on generated output. By the same token, developer guide topics written by a technical writer need to be reviewed by a developer or architect to ensure their technical accuracy and consistency with the reference information.

API naming guidelines

Names are the user interface of APIs. Meaningful, clear, and self-explanatory naming is a key factor in API's usability and adoption. Even though API names are in most cases defined by developers and architects, technical writers should be involved to make sure that these names are:

- Written in professional and correct English.
- Using correct terminology.
- Consistent, meaningful, and unambiguous.
- Compliant with the industry-wide naming conventions for the relevant language or technology.

API names aim to convey the meaning of each API element and follow the function and variable naming conventions for programming languages. The S&G elaborate on these conventions and the naming conventions for REST/OData resources as well as on the most common API naming mistakes such as:

- Very long names
- Names with grammar errors
- Ambiguous names and abbreviations
- Embedded product names
- Names that explain implementation
- Names that mismatch descriptions
- Names with acronyms
- Names with redundancies

These mistakes are explained in detail and illustrated by good and bad examples.

Documenting REST/OData APIs with the OpenAPI specification

REST (Representational State Transfer) APIs, also known as RESTful Web services, are cross-platform APIs that perform CRUD (Create, Read, Update, Delete) operations on data resources using the standard HTTP calls over the Web. The Open Data Protocol (OData) is a standard protocol for interacting with data via RESTful interfaces. An OData service is an implementation of the OData protocol that exposes data to client applications, which can perform

CRUD operations on the data using REST API calls.

The most effective way to produce and maintain REST/OData API reference documentation is to auto-generate it from comments or annotations in source code or from the definition files of a special format.

There are several API definition protocols currently used in the software industry, such as RAML, API Blueprint, and OpenAPI Specification (OAS, f.k.a. Swagger).

The OAS and Swagger tools are widely recognized as the most popular open source framework for defining and documenting REST APIs. An API definition written according to the OAS in JSON or YAML format describes all the elements of an API.

The OAS supports verbal descriptions for most API elements, such as operations, parameters, responses, error and status codes, security parameters, and more. Usually, API definition files are written and maintained by developers together with the code, but technical writers should review the descriptions to ensure their quality.

The S&G provide comprehensive guidelines for writing the descriptions of API elements in the definition files, illustrated by examples.

API definition files are used as a source for automatic generation of interactive HTML documentation by Swagger or similar tools. If for some reason auto-generation is not an option, you can document REST and OData APIs manually using the dedicated structured templates included in the S&G.

Documenting Java, JS, .NET and C/C++ APIs

API reference documentation for these languages can be auto-generated by tools such as Javadoc, JSDoc and Doxygen from documentation comments that are written in source code according to certain syntax and formatting rules.

The S&G include comprehensive writing guidelines for documentation comments, descriptions and tags, accompanied by examples. These guidelines are derived from well-known sources such as the Javadoc writing guidelines by Oracle Technology Network, JSDoc Tag Dictionary, and MSDN library for Microsoft Visual Studio.

These guidelines are complemented with sample Javadoc templates for packages, interfaces, classes, methods and more.

Writing helpful developer guides

Developer guides differ in various parameters, such as platform, technology, product, scope, size and more, so there is no one-fits-all standard. This section suggests how to make your developer guides clear, concise, helpful, and pleasant to use. A typical developer guide:

- Complements API reference documentation by explaining how to set up and use APIs (and/or services, SDK, development platform).
- Contains conceptual, setup, quick start and how-to information.
- Does not contain implementation details irrelevant to users.
- Is created and maintained by technical writers in the documentation systems.
- Is written in free style.
- Is delivered as part of product documentation.
- Provides effective navigation and search capabilities.
- Includes an integrated or easily accessible API reference.

Various usability studies show that API documentation users differ in their learning preferences:

- Those with a top-bottom approach would first read all the conceptual topics, and only then start trying the API calls.
- Those who prefer a bottom-up approach would delve right into code samples to get a quick hands-on experience with the APIs.

Thus, a good developer guide should accommodate both approaches, and help all users to easily find what they need most.

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Anne Tarnoruder is an experienced technical communicator with a strong background in software engineering. Leveraging her background, Anne focuses on documentation for developers, APIs and SDKs. She is a frequent speaker at professional conferences on API-related topics.



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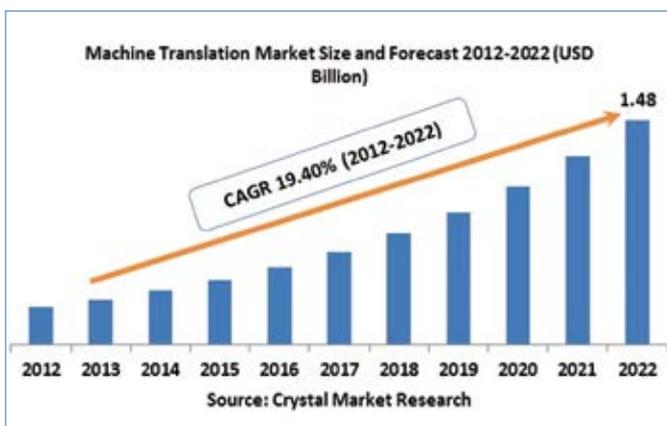
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iiRDS Consortium: Be part of it!

The iiRDS Consortium was founded in January 2018 and has been growing ever since. Now counting 30 international members, the Consortium pursues the goal of further developing the standard for intelligent information request and delivery.

As a standard for intelligent information request and delivery, iiRDS aims to meet the demands of an industry that has been revolutionized by buzzwords such as "intelligent information", "Industry 4.0", and "Internet of Things". The future development of the standard lies with the iiRDS Consortium.

With system vendors, industry members, consultants, and technical writers all in one pool – the iiRDS Consortium connects members with a wide variety of expertise, all with the aim to foster the world of technical communication. The diversity of our members is a great advantage, as different experiences result in a highly creative process of generating ideas. This makes the Consortium a strong and vibrant community. And you can jump on board too:

The Consortium is open to anyone who wants to be a pioneer in the world of Industry 4.0!

You can also profit from these membership benefits: You can improve your competencies in the field of intelligent information delivery, share your opinion, help to reach decisions regarding our industry with other experts, and be ready to implement new releases as soon as they are launched.

iiRDS is heading towards large international recognition and is expected to be the most common standard for content delivery in upcoming years.

As a member you can actively participate in these new developments.

Would you like to learn more? Then come and visit the iiRDS Café, which will be held at the tcworld conference from 9:45 – 12:00 on November 14, at Plenum 2. In this interactive forum, our experts will give insights into the use of iiRDS such as exploring the RDF schema or generating an iiRDS package. Whether you are an expert or a novice, this forum will surely provide answers for your questions.

www.iirds.org



Seven rules for quality

Quality is a concern for anyone who processes and produces content. However, there are often stark discrepancies when it comes to the definition of quality. Just like with beauty, the individual's assessment plays a decisive role. In this article, we want to demonstrate which traceable criteria can make quality verifiable.

Thucydides once said that beauty is in the eye of the beholder; in other words, people decide for themselves what they like and why. The same can be said for content and, of course, translations. However, in the "industrial" process of producing global content, individuality and spontaneity are problematic. Customers, service providers, and translators would much rather opt for predictable quality with calculable risks. Clearly defining quality expectations is crucial for choosing the right production workflow and for objectively evaluating the outcome. These seven rules make quality measurable – and thus also manageable:

1 Define quality targets and key figures.

2 Encourage active and sustainable terminology work.

3 Make use of the quality potential that is hidden in queries.

4 Turn the review process into strategic quality management with "Business Intelligence".

5 Use content profiles and sampling.

6 Collect and visualize process data to optimize the overall system.

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Let's leave it all in one place

How new tools make cross-departmental work for SCHEMA ST4 easier and enable automation. Before publishing any document, technical writers have to take a whole range of steps that involve interdepartmental collaboration. From the first briefing and multistage review processes to the final approval and publishing, many people can be involved – and some of them might not be overly familiar with the work environment of technical writers. Quite often, the process involves emails, various text editors or, in the worst-case scenario, a quick chat shouted across the breakroom. All information and change requests then somehow need to be collated and implemented by the technical writing team before finalization. For this reason, information often goes missing outside of the editorial system, or misunderstandings occur that lead to a final document that does not meet the demands of all those involved.

Fortunately, we have a solution: the new Workflow Designer for SCHEMA ST4 2018. Together with the Workflow Automation Library, it can be used to compress ST4 for external parties, so that previous knowledge of how to carry out tasks in ST4 is no longer relevant. The browser can be used to carry out reviews, make comments and grant approval, or a wizard can be used to retrieve concrete information from colleagues. SCHEMA ST4 can therefore even be used by colleagues from different departments, as all information stays in the same place in the editorial system right until the document is published. This means that nothing is lost, and no misunderstandings occur during the creation of a document. Along with collating information, feedback and approval, the workflows also provide a greater degree of consistency. It becomes possible for colleagues outside of the department to standardize texts, for example. SCHEMA – complex documents made easy | www.schema.de

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- 🌐 <https://ua-reloaded.de>

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- 🌐 <https://tcworld-china.cn>

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- 📅 November 27-29, 2018
- 📍 Menlo Park, CA, USA
- 🌐 informationdevelopmentworld.com

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- 📅 March 24-27, 2019
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- 🌐 www.gala-global.org

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- 📅 September 3-6, 2019
- 📍 Cleveland, OH, USA
- 🌐 <https://contentmarketinginstitute.com>

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- 🌐 www.iaop.org/summit

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- 📅 April 8-10, 2019
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- 🌐 www.contenttechsummit.com

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- 📅 February 27-28, 2019
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- 📅 March 21-22, 2019
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- 🌐 www.tekom.de/tagungen.html

Information Energy 2019

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- 🌐 www.informationenergy.org



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Information Energy 2019 focuses on how we empower emerging technologies with information. In 2018 we focused on natural conversation machines and humans working together, and trying to understand the roadmap to AI. During the last year we have observed new initiatives in research and implementation to find practical industrial applications. Information Energy 2019 continues our exploration of the relationship between information and technology, focusing on examples that are already in place or will be in the near future.

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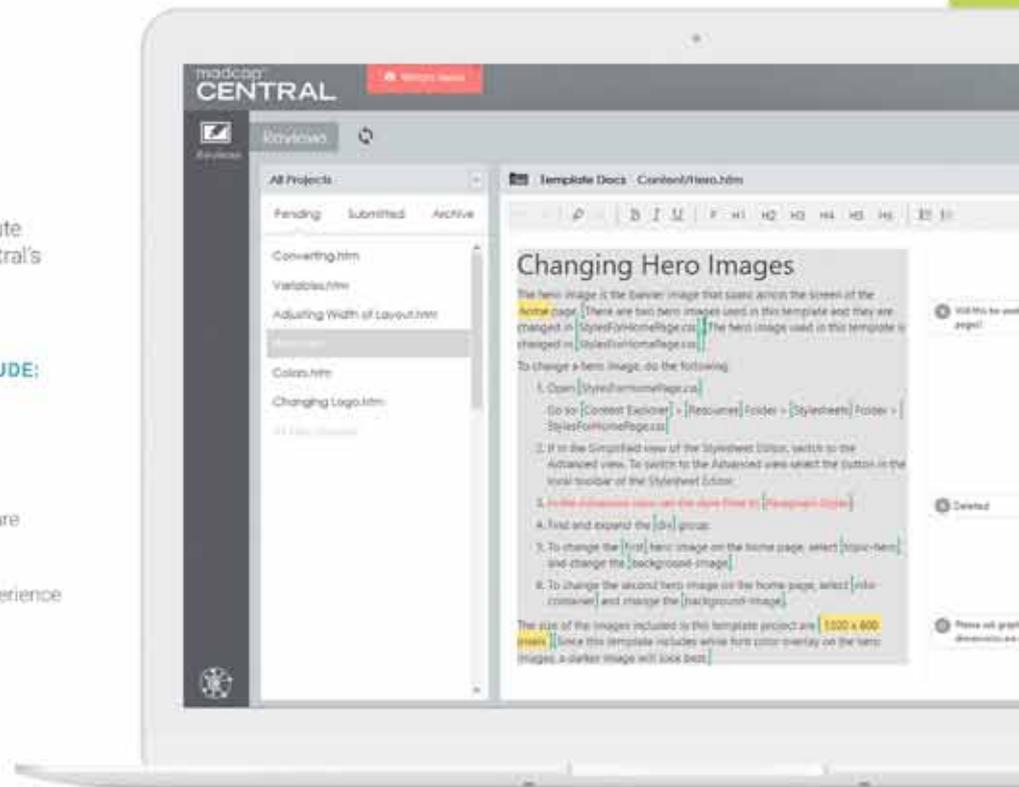
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