Charting a course for the future

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Megatrends are on our minds as we release this second installment of the quarterly HP Innovation Journal. As I noted in the first issue, the vision of the new HP is to create technology that makes life better for everyone, everywhere. As you’ll read in these pages, that’s a commitment we are doubling down on with deep thinking, planning, and innovating around socio-economic trends that are profoundly influencing where and how we live and work. As a global population, we’re looking at who we are, how we are, where we are, and what kind of world we’ll be living in, a decade or two from now.

Taken together, these trends create a picture of where the world is going, and of the technology that will be needed in the future. We study developments that are transforming our business and social landscape, and we’re inspired to adapt and evolve. From Bristol to Boise to Taipei, our passion for shaping our future by engineering experiences that amaze is unwavering. In celebration of that global commitment we are releasing this issue to coincide with the Personal Systems Innovation Summit in Taiwan.

The features you’ll find in this issue include an overview of megatrends, and an exploration of ambient computing and its role in the future of home and work. You’ll also learn about how our innovation efforts apply not only to products—but to processes, as we expand the journal to include coverage of the dramatic and positive changes in our channel strategy.

As we share so much at HP that is exciting and new, we’re also marking, this month, an incredible milestone. March 3, 2016 marked the 50th anniversary of HP Labs. Our innovative spirit shines every bit as brightly today as it did at HP’s founding. Labs continues its mission to create, identify, and develop novel technologies and experiences that delight customers and define the future of HP.

To the road ahead,

Shane Wall
Chief Technology Officer and
Global Head of HP Labs
The HP Innovation Journal is a celebration of HP’s culture of invention and innovation—blending the heart and energy of a startup with the brains and muscle of a Fortune 50 company. Each issue will shine a spotlight on the intersection of our people and their ideas; on the notable new technologies and experiences that we’re developing; and on the key industry trends that we will drive through innovation. In this issue, we’re also looking at global trends that are shaping our efforts even as our work is shaping the future. We’re passionate about staying ahead of the curve, and ensuring our partners’ and customers’ success. As we celebrate HP Labs’ 50th anniversary, we also celebrate the momentum and opportunity we find in innovating for this fast-changing world.
Megatrends shaping our future
Using global trends to chart our course

By Andrew Bolwell,
Global Head, Technology Vision and HP Ventures, HP
There’s so much change happening around us these days that it’s easy to forget the speed at which things are changing.

We now have more computing power in our pocket than all of NASA had in 1969 to put the first man on the moon. India sent a spacecraft to Mars for less money than it took Hollywood to make the movie Gravity. It took Uber a mere four years to hit $10 Billion in gross revenue. And Artificial Intelligence took just 42 hours to solve the 100-year-old mystery of how flatworms regenerate body parts.

This pace of change will continue to accelerate at warp speed, with more change expected in the next 15 years than in all of human history to date.

So how does a company like HP stay ahead of all this change, to innovate, adapt, reinvent and engineer experiences for a future that promises to look very different from today?

While we can’t know what the future will hold, we can look to the major socio-economic, demographic and technological trends occurring across the globe to help guide us: megatrends that we believe will have a sustained, transformative impact on the world in the years ahead - on businesses, societies, economies, cultures and our personal lives.

At HP, we’ve identified four major megatrends: Rapid Urbanization, Changing Demographics, Hyper Globalization, and Accelerated Innovation.

**Rapid urbanization**

By 2030 there will be 8.5 billion people walking the earth. 97% of that population growth will be in emerging economies, and most of these people will choose to call cities their home. By 2025, 58 people will live in cities, 2.5B of them in Asia.

And as people move to cities, our cities will get larger, and we’ll have more of them, including megacities in places many of us have never heard of today. In 1990 there were only 10 cities with more than 10 million people, but by 2030 we will have 41 such megacities. Meanwhile, the area of urbanized land could triple globally from 2000 to 2030. This is equivalent to adding an area bigger than Manhattan every single day.

With bigger cities come major economic growth. By 2025, urbanization will welcome an additional 1.8B consumers to the world economy, 95% of them in emerging markets. And consumers in emerging markets are forecast to spend $30T in 2025, up from $12T in 2010. However, urbanization is not only driving economic growth, it is also changing how we buy and consume products and services, propelling the sharing economy and convenience-based services.

But urbanization is also having a toll on the environment. If nothing changes by 2030, mankind would need the resources of two planets to sustain its current lifestyle. And so sustainability becomes an even more important theme, for consumers and businesses alike.

How can HP address some of the opportunities and challenges posed by rapid urbanization? Given that city economies are becoming as big as country economies, should HP consider putting in place City Managers for top tier cities of the future? How can we reduce the energy used across the lifetime of our products? How can we offer people living in cities more convenience through new services?

**Changing demographics**

Simultaneously, changing demographics will dramatically shift the tapestry of our society.

As fertility rates decline and life expectancy increases, the composition of our population, and our workforce, will shift older. By 2060 we’ll have 3B more people over the age of 30 than today. More and more countries are becoming super-aged, meaning that more than 20% of their population are over the age of 65. And by 2030 we’ll have twice as many people over 65, nearly 1B. China is a perfect example of this phenomenon. Today 26% of their population is over the age of 55. By 2030 that number will grow to 43%. To deal with this shift they recently rescinded their one child policy after 35 years.
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Personal and commercial robotic solutions to augment our lives and tasks?

Hyper globalization

Globalization arguably began 2000 years ago with the 6,000km Silk Road that connected Eurasia. However, no one can argue that a truly dramatic “flattening” of the world happened when the Internet was created. And today it’s not just data that’s freely flowing between countries—it’s capital, products, services, and people. For example, how and where we design, sell and manufacture products will become both hyper-global and hyper-local thanks to us now living in a globally connected world with a diverse set of local requirements.

Amplifying this globalization is the internet, which has enabled the growth of a vast digital marketplace from companies we’ve never heard of, from cities we’ve never been to, and working on digital platforms that are changing the competitive landscape. Anyone with an idea can become a global business overnight. It’s now easier than ever for start-ups to scale globally, and for emerging market companies to become real challengers to established multinationals. By 2025, half the Fortune 500 will be headquartered in today’s emerging markets.

All of this meaning that market disruption has become the new norm. Long gone are the days when 75-year-old companies are commonplace. The average tenure of companies on the S&P 500 dropped from 35 years in 1980 to 18 years in 2012. By 2027, 75% of S&P 500 companies will be removed from the index. Disruption is now happening everywhere to everyone, even to those companies who were themselves doing the disrupting just a few short years ago. Companies around the globe will have to constantly reinvent themselves to stay competitive.

How can HP enable our customers to navigate this era of constant disruption in an increasingly globalized world? Printers that provide automatic language translation to make remote collaboration more efficient? Immersive computing solutions focused on helping us work across cultural and geographic boundaries? Hyperlocal products and services?

Accelerated innovation

Even though we are being constantly bombarded with faster, cheaper, more powerful technology, it’s easy to forget that the rapid pace of technological change is because digital technologies generally follow an exponential trajectory versus a linear one. And this is why in 30 years’ time, our phones won’t just be 30 times more powerful, but a billion times more powerful than today.

In turn, this will lead to a shrinking and aging workforce and put a strain on economies and government spending, simply because as the world ages, there will be fewer people working to support the number of people retiring. Germany, for example, will lose nearly half its workforce by 2060, putting its economy at serious risk. Companies will also be forced to reevaluate their workforce programs for aging workers.

But every cloud has a silver lining, and in this case it’s the fact that an aging working population also means a significant market opportunity. ‘Silver spenders’ as they are known, have greater purchasing power than their younger counterparts, and could represent a significant untapped opportunity for companies in the future. The European Commission estimates that by 2020, the spending power of people over 50 will reach $15T. This will create a significant shift for brands who today devote the majority of their marketing spend to people under the age of 30, even though in places like North America half of the money spent is actually by people over the age of 50.

How should HP best cater to a diverse (and aging) customer base? Simple, secure, and seamless printing and computing for the “silver generation”? Commercial wearables to make us more productive at work? Disruptive healthcare solutions?
As technology components mature and become commoditized, they become the building blocks for new breakthroughs to emerge. And this is why the rapid pace of change we are experiencing today is only going to accelerate moving forward. Electricity evolved from standalone generators to utilities, that now power computing. Computing evolved from standalone servers to cloud computing. Cloud computing enabled Big Data, which more and more is now also evolving to a utility model. And as that happens, Big Data is giving rise to new technologies like Intelligent Assistants. It’s technology’s equivalent to the Circle of Life.

As technology leaders and innovators it will be up to us to look out for new emerging technologies on the horizon, that will themselves one day become the future building blocks for huge new markets.

At HP we look at these Megatrends through the lens of our Blended Reality vision. This allows us to identify new technologies and business models that will help fuse our physical and digital worlds, reinventing and creating new experiences for everyone, everywhere. The emerging technology areas that we believe will be the building blocks for our future success are HyperMobility, Immersive Experiences, 3D Transformation, Internet of All Things and Smart Machines. Business teams across HP are starting to use an understanding of these Megatrends combined with our technology vision to identify new opportunities for market transformation and future success.

And while Megatrends won’t give us all the answers, they can be a beacon for where the world is headed, giving us the opportunity to adapt, chart, and reinvent our own future.

The opportunity is ours.

For article references see back cover

Andrew Bolwell is VP, Global Head of Technology Vision and HP Ventures, responsible for driving HP’s long-term technology vision, and for corporate venturing activities, working across start-up and venture capital communities to identify, source, commercialize and invest in early-stage disruptive technologies.

Big-picture building blocks for HP strategy

There are many considerations that inform the development of an overarching strategy for the new HP, and the product and services models we are creating. What can we build, based on the amazing technology capabilities unfolding every day in our own labs and elsewhere across our industry? What should we build, to help our customers realize their immediate and future business objectives? What must we build, based on where the world is headed demographically, economically, environmentally?

The latter question is where our Megatrends effort comes into play most directly. Megatrends research was a critical point of input in the strategic process this past winter, leading to a pivotal gathering of HP leadership at the start of this year. We looked at strategic choice points based on megatrends as well as core assumptions around factors including market outlook, customer and industry directions, investor perspectives, competitive dynamics. We debated and established priorities around our product direction, service models, geographic focus, and more. As this issue goes to press, teams across the new HP are putting forward their ideas and proposals for projects and areas of investment going forward.

The strategic leadership will evaluate proposed areas of investment and consider the anticipated trade-offs and advantages in each. Megatrends will help inform both the projects presented for consideration, and the decisions as to which projects to prioritize. The Megatrend Rapid Urbanization, for example, might lead us to look at devices tailored to urban populations: smaller, lighter devices for denser environments, and more mobility solutions for people moving around cities and coming into enterprise. For each Megatrend, we review the service model and product roadmap that will allow HP and customers to meet challenges and capitalize on opportunities.

Also, as we focus more on the commercial space it’s important to reflect on how megatrends will shape manufacturing and business processes across industries. We consider megatrends relative to our focus on emerging markets as well—investing in India and China, for example. As we think about some of our technologies most relevant to Accelerated Innovation—Sprout and Blended Reality for example—we see special opportunities in a services model that allows us to innovate even more rapidly, with the ability to deploy updates and not wait for an overall product refresh.

Across the new HP, there is a sustained excitement about our future as a focused, agile and innovative competitor in the global market. At the “world’s largest startup,” our work on Megatrends is not only about predicting where the world is headed, but about boldly ensuring a successful and relevant place in it for HP and our customers.

Philipp Jung is Chief Strategy Officer at HP, responsible for developing profit-generating strategies, devising and evaluating new growth opportunities, and leading the strategic planning process.
Ambient computing
Technology in the fabric of everyday life

By Ticky Thakkar,
Head of Emerging Compute Lab,
Chief Technologist Personal Systems,
HP Fellow
and
Louis Kim,
Global Head and General Manager, Immersive Computing, HP
conscious of, and more so every day. Just as importantly the data is there, courtesy of computers aboard devices, machinery, vehicles, and anything you can stick a sensor on. Extracting intelligence from oceans of data is a monumental task—way beyond what humans could do unassisted. We can use ambient computing to help us turn massive volumes of data into insights and useful guidance.

From Altair to ambient: we’ve come a long way…and quickly.

Not a single segment in the world has transformed like computing. If cars had transformed since their introduction the way computers have, we’d be flying around like George Jetson in solar rocket cars. On the other hand, we carry devices in our pockets with many times the computing power that once could be harnessed only by an enormous water-cooled machine, a behemoth in a dedicated room, serving one user at a time. Even as computers evolved they were locked away in offices and universities.

In 1983 the personal computer was born. Apple and a few other makers had existed before that, but they were mostly the domain of tech enthusiasts. More accessible PCs with graphical interfaces soon appeared and improved through the early 90s. Then they met with a fresh new current: the Internet. Overnight, or so it seems, PC users around the world could connect to information and each other.

With this confluence of developments, we were off to the races. Computers were becoming lighter, wireless connectivity was introduced, as was broadband at home. In 2006, the iPhone was introduced, and changed how we used mobile phones forever. Three years after that came the first tablet—introduced to a skeptical public, and wildly embraced shortly thereafter. Today we have multiple computers that we easily carry with us through our days.

What do you think of when you hear the phrase, “ambient computing”? It doesn’t conjure up a sleek device you can hold or wear, nor an ingenious app you can download. Ambient computing—or ambient intelligence, a term used synonymously—is more abstract: it’s a condition, a state of the art. It describes a computing era that is unfolding around us, as technology continues its staggeringly rapid evolution. To understand it, focus not on the word “computing” but on “ambient.” Think of ambient lighting. Ambient music. An ambient element is tuned to your immediate environment, adapted to enhance a particular mood or activity.

As the IoT landscape populates with smarter devices and the data they generate, ambient computing is the fabric that knits them together. It is the intelligent synthesis and analysis of many disparate elements, generating insights and taking action based on those insights.

The idea of ambient computing has been around for a long time. In 1988 Mark Weiser, a scientist at Xerox PARC, described its precursor, “ubiquitous computing”—as he imagined a future in which people would interact with computers not constrained to a desktop but anywhere at any time, on a host of different devices. It would be years before technology’s physical capabilities caught up with the dream of anytime, anywhere computing. An idea we can nearly take for granted today was decades ahead of its time.

Today, the physical capabilities are there. Computers are woven into our environment to a degree that most of us are not even aware of, and more so every day. Just as importantly the data is there, courtesy of computers aboard devices, machinery, vehicles, and anything you can stick a sensor on. Extracting intelligence from oceans of data is a monumental task—way beyond what humans could do unassisted. We can use ambient computing to help us turn massive volumes of data into insights and useful guidance.

At home, you’re CEO of your life with an amazing (and tireless) staff of assistants. At work, there’s monitoring, management and insights that can improve efficiency, safety, resourcing, and customer service.
From lighter laptops to tablets to watches to phablets to fitness bands and watches, we live and work and play in a mobile world. And beyond those things we carry, display technologies are advancing rapidly as well—bendable, projected, and all at ever increasing resolution.

**Sensor sensibilities**

The sheer amount of data coming through sensors is mind-boggling. If the IoT’s data had to be interpreted solely by humans, its potential would be severely limited. Ambient computing includes the analysis to turn bits and bytes into insight, and the intelligence can take actions and learn from feedback of those actions.

What will life look like when ambient computing is fully realized? We believe it will put technology in its proper place relative to people and their potential: Anticipating needs and proactively addressing them. Adapting to changing conditions, and making suggestions that enhance our lives, at work and at play. Today, we gaze at our screens large and small, with obsessive attention—sometimes diminishing our experience of everyday life. Ambient computing makes the technology pay obsessive attention to us—serving us, helping us make good decisions and operate more efficiently. As we pursue advancements, it’s not just ambient computing’s potential we stand to unlock. It’s our own.

*Ambient Computing is an area of research in HP labs that relates to fusing our physical and digital worlds through Ambient Intelligence, Smart Surfaces and Natural interaction.*

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**A day in the life**

Natural interfaces are a key manner in which ambient computing helps make technology blend into the fabric of daily life. It does this by using and responding to natural language and familiar gestures, and embedding seamlessly into our environment.

**6 a.m.**

Nora Jones’ “Sunrise” plays. Coffee starts brewing.

**8 a.m.**

Finish dressing while headlines, weather and traffic updates delivered to bathroom vanity. Traffic delay: sends note to first appointment pushing out 15 minutes.

**9:15 a.m. – 3:30 p.m.**

Team meetings; virtual assistant rounds up interview candidates, assembles materials for noon review, orders chocolate donuts and coffee for an afternoon pick-me-up.

**3:30 – 5 p.m.**

Notification of project over budget; sends meeting invite to purchasing contact. Home system advises that husband and kids are home from school; sends a reminder to them to walk the dog and do homework. Remote conference with communications colleague to prep for presentation.

**6 a.m.**

Freezing tonight! Virtual assistant suggests hot soup for the family and orders it delivered. Dials up sister to wish happy birthday while warming soup.
Celebrating 50 years of innovation

On March 3, 2016 HP Labs celebrated the anniversary of its creation and its rich history of innovation. HP’s founders set out to change the world by developing technology that would improve the lives of people everywhere. Fifty years ago in 1966, they opened HP’s first centralized organization focused on exploring new ideas. HP Labs became respected not only for the work that was being done there, but also for sharing it with the larger scientific community. From the first programmable desktop calculator to office laser printers, digital data storage drives, and most recently the Sprout immersive computing platform and commercial-scale 3D printing, HP Labs has created some of the greatest technological breakthroughs of our time.

To celebrate our 50th year, we are bringing a renewed openness to HP Labs. As part of Keep Reinventing, we are looking at new ways to share the mind-bending technology we are creating in HP Labs that will transform businesses and lives—technologies such as 3D printing, immersive computing, hyper mobility, Internet of Things, smart machines and more. Through lighthouse moments along the way we will bring these technologies to life—disrupting markets and fundamentally changing the way we live and work.

The first 50 years of HP Labs were incredible, but we are just getting started. Keep Reinventing!
Accelerating into the future with channel partners

By Jos Brenkel, Global Head, Sales Strategy and Operations, HP
Innovation at HP is not just about products, but about processes—and both types of innovation have been deployed in radically revamping our channel program for speed, simplicity, and accelerated growth.

Our 250,000 channel partners deliver eighty percent of our global sales, functioning as an independent extension of HP. We deliver value to partners, so partners can deliver value to customers. The execution is complex, but the driving idea is as simple, and powerful, as that.

A focus on delivering value and building loyalty

Customers in every industry are transforming their business models in response to disruptive market conditions, IT innovation, and changing consumer behaviors. IT organizations are increasingly integral to strategic business direction. For partners, great opportunity lies in understanding customers’ challenges, and helping IT teams to provide not just infrastructure but business solutions.

HP Partner First: unlocking opportunity at every level

Some channel partners are farther along on solutions-first selling than others. We have designed our new Partner First program to meet partners where they are on this journey—meeting immediate business needs while making new opportunities available to encourage future growth.

The program features three tracks: Transactional, Value and Alliance, and OEM. The Transactional track is helpful for volume sellers and small companies that don’t have a large service business. The Value track is optimized for VARS moving toward services; it features training and benefits along the road to solutions selling. The Alliance track focuses more on ISVs, and on partners adding value in emerging categories such as immersive computing and 3D printing.

In all three Partner First tracks we are making it easier for partners to access a wealth of streamlined training programs, tools, and processes for speed and consistency across markets and geographies. We are committed to being first in speed and agility, first in simple and consistent operations, and, as a result, first in driving partner growth and profitability.

Building relevant solutions for today, tomorrow and beyond

We started strong with the Partner Navigator program, ensuring a smooth transition in the transition of our new company, we are able to be more focused and responsive to our partners’ needs, and help them deliver value in an evolving market.

One of the most compelling things about the new HP—the “world’s largest startup”—is the opportunity to innovate in every pocket of the organization. Our mission, “to engineer experiences that amaze,” is being applied as vigorously to our channel strategy as it is to our R&D labs. With the launch of our new company, we are able to be more focused and responsive to our partners’ needs, and help them deliver value in an evolving market.

Jos’ take on Megatrends and the HP sales channel

30 words or less:
Jos’ take on Megatrends and the HP sales channel

RAPID URBANIZATION

“More population density in megacities will offer our partners efficiencies, but they’ll also face the challenge of increased complexity and higher expectations around speed and service.”

CHANGING DEMOGRAPHICS

“Millennials will be 40% of the workforce in the 10 years, expecting to use the devices, apps, cloud services and other tools they choose to work with for speed and agility.”

HYPER GLOBALIZATION

“As the heat shifts to emerging markets both for startups and established companies, HP’s global channel strength can help partners thrive in new markets.”

ACCELERATED INNOVATION

“Every day brings more speed, more power, more connected devices, more information. Partner First keeps pace with more resources and innovative tools and technologies to support partner growth.”
Innovation at HP is not just about products, but about processes—and both types of innovation have been deployed in radically revamping our channel program for speed, simplicity, and accelerated growth.

The global channel infrastructure is complex, but the formula is simple: speed plus simplicity equals greater sales. Our goal is to enable our partners’ success, delivering innovative and valuable solutions, and setting the stage for a profitable future where we will grow and thrive together. Everyone has a customer—the job of our solutions is to create value for our customers, so they can in turn create value for their customers.

There are three areas of focus for HP’s product and solutions development: Core, Growth, and Future. The Core category is shrinking—it is built on a transactional business model. At the same time, Growth and Future categories are getting larger. Our strategy is to slow down deceleration in Core by growing market share, which we do by out-executing competitors and putting more focus on online partners. The growth and future categories represent a shift to a contractual business model. It’s a different mindset requiring different capabilities and new relationships with systems integrators.

Core
Products focus on reinvigorating printing in the home, capturing commercial print market share, and leveraging our PageWide technology. In Personal Systems we’re focused on leading in commercial, delivering the best devices across multiple operating systems and form factors.

Growth
We are driving solutions areas. This means leading and expanding the market in commercial mobility, while also capturing copier pages and driving the digital transformation in Graphics.

Future
We are building a strategic partner ecosystem to drive new solutions and services for tomorrow, including 3D Printing and Immersive Computing.
HP’s Maker Space

Projected to open this Spring, the HP Maker Space in Boise, Idaho will help grow the maker spirit globally across HP.

In our inaugural Issue we introduced you to Chris Morgan, the Engineering Manager of the HP Robotics Lab in Boise, ID. The robotics team is filled with strong multidisciplinary backgrounds that include computer, mechanical, and electrical engineering disciplines with emphasis on AI, Automation, and Mechatronics.

This year they’re extending beyond robotics to build the HP Maker Space in Boise. Intended to give all HP employees greater access to innovation and group collaboration, the space will be filled with several work stations, staging areas, along with four 50” monitors and a 360° camera system to enable virtual collaboration with HP Makers across the globe.

“Our goal is to promote and encourage innovation in technology, engineering and robotics. The best part of our jobs as Makers is when we can take what we have learned and share it with others. This space will help us to do just that,” said Chris.

The space, filled with useful tools and supplies, removes inhibitors to innovation, encourages collaboration and network building across teams and organizations, allows for product testing and feedback, provides employees with new skills and experiences, and offers the opportunity to discover the next big thing.

One person especially enthusiastic about this Maker Space? HP Robotics Lab Intern, Camille Eddy. As an intern at HP, Camille created a 3D-printed robotic hand that uses a 3D camera to capture human movements and then mimic them. With the new Maker Space, the possibilities for what team members like Camille can create are endless.

“There’s a lot of excitement around the Maker Space at HP. I’m looking forward to seeing all of the collaborations and innovations that will be realized because when you have the tools you need, you can create things you never imagined possible,” said Camille.

To learn more and stay up to date on the latest about the HP Maker Space, visit www.hp.com/go/innovationjournal.
Innovation spotlight

HP launches the next wave of computing at Mobile World Congress with the Elite X3

Mobility in the commercial space was supposed to make everyone’s lives easier and make workforces more efficient, but has it really reached its potential? People still carry round heavy bags with multiple devices running different OS’s, and IT still faces challenges securing and enabling BYOD mobile devices to give the best experiences.

People have learned to live with all these inconveniences, but computing isn’t anywhere near as seamless and intuitive as it should be.

The Elite x3 aims to be the first step in the next wave of computing and to solve many of these problems. Amazing advances in mobile chipset power aligned with Windows 10, the first OS to truly span device form factors with Continuum, means we’re at a new threshold. With the Elite x3 we can think beyond the phone and see a powerful new way of computing.

At the heart of the platform is the Elite x3 itself, a killer 6” phablet with a Qualcomm Snapdragon 820 processor delivering proper PC performance from a mobile device for the first time. With the addition of the Desk Dock and Mobile Extender it allows users to dock the Elite x3 and work on a big screen and in a laptop style, all using the compute power of the phablet. In addition to the hardware, HP will bring HP Workspace to market, allowing users to run legacy and traditional x86 apps through a virtual desktop solution.

HP has made some amazing steps forward in engineering with the Elite x3, such as the ability to work with the Elite x3 in your pocket, running the Mobile Extender wirelessly over 802.11 AC WiFi. In addition the Elite x3 is designed for business: waterproof and rugged to pass IP-67 and Mil-STD testing as well as dual biometric solutions with Iris scan and fingerprint reader for incredible security.

The development process involved taking a very small, experienced and cohesive team and giving them space, within the larger organization, to move quickly, push limits, and take risks. This allowed for quick design iteration, making mistakes, correcting them quickly, and accelerating the path to realizing the Elite x3, which is expected to be available this summer.

Sprout Pro finding a home in manufacturing

When Sprout by HP debuted in November 2014 for the consumer market, it was hard to imagine it improving worker productivity in manufacturing environments. Nearly 18 months later, however, Sprout has branched out with a Pro version targeting the Education market while also discovering a unique niche in manufacturing.

OPS Solutions, an HP OEM partner based in Novi, Michigan, utilized the Sprout SDK to port their proprietary guided assembly software (Light Guide Systems) to Sprout Pro. Sprout Pro’s projector and durable touch-mat combined with the Light Guide Systems software creates a scalable Augmented Reality platform. Customers are deploying this platform to provide assembly line workers a visual workflow experience for error-proofing manual assembly processes.

“Sprout Pro allowed us to scale our existing hardware solution down in both size and cost to help companies improve reliability of processes such as fuel injector assembly,” said Paul Ryznar, CEO of OPS solutions. The Light Guide Systems Pro solution is receiving strong interest from companies like General Motors, Chrysler, Johnson Controls and Tesla for use in a variety of small assembly processes. LGS Pro is also garnering interest in the healthcare industry for applications such as surgical instrument kitting and pharmaceutical pill sorting.

Louis Kim, Global Head and General Manager, Immersive Computing, adds: “HP and OPS have combined to take advantage of all of the projective computing capabilities of Sprout to boost productivity in manufacturing and assembly environments.”

HP’s Global University Program

The Global University Program is an important part of HP Labs’ research strategy. The program fosters new opportunities for innovation through the coordination of research collaborations, increased visibility in the academic community, and technology transfer.

HP’s university relationships have a positive impact on technology transfer from university research to product. Through talent acquisition the skills, experience, social networks, and passion of students can be harnessed as an effective person-to-person technology transfer strategy.

Steven Fraser, Lead of the Global University Program, knows how vital university research collaboration is to sustain HP innovation: “Collaborative research strategies are essential to promote the sharing of ideas and organizational learning. The power of collaboration should never be underestimated—whether planned or serendipitous.”

HP’s long-standing relationship with Purdue University has created one of these important partnerships. Since the collaboration began almost 25 years ago with HP Labs in Palo Alto, it has expanded to the HP Printer Divisions in Boise, Vancouver, Barcelona, and Israel. With over 30 patent applications filed, over 50 PhD degrees granted, more than 15 master’s degrees granted, over 200 conference papers published, and more than 50 referred journal articles, the collaboration with Purdue is contributing to a brighter, more innovative future. Currently, the team is focused on investigating ambient computing devices for home and office applications.

Qian Lin, Research Scientist at HP Labs, who was responsible for initiating the Purdue and HP Labs relationship by inviting her Purdue University professor to speak at HP Labs, summarized the collaboration perfectly: “Purdue has a long history of research in imaging and computer vision in partnership with HP. We are excited to expand the relationship and explore using deep learning to further enhance the computer vision capabilities of our devices.”

HP Ventures and Immersive Computing team at an EvoNexus event

HP’s Venture group teams up with EvoNexus for San Diego incubator event

HP Ventures works across start-up and venture capital communities to identify, source, commercialize and invest in early-stage disruptive technologies for HP competitive advantage. Recently we teamed up with the HP Immersive Computing team and EvoNexus to host a startup event in San Diego focused on identifying companies that share our Blended Reality vision and desire to deliver immersive experiences.

EvoNexus is Southern California’s leading technology startup incubator, designed to accelerate the growth and success of promising entrepreneurial companies in the San Diego and Irvine areas. Startups lucky enough to be selected into this non-profit incubator, benefit from premium office space and a cadre of mentors and advisors made up of the region’s leading business and technology entrepreneurs, investors and executives.

HP has been deeply involved in the growth of the EvoNexus program with Mike Salfity, Global Head of HP’s Graphics Solutions Business, serving as EvoNexus’ chairman. In addition HP joins other global multinationals such as Qualcomm, Cisco and Accenture in sponsoring EvoNexus’ ongoing efforts. In the six years since it began operations, EvoNexus’ companies have been able to raise nearly $1B in funding and acquisition proceeds. “EvoNexus represents a key resource that HP can use to find and leverage outside talent and ingredient technology for HP business units,” said Salfity.

This past February, HP’s Venture team combined forces with the Immersive Computing team to meet 14 companies at a two-day MarketLink event in San Diego. Among the innovative technologies presented to the HP team was an immersive audio solution with head tracking for a new 360 degree sound experience. This startup company just debuted on Kickstarter and quickly exceeded their funding target. Also presented were a pressure-sensitive touch screen for glass, and security for the emerging Internet of Things chip industry.

The HP team was led by Irit Hillel and Mitchell Weinstock from the CTO Venture group and Geoffrey Maine and Ben Wynne from HP’s Immersive Computing group.

This early exposure to promising startups allows HP to innovate and differentiate our product lines with new disruptive technologies, allowing us to strengthen our leadership in the markets we play.
Community voice

What do you think HP’s greatest innovations will be in the year 2030?

Lee Atkinson  
Distinguished Technologist  
HP Taiwan Consumer PC R&D

Invisible computing! Of course, not really invisible, but computing products that are integrated around our lives so much that they simply work for us. So much of “computing” today still requires too much effort. In 2030 we won’t think of separate categories of technology and components that we call “personal computing.” Instead, our lives will be assisted by networks of seamlessly connected devices that adapt to our different needs and truly enrich our lives—from the mirror in the bathroom and locks at the door to the world outside and around us, the disconnected bits and pieces will work together in a way that we won’t identify them separately anymore.

Maureen Lu  
Audio Architect  
HP Taiwan Consumer PC R&D

Providing secure and seamless experience to customers everywhere they go, whether they be at home, on the go, at office, at school, etc. We will be able to deliver products and processes that combine the rich experience and knowledge from different groups that changes the way people interact with technology, and there will be no barriers to technology. A product will no longer be traditionally categorized into its own category. For example, a PC will no longer deliver only PC functions, and a printer will no longer just print.

Leo Gerten  
Director, Communication Tech  
HP Taiwan Commercial PC R&D

The “HP 4 Life” Essential Service. HP Quality will now last much longer than your technology hungry appetite. So with HP 4 Life Service, you can always be sure to be able to update your hardware to the latest life changing tech from HP.

Emily Wang  
Product Strategy Program Manager  
HP Taiwan Commercial PC R&D

EVERYTHING will be online. One trillion of devices will connect to internet with evolving A.I./much more mature AR to calculate/learning human activity based on big data analysis. This will be stored by (5D) digital data by femtosecond laser writing. The storage allows unprecedented properties including high data capacity, thermal stability and virtually unlimited lifetime at room temperature (13.8 billion years at 190°C)—opening a new era of eternal data archiving.

KT Wu  
Material Scientist  
HP Taiwan Commercial PC R&D

Establish a multiple access authentication system to secure the information safely. Secondly, I believe HP could deliver a low battery charging time solution by green energy utilization.

Geisa Rocha  
Software Engineering Manager  
HP Brazil R&D

HP’s greatest innovation in 2030 will be enabling people to create things with 4D printing. The current society major challenges are related to construction and manufacturing inefficiencies, that require a lot of energy consumption and material resource. This system is known to be unsustainable, as it demands more than what our planet is able to provide and degrades the environment. Instead of brute force assembly lines, HP can reinvent how people build the objects they need. Beyond that, build objects made of material that change shape and property, even compute, based on their use. The 4D technology will allow a more intelligent use of resources, while providing people the autonomy to build what they need, and the product may be even able to adapt itself for new usages.
Meet Haven Zhu,
Hardware Development Manager, LaserJet Printer Team

Technology changed the course of Haven’s life. As a child growing up in Wuxi, a small town outside of Shanghai, China, he never had access to a computer. Watching dramatic technological advances unfold before his eyes, Haven was inspired to pursue a future in technology. He is now responsible for managing an experienced team of mechanical and electrical engineers who continually improve and deliver LaserJet hardware design.

I pursue my passions at HP every day.

When I graduated high school, my passion was engineering. To further that passion, I attended Shanghai JiaoTong University and completed Graduate School at the Robotics Research Institute. I could have never dreamed that I could work at HP—a world-class technology company that’s contributing to a better future.

I’ve worked at HP for 9 years.

I began as a mechanical engineer and then after five years, I became a project manager for HP LaserJet business. LaserJet is the high end segment in the whole HP portfolio. I am thankful to be part of the team where we are constantly pushing ourselves to build more affordable, reliable, and high quality laser printers. Knowing our customers are getting faster, cheaper and quieter printers from HP is the best reward to our innovative work at HP.

I enjoy innovating when...

I am participating in the Innovation Forum—nurturing innovation and creation at our Shanghai site. My goal is to help others realize their ideas and turn those ideas into products. In the past two years, we have submitted over 100 disclosures and patents. It’s inspiring to see the makers spirit thriving within HP.

My favorite part of working at HP is...

The collaboration opportunities. I recently attended the B.I.L Program at Stanford University. Not only did I receive a great education from the professors, but I was also able to collaborate with HP’s greatest talents. Ten years after completing my Graduate work at the Robotics Research Institute, it was exhilarating to return to the world of robotics.

HP has allowed me to achieve my dreams.

I’ve been fortunate enough to work on ground-breaking projects and push myself to solve real-world problems every day. My proudest moments are when I walk through a retail store with my daughter. I can show her products on the shelf that I designed—that is a huge gift that HP has given me.
"As a separate company, HP can more quickly respond to market changes and invest in necessary research to keep it relevant."

Dion Weisler, HP CEO, explaining HP’s commitment to keeping the innovation engine alive to Fortune

HP Elite x3 named one of the 5 best gadgets from Mobile World Congress 2016

Source: Paste Magazine

HP Inc. unveils huge printer update with new PageWide portfolio and secure managed print service

Source: Computer Dealer News

HP PageWide wins prestigious golden design award

Source: Print Week

Introducing the Titan JUXT and the Isaac Mizrahi Smartwatch Engineered by HP

Source: HP Wearables and Smart Objects