



# A DAY IN THE SENTIENT WORLD OF 2030

By Richard Sear  
Partner & Senior Vice President

FROST & SULLIVAN

---

## BEGINNING OF THE DAY

“Wake up, Matthew. Wake UP, Matthew. No really, WAKE UP, Matthew!” The familiar sound ringing in my ears each morning greets me as I attempt to rise. The reality is that this is far better than the wet hand towel my father used to wield to get me up for school when I was a kid. My, how times have changed! First, the wet sting of a towel, then an alarm clock, and, now, my Personal Companion (PC) 2030 life system that I named Sammy after my childhood dog.

My LifeLike PC2030 series, now in its third generation, has made amazing progress since it was first launched five years ago. In addition to my PC2030, I also added the home robot assistant when I subscribed. Initially, the robot was awkward, unable to navigate adroitly around my home and certainly not capable of moving up or down steps. Today, Sammy can navigate anything I put in its way.

Waking up with Sammy has taken some adjustment, as I opted for the embedded voice control when I purchased him. As such, Sammy is not an external noise I hear, but, rather, an inside voice. It makes me laugh as I always think of that Disney movie from 2015, “Inside Out”. Sammy’s voice used to sound so robotic, but now it’s just like talking to a friend because of the true conversational natural language.

---

Your day begins, aided by embedded technology.

---

Subscription models will be in virtually every space, as owning less becomes the defacto standard for living.

---

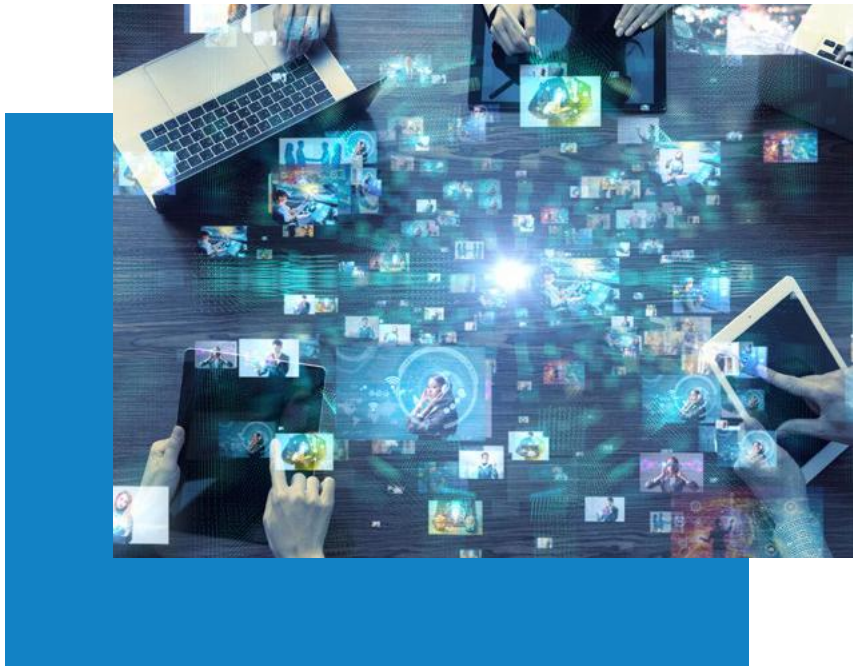
Brain computing interface devices (BCIs) will emerge by 2025 and will reach market prevalence by 2030.



---

Predictability to enhance how we use our time will be a key future business model.

He proactively reminds me about things like birthdays and taking my medication. He even prompts me when I am coming up on a work deadline, which is nice because, when I am not traveling for work, I work from home. Sammy does all of this, proactively, throughout the day, nudging me to take action. Yesterday, he saved me when I was on a call that was running long. Instead of constant late reminders like it used to be, Sammy not only gently nudged me, but he also let attendees in my next meeting know that I was running late. These latest personal touches are advancements from just a few years ago when, to be honest, the system could be quite annoying with its constant reminders. I marvel at how the next series of programming will look! Sammy continues to gradually learn more and more about me each week, including things like my personal taste preferences and even my mood swings.



---

The battle for data has already been won by technology companies.

---

Expect to see a high degree of competition around innovation to zero models.

Sammy is also my home's control center. He aggregates all of the information flowing around the house and synthesizes it into outcomes. One of the most useful things he does is speak to my family about meal plans. By taking all of the data from the refrigerator and pantry, Sammy is able to design meals that make the best use of all the items in the house while minimizing food waste. He customizes each meal to make sure each person's dietary needs and health conditions are addressed. When he first arrived, Sammy calculated we wasted close to 40 percent of our food. Now, he is saving our family nearly \$300 a month in food costs. Sammy communicates with us regarding our meal options and, if necessary, places an order for any items we are missing with a 30-minute guaranteed delivery.

We bought our house, in part, because it is located within the 30-minute guaranteed delivery window. While this came at a premium, it has been well worth it. Additionally, we settled on this property because it features tied-in location security. Every vehicle and drone is monitored by our subdivision's security company. When the delivery person arrives with the groceries, Sammy will securely greet them and then put away the delivery. Once Sammy has made our collective decision on food, the rest is automated. I don't remember the last time I had to go out for milk or eggs. We don't waste grocery bags anymore—recycled or not. The house is constantly interacting with us, asking whether we plan to have guests or what is on our meal plan for the day. These are the very types of things I never used to like to spend time doing, and now that they are handled by Sammy, it's such a huge relief.



My favorite part of every morning now is how organized the children are. By the time my wife and I get up, Sammy has already awakened the children on time and prevented them from falling back to sleep by monitoring them until he can acknowledge continuous motion and activity, usually the shower running or constant complaining! All clothes are laid out the night before and breakfast is ready to go for the morning. I can sometimes be slow to rise and get out of the house, and I had a habit of being frequently late, but since handing off some of these mundane tasks to Sammy, it has been a major timesaver.

---

Localization will be key to the supply chain with increasing customer expectations.

---

Automation and security enhancement will lead to stronger co-opetition.

---

Children will be protected from BMIs.

---

Around 2030, we can expect to see a tipping point for robotic inclusion.

---

Governments are already starting to formally collaborate around cyber security. We expect this to continue.

---

My companion will morph into whatever form of technology I am interacting with.

---

Technology has increased social divides. We expect this to continue.

---

Technology will be used to drive and monitor behavioral change.

While I did spend time questioning the appropriateness of parenting through a personal robot, when push came to shove, it proved to work brilliantly for me and now many of my friends are finding the same rewards, in terms of time and cost savings, that I have found through my own experience. To be honest, when the kids are working directly on a visual interface, or if they are directly talking to “Robot Sammy,” as the kids keep calling him, it is helpful to have him there as a tutor, keeping them on track with homework. However, with technology integrating into ever expanding areas of our lives, public outcry has reached an all-time high. I belong to the association, F.O.R. (Friends of Robots). Even within communities like F.O.R., where people are proponents of ingratiating significantly more technology into their lives, they are still generally concerned that robotics are receiving too much autonomy and that, more importantly, robots have begun programming and repairing other robots, something many have tried to stop through legislation. The World Cyber Government Alliance that was formed during the ongoing battle against cyber terrorism has tried, and failed several times, to agree on robot rights. This is a battle, not only for balancing jobs and automation, but also over the very nature of robots potentially achieving more autonomy from humans. I believe the only way to maintain balance is through fair treatment because it is inevitable that robots are here to stay, so it is incumbent on us to work with them and design them based on what we need.

I embrace Sammy and the various forms he takes on, whether it is the shared car, the personal robot or my office space, but some of my friends are vehemently against this. For some, it is a matter of the cost involved, which separates the class structure even more. For others, it is purely an issue of data protection. Looking back, perhaps we should have done more early on to create a better path for the development of artificial intelligence to make it more structured.

As I am about to leave for work, the school bus arrives to pick up the kids. If you had asked me 10 years ago if I would hand my kids off to a school bus with no driver, I would have laughed. Now, two years in, we have not seen a single school bus accident. The bus is monitored via onboard sensors and video cameras. Children are awarded demerits for disrespectful behavior. The system has actually worked; there has been a substantial reduction in school bus bullying, which has allowed the majority of kids to focus on their homework while traveling, as if the bus has become a mobile classroom. I can have peace of mind that they are using their time productively for once, but it is highly likely they are motivated by the credits they can earn to shop or use in the school virtual reality chamber.

Getting to work is a much more pleasurable experience with my shared electric hybrid driverless car. I had doubts about this, but I was an early adopter through my company, one of the 100,000 people involved in the program here in Chicago alone. I am lucky to live in a city that approved this vehicle for use. The only drawback is I miss driving myself sometimes. Fortunately, I can still use another shared system that allows me to drive myself, but the insurance costs are high. It's remarkable to live in a time where I do not need to own a transportation system, and, in fact, my parents do not have a transportation system either. Instead, they have signed up to lease the space in their garage to a logistics company. Now, their garage houses a recharging station for drones. A small window in the garage door was added that allows drones to enter and leave. They are paid a monthly lease fee of \$250 plus 15 percent of all products shipped by Proton (more on them later). After seeing the results from test cities like Ann Arbor, Michigan, the government has finally gotten on board. Every city in the country now offers rebates on electric vehicles, and, while adoption is strong, only one of the major OEMs has 100 percent of its vehicles on an electric powertrain. My choice is sharing, and I can use my subscription to pick up friends, go shopping, and, if I so desire, order a vehicle that I can physically drive myself. While many saw the advent of the flying car as a joke just a few short years ago, we have already seen a full commercial launch of the first flying car model in Dallas, Texas, last year and people, albeit wealthy people at this point, are already using them. The concept is interesting, and it does make sense. Our cities have become even more crowded, despite predictions that driverless cars would solve our traffic problems. The reality is traffic at ground level is horrific and it was only a matter of time before mobility solutions went to a whole new level to counter these traffic nightmares. As cities have continued to vastly underestimate population growth, the number of people choosing to switch to shared or electric has grown exponentially.

---

## MIDDLE OF THE DAY

One of the benefits of not needing to drive during my one-hour commute is being able to get work done in a dedicated environment. Through my adaptive user interface, I am able to hold video conference calls, check email and check in on some of my designs through the in-car VR (virtual reality) system. I can do almost anything from my shared service, including interacting with people directly using the vehicle's integrated holography capabilities. It is made easier now that my company has integrated all of our platforms into a single aggregated company.

---

Companies will increasingly look for a lifestyle edge to retain the best employees.

---

More opportunities for all people to earn income will present themselves.

---

Flying cars are expected to reach commercialization by 2023.

---

Adaptive user interfaces will mean the environment around us adapts to our presence and can become personalized.

---

A few "mega companies" will control the vast amount of data and digital services we consume.

Many may remember when we had so many software platforms that it was confusing. Today, information technology is primarily automated and you only have a couple of choices. The past 10 years have seen a rapid consolidation of key companies collaborating on two competing ecosystems that have integrated technology from beginning to end, morning to evening. This spans the entire spectrum, from home-based technology, to automotive AI, to the devices I use everywhere, as well as my office environment.



---

Sammy is a cloud and edge-based software application that moves between objects, both implanted and physical.

---

By 2030, form factor of many objects will be more open as batteries start to disappear from everyday objects. Cords are no longer required for charging everyday items.

Why is this so critical? Beginning in 2010 and 2011 with the onslaught of voice-controlled systems, driven by the massive amounts of in-device, AI processing development taking place, this technology was supposed to give us hands-free capabilities and perform simple tasks such as web searching, turning on music and lights, and controlling a security system. Today, my life is shadowed by Sammy, my personal digital companion. His presence is everywhere and maps into any device I sit in, touch or work with. It is a ubiquitous system that our entire family uses. My kids can call on Sammy while at school to help with a particular problem they may be attempting to solve at the same time as I am asking Sammy to show me a virtual 360-degree image of a building I am rendering. He does not have a physical body of his own but takes on the form of whatever interface I am interacting with, even a building wall.



Looking back, it's funny that we made such a big deal about access to content and data that was "private" to us. In the past few years, there has been an explosion of personal privacy companies focused on protecting those rights, but, in reality, if you choose to place a firewall around significant parts of your data, you will not be able to effectively use most of the products and services around us today. Most kids today don't even give a second thought to sharing their information. Even people my age are far more tolerant of sharing than the generation before us. Any shared car, for example, requires access to all my data and the data of anyone who travels with me. The richness of your experience varies based on the degree of access you allow. I have made the decision to share a significant amount of my information, however, I do stop short at sharing the interactions between my family and myself. While it is great that I do not need to pay for some things because my data pays for them, with my family, I have set certain limits. Our connected smart home requires access to all my health information to keep my premiums low for our family, and I am fine with that because health costs are something I need to control. My wife loves receiving food packages that contain new types of nutrition products. She receives them for free because she allows access to her medical records, her daily health checks, and her food consumption patterns. The company gives her free products because it uses her to test new products it has created. Most new appliances are shipped already connected and only work properly when networked into our smart home technology ecosystem. Sammy takes care of adding any

---

This further compounds discussions today about data use. Ultimately, for experience and relevance, our data will be required to be open. However, progress will be made on ease of awareness for consumers.

---

This introduces the notion of data as a currency as a future consumer empowerment tool.

---

One of the highest increases remains in healthcare costs. Companies will deploy technologies to offer employees monitoring and counsel to improve health and well-being, and costs.



---

Advanced healthcare options are available to consumers to lower the overall cost of care. Still in its early stage, internal nano medicine is the fastest growing market in health.

new technology to our network, of course, but this is just one small example of how my very large connected world has grown beyond my ability to keep track of just how much of my personal data is out there and with whom that data is stored. This is something many have tried to create regulations around but have failed. Thus, the enormity of the issue continues to grow.

When I get to my office, the entire team is aware that I have arrived because Sammy is communicating in real time with the team through their personalized digital companions. We recently leased office space in our new, state-of-the-art building, and, for a geek like me, it is an incredible place to work. The entire office is surrounded by smart objects—from smart waste baskets that communicate when they need to be emptied to smart charging stations placed strategically throughout the office. These charging stations are wireless, so if I am within the office walls, any device I am carrying is automatically charged. Ambient charging is amazing!

A little after noon, I get a call from our chief health officer (CHO), Diane. As more of the traditional human resource functions have become automated, the primary focus has always been the health and safety of our employees. The CHO exists because most companies have been faced with significant healthcare cost increases, warranting a dedicated focus on the health and well-being of employees. One of the responsibilities of the CHO is to create partnerships with companies to drive collective insurance discounts and encourage employees to use cross-company resources to attain health and life goals. One of our company's health officers recently video called me because she saw a report notifying her of elevated blood pressure readings from my ambient devices. As usual, I had ignored the reports, but it was this kind of constant attention to my health that actually saved my life. Last year, I had an unexpected anaphylactic reaction to an unknown source, and, had it not been for the early health warning systems in place that indicated specific measures I needed to take immediately, the anaphylaxis would have caused massive over production of histamine, which is life threatening and could very well have ended my life.

One could argue that this is highly intrusive, but I have seen a 15 to 20 percent reduction in my healthcare premiums as a result of ambient monitoring actually predicting attacks. If I were to choose internal nano monitoring, I could achieve as much as a 30 percent reduction in my premiums, however, this would also involve implanting nano-sized robotic technology in my body that would constantly monitor me. This variable system has taken off as major technology

companies acquire more health companies, ranging from traditional insurers to device manufacturers. For my family, I am still concerned about the vulnerabilities of nanotechnology. A good friend of mine is a cybersecurity specialist, and he looks nervous every time we speak about this subject. I tend to agree, but, again, it is a personal choice.

The company health office has requested that I take a one-hour health break during which I choose to take some time in our office VR simulator. Nothing relaxes me more than walking in the mountains — no houses, no hustle and bustle, no flying cars, just beautiful peaks and valleys. It is such an elevated experience. I feel like I can smell every flower petal and sense every blade of grass. I experience gentle zephyrs that blow the leaves, skittering across the ground. It relaxes me and I can continue with my day, always calm and prepared for visits with potential clients. This is a great example of how strategic partnerships help our company become an integral part of our connected life solutions.

---

## AFTERNOON

Sammy gets me to my client site on time and I'm ready to meet the CEO of a company that has been facing challenges from newer manufacturing facilities. He wants us to improve his level of competitiveness by modernizing the factory floor space around a more AI-intelligent design. This client realizes that factories need to be increasingly more agile to keep pace with the frequency of changing customer needs and the physical proximity to end users, so he wants our team to help him from material through to the end customer. It should be an interesting project as so much has been happening in this area. A full 50 percent of the workforce that was performing factory component work in the past has now been retrained on machine maintenance, programming, and quality-adherence jobs. Many of my old colleagues are now retrained in other industries because overall job numbers in manufacturing have been negatively impacted. Fortunately, companies have been preparing for this and working with academia to train for the future. When I was in college, my dad told me that robots would never replace a human worker, that it would be a race to be the best at the jobs that would be created by automation. That has held true, and, in fact, there has been a net increase in jobs, so automation has actually helped increase overall skill focus.

I love my new client user experience software. For the past year, our team has used an overlay device to project the optimal factory over the existing space. All we do is provide a simple pair of eyewear to the client and have them look and move through the factory floor. In real time, the client can see the optimized space spring to life, new advanced

---

The idea of connected living extends from your personal life to the work life, and companies will play an active role in ensuring health, wellness and well-being.

---

Reskilling because of automation has hit a tipping point. It is different jobs, not fewer jobs, that are the focus. Creative jobs become the most sought after.

---

Enhanced digital twins will showcase a digitally improved replica of objects to show how performance improvements can occur.

---

Pressure on speed of communications will see the entry of early stage 6G technologies by 2030.

---

This raises the concept of transhumanism, whereby we will see many workers and consumers pairing themselves with devices and even each other to generate a more seamless experience.

---

Optimizing the total workforce production will be a key corporate mandate.

connected machinery, as well as the increase or decrease in human activity with efficiency gains and safety statistics. We prefer the use of the augmented system because it gives a factory operator a feel for their space versus the somewhat impersonal feel of a VR space. The overall experience is much improved. Now, no matter where I travel around the world, our system works well. It did require massive communications infrastructure upgrades, but the competitiveness for speed has led most rapidly developing and developed countries to have 5G in place already. In many cases, countries leapfrogged over 4G because it made more economic sense. We are already seeing companies investing and trialing 6G, with the first city-wide launch expected in only two years.

The true goal is to ensure that the client is immersed in the experience of the transformation so they can ask questions they may not have thought of before and our team is able to respond to those questions immediately. One question had already been submitted by the factory's chief health and safety officer (CHSO) by the time I returned to my office. The CHSO was viewing her personalized research and saw a segment on enhanced cognitive performance. This new option acts through an implanted sensor that allows a machine operator to "pair" with any device. The controls, seat, and digital layout are all mapped to the user, including issues such as personal sensitivity. In doing so, a user can become immediately more productive and safer because each machine is instantly familiar. Another feature helps us monitor the major bodily functions in real time and sense for issues, such as stress or increased alcohol levels. This mitigates risk from increasing insurance rates and allows companies to provide increased value for families. We have seen many instances where this level of monitoring has helped identify health problems such as strokes and diabetes. Our team briefs the CHSO on this issue and its implications, and runs some real-time scenarios to illustrate the cost savings and social benefits.

---

## EVENING

Arriving home is always my favorite part of the day. I love seeing the kids and asking about their day. We have made it a family imperative to disconnect from technology for a brief period. During the day, I am so focused on work that I rarely have time to talk to my wife and check in on the kids, and a serious concern we have had is this odd feeling of almost outsourcing parenting to automated systems. At school, they have two periods where the teacher is virtual due to school cost-cutting measures. This was controversial at first as the initial model focused on teachers from lower-cost countries, but one of the superintendents in New York started to bring in retired teachers and teachers in training.

This shifted the balance with the costs being reasonably competitive, but, more importantly, students were significantly more engaged. The kids arrive home by autonomous bus. Homework coaching is through virtual AI, and dinner can be delivered by autonomous drone. Get my point? This was getting a little out of control, and the family was feeling disconnected from each other while being “connected” to everything else. Even if we were to try to homeschool our children, we cannot as those curriculums are taught by virtual systems as well.

Balancing our personal and professional lives is difficult, especially when each moment of our lives are seemingly constantly connected. The reality of a connected environment is that one has to select which connected ecosystem you want to be a part of while weighing the pros and cons. For many years, the market leaders, Proton and Maximus, have battled for supremacy. Our family chose the Proton platform, which integrates with a wider ecosystem of partners and allows us to make modifications ourselves, as long as one of us is capable of some fairly basic coding. It is for advanced users and is fully integrated into our home, appliances and personal devices, such as smartphones and autonomous cars. I am thankful that I no longer have to type; everything is entered verbally and responded to in the same way. The system can even deal with my father’s strange dialect. Coming from England and living in Texas, he sounds Australian to most, even to an intelligent personal assistant. I do hear a lot more personal conversations than I ever wanted to. Speech equals a total lack of privacy!

Tonight is family game night, so I am prepared for all-out competition. We finally got the kids to agree to one week on and one week off of using technology during game night. Tonight is the kids’ choice and it is no surprise that they have chosen the family Minecraft VR experience. The kids have been building a village for quite some time and are even farming crops and raising cattle. What is so incredible is that we can also feel and smell the experience with these next-generation sensory stimulants we bought for the kids last Christmas. They have many different applications outside of gaming, but it has taken interactive, immersive gaming to a whole new level with a truly realistic environment. That was a problem with older VR, where no matter how hard we tried, our brains could not compute the experience as reality. The downside is kids, especially, are spending far too long immersed in virtuality and the belief is that it has profound negative health effects, both physically and mentally. Incidences of depression and anxiety are through the roof, so we proactively limit time. One lawmaker has even suggested limiting immersion times to counterbalance this at a federal level. To be honest, I can’t see that going anywhere, but it is proof of concern over the effects of too much time out of reality.

---

The mega companies will drive our experiences. In the case of technology, we will see two or three integrators who manage and feed our lives from work through play.

---

By 2030, virtual reality will have matured to the point where enterprise-level experiences will be in the home, seriously raising challenges about the amount of time being spent in non-reality environments.

---

Social networks become real-life networks, whereby we have access to those we want and AI helps filter our experiences.

---

Access to digital content is, quite literally, on demand, embedded into walls, glass, and more.

The kids won this round. Their house was built three times as fast and produced food and fuel for sustenance just as quickly. Some compare this game to a more lifelike version of Farmville on Facebook all those years ago. Every time I reference Facebook, the kids laugh. It is not like Facebook doesn't exist; it does, but the notion of posting things is quite funny. Actually, a company Facebook acquired a few years ago has become the de-facto social experience now with Facebook acting as more of a holding company. Today, you control what information is shown to your social network. My "followers" can see what I am doing whenever I choose to let them and I do not need to have a device of any kind in hand. My life is an open book by tapping into my cognitive implant that is there with Sammy. Sammy knows my security settings, so it is not on while I work, but I do choose to open my life for roughly an hour or two each day. My connections are weighted by impact on me. Advanced analytics have rated and ranked each person based on their meaning in my life, and I receive nudges from Sammy when my mother or my kids are viewing something I might need to see. The notion of scrolling through a page has become obsolete. With the kids in bed, my wife and I can enjoy some time together. More often than not, we end up watching a show. Television, as my dad likes to call it, has become even more accessible in the past year since Proton added a holo-projection function to all of its home devices. Now, no matter where one of them is placed, we can perform all the typical things such as shopping or gaming. Older people use it for watching programs!

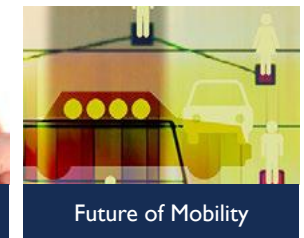
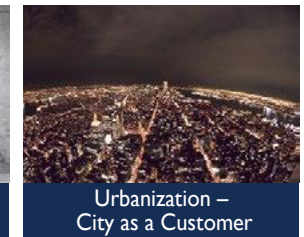
When I reflect on my life today, I can appreciate how we have evolved. It is still a frantic pace of change, but the human resistance, if I can call it that, has urged technology companies to face human issues head-on. One of the most pressing is stagnating wages, so companies have focused on how to save us money (such as on shopping bills). My health bill is much lower than it would have been 10 years ago. I can spend time and manage it better based on my personal needs, and I have so much more transparency around what my kids and family are doing each day. Sure, there are things to work on, but all in all, I am fairly positive about the future.

## Horizon scanning for future markets, consumers and societies.

Frost & Sullivan's Visionary Innovation service provides actionable and value-focused insights on how transformative developments will impact future markets and the world we will live in. A thought-leader in global future trends, the Visionary Innovation service has built its expertise in understanding early warning signals, providing global companies insurance in the form of contingency planning for the future.

The team works with clients in a unique way— bringing together strong acumen for the future by identifying scenario-based opportunities and the deep industry expertise from Frost & Sullivan's industry-specific verticals. The global team of consultants and futurists work with clients from all verticals using a unique macro-to-micro methodology. Through this process companies are guided to design long-term strategy including product and technology planning in the light of Mega Trends.

## The Mega Trends We Track:



Schedule a dialogue with our team to discuss your  
strategic growth development

1.877.463.7678 • [www.frost.com](http://www.frost.com) • [myfrost@frost.com](mailto:myfrost@frost.com)

### SILICON VALLEY

3211 Scott Blvd.  
Santa Clara, CA 95054  
Tel 650.475.4500 Fax  
650.475.1571

### SAN ANTONIO

7550 West Interstate 10  
Suite 400  
San Antonio, TX 78229  
Tel 210.348.1000  
Fax 210.348.1003

### LONDON

Chiswick Business Park,  
Floor 3 - Building 5,  
566 Chiswick High Road,  
London W4 5YF  
Tel +44 (0)20 8996 8500  
Fax +44 (0)20 8994 1389