To Infinity and Beyond

How can outcome focused thinking help us innovate in the travel industry?

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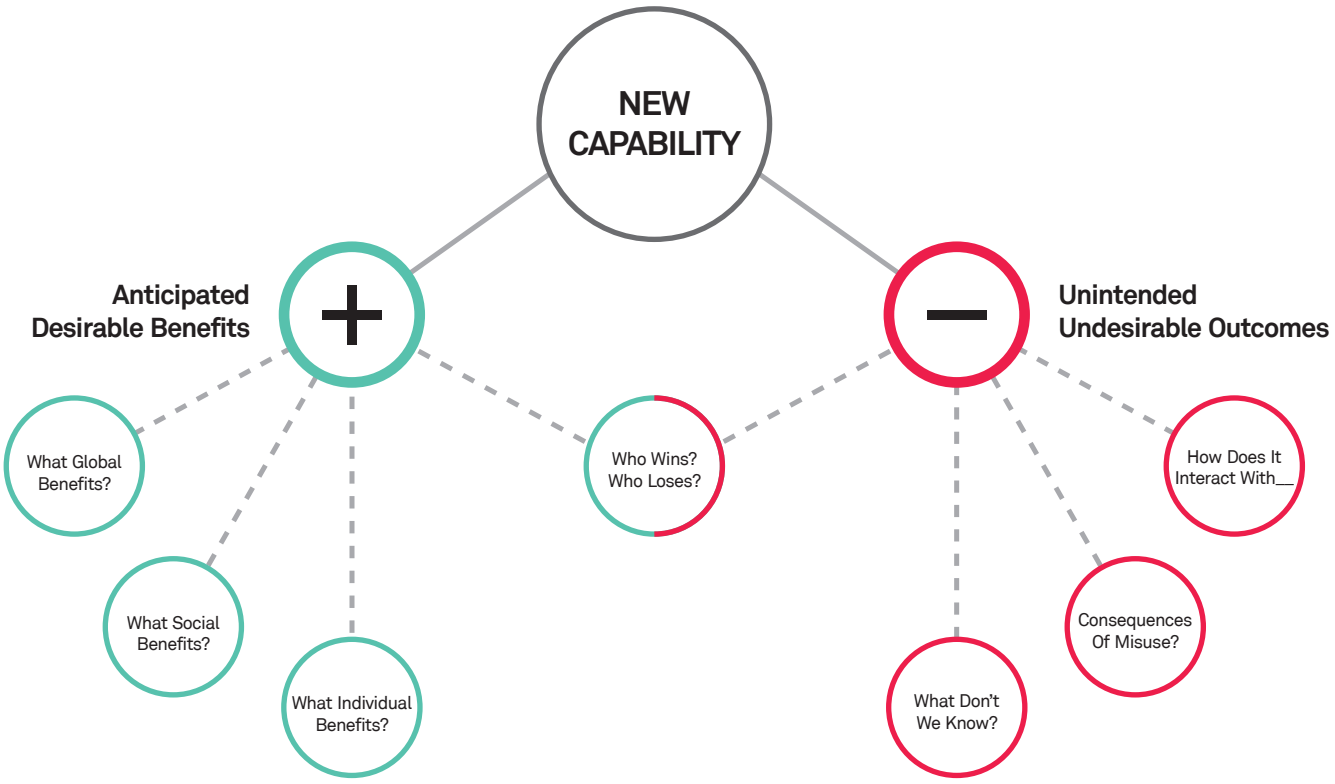
"Technology is neither good nor bad; nor is it neutral."

Melvin Kranzberg's First law of technology

The travel industry is grappling with a wave of technology improvements and rapidly increasing customer expectations – from the utopian Hyperloop concept to the just-around-the-corner completely automated airport. And while travel has never been safer and faster, and we have tons of new services, apps and options to make our experience better, there clearly are opportunities for airports and airlines to make a dramatic improvement in the quality of the passenger experience. With so many new technologies, one of the travel industry's biggest challenges will be to predict which innovations they should invest in and which ones will take off. A good compass that could help focus on the best opportunities is analyzing the potential positive and negative outcomes of each technology.

Outcome-focused thinking does not focus exclusively on positive outcomes of a design or technology. Predicting the potential negative outcomes is vital, yet is often ignored. At Artefact, we call this outcome-focused approach to technology 21st Century Design. We think that is the only way to mitigate the risk of ending up doing something bad. It also maximizes the good of what we do at an individual level, but also socially, and globally.[1]



Self Driving Cars

Today around 75 million US Americans live in suburbs, a landscape that would probably not exist without the invention of the automobile. Cars didn't just change where we lived, they changed how we lived. Only few other milestones confer an independence as tangible, as official and as immediate as the license to drive a car. From our highest collective aspiration down to the seemingly minor triumph of a sixteen-year old teenager passing the driving test, the entirety of our culture has been shaped by the disruptive mode of transportation that is the automobile.

However, this seems to be about to change pretty soon... Google, Nissan, BMW and other several companies are all working towards fully autonomous vehicles and it is estimated that self-driving cars will account for 75% of vehicles on the road by 2040.[2] This is going to be one of the largest disruptions and has the potential to also dramatically impact our culture, society, geography and our way of live. Will self-driving cars make our lives easier or widen the differences between us?

Will self-driving cars make our lives easier or widen the differences between us?

Outcomes for Self-Driving Cars

Anticipated Desirable Outcomes

30,000 lives saved per year.[3]

$450 billion saved in accident-related insurance costs.[4]

2.4 billion gallons of gas saved due to improved traffic efficiency.[5]

4.8 billion hours spent 'not' commuting.[6]

Unintended Undesirable Outcomes

8 million American's employed in transport industries face joblessness.

Auto companies and mechanics face huge disruption.

Fewer traffic, police, emergency workers required.

Urban sprawl will get much worse.

Wearables

While the self-driving car will definitely change the way that we may travel in the future, travel and buying experiences will become more and more personalized as passengers seek greater control. From smart clothes and shoes, to activity monitors, smart watches and head mounted gear, the last couple of years have seen a very rapid growth of dizzying array of new technology gadgets. While we are still fumbling around in the "first generation" of these gizmos, the market of wearable devices is growing like no other technology and is estimated to be a $750M market today and reach $50B by 2016.[7] Undoubtedly, wearable devices will find their way into our travel experience. So what outcomes should we strive for what should we try to avoid?

Smart Watches

Smart watch form factor is already heating up to be incredibly competitive space. The watch itself is an easy place to start with wearable devices as the "category" is familiar to consumers. Afterall, we have been wearing a watch on our wrists for a long time. Unlike Google Glass, there is no need for "cultural change" to occur before we are confortable with strapping one on.

By 2018, it's anticipated that over 39 million smart watches will be sold.[8] But in order for the watch to appeal to more than trendy techies and early adopters, three key pieces of technology need to be in place before consumer adoption takes off, especially in the context of the travel industry.

Wearables Everywhere
From smartwatches to fitnes trackers, wearable devices are here to stay.

What outcomes should we strive for and what should we try to avoid?

Near Field Communication technology (NFC) is probably one of the most talked about technologies when it comes to wearable devices. It allows you to use wristbands and other devices as keys, for payment or for authorization.

The much talked about MyMagic system that was currently rolled out at Disney World uses NFC in little wristbands to allow the park visitors access to their hotel rooms, the park itself, for check-ins at Fast Pass locations and sends Disney Photo Pass pictures to your account. It can also be loaded up with money so you can buy souvenirs or meals anywhere in the park. Perhaps one of the more delightful features is the ability to give the Disney characters a heads-up on your child's name and add some personal details like the fact that it might be your child's birthday. For a kid, that can be a pretty magical experience.

What if that band also knew who you are? That's where **biometrics** come in. Biometric devices are equipped with sensors capable of listening for the unique signature of person's body and determining if the person wearing the device is the owner. Imagine if we combined Biometrics and NFC capabilities – we can have a hands-free secure mobile payment experience and devices that give you easy access to a wide range of facilities.

The most natural of all interfaces is not touch. It is speech. That is why **Natural Language Processing** will probably be the technology that will make all the difference. Getting it right is hard but the next generation Speech assistants, like SIRI, are likely to be impressive. When it comes to booking vacations, you often spend hours doing hundreds of search queries on dozens of sites. Now what if a technology like SIRI could do all the work for you? The promise is not only being able to speak a complex query to your device and have it understand what you really mean, but also the power to go out, do the hundreds of queries, look and compare schedules, prices, reviews, ratings, vacancies information and formulate some different kinds of plans.

Now what if a technology like Siri could do all the work for you?

Wearable devices will not only produce more data, they will also generate a different kind of more personal data about you. **Galvanic skin response sensors** are used today in lie detection machines. But when added to a wearable device, they can tell a million other things about you, potentially even identifying if you are sick, suffering from lack of sleep, aroused, under the influence of alcohol, drugs, fearful, angered, excited and so on.

It is a scenario like the above that makes us pause and think about what an innovation can mean to us, our privacy and our relationship with others. It may be two to five years out but now is the time to be asking the questions, and having the debate about the impact of these technologies and the level of trust they would demand from us and the providers that deliver them.

Outcomes for Smart Watches:

Anticipated Desirable Outcomes

Biometrically authenticated wireless commerce transactions could reduce the $190 billion dollars lost to credit card fraud, annually. (Not to mention fraudulent ticket sales).[9]

Biometric authentication and NFC offer the potential for removing identity checkpoints from airports, and offers the potential for more personalized greetings and improved customer service.

Bio sensors could offer us new insights into our mental and physical health. Persuasive design techniques could encourage people to live considerably better.

Conversational interfaces, offer us the ability to radically simplify tasks like researching, booking, and embarking on travel.

Unintended Undesirable Outcomes

Although the communication range of NFC is limited to a few centimeters, NFC alone does not ensure secure communications and can be eavesdropped.

Agents like Siri don't disclose where 'they' get answers. This obscures hundreds of business sources and may dramatically impact revenues for them.

Agents need knowledge of context and personal details to work well, opening up privacy concerns. We are forced to ask, "*who else benefits?*" from the intimate knowledge they have of their users.

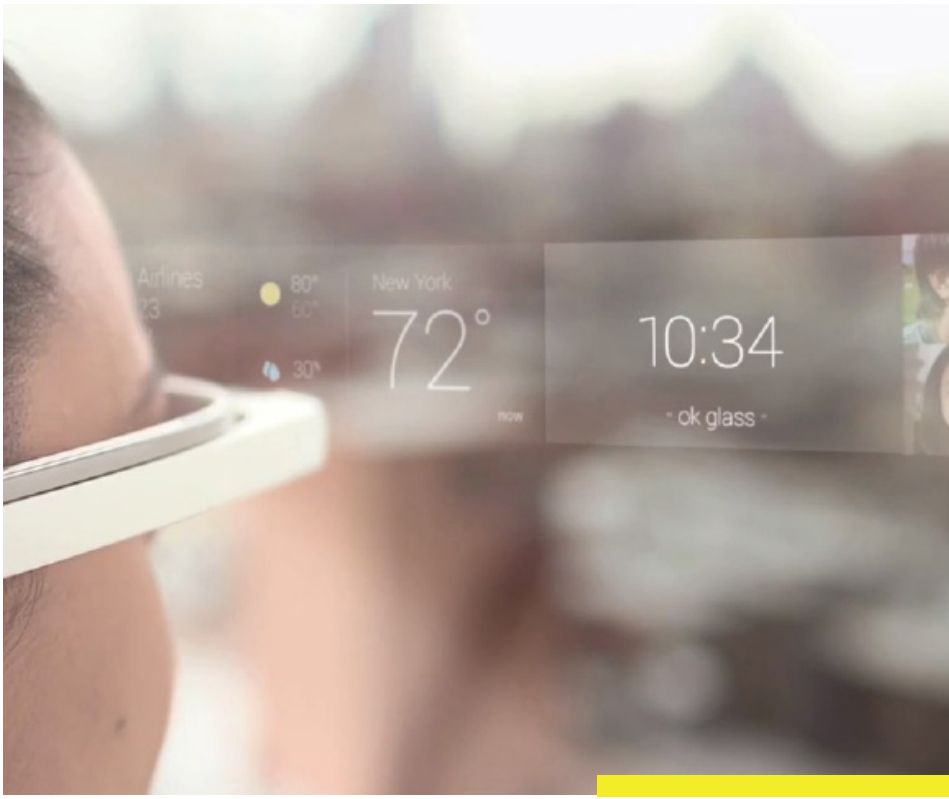
Bio sensors can potentially reveal far more about us than we are aware of. Sensors and algorithms can probably tell if we are drunk, lying, aroused, angry, nervous, high etc. More privacy concerns.

Google Glass

Experiments with wearable technology go back to 1980 when Steve Mann, often referred to as the father of wearable computing and now a professor at the MIT, built his first wearable devices. 32 years after Steve Mann's first wearable head-mounted contraption, Google Glass has arrived. Google Glass is in a way the first prototype of a new wearable platform. On one hand, Glass represents a new era of technology and marks the beginning of a new industry, but on the other hand, it also represents the tremendous challenges that we have ahead of us as we move forward into mainstream wearability.

In *The Hitchhiker's Guide to the Galaxy,* the Babel Fish was a small creature that acted like a universal translator. Stick it in your ear, and you could understand anyone. While this scenario is still in the real of science fiction, we are not that far off from the capability it provides. Natural Language understanding will be a huge step forward for the ability to do near real time translation. And while it will be incredibly hard to perfect, imagine having the power of Google Translate live into your year via Google Glass.

Google Glass will face a long journey toward cultural and social acceptance. Its use is prohibited in Las Vegas casinos, and legislators in the UK are considering banning it for being too distracting with GPS features that will put the information right in front of your sight. Yet, it won't take too long until the technology reaches a point where it is discrete and fashionable enough to succeed as a mainstream device.



Early adopters are ambivalent about the outcomes from Google Glass..

Outcomes for Google Glass:

Anticipated Desirable Outcomes

Hands free input and output is a dramatic improvement, and a far more natural interaction than smartphones.

Customer service scenarios improve because of the fear that sessions are being recorded by customers. Facial recognition from cameras that see where I'm looking has the ability to greatly improve customer service.

Augmented reality has the ability to enhance experiences especially for tourism, for example touring ruins, wayfinding.

Having a potentially photogtaphic memory is a superpower. You-can see-what-I-see, is a huge deal for the tourism industry, amateur journalism, telemedicine, remote collaboration, education.

Unintended Undesirable Outcomes

We create a dependency on intelligent assistance that raises challenging questions about education, scholarship, knowledge aquisition and memory.

We create the illusion of paying attention, and the potential for near constant distraction. It becomes an inhibitor to normal human discourse and communication.

Autonomy is undermined as some employers make it a requirement for service workers to wear glass so they can be supervised.

Surveillance is nearly ubiquitous to the point where its increasingly hard to insure any kind of confidentiality, interpersonal and employment trust is eroded.

Outcomes before technology

Yesterday

Technology > Experiences > Outcomes > ⊖ ⊕

Today

Outcomes > Technology > Experiences > ⊕

In more innocent times, innovation largely drove the ideation of new experiences. Now that we have enough technology building blocks, the harder challenge for us is to decide before we rush in and build it, what we want from technology, what it is that we try to improve. Having the discipline to examine the preferable AND non preferable outcomes, in the travel industry and beyond, is what will help us get closer to a preferable future.

About the Author

Rob Girling

As a co-founder and principal of Artefact, Rob is responsible for designing exciting products and experiences that inspire positive changes in human behavior. Rob's design career spans some of the leading agencies and design brands in the world, including Apple, IDEO, Microsoft, and Sony, and touches everything from interaction design experience, to natural user interfaces, motion graphics and 3-D design.

Sources

1 http://www.sveiby.com/articles/Unintendedconsequencesl SPIMfinal.pdf

2 IEEE, http://www.prnewswire.com/news-releases/lookma-no-hands-168623236.html

3 http://www.forbes.com/sites/chunkamui/2013/01/22/fasten-your-seatbelts-googles-driverless-car-is-worth-trillions/

4 http://www.forbes.com/sites/chunkamui/2013/01/22/fasten-your-seatbelts-googles-driverless-car-is-worth-trillions/

5 http://wap.npr.org/news/U.S./215843842

6 http://www.forbes.com/sites/chunkamui/2013/01/22/fasten-your-seatbelts-googles-driverless-car-is-worth-trillions/

7 http://blogs.barrons.com/techtraderdaily/2013/05/17/aapl-goog-brcm-tops-in-credit-suisses-wearables-worldview/

8 http://www.imsresearch.com/press-release/fast_facts_and_analysis_of_todays_smartwatch_announcements&cat_id=175&type=LatestResearch

9 http://www.forbes.com/sites/haydnshaughnessy/2011/03/24/solving-the-190-billion-annual-fraud-scam-more-on-jumio/