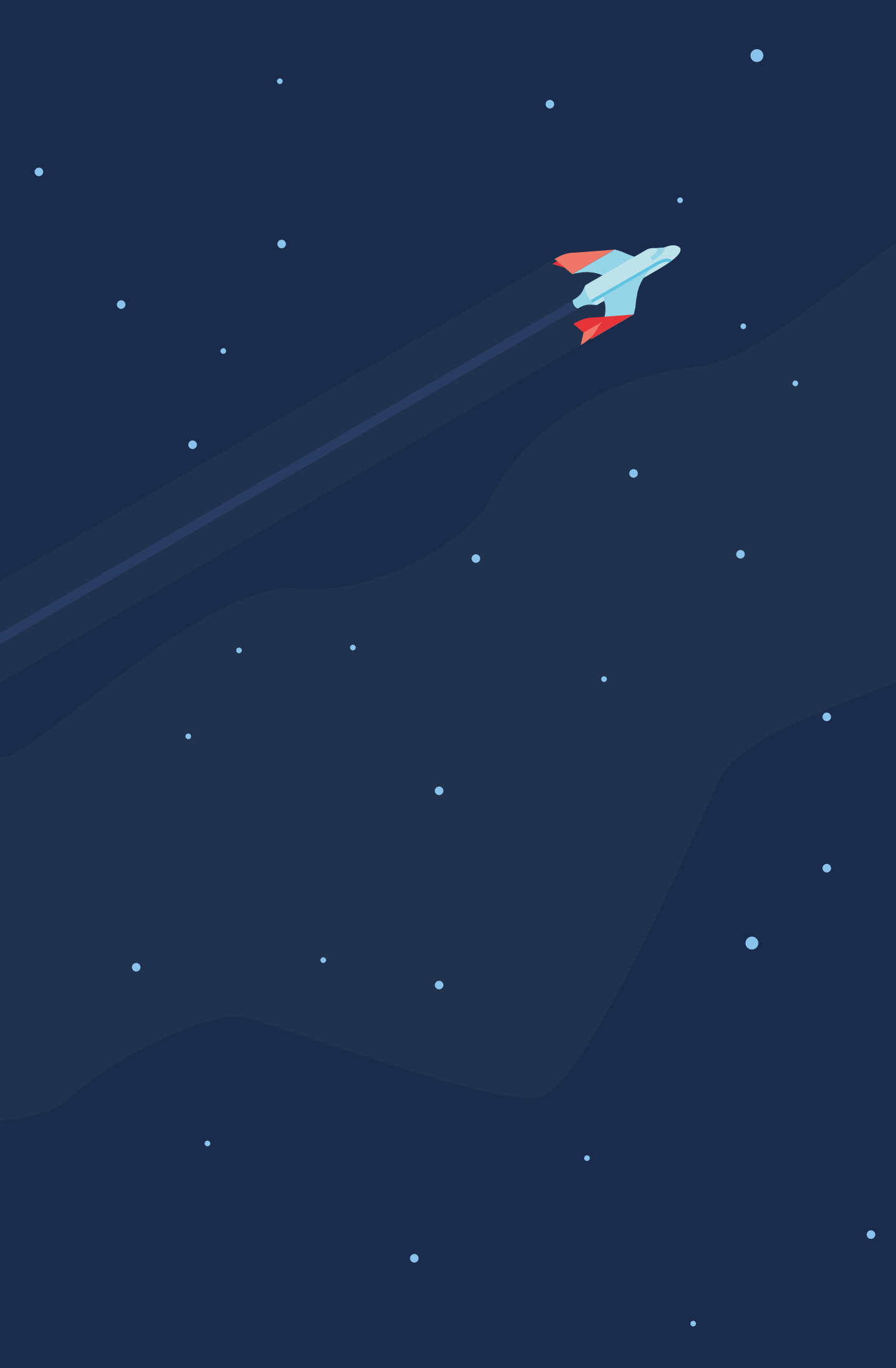


 **skyscanner** presents

# *the future of travel 2024*

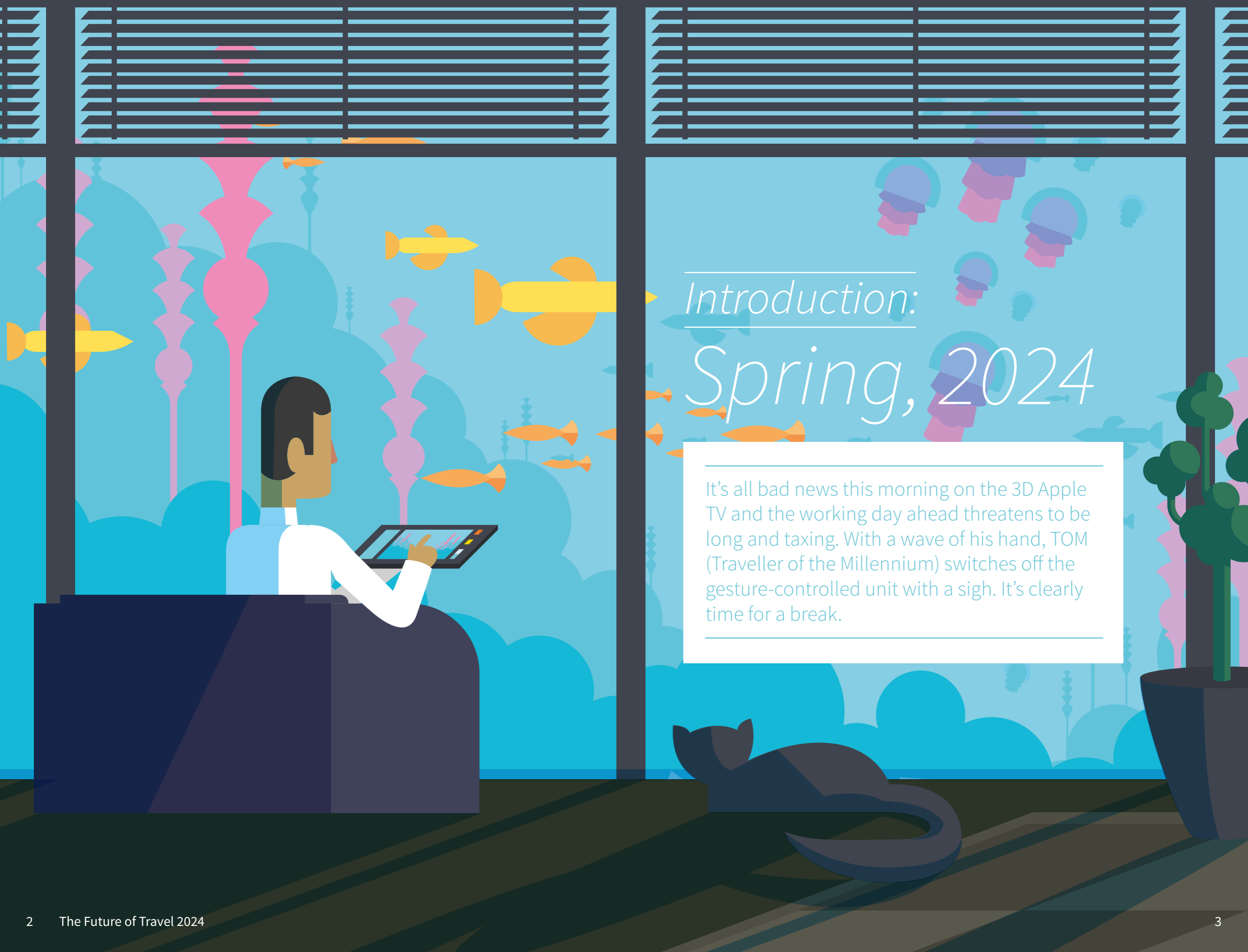


Planning & booking



# *the future of travel: planning & booking*

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## *Introduction:*

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# *Spring, 2024*

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It's all bad news this morning on the 3D Apple TV and the working day ahead threatens to be long and taxing. With a wave of his hand, TOM (Traveller of the Millennium) switches off the gesture-controlled unit with a sigh. It's clearly time for a break.

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After a run of 60-hour weeks, even his MeTube alerts are telling him he needs to get away from it all. Siri, his virtual housemate, has spotted the signs of burnout too.

Without any instructions from him, she begins to compile journey possibilities that she knows he'll love. 'Perhaps a trip to see Africa's disappearing elephant herds? Only 20 years before they're gone for good,' she adds.

'Maybe something a bit more relaxing,' he replies.

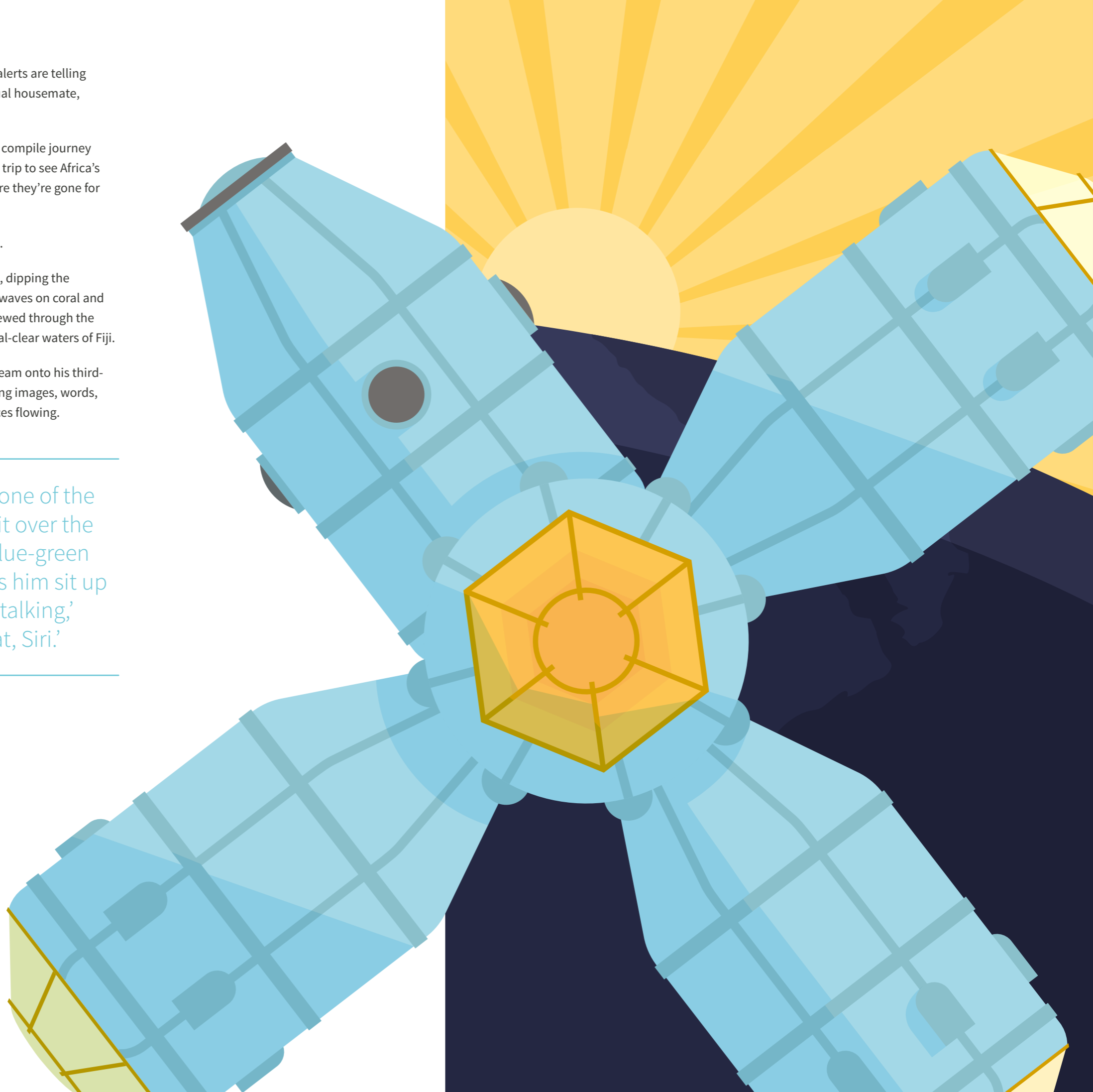
'One of the new underwater hotels,' she suggests, dipping the lights, filling the room with the sound of lapping waves on coral and projecting a hologram of a gorgeous seascape viewed through the panoramic windows of a room beneath the crystal-clear waters of Fiji.

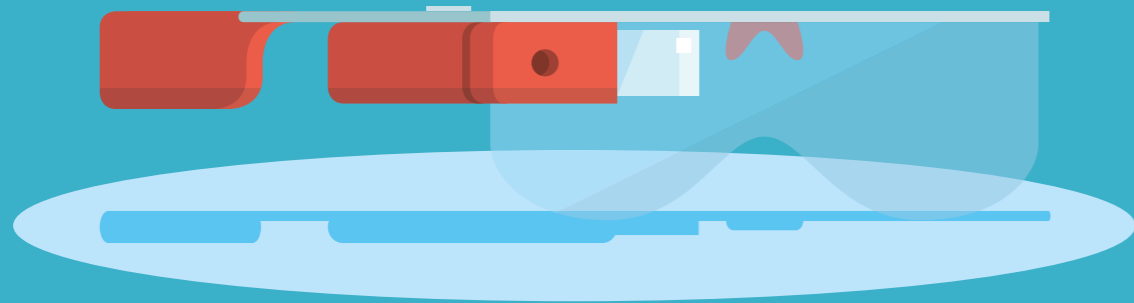
Over the next 20 minutes, Siri directs a virtual stream onto his third-generation Glyph TV, a curated cascade of inspiring images, words, sounds and prices calculated to get his travel juices flowing.

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Finally, a stunning image of one of the new space hotels in low orbit over the heart-stoppingly beautiful blue-green curvature of the Earth makes him sit up and take notice. 'Now we're talking,' he murmurs. 'Book me a seat, Siri.'

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‘Within five years, gadgets such as Google Glass will be using these areas of technology and we’ll see a change in how we handle foreign languages, or choose what restaurant to eat at, based on the wisdom of crowds that we can instantly access.’

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‘**TOM is fictitious**, but the technologies mentioned in the above scenario are either real, being tested or undergoing prototype development,’ says The Future Laboratory’s Co-founder Martin Raymond, who collaborated on this report with Skyscanner.

Our research and expert interviews suggest that in 10 years’ time the era of time-consuming online travel discovery, research and booking across multiple platforms and devices will be long gone.

As Skyscanner’s Head of B2B Filip Filipov says, ‘In the near future, there is going to be a mass-market conversion to semantic, location-aware and Big Data [data sets that are beyond our reasonable abilities to manage or comprehend so that more imaginative methods and ways to visualise them are required] applications, which will be of transformative use to travellers.’

‘**It’s tempting to raise a sceptical eyebrow** at forecasts about the impact of new and emerging technology on the travel industry of the 2020s. Predicting which interfaces and devices will succeed – and which will disappear without trace – is tricky.’



‘Ten years ago, who would have predicted that it would be the norm today to communicate directly with all friends on holiday by Skype or mobile phone rather than sending a postcard, or make travel choices from a website on a computer screen rather than from a travel agent’s brochure?’ asks Filipov.

The explosion of the internet and its associated digital technologies since the turn of the century has disrupted almost every field of human endeavour, and transformed the way that we plan, book and experience travel.

Nevertheless, Filipov believes this technological revolution is in its infancy. ‘We are at the start of a journey that will see personalisation of content and advances in areas such as Artificial Intelligence that will totally change once again the way we book and take our holidays,’ he says.



‘Travel services such as Skyscanner will be able to deploy online semantic and intuitive tools that will know your preferences: that you are a regular business traveller, that you only ever take hand luggage, that you always fly premium and like to stay in a four-star hotel no more than a mile from your meeting.

‘Summer holiday booking will be similarly seamless, knowing that you prefer sunny destinations within seven hours’ flying time, that you take at least two suitcases, and like a hotel with a gym close to a beach.

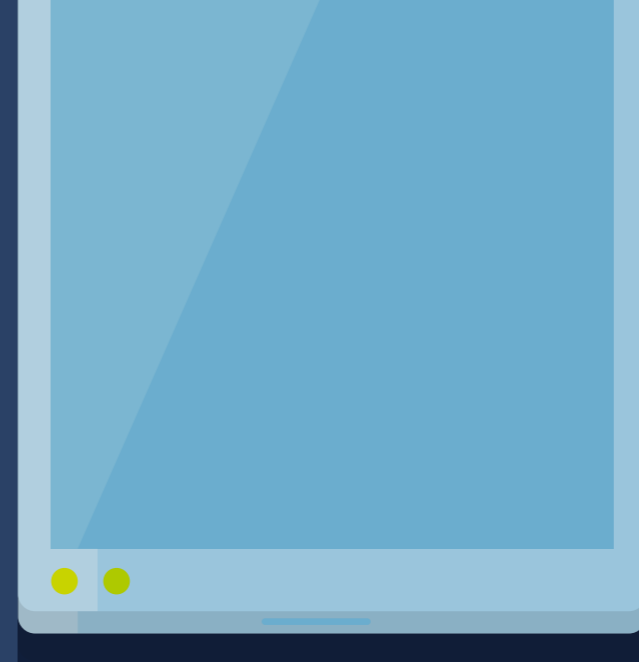
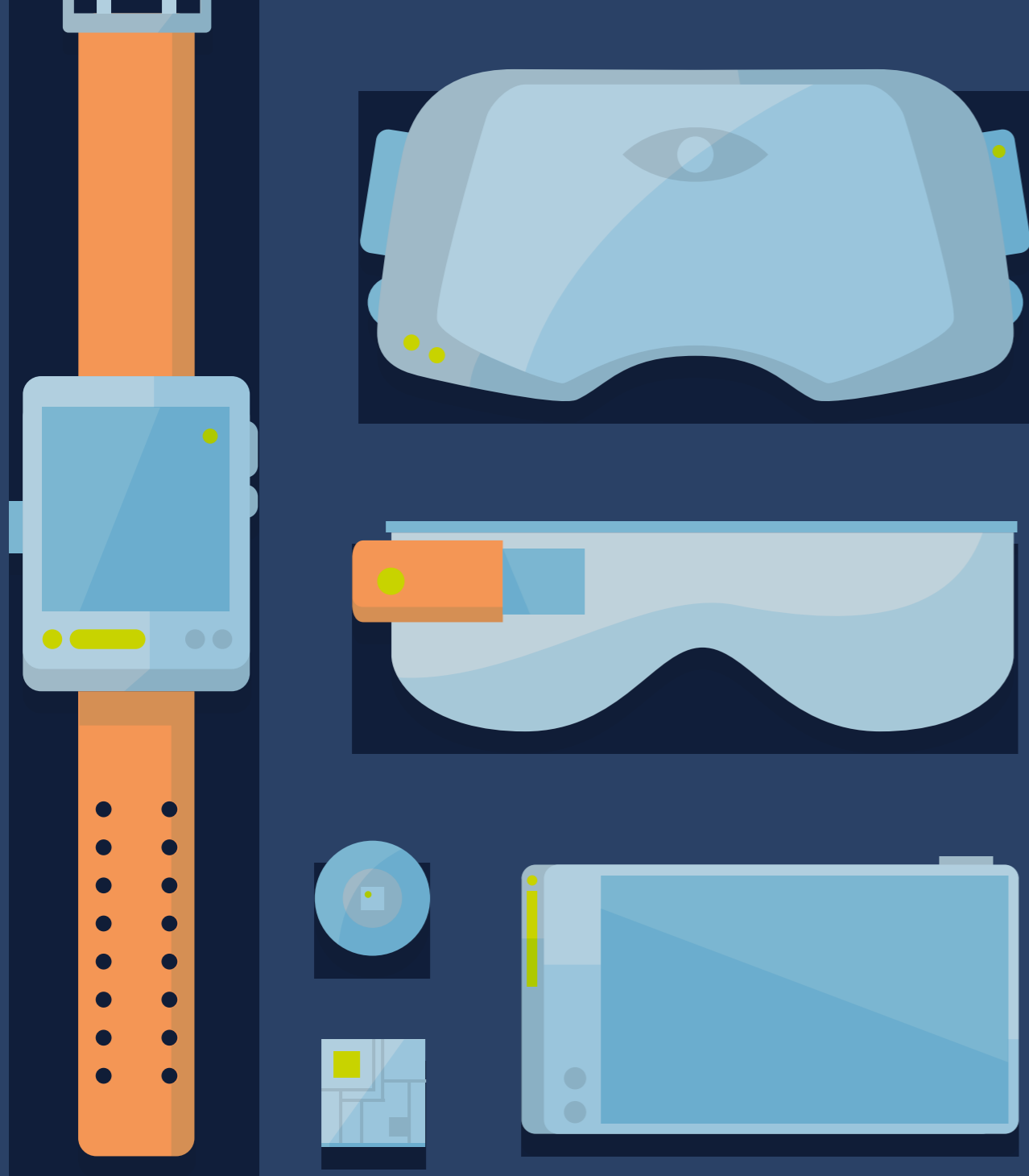
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‘By the middle of the next decade, travel websites will be able to deliver personalised inspiration to the digital technology in your home almost without being asked.

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‘Essentially, think of a world of travel where the traveller comes first – and the technology comes together to make that experience intuitive, rich and inspirational.’

This is the world that Skyscanner’s Future of Travel report explores as it reveals and explains the range of technology being developed today that will evolve to shape the global travel industry of tomorrow.



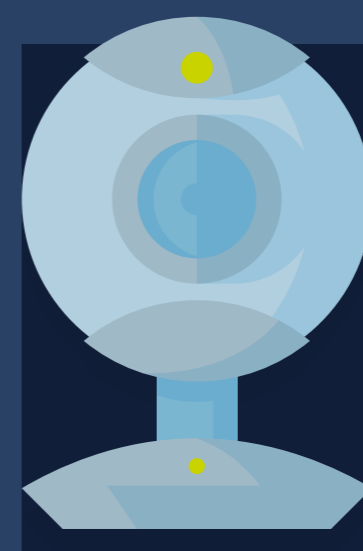
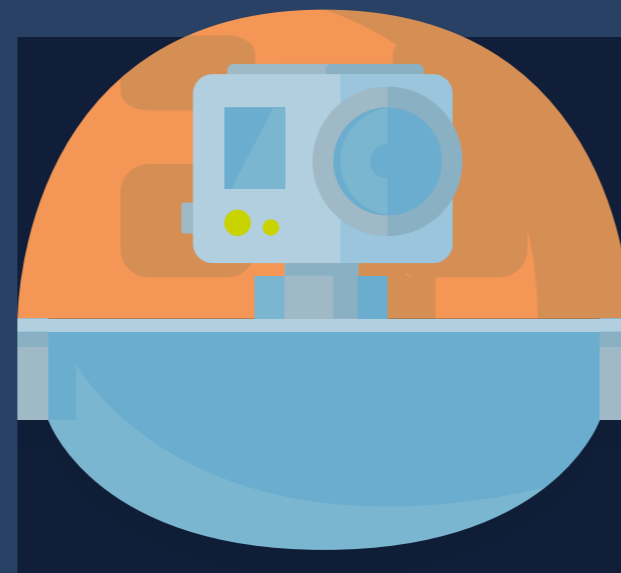
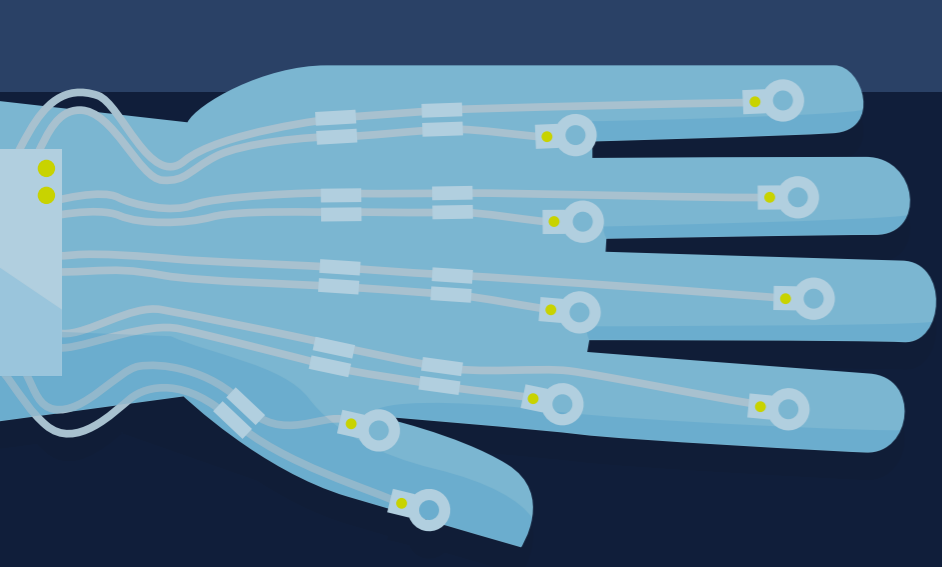
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A decade from today, all travellers will have at their disposal a startling array of next-generation digital technologies that will transform the discovery, planning and booking of their next journey into a seamless and intuitive experience.

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**As Skyscanner's CEO and Co-Founder Gareth Williams puts it,** 'Travel search and booking will be as easy as buying a book on Amazon.'

In this first section of Skyscanner's three-part Future of Travel report, we discover and dissect the advances in wearable, intelligent technology, virtual reality and haptic websites – which take advantage of a user's touch to provide tactile feedback – and semantic search engines that our experts and researchers predict will revolutionise the travel landscape of 2024.





# 1. Digital Travel Buddies



**Long gone are the days** when TOM (Traveller Of the Millenium) would have had to spend hours online, tapping away on a computer keyboard to compare flight, hotel and car hire prices and various permutations on dozens of different websites. In the noughties a range of comparison sites emerged to ease the stress of travel planning and booking, but by 2024 our traveller will have a new friend to take the strain out of travel discovery, search and booking: his Digital Travel Buddy.

Global Futurist Daniel Burrus, author of *Technotrends: How to Use Technology to Go Beyond Your Competition*, best explains the nature of the high-tech companion that our traveller will have at his command.

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*‘In the 2020s, each of us will have an individual ‘e-agent’ that goes everywhere with us, inside a watch or a small piece of jewellery,’ he says.*


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‘It will essentially be an Artificial Intelligence device, constantly connected to the web, which has learned to intimately understand our individual preferences.

‘It could have the face, voice and personality of our favourite actor or comedian and appear to us as a 3D hologram image, or inside a virtual environment, at our verbal command.

‘It will personalise all of our travel experiences, planning itineraries based on our particular likes and dislikes, and act as a tour guide, telling us only about the elements of the destination that it knows we will be interested in.

‘Travel brands will even be able to rent out a personalised e-agent to their consumers as part of the holiday package. Customers will be able to continually engage and interact with their travel company to fine-tune their trips in real time and troubleshoot any problems that arise.’



TOM's Digital Travel Buddy will have had his origins in today's emerging technologies. Desti, a conversational travel app from SRI International, the research institute that developed Apple's Siri system, is one of this new breed. It is pointing the way towards a world in which our mobile devices will learn from their interactions with us.

**The app can find relevant online travel reviews** and comments based on its user's past preferences and searches. A traveller with a young family, for example, might be presented with a selection of reviews of family-friendly hotels in his destination of choice.

Other technology brands are developing interactive devices that feel more like friends than machines. South Korea-based Samsung's SAMI interactive AI system will automatically monitor the lifestyle and health needs of its user by plugging into the aggregated knowledge of the 1.5 trillion sensor-enabled smartphones, wearable and other smart devices that will exist by 2020, according to project director Luc Julia.

**Mobile devices that can speak to us** and understand our verbal replies, and even our facial expressions, are also under development. Microsoft has Cortana, a voice-activated personal assistant that will act as a human-sounding interface to all of the brand's email and search functions.

'It will be deeply personalised, based on the advanced, almost magical intelligence in our cloud that learns more and more over time about people and the world,' says Steve Ballmer, former CEO and now Director of Microsoft.

**More importantly**, by scanning our searches online, and cross-referencing our holiday, food, travel and hotel searches it will use predictive algorithms to make original suggestions tailored to our price range, peer and gender needs, and whether we usually prefer a fly-and-flop trip or a white-knuckle adventure holiday.

The Future Laboratory Co-founder Martin Raymond says: 'We're used to Amazon and Google suggesting products to us. Soon this kind of predictive software will be putting together detailed and bespoke travel experiences, like our own top-end digital travel broker.'

'Drawing on the huge amounts of personal data we post about ourselves on social networks such as Facebook, Twitter, Mixi, Sina Weibo, Cyworld, Kaixin001, Orkut, Vine and Instagram, it will deliver intimate, personal and surprising itineraries, with everything from exotic food trips to guides to neighbourhoods where you are most likely to meet like-minded people who share your tastes in food, drink and socialising.'

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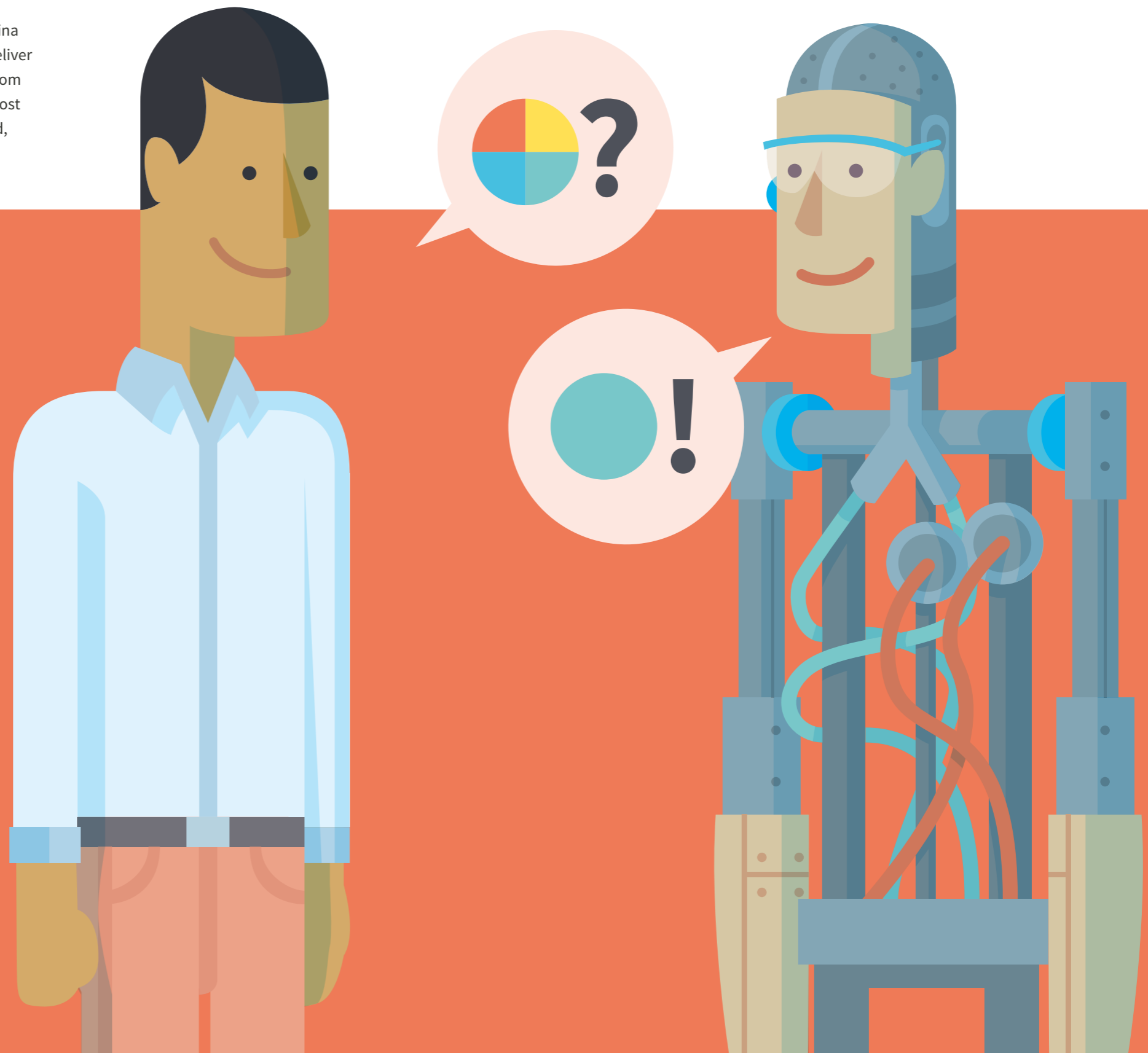
The move towards the advent of the Digital Travel Buddy can be seen all around us. Russian innovation brand i-Free has designed an Artificial Intelligence system that processes a listener's question and supplies an appropriate verbal answer in a split second to enable its bio-robot Frank to hold meaningful, sequential conversations.

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Intel's RealSense 3D camera is an example of the type of technology that travel devices in the 2020s will use to recognise and react to human emotions. The camera is being designed to gauge the mood of its users by their facial expression and body posture, and to understand and respond to colloquial verbal commands.

**Facebook's own Artificial Intelligence Unit**, launched in October 2013, is working to create an intelligent voice recognition system too. 'The goal is to use new approaches to AI to help make sense of all the content that people share so we can generate new insights about the world to answer people's questions,' says CEO Mark Zuckerberg.

'In time, I think it will be possible to build services that are much more natural to interact with and that can help solve many more problems than any existing technologies today,' he says.



As the software systems for a talking, learning online entity converge to create the 'mind' of our traveller's Digital Travel Buddy in the early 2020s, so a range of interconnected miniaturised hardware will serve as its wearable 'body'.

The first generation of such devices is gaining market traction today. Annual sales of wearable technology such as wristwatches with smartphone functions, including the Sony Smartwatch and the Samsung Galaxy Gear, will hit 485m by 2018, according to market research company ABI Research.

Google will ship 6.6m units a year of Google Glass, the camera-enabled smart glasses, by 2016, moving the technology into the mass market, according to IMS Research.

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But in the 2020s, wearable devices will be far smaller and faster, and with many more capabilities, providing the technology to make the Digital Travel Buddy a practical reality.

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By 2017, we will be using on-body devices powered by microchips just seven nanometers in length – the width of 15–20 atoms – that will 'transform every area of our lives,' according to Renée James, President of Intel.



'The miniaturisation of technology,' says Raymond, 'will open a whole new world of possibilities as we combine wearable technology with near invisible technology. Already, parents are using trackers for their children when they are travelling with them – phone devices that tell you where they are geographically, and increasingly, tags that can be embedded in clothing, even inserted under the skin.'

Add to that the possibility of retinal cameras – cameras so small you can mount them on a pair of glasses that won't look anything like Google Glass looks now. You won't just be able to track your child, you'll be able to see their holiday, or where they are, from their point of view.'

Being able to see a destination from someone else's point of view is proving popular in Melbourne, with their remote control tourist. Here, tourists and special tour guides wear camera-mounted helmets, while their armchair equivalents sit at home and suggest places they should walk or cycle to. 'While it's not quite the same thing,' says Raymond, 'it gives you an idea of how wearable and mounted technologies will be used in the future.'

A next-generation smart watch reportedly being developed by Apple and expected to be called the iWatch, will contain 3D holographic displays and web access, placing streetscapes, a terrain schematic, 3D walk-through versions of a neighbourhood, or the fastest route through an airport at our fingertips.

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And the trend for mobile device miniaturisation will gain momentum as current advances such as microscopic bendable circuits developed by the Swiss Federal Institute of Technology – 1/60th the thickness of a human hair and implantable on a contact lens – will hit the mass market by the end of this decade. All will make it easier to access and indeed to carry so-called wearable or bodyTECH, which some of our experts are now referring to as buddyTech.

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**Alistair Hann, Skyscanner's Chief Technology Officer,** predicts that the advent of the Digital Travel Buddy will change not just the way that travellers plan and book, but their experience of the journey itself too.

'Imagine wearing a device that is able to provide a simultaneous verbal translation of what your taxi driver is saying to you in Chinese,' he says.

'Or a device that is able to translate your restaurant menu from Russian into English in seconds? The possibilities of these technologies are endless. Suddenly, travel will hold no fears.'

Grand predictions are often made about the emergence of game-changing new technologies, only for the date of their launch to move further into the future.

However, Dr Ian Yeoman, Travel Futurologist and Associate Professor of Tourism Futures at Victoria University of Wellington, is confident that advanced wearable devices will become part of the mainstream by the end of the decade.

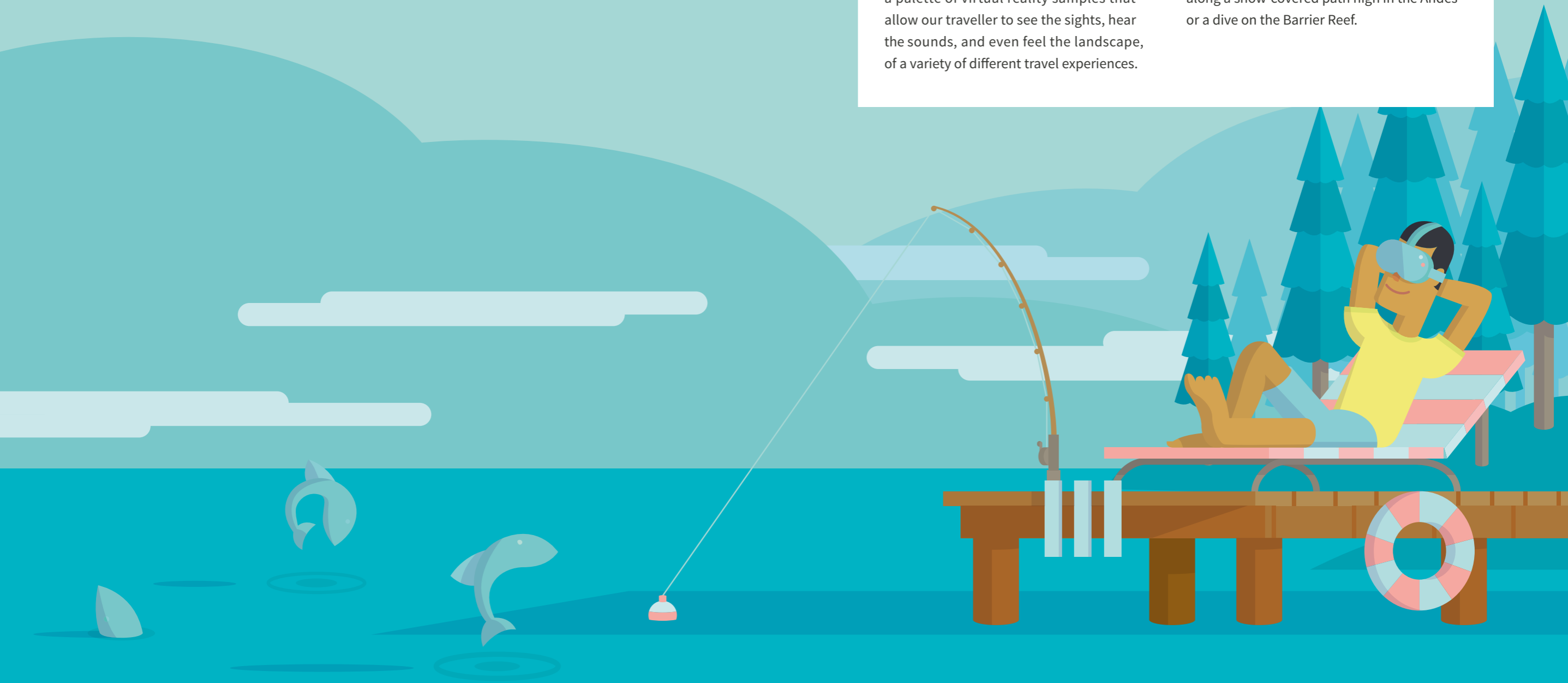
'Developments such as Google Glass will be mainstream within 18 months. Within five years, everything that Google Glass can do now will be available on a contact lens,' he says.

# 2. Virtual Becomes a Reality

A simple verbal command sets TOM off on a journey of travel discovery from the comfort of his own bed. 'I really need a holiday,' he murmurs, sending his Digital Travel Buddy into action on his behalf.

**His wearable AI connects online** with a new generation of 'try before you buy' websites operated by travel brands. It returns with a palette of virtual reality samples that allow our traveller to see the sights, hear the sounds, and even feel the landscape, of a variety of different travel experiences.

His sense of anticipation and excitement will be piqued by a 3D, multi-sensory stroll along a sun-drenched Costa Rican shore, a trek along a snow-covered path high in the Andes or a dive on the Barrier Reef.



‘Virtual reality won’t replace real travel, as is often portrayed in sci-fi movies,’ says Technology Futurist Daniel Burrus.

‘It will become a new form of showrooming, an incredible 3D taste of a destination that will make travellers long to experience the real thing.’

In 2014, the technology to make this future vision a reality is already beginning to emerge. A CGI tool developed by technology brand 3RD Planet enables users to take an amazingly realistic walk through the streets of a city.

A research team from the University of North Carolina have engineered a virtual reality recreation of a crowd scene outside St Paul’s Cathedral in London in 1622 that allows visitors to change viewpoints at will.

The new Oculus Rift VR headset from US start-up Oculus VR is the predecessor of the virtual reality devices that our traveller will deploy in his home as he samples a range of holiday scenarios in 3D.

Resembling a set of ski goggles, the headset combines smartphone technology and motion sensors to produce an experience similar to watching a never-ending IMAX screen. In essence, images are projected onto the retina in much the same way as old-style projectors throw images onto a screen.

Another virtual reality headset, designed by a team at Vienna University of Technology, allows a user seemingly to walk through an endless labyrinth while really walking around in circles in a small room. The researchers are now adding motion and proximity-sensing technology that will enable more than one person to experience the same labyrinth at the same time without bumping into each other, according to New Scientist magazine.



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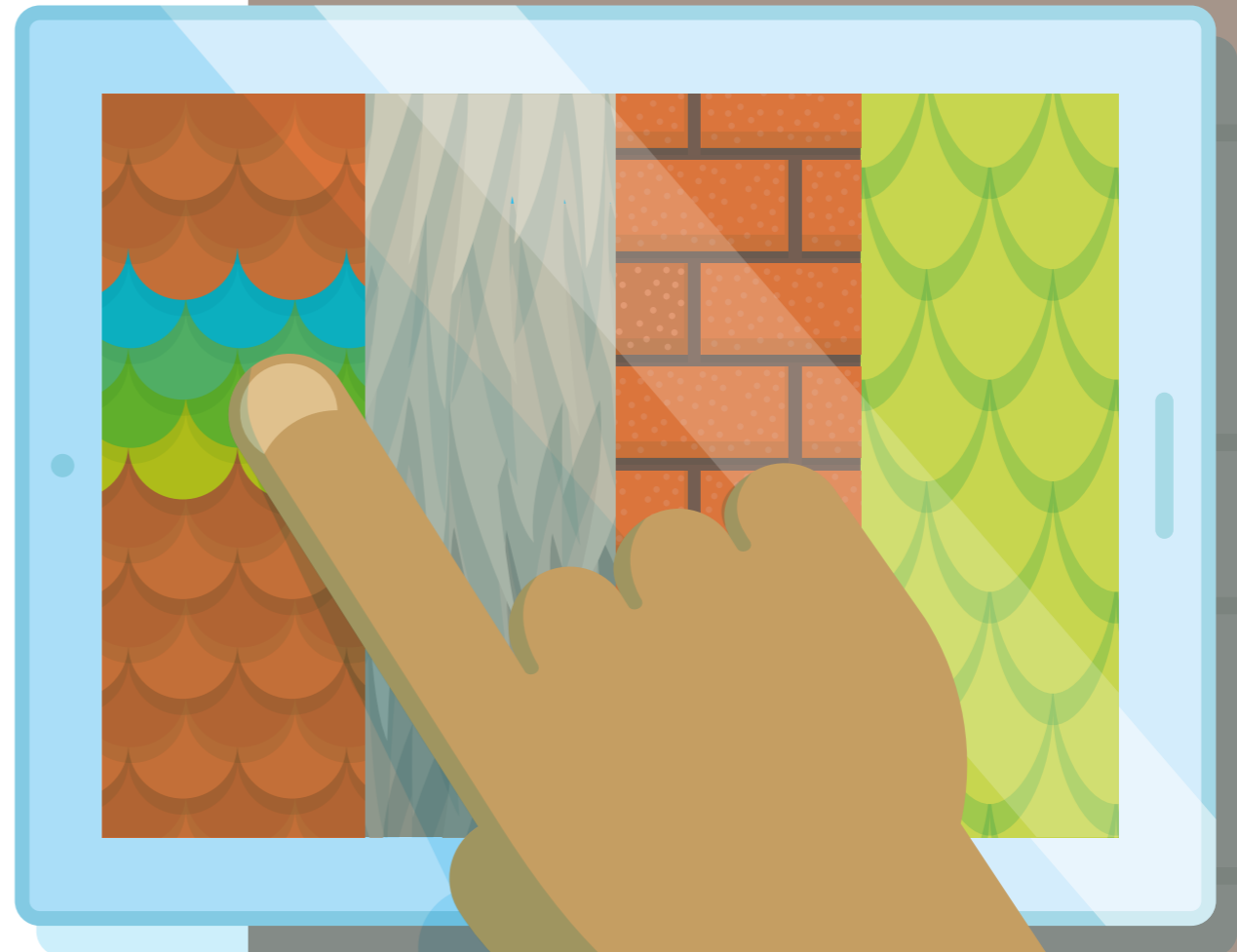
Other advances will add a further layer of sensation to the virtual reality experience: the sense of touch through haptic technologies.

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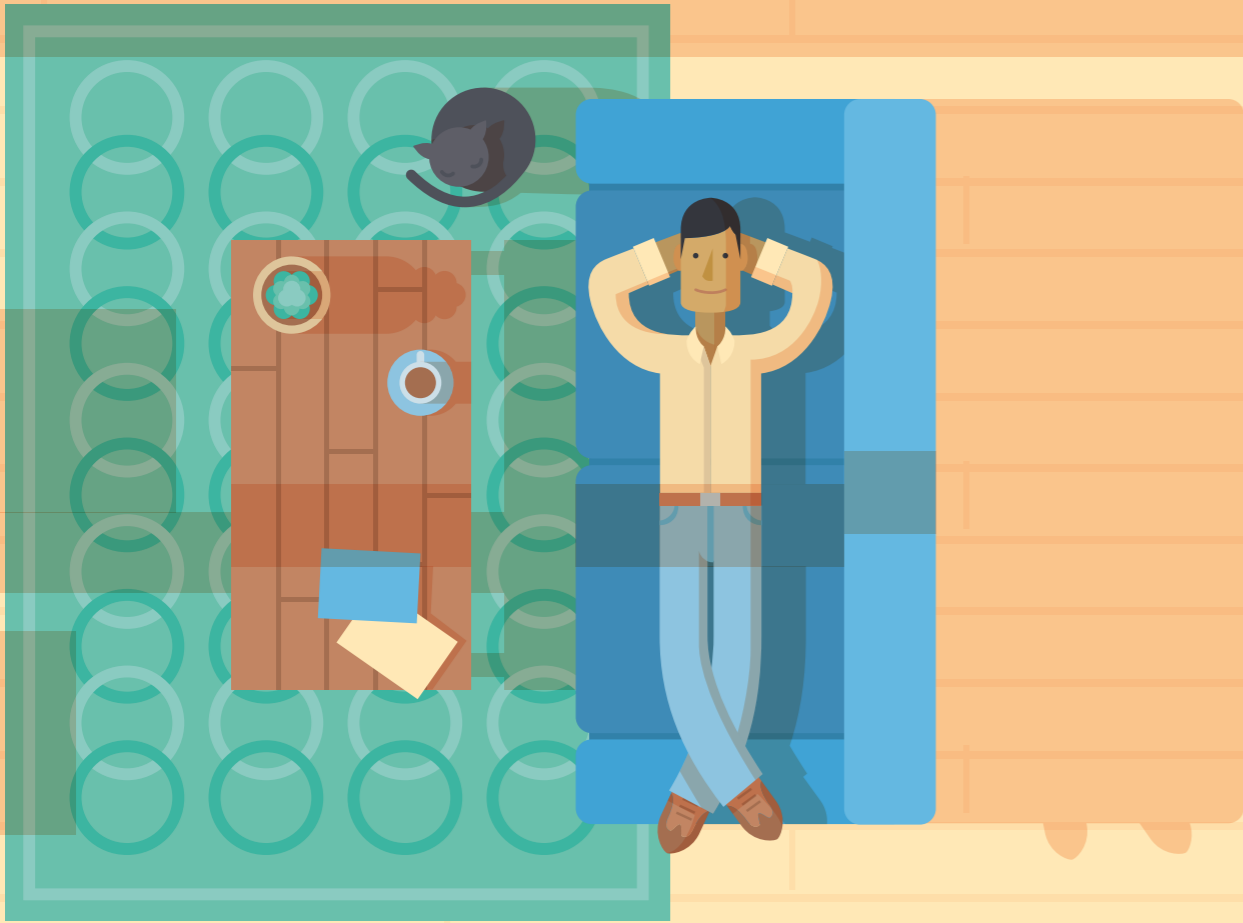
Disney has created a new interface called **REVEL** that gives tactile feedback through minute vibrations from virtual 3D objects. The system will enable users to feel the craters on the Moon, the spines of a cactus or the outlines of a delicate object. Japan's NHK public broadcast network is now prototyping a similar system that enables viewers to 'feel' the surfaces and textures of objects viewed on screen, including sand, sea and foliage. Meanwhile, at Japan's Tachi Lab, researcher Masashi Nakatani is working on the haptic **TECHTILE** toolkit, a device that will enable you to convert sounds into textures and surfaces that you can feel.

'Imagine being able to feel the heat of the sun on your hand,' says The Future Laboratory's Martin Raymond. 'With software like the **TECHTILE**, which converts sound waves to tactile feelings, you will be able to feel the sound of a gamelan in Bali, or touch fluttering prayer flags in Tibet or Bhutan.'

By 2020, similar vibration-based haptic techniques will enable shoppers to feel the texture of the wool, silk or cotton of the item they are about to buy on their tablet, according to Robyn Schwartz, Associate Director of IBM Research Retail Analytics. By the next decade, travellers will be able to use similar technology to feel the sand between their toes on a beach thousands of miles away.







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‘In 10 years’ time, a traveller will be able to take a virtual reality walk through the hotel he is planning to book in real time,’ says Nik Gupta, Director of Hotels at Skyscanner.

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‘He will be able to watch staff preparing his room as it happens, see the staff in action and watch chefs cooking his favourite food. That will be ground-breaking – an incredibly powerful tool for building engagement and trust between the traveller and the brand.’

TOM’s relaxed and exciting virtual reality tour through a series of very different travel scenarios allows him to fine-tune his desires. He now knows whether he would prefer a city break to a mountain walking adventure or a trip to an exotic beach idyll.

Reacting instantly to his decision, his Digital Travel Buddy sets off on the next stage of discovery: actively seeking, and finally planning and booking, his trip of choice.



# 3. Semantic Search

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TOM's next stage of engagement is with the powerfully intuitive and semantic search tools that will be deployed online by the leading travel brands of the next decade.

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**Connected to him via his Digital Travel Buddy**, which communicates hyper-personalised preferences from his favourite breakfast food to his gym regime and the stitch count of the cotton sheets on his bed, he uses gestures and voice commands to interact as the tools engage Big Data analytics to compile a selection of ideal holiday packages.

It is a one-stop-shop experience with every aspect of his journey researched, considered and booked. As Stefan Rust, CEO of Exicon, says: 'In the near future it is likely that all-encompassing mobile apps will provide a thorough, end-to-end service – aggregates of airlines, airports, hotels and ground transport systems will provide the tools for every part of the experience.'



**'Before your flight**, the technology will enable you to research and book your flight and arrange your local travel. At the airport it will guide you through the terminal, tell you where to check in, track your luggage, exchange your currency and let you plan your arrival, book a room and hire a car, as well as providing you with all the information you will need when you get to your destination.'

Technology and online brands are swiftly developing intuitive new approaches to searching in cyberspace. Users will come to expect their preferences and previous search filters to be saved, even allowing brands to access their social media networks, search history, even email strands more proactively so that they can develop intimate, comprehensive cartograms of their needs, likes and possible future behaviour.



**Margaret Rice-Jones**, Chairman of Skyscanner, believes this technology will enable travel brands to more effectively use a person's social media presence, or even advice from their peer-to-peer networks, to more accurately and imaginatively suggest future travel options.

'In the near future, we will see more integration across travel sites and social media sites,' she says.

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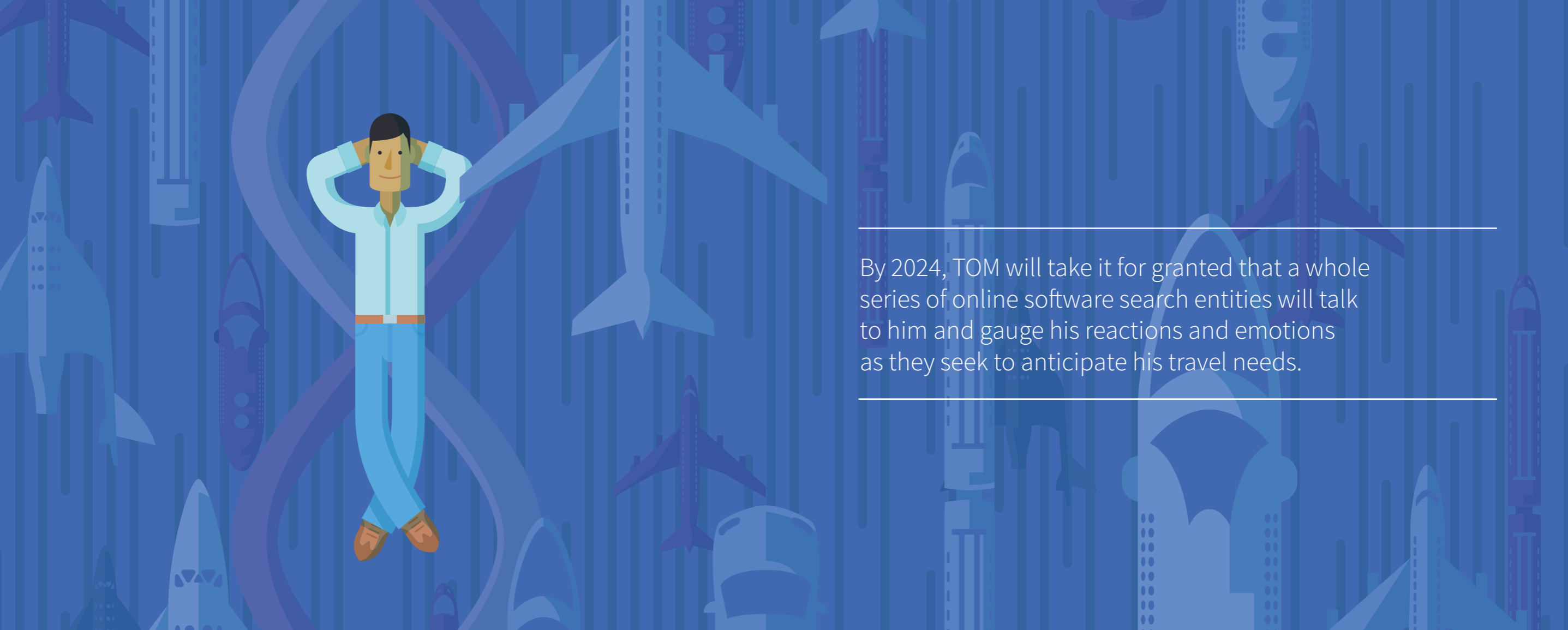
By 2024 this intuitive approach will be developed further, with software able to read facial expressions or build a digital DNA of user preferences.

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**Tech firm Affectiva is creating a facial coding algorithm** that will enable search engine software to read human expressions and thereby judge whether the results it is providing are pleasing or frustrating the user. New personal discovery engine Nara uses neuroscience concepts to mimic and understand the thought patterns of the human brain, allowing it to build a 'digital DNA' of a user's likes and dislikes.

Facebook's Graph Search answers questions in colloquial – and even grammatically incorrect English – and makes intuitive suggestions drawing on peer-to-peer social media data.

Increasingly, these tools will automatically trawl the huge amount of personal customer data at their disposal to instantly ensure that travel search results conform to an individual user's demands and desires.



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By 2024, TOM will take it for granted that a whole series of online software search entities will talk to him and gauge his reactions and emotions as they seek to anticipate his travel needs.

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‘Big Data can be a powerful force in transforming the travel industry,’ according to the Amadeus IT Group. ‘It could be one of the most influential initiatives since the online reservation system.’

Not everyone agrees. Technology insiders, such as Betsy Bilhorn, Vice-President of Product Management at Scribe Software, dismiss it as over-hyped and likely to cause confusion through information overload rather than provide a holistic view of customers’ needs.

However The Future Laboratory’s Martin Raymond highlights that: ‘As well as technology influencing technology, how we develop technology is hugely influenced by the consumer.’

‘In our research with Generation I (Generation Interactive) pre-teens, and their older brothers and sisters that we dubbed Generation D (Digital), we discovered that few of them fear the arrival of Big Friendly Data, as we call it, while more of them welcome it, provided it brings them closer to what they want – seamless communications with the world around them.’

**As Travel Futurologist Dr. Ian Yeoman says,** ‘Our young children will think that it is completely natural to talk to a machine that understands them without tapping a keyboard or touching a screen.’

‘Speech recognition involving smart agents that can use natural language and learn from experience is already becoming more mainstream.’

Within minutes, TOM’s wearable AI will present him with a selection of door-to-door bespoke travel packages to browse through.

Once he has made his choice, his Digital Travel Buddy will make all of the bookings – and manage payment transactions – by liaising with a travel brand’s intelligent software system.

That will be travel discovery in 2024. A trip sampled, researched and booked intuitively and seamlessly in less than an hour – without ever leaving the house.

It is a world that will seem perfectly normal to our traveller. Martin Raymond concludes: ‘Current travellers and users are wary of online systems having this level of in-depth understanding of their thoughts and feelings.’

But teenagers and the under-10s are puzzled about why people are so worried. They expect technology to work intuitively, to offer them solutions as they need them without ever being directly asked to do so.’

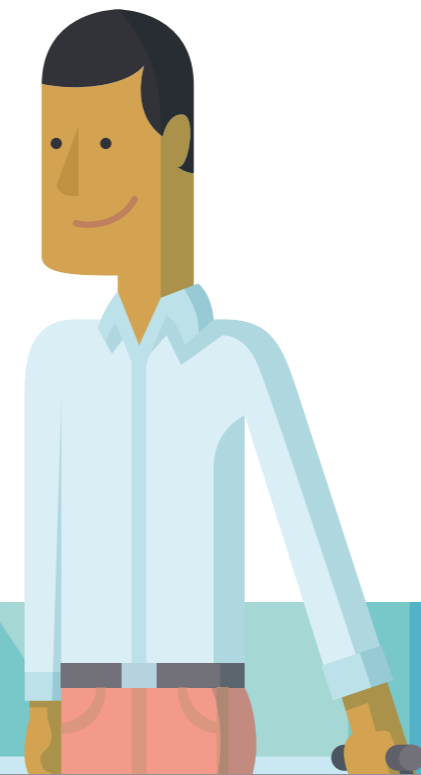
# Conclusion

TOM's booking and planning experience will be incredibly seamless, collaborative, bespoke and immersive.

**A Digital Travel Buddy**, a wearable Artificial Intelligence device incorporating the latest voice- and gesture-control technology, will intuitively sift through the online information overload to provide him with the bespoke trip of his dreams.

Travel discovery will be enhanced by brand websites that deploy next-generation virtual reality and haptic tools to enable our traveller to see, hear and feel a series of possible destinations from the comfort of his own home.

Booking will be a quick, easy, stress-free and one-stop experience conducted through semantic websites that are capable of learning the likes and dislikes of a customer from his previous online actions, and of conversing with them verbally in everyday language.











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