Cognizant

SMART INSIGHTS, SMARTER PRODUCTS

Using data to design and improve meaningful products and services

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UNDERSTANDING HUMAN EXPERIENCE

THE 'WHAT' AND THE 'WHY'

Business and design often borrow expertise from researchers – and even data scientists – to assess problems in the customer experience, identify pain points, and reveal uncovered wants and needs. However, you can make much more innovative use of qualitative and quantitative data to inspire groundbreaking ideas and new effective business models.

Smart insights can help build new digital products and improve existing ones, and make them uniquely human-centered. With this whitepaper, we aim to:

- **Share learnings, sentiment and practices emerging in the tech world;**

- **Indicate the directions in which your company can move to get started;**

- **Lay out current and future challenges related to data use.**

Every day, we encounter driven stakeholders who are excited to use technology to advance their business practices and serve end-consumers and employees at the next level. Sometimes, we offer to explore new technology, create new services or identify growth areas for the business together. Other times, product improvement and cost reduction – in the logic of efficiency and optimization – are primary project objectives. Product improvement and service creation are areas of interest that belong primarily to digital and design officers. Business executives are often focused on cost reduction and revenue growth.

The worlds of business and design sometimes appear to be driven by antithetic goals in their attention to understanding human experience. The first is driven by logic of profit and growth, whereas the second by the desire to solve problems and improve the life of individuals and communities through technology.

Whatever the underlying motive, there is a shared agreement that understanding contextual experiences is at the core of delivering more relevant digital products and services. Understanding User Experience, or as we prefer to call it, Human Experience, consists of breaking down and researching the three key components of every human phenomenon: actions, thoughts and emotions. A single method or discipline won't be enough to research how your customers act, think and feel. In this paper, weare going to show you how to do it effectively.

Beyond big data

In our era, the possibilities to store and detect data on all interactions and transactions between customers and products and touchpoints are unprecedented. Collecting this kind of information can inform companies to the highest detail about what customers search for and use. However, since the human factor comes into play, many companies struggle to understand how their product is experienced. It's also difficult to determine how people make decisions about purchase, given that the digital 'traces' they leave are purely quantitative. Moreover, companies risk collecting unnecessary data that can potentially harm privacy and fail to comply with GDPR.

Many companies that, in the past years, have embraced big data as a fundamental asset and developed data science and analytics capabilities are now facing the need to make sense of a huge amount of unorganized information. This is why more and more digital native companies in the world have turned their attention to human sciences.

We were present at the 2018 Ethnography Praxis in Industry (EPIC) conference, where researchers and designers from major tech companies discussed the practices and implications of their recent attempts to integrate ethnography and data science.

As a systematic study of people and culture, ethnography is a meta-discipline. Several human science disciplines use it to study the culture and behavior of people in their contexts. Ethnography and data science are considered traditionally opposing disciplines that rely respectively on qualitative and quantitative sources and on very different methodologies and approaches. The fundamental questions that each of these disciplines ask are different. In data science, the goal is to assess what happened and in what measure, whereas ethnography looks at why something is happening.

Marketing departments – and businesses in general – have traditionally relied heavily on quantitative measures to assess performance. With the advent of customer experience, which became one of the main KPIs to both digital and non-digital native companies, the assessment of success has become more problematic.

SMART INSIGHTS
DATA AS VALUE

Some of the companies that we see excelling in customer experience use a combination of data science and ethnographic techniques to make top-notch products that remain relevant, contextual and personalized for consumers.

Design research is conducted within these companies with mixed teams and in continuous iterations. It results directly in by-products (prediction models, AIs) or in the final digital product. The insights derived are thus not only static (e.g. customer journey maps, service blueprints), but are actionable ones that can be used immediately, for example in product backlogs.

The most advanced use that can be made of these insights is the creation of smart, contextually aware AIs. However, we can also build more accurate prediction models for business intelligence and provide input for effective front-end designs.

Creating algorithms to feed contextual AIs

As mentioned earlier, the biggest impact Artificial Intelligence can have on product design is in the creation of smart, contextual experiences. At one of the leading data-driven product companies in the world, Spotify, experience design is no longer considered to be static. Real-time collection of user data makes tools like traditional personas obsolete. Insights derived from qualitative research are embedded in algorithms in the form of variables, and – thanks to machine learning – are perfected over time. Qualitative research results often lead the quantitative data interpretation.

Spotify is best in class in expertise integration. Joint teams of user researchers, data scientists and designers work hand-in-hand to deliver a pervasive music experience that goes beyond the transactional aspect of the platform into daily life. Every feature and experience created is researched and framed starting from context. Any of us would, for example, want to listen to dance music on a Friday night and classical music to focus on a Monday morning. This means that music is presented not only by artist, but also by mood.

Next to using moods as general context frames, Spotify relies on usage data to build accurate personal profiles. The more we use Spotify, the better Spotify will know our taste. This way, both personal taste and novel exploration are incorporated in the platform.

Developing reliable prediction models

Data science traditionally looks at correlations or formulates hypotheses derived from business or common sense. However, understanding factor causation – what is causing the patterns detected in the datasets - is key for creating precise algorithms. Qualitative insights gained through ethnographic practices can shed light on variables that can explain those patterns.

Recently, with our partner company ReD Associates we developed fraud detection intelligence for a major credit card company[1]. Previous attempts to build such algorithms had failed, as they only included external factors – traces – left by fraudsters once the crime was already committed. The 'predictive power' of the algorithm increased dramatically when anthropologists and data scientists included new 'proxy' data, based on insights derived from shadowing and interviewing fraudsters.
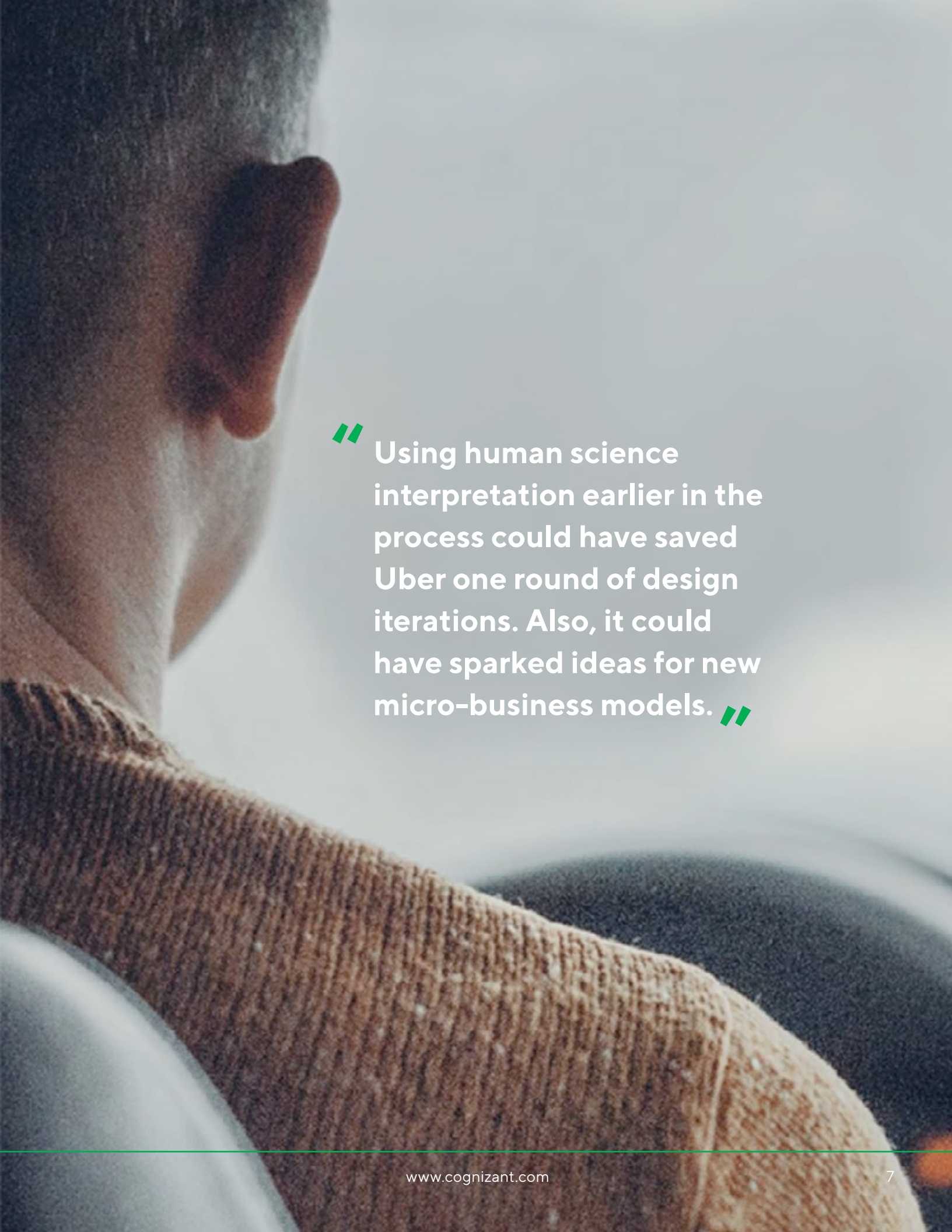
This ethnographic study of the fraudsters' habits allowed human scientists to uncover their motivations, which then were translated into trackable and measurable elements.

We similarly applied this approach similarly for one of our oldest clients, Transavia. In the attempt to help the airline build a reliable boarding times prediction tool, we identified the main variables that affect boarding times. Through several observations in context conducted in the past, we had pinpointed the main causes of delays during boarding. This discovery allowed us to produce the most accurate prediction model.

Creating actionable insights for design

The insights produced combining data science and ethnography do not necessarily have to become complex algorithms. Designers can also use them as insights for routine product iterations. The difference is that these will be super insights, as they overcome the limitations of standard qualitative design research techniques (by having a broader sample reach) and standard analytics (by having the context of 'thick' ethnographic data).

1. Arora, M. et al. Contextual Analytics: Towards a Practical Integration of Human and Data Science Approaches in the Development of Algorithms. EPIC 2018 conferenceproceedings.

Smart Insights, Smarter Products

"Using human science interpretation earlier in the process could have saved Uber one round of design iterations. Also, it could have sparked ideas for new micro-business models. "

In companies like Airbnb and Uber, these insights come alive through quick iterations of the digital experience. When Airbnb[2] decided to redesign their guest feedback experience to improve overall trust in the platform, previous ratings and written feedback given by hosts were used. This stored data revealed that hosts were not being completely honest in their evaluation of guests, when the evaluation had to be given publicly. It was only thanks to interviews and focus groups, performed in multiple rounds, that the true motivations for this behavior appeared.

Realizing the reasons behind hosts' actions allowed the design team to build a rating system that would prompt them to be honest. This is utterly important in a peer-to-peer community, which is essentially based on trust mechanisms.

Another relevant example comes from Uber. The company was trying to influence its users to carpool, by increasing the usage of their new UberPOOL product[3]. The numbers initially showed a growth of this new feature, but stakeholders did not understand why this was the case. Only by relying on field observations were they able to answer questions such as "Which trade-offs are people willing to make?" Namely, the trade-offs appeared to be highly context-dependent: factors like weather, haste and traffic or routes have a big influence on users' decision to carpool.

In fact, according to cognitive and socio-psychological theories individuals make trade-offs in their daily lives to an extent that is influenced by context.

By shaping the research frame in a specific context, rather than having to understand complex decision-making processes broadly, this round of research could have been more effective. Also, it could have inspired the creation of new contextual products, more thoroughly targeted – and therefore more profitable – as micro-business models.

2. Carter, S. & Dear, R. Humans Can Be Cranky and Data Is Naive: Using Subjective Evidence to Drive Automated Decisions at Airbnb. EPIC 2018 conference proceedings.

3. Lo, J & Moserman, S. The Perfect uberPOOL: A Case Study on Trade-Offs. EPIC 2018 conference proceedings.

SETTING UP YOUR OWN CAPABILITIES

AN INTERDISCIPLINARY APPROACH

What are the first steps to take to leverage the power of smart insights in your own organization? Not surprisingly, most of them involve a change in your company's mindset and processes.

Creating a culture for all data

- **Tip 1: Define what constitutes data**
  The first step to promote the integration of ethnography and data science in your company is to nurture a critical mindset towards what constitutes 'data'. What do your product teams and stakeholders consider to be evidence? Just because a phenomenon is quantifiable does not mean it is more relevant than one that is not yet tracked or quantifiable.

  As mentioned before, to assess product experience, we need to understand not only actions (tracked by your analytics, for example) but also emotions and thoughts. These two last components of experience are almost impossible to track quantitatively. They require human intuition, pattern detection and in-depth knowledge of sociological, anthropological or psychological theories to be identified, studied and synthetized.

- **Tip 2: Identify the right KPIs**
  Addressing evidence in a purely quantitative manner often results in the wrong choice of Key Performance Indicators. Companies that set KPIs to track success often do not identify the correct indicators: ones that can show if user experience is actually improving. They measure traces of actions that are not central to the experience, rather than the quality of the experience itself, which constitutes a combination of emotions, actions and thoughts.

  The following ReD Associates and Cognizant[1] case provides a great example. For a theme park a mixed team was tasked to re-design an optimal experience. Having discovered how important the 'bonding factor' is in a theme park, anthropologists suggested new KPIs that were meaningful to measure. They realized that most companies just look for ways to digitize current data, rather than taking a holistic perspective on what data should be collected in the first place. Based on their insights, they envisioned how to rearrange the park to provide a better bonding experience for guests. We find this approach to be equally effective for designing and measuring the digital product experience.

1. Wachmann, J. Juni, A. Baiocchi, D. & Welser, W. Below the Surface of the Data Lake: An Ethnographic Case Study on the Detrimental Effect of Big Data Path Dependency at a Theme Park. EPIC 2018 conference proceedings.

Building joint teams

Once you have managed to create confidence in qualitative data, a culture of trust in ethnographic research methodologies and the insights derived from them, the next step is to create joint teams.

- **Tip 1: Hire human scientists**
  Ethnographic research practices rely heavily on the ability to methodically plan research in an effective way, and on the interpretation skills of the professionals that perform it. Among different human scientists, which ones have the characteristics that your company can most benefit from? Anthropologists traditionally master the art of observation. They prefer to value context above any other setting of study, which means that they will never use methodologies that extract or study people outside of their natural settings.

  Anthropologists' main strength is to limit assumptions by practicing observation without any given hypotheses or judgment. The absence of hypotheses allows anthropologists to avoid confirmation bias, and ensures results are as unfiltered and realistic as possible.

  Observing non-verbal behavior cues is another capability that anthropologists possess. But detecting these kinds of cues is a prerogative of psychologists. Identifying personal and situational variables that affect behavior is their mastery. Psychologists are highly skilled in explaining personality patterns, social dynamics and the 'why' behind human actions. They are especially good in isolating and understanding relationships between emotions, attitudes and behavior. Psychologists are of great help, for example, in clustering data and identifying patterns on experience maps or creating variables to test in datasets.

  Sociologists are another kind of human scientist that serve the design practice very well. They understand dynamics between people, phenomena and their impact – also in the long run – on individuals and communities. They can add value in projects or companies that aim for social or behavioral change.

- **Tip 2: Evolve and question standard methods**
  Producing smart insights requires your mixed teams to have an open mentality that continuously shapes established methodologies to the circumstances or the business challenge. Inevitably, new methods will emerge. For example, traditionally data scientists would not include datasets that are not refined or cleaned. However, proxy data that is generated from qualitative studies is often 'imperfect' and incomplete. The lack of completion or scale in proxy data does not prevent experimentation with it to verify which patterns emerge in the data sets, and whether that data source can be at all meaningful. It will allow the teams to iterate quickly on predictive models or to create design prototypes to further test.

"Producing smart insights requires your mixed teams to have an open mentality that continuously shapes established methodologies to the circumstances or the business challenge. "
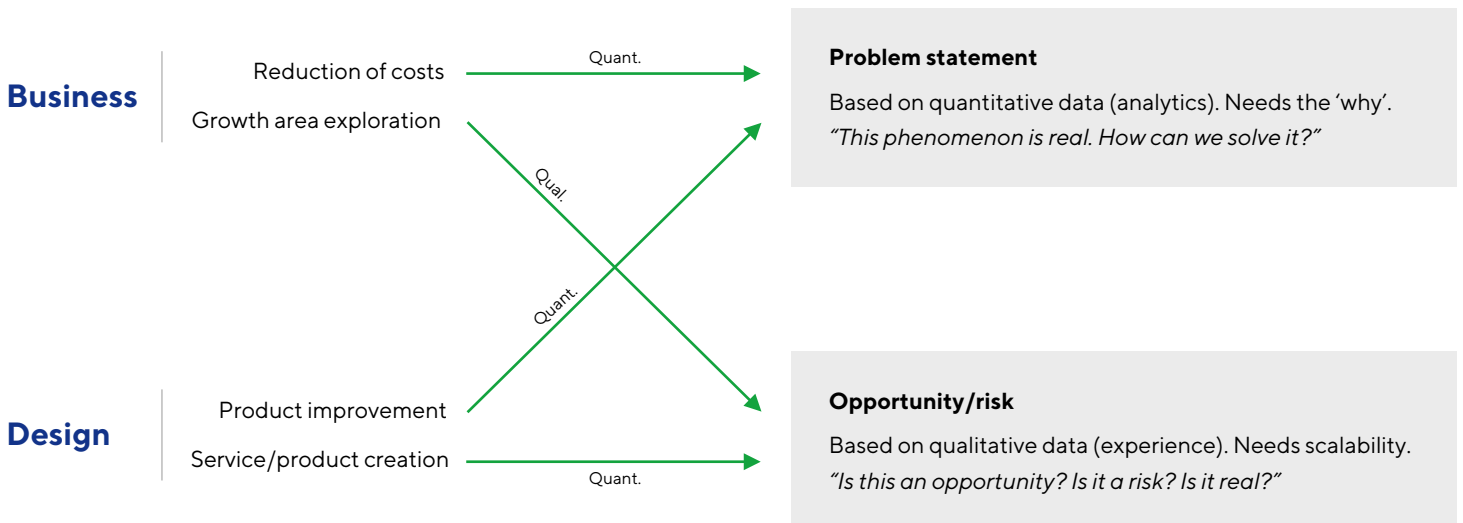
Aiding both business and design

Once there is enough confidence in the organization and the right experts are organized in joint and empowered teams, many departments will have the opportunity to use these new capabilities. Sometimes, the request can come from business stakeholders. In that case, the following scenarios are frequent:

- There is a need to reduce costs. Reliable business intelligence data shows expenses are increasing. This means there is a necessity to understand why this is the case and which relevant factors we can affect to change this;

- There a desire to create business growth in a certain area. This desire could come from stakeholders' ambitions or from competitor analysis. In any case, the next step would be to understand if certain growth is feasible and realistic for the company to sustain.

The desire to produce accurate insights could also push product or design teams to work with data scientists and human scientists. In this case, the following scenarios are probable:

- The product/service needs to be improved. The analytics show poor performance, and the design team wants to understand the reasons behind this data. Therefore, qualitative research will follow (e.g. interviews or usability tests) to provide details to further analyze or iterate on the designs;

- There is a need or a desire to create a new product. Qualitative research might have identified hidden customer needs, or that the competition seems to be ahead. This input could be correct, but its validity at scale has to be verified. Quantitative research would then follow.

Business
Reduction of costs ——— Quant. ———→
Growth area exploration ——— Qual. / Quant. ———→

Problem statement
Based on quantitative data (analytics). Needs the 'why'.
"This phenomenon is real. How can we solve it?"

Design
Product improvement
Service/product creation ——— Quant. ———→

Opportunity/risk
Based on qualitative data (experience). Needs scalability.
"Is this an opportunity? Is it a risk? Is it real?"

FUTURE AND CHALLENGES
GUARDING CORE HUMAN RIGHTS

Collecting information about people has always posed ethical challenges; however the reach technology has provided for collecting data and the influence that Artificial Intelligence systems can have on society is unprecedented.

Consequences on data collection, interpretation and analysis

As the presence of automated systems powered by AI increases, the community of design, technology and research practitioners at EPIC 2018 acknowledged that AI could impact ethnographic practice just as much as ethnography can impact data science. Machines could be able to co-design, co-execute and co-interpret research.

With information collected through surveillance, tracking systems and IoT, a broader set of data can be gathered, potentially at scale and/ or remotely[1].

Interpretation of data would inevitably be affected by transferring some of the collection responsibility to AIs. But mostly, comparing different datasets at scale with AI could enhance interpretation. We imagine this could be particularly interesting for global product teams, such as those at Spotify or Airbnb.

Ethnographers could also use AI to analyze data collected during observations. Machines could, in fact, detect patterns in face recognition, posture and detect background noise that human senses cannot.

While these possibilities create exciting opportunities for expanding knowledge and would make remote research easier, we wonder what will happen to the necessary human interpretation and sensemaking that ethnography requires (and to research ethics, as we will outline later). Design and product teams need to participate actively in sensemaking to develop empathy and create a theory of mind on the user group for whom they are designing.

Privacy and Ethics

The possibility to access a whole new level of information through intelligent systems poses new challenges to the current ethical guidelines in research and design. How could we design an informed consent for data manipulations made by an algorithm? These algorithms could be ever-changing as we perfect them.

Teams overseas see recent legislations that have been approved in Europe, such as GDPR, as a positive step. These laws will inevitably push to strengthen the rigor with which data is collected and used.

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1. Zafiroglu, A. & Chang, Y. Scale, Nuance, and New Expectations in Ethnographic Observation and Sensemaking. EPIC 2018 conference proceedings.

In addition to these challenges, participating in data scientists' work and developing prediction algorithms will give designers and product teams the opportunity to adjust the digital tools they create in a way that does not affect privacy. A company called Hoxton built a tool to perform retail analytics by tracking shoes, rather than tracking location or scanning face features. This is an excellent example of how data collection does not have to affect privacy. After all, retailers do not need personal data, but just trends.

As phrased by Nathan Good, CEO of Good Research, "Users are aware of the trade-offs made when using technology, they just feel a lack of agency in addressing them." At the same time, privacy should not become a prerogative of those who can afford to pay a service. If a service is conceived to be accessible by anyone, it should remain so even if personal data is not shared.

The presence of a role that guards ethical implications will therefore become essential for tech companies in the near future. Salesforce has recently nominated its first Chief Ethics Officer, and we expect many more tech companies to follow.

Towards a smarter tech world

Every day, we are inspired by the desire and ambition to build a digital team in which data scientists, researchers and designers work together interdependently to design a smarter world. Many global tech companies are already successfully applying this way of working. As they search to build trust and – where possible – influence consumers' behavior, there is a growing awareness of how each system - even digital - is a social system, where multiple factors and actors are involved.

Customers' actions, opinions, and especially emotions about products, such as decisions to purchase or repurchase or loyalty towards a brand, are all equally important factors. These can only be understood fully while using a variety of methods from different disciplines. We cannot expect to ask consumers in a survey how they feel: leveraging our empathetic intuition to interpret qualitative data and to design experience, as well as using the best data science techniques to build accurate and ethical algorithms, is what we strive for. We owe each person we are designing for our effort to acknowledge his/her humanity, without asking effort in return. Free and fair access to technology will ultimately make our AIs and our products smarter, and deliver ever-more-delightful digital experiences.

"The presence of a Chief Ethical Officer will become essential for tech companies in the near future."

ABOUT THE AUTHOR

With a core expertise in the human sciences, Emanuela helps clients build digital strategies and products that are truly centered around people. Creating rich experiences ultimately means making people's lives easier. Combining research, design and technology to build tailor-made experiences, she seeks the perfect balance between business offering and customer fulfilment.

Do you have questions about digital strategy? Want to share your thoughts? Feel free to contact Emanuela for more information.

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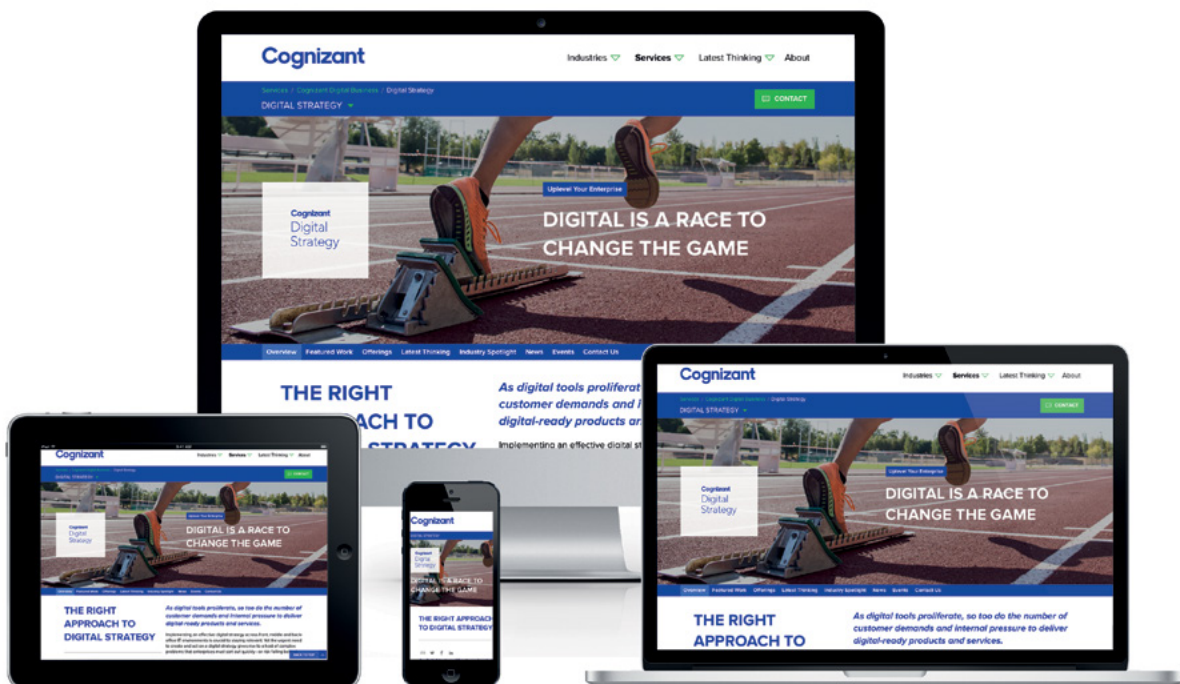www.facebook.com/cognizant

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