Crafting a bolder future. Together.

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Time travel is one innovation our Labs team hasn’t cracked yet. Just now, I wish we had. I would invite our founders Bill and Dave to the first Global Partner Conference of the new HP Inc. And I’d hand them a copy of this Journal. I think they’d smile when they opened it up to the “Rise of the Makers” feature article. It would be a perfect snapshot of HP’s past and future: the quintessential, original makers reading about today’s Maker Movement. They’d be pleased and excited by the role HP is playing in the Maker community, and how vibrant the spirit of innovation continues to be. They’d no doubt remark upon how lucky today’s makers are to have such amazing tools at our disposal. (Why, making in the late 30’s was like walking five miles in the snow to school, barefoot!)

I’d show them how far and wide their company has grown, with channel partner relationships as the backbone of our business. Their earliest emphasis on innovation and good relationships laid the foundation for the partnerships we have today. Partnerships that yield incredible new technologies and solutions to complex problems. Partnerships that help us deliver those solutions to customers around the globe.

I often say that “innovation is culture.” This is true when technology developed in our labs finally arrives in the form of an exciting new product. It’s equally true when you look at process innovation and digital transformation—critical and ongoing activities for the new HP, for our channel partners, and for our customers in every industry.

In this issue of the Journal, you can read about many ways that HP innovations are having an impact: in medicine, in music and the arts, in sustainability efforts, and of course on a generation of makers who are about to bring their innovations to life using the 3D printer we are delivering this fall.

It has never been more exciting to be at HP. I wouldn’t mind a little time travel to see how today’s breakthroughs will change the world in 20 years. But for all the reasons you’ll read about in this issue and countless more, today’s a pretty amazing time to be in.

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 are exploring how the “maker spirit” has become the fabric of HP, our customers and partners for the past 76 years. We hear first-hand from HP partners and customers how they are embracing today’s DIY innovators and entrepreneurs. Get a glimpse into some of the radical new channel approaches that will be a centerpiece at HP Inc.’s inaugural Global Partner Conference this September; and hear more about HP’s sustainability efforts, and the rise of the circular economy. Plus, more behind the scenes with HP Makers, the new Tech Ventures team and HP’s involvement at the Panorama NYC music, art and technology festival.

Share your thoughts on the Innovation Journal—we want to hear from you! Email hpinnovationjournal@hp.com

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FEATURED ARTICLE

Rise of the makers

A new wave of entrepreneurs and business disrupters

by Peter Weijmarshausen, CEO and Co-founder, Shapeways; Chandrakant D. Patel, Senior Fellow and Chief Engineer, HP; Mei Jiang, Head of Pan HP Innovation Strategy, HP
Makers of necessity
A hands-on approach to innovation and ingenuity

“There is something unique about making physical things. Things we make are like little pieces of us and seem to embody portions of our soul.”

—Mark Hatch, Author of the Maker Movement Manifesto and Former CEO of TechShop

We are living in the midst of an amazing and accelerating amount of change and progress. As discussed in Issue 2, we will experience even more change in the next 15 years than in all of history to date.

- We now have more computing power in our pocket than all of NASA had in 1969 to put the first man on the moon.¹
- 43% of the world’s population is connected to the internet, mostly in developed countries. And by 2024, more than half of all home Internet traffic will be generated by appliances and devices.²
- 42% of the overall primary hospitals and 50% of the total provincial level hospitals in China have their own telemedicine center.³
- It’s expected that the first 3D printed liver will be created by 2025.⁴

And while things might be moving at lightning speed today, the phenomenon of embracing change with new tools and processes harks back to our origins. Some of the most influential advancements in our history were driven by inventors and makers who turned the tools and technology at hand into world-changing innovation. From the fire-making apparatus of the Stone Age, to the clockworks and turbines of the Middle Ages, to the telephones, light-bulbs and automobiles of the Industrial Revolution, our desire to create and innovate is ingrained in us.

There are natural human traits that drive us to innovate: curiosity, resourcefulness, opposable thumbs (ha!), ability to design and build and combine elements to make new things. Some of the tools and processes we invent DRIVE change, others help us embrace change—it’s all connected.

Mass production in the 20th century gave way to mass individualization. And from that, a rising appreciation for the bespoke, the unique, the handmade and one-of-a-kind. We have tools to amplify or even transform traditional crafts—from handmade models to 3D printed models, for example. We can put world-class tools and instruments within reach—consider a digital keyboard for a composer that synthesizes input from a hundred Steinway Grands to deliver sound from the world’s best piano in a $200 keyboard.

The makers spirit

But what drives this need to push boundaries, look at ideas through a new lens, and overcome challenges and constraints?

In recent years we’ve seen the rise of artisans, tinkerers, hobbyists and creatives looking for (and finding) new outlets for their need to make. A flurry of technology advancements have made way for new immersive creation tools like HP Sprout, new collaboration avenues like Make Online and the global Makers Faires, and new distribution and sharing sites such as Shapeways.

It’s estimated that there are 135 million makers in the U.S. alone, creating a new wave of products.⁵ These entrepreneurs and innovators are fueling business with some $29 billion

¹ ZME Science
² United Nations
³ Research and Markets Report
⁴ World Economic Forum
⁵ Time Magazine and Atmel
poured into the world economy each year.⁶

Today, makers are everywhere: in the enterprise, in university and high school robotics teams, on Etsy, on Makers Row, Opencompute.org, on 23andme. Open source technology, Raspberry Pi, miniaturization and commoditization of components, access to new 3D printing manufacturing tools and services—this new generation of makers is working with the ultimate set of Legos (or in this case, Arduino boards).

What is a maker? How is a maker different from an innovator?

Makers make things. More than an idea, today’s makers are focused on combining tangible materials and output with physical and digital ingenuity. They epitomize HP’s concept of Blended Reality, by fusing the best of our analog world with the advancements of our digital world to create new products never before imagined.

Makers look to roll up their sleeves, reimagine what’s possible and build on new ideas, in order to enrich our lives. In some cases, they enrich our lives by accident, simply by pursuing their own joy of inventing.

Fostering the maker spirit

The maker spirit of unbridled innovation for betterment is a long-standing tradition for HP, our partners and our customers.

From the beginning, the HP community has been creating new categories of maker-fueling products as well as new tools for future makers to produce their own. From the first Light Emitting Diode (LED), to the first office laser printer, to a 64-bit high power computing architecture and now the world’s first production-ready 3D Printing System, the story of innovation continues to unfold.

That desire to build, collaborate and manufacture may have started in Bill Hewlett and Dave Packard’s garage, but it is now actively underway at our offices across the globe, in our formal research and development programs, and in our grassroots Maker Communities (read this issue’s Maker’s Spotlight for a behind-the-scenes look into the HP Maker movement.)

So how do we keep that spirit alive at work, at home, in our schools, and around the globe?

Timing is everything

Added bonus makers rule: Grab a lucky charm, because being a successful maker means having a little luck.

A creative spark, passion and ingenuity are important, but timing is everything. Being able to take advantage of the moment when the time is right, the tools are there, and the path to delivering new innovations becomes accelerated, is key.

Consider this example of timing and opportunity. Thomas Edison was able to take a 50-year-old idea of the light bulb and create not only incandescent electric light, but also an electric lighting system that contained all of the elements necessary to make the incandescent light practical, safe, and cost-effective. This would not have been possible if in that same time period the parallel circuit, a durable light bulb, an improved dynamo, the underground conductor network, the devices for maintaining constant voltage, safety fuses and insulating materials, and light sockets with on-off switches where not also available.

The technology planets were aligned at just the right moment to turn a spark of ingenuity into a game changing invention.

A global phenomenon

Those sparks of ingenuity can occur at any time, anywhere and sometimes to multiple people. That’s why Nobel Prizes are often shared for inventions happening simultaneously at different places in the world.

A hackathon in Palo Alto and a hackathon in Taipei can generate the same great output even though they are staged in different locations with different perspectives.

Sometimes a maker’s inspiration can occur out of necessity. India has the concept of Jugaad—an innovative fix or workaround. It could be the maker at home who develops a novel way to air condition their house, create a shower head out of a water bottle, or build a water pump using the wheel of a motorcycle.

The spirit of Jugaad can be seen around the world, from the same principle of Jugaad, or the “why not” attitude. The spirit of Jugaad can be seen in the development of a simple answer to a complex problem—making it easier, faster and better.
globe. In Africa, bicycle operators who transport passengers from one border to the next have no way to charge their phones (which are the lifelines to their business) during the day. So Dominic Wanjihia, a recent Maker Africa Faire participant, developed a charging vest made with a flexible solar panel. This way the bicycle operator is generating power from sun-up to sun-down, an average of 12 hours a day, all while running his business.

Makers come in all shapes, sizes and professions.

The Japanese inspire maker ingenuity throughout their business organizations. The concept is called Kaizen—a system that involves every employee, from upper management to the cleaning crew. Everyone is encouraged to come up with small improvement suggestions on a regular basis. Toyota is most recognized for applying the Kaizen philosophy to manufacturing production.

But the Kaizen maker spirit can happen at any level and impact a business in various ways. In the 1950s the El Cortez Hotel in San Diego wanted to add an additional elevator for guests. The high-paid engineers hired by the hotel came up with a plan that would have required the hotel to close for a few months during the interior construction. That was until a janitor at the hotel offered up a simple and smarter solution to build the elevator outside of the hotel. The world’s first outside glass elevator allowed the hotel to remain open during the construction, alleviating concerns around lost revenue and jobs.

At HP we have embraced the Kaizen philosophy across organizations and roles. In fact, to reinforce our “everyone is a maker” philosophy we’ve been actively recruiting all types of employees into the MakerSpace Community. Recently our Boise, Idaho MakerSpace hosted a five-class series of events called “CD Clocks” during its grand opening week. Employees made their own CD clock with 3D drawn hands. This event was aimed at teaching employees how to use the MakerSpace’s 3D printing pens. There was a great turnout of local employees from all walks of HP life including janitors, administrative assistants, interns, engineers and their families. These HP Makers had a great time unleashing the artistic abilities they didn’t know they had, and christened the new MakerSpace.

Empowering the next generation of makers

We are still in the early stages of the maker’s movement. With increased focus in our schools and communities on advancement in science, technology, engineering and math (STEM), a growing emphasis on multi-disciplinary skills, accelerating technology innovation, and crowdfunded knowledge, we are empowering the next generation of makers to take their curiosity and creativity to a whole new level.

Young makers like Nicole Mendoza and Kimberly Veliz—creators of Slapband, a wearable wristband for monitoring health vitals including blood pressure—are able to prototype and bring products to market faster than ever before.

The sky is the limit for this new generation of makers. Our “hands-on” attitude of the past can be our future, by allowing students to tinker from an early age, gain a full appreciation of the fundamentals, while promoting the next wave of technologies. With the potential to transform industries and create new markets, it will be exciting to see where these makers take us—and what technologies we can provide to help them to reinvent the future together.
I started Shapeways in March 2007, with the vision of building a platform that would enable people to make amazing products using 3D printing. I felt we could change the game, and help realize the potential of digital manufacturing.

We launched our service in July 2008. It was a big undertaking because 3D printing was initially used for prototyping: built for engineers, by engineers—and we were using it to make final products. In doing so, we encountered some big challenges: the cost was too high, the machines were not really suited for the job, and the production lead times too long. I figured we’d find issues, provide feedback to the 3D printing companies building the machines, and that they’d improve their machines accordingly. Unfortunately, that didn’t happen—-at least not fast enough. For six or seven years after our launch, the technology didn’t improve much.

In July 2014, I had a phone call with Steve Nigro, now President of the 3D Printing Business at HP. He told me HP was working on a new type of 3D printer built specifically for manufacturing, able to deliver products at lower cost, higher quality, and far greater speed than existing printers.

I’ve seen early prototypes of the HP Jet Fusion 3D Printing Solution, and it is heading exactly in the direction the Shapeways community and consumers have been asking for. The new HP machine enables us to significantly lower lead times and decrease costs while offering improved quality of products. In the near future, it will even allow us to deliver full-color plastic, which will be widely embraced because our community who frequently uses plastic for board game figurines, Internet memes and scale models.

Speed, color, quality: driving 3D into the mainstream

This speed breakthrough can play a huge role in the adoption of 3D printing for consumer products. People are used to the instant gratification of retail. Even with e-commerce you can generally get your order fulfilled in a day or two. With a substantially faster printer, we can offer more competitive 2-day service. And we’re exploring the logistics of even offering a same-day service.

Full-color printing will be a huge development, making it easy to add color, type, and pictures to customize existing products. Adding a picture to the back of a smartphone case or printing scale trains in full-color are both perfect examples.

Materials quality and variety will expand with the new printer, as well. The model coming this fall works with nylon, but HP has a roadmap for multiple types of plastic and other materials including ceramics. HP has an open-material platform, meaning anyone can develop their own material and use it on the machine. Another exciting development, I think, is HP’s work on conductive pathways, so you can make your own electronics. This will open a whole new field of creativity, as people can print and embed RFID chips, antennas, power leads, and other elements into their products.

Creative confidence is an additive process

Shapeways is a platform that enables people to make products they want. We provide feedback and inspire people by showing them the enormous range of products Shapeway community members are creating: from scale trains, puzzles, board game characters to beautiful earrings, rings and even coffee cups. We support all major 3D design software and operate on open standards, to ensure that sure all the content people want to print will be compatible. Through our partnership with HP and others, Shapeways is building a network for digital manufacturing around the globe to bring manufacturing closer to the end user, getting it into peoples’ hands more rapidly. Makers can produce in small quantities, test, iterate, and create many specialized products. It’s a huge departure from the days of mass manufacturing with its high cost of entry and hit-or-miss inventory.

With technology like the new-gen 3D printer, and the contributions of an enormous open source maker community, I think the variety and sophistication of products we use in the future will vastly increase. Together, we are fueling creativity at a massive scale.
Bringing sustainability full circle

How HP is reinventing the way its products are designed, made, used, and regenerated

by Stuart Pann, Chief Supply Chain Officer, HP; Nate Hurst, Chief Sustainability and Social Impact Officer, HP; Chandrakant D. Patel, Senior Fellow and Chief Engineer, HP
On August 8, 2016, viewers around the world watched as swimmer Ryan Murphy of the U.S., weightlifter Sukanya Srisurat of Thailand, and marksman Niccolo Campriani of Italy set Olympic records during the Games in Rio. While millions saw the competitions, most didn’t notice another, more significant record that was set that day. According to the Global Footprint Network, August 8 represented this year’s Earth Overshoot Day—the day on the calendar when humankind has used all the renewable natural resources that the planet can replenish in a whole year. What’s even more disturbing is that this year’s milestone occurred four months earlier than it did three decades ago in 1981.

The Global Footprint Network has calculated that today it would take the natural resources of 1.6 Earths to sustain all the demands of humankind, and that carbon emissions account for 60 percent of humanity’s demands on nature. And the problem is expected to increase, as the UN estimates the world’s population to surge from 7.3 billion to 11.2 billion by 2100. These statistics highlight why governments and companies like HP are committed to taking action to lower greenhouse gas emissions in support of the UN’s climate agreement signed in Paris in December 2015.

HP has long recognized the need to analyze the impact that our company, and the products and solutions we build, have on the planet—and work to reduce that impact. All while creating solutions that make the world more sustainable. Our sustainability strategy integrates the environment, society, and integrity into what we do and deliver every day.

- Conducting business and engineering solutions to the highest ethical principles, such as adhering to strict, industry-leading standards that protect workers throughout our supply chain.
- Carefully choosing the materials we use in our products as well as those we don’t.
- Developing solutions that perform efficiently and effectively throughout their entire lifecycle.
- Creating solutions that empower people around the world to do amazing things that make life better for everyone, everywhere.

This work is core to HP’s business strategy and contributes directly to our customers’ success. As HP President and CEO Dion Weisler has stated, “We believe sustainability is a powerful force for growth and innovation, at HP, sustainability serves as a guiding principle for how we conduct business and create solutions that are changing the world.”

—Dion Weisler, President and CEO, HP

The HP’s focus on sustainability includes: Environment Improving the environmental performance of our customers, operations and supply chain. Society Strengthening our communities and enabling the sustainable development of society. Integrity Acting with integrity and respect for human rights around the world.

At HP, sustainability serves as a guiding principle for how we conduct business and create solutions that are changing the world.

Innovating using our core capabilities

For many people, recycling is the simplest circular economy concept to understand. The notion that everyday products, such as soda bottles, can be collected, recycled, and turned into new bottles is pretty straightforward. But
recycling products, such as PCs, printers, or cartridges, is more complex.

HP has been a recycling leader for decades, developing innovations that enable us to reduce our products’ environmental impact and meet our customers’ demands to reduce waste. For example, 25 years ago the company launched the HP Planet Partners return and recycling program. Through this program, we have collected more than 3.3 billion pounds of hardware and supplies—the equivalent weight of more than 150 Eiffel Towers.

HP Planet Partners facilitates another ground-breaking innovation—our closed loop recycle program that allows us to use millions of pounds of plastic to create original ink and toner cartridges. Through this program, we have manufactured more than 3 billion ink cartridges using more than 177 million pounds of recycled content material—including returned cartridges, more than 3.3 billion plastic bottles, and 50 million apparel hangers. Today we are helping divert on average more than 1 million plastic bottles per day from landfills.

But the circular economy is about more than just recycling. For HP it means extending the life of our products by creating modular designs that are easy to maintain. A prime example of this design philosophy is the HP Elite x2 1012 G1 tablet, which comes with online repair documentation and readily-available parts. The tablet is so easy to service, that ifixit.org gave the system its highest repairability score, 10 out of 10.

Meeting growing demands

That same innovative spirit can be seen in our service-based solutions, which are helping customers save money and lower their environmental impact. Solutions such as Managed Print Services (MPS) and Device-as-a-Service provide customers with access to the latest technologies, allowing them to scale up or down as their business grows or shrinks and ensuring that resources are not wasted through equipment reuse, refurbishment, or recycling. For example, MPS customers can see up to a 40 percent reduction in printing-related energy usage and paper waste reductions of 20 percent or more.

Similarly HP Instant Ink, a consumer-based subscription service, reduces costs by up to 50 percent, while ensuring that customers never run out of ink at the wrong time. Through this service model, ink subscription printers use up to 67 percent less materials per printed page than conventional business models.

And as we adapt our business models, we keep the environment in mind. For example, while we continue to reinvent printing, we also recognize the increased importance to source paper responsibly. This is one of the reasons that in June 2016, we set a goal to meet our objective of zero deforestation, in which all HP brand paper and paper-based product packaging will be derived from certified and recycled sources by 2020.

Circular economy supports HP’s strategy

HP believes that by reinventing how they make, use, and regenerate technology—businesses, communities, and individuals can thrive. HP’s approach to the circular economy—one in which we build on our industry leadership in environmental design, materials innovation, energy efficiency, and product reuse and recycling—is one way to help both HP and customers meet their business and environmental objectives.


Reinventing the future of computing today

And HP will continue to innovate with disruptive technologies such as 3D printing that will transform how whole industries work. For example, using 3D printers to manufacture spare parts or fully assembled products, companies will be able to perfectly match supply with demand. This will reduce waste and the need for physical inventories of thousands of parts and products that are stored for later use—or worse never used at all.

Stuart Pann is the Chief Supply Chain Officer at HP. He is responsible for the global strategy of manufacturing, procurement, partnerships, and product and supply chain sustainability and compliance for every HP product.

Nate Hurst is the Chief Sustainability and Social Impact Officer at HP. He has 20 years of professional experience in environmental sustainability and social innovation working in the private, public, and non-profit sectors.

Chandakant D. Patel is a distinguished Senior Fellow and Chief Engineer at HP. In 2014, he was inducted into the Silicon Valley Engineering Hall of Fame.

1 Packaging is the box that comes with the product (including all paper and materials inside the box).
FEATURED ARTICLE

Design for innovation

HP Labs keeps exploring new experiences

by Mirjana Spasojevic, PhD, Head of Immersive Experiences Lab, HP;
Alexander Thayer, PhD, Senior Manager of Immersive Experiences Lab, HP
Invention defines HP, and the 50-year history of HP Labs exemplifies the kinds of research projects that result in market-changing innovation. The light-emitting diode (LED), the handheld scientific calculator, and inkjet printer technology are among the results of HP Labs research and development efforts. And after 50 years, HP Labs is as vibrant and innovative as ever.

HP Labs was the brainchild of Bill Hewlett, Dave Packard, Barney Oliver, and others who had a vision for the future of technology. This vision was not constrained to humanity either. When Barney Oliver retired from HP, he helped lead the search for extraterrestrial life as senior manager at the SETI Institute. Clearly these technology leaders had potent visions of the future, visions that they believed Labs could help HP achieve.

But as a company that prides itself on invention, HP must also demonstrate innovative user experiences. The HP mission is to engineer experiences that amaze, while the HP vision is to create technology that makes life better for everyone, everywhere. Both of these statements describe the tremendous importance that HP has placed on end-to-end experiences that provide real customer value.

**Bridging the social and the technical**

Enter the Immersive Experiences Lab. The members of this Lab design for innovation by considering people first. The Lab’s mission is to understand people and their practices in order to craft the best experiences with future technologies. The Immersive Experiences Lab exists to understand and fulfill the promise of valuable, delightful experiences through data-driven, user-focused solutions.

“Real life is messy and part of our job here at HP Labs is to make sense of the mess so we can help improve people’s lives.”

—Mirjana Spasojevic
Head of Immersive Experiences Lab, HP

Mirjana Spasojevic, PhD is the driving force behind the Immersive Experiences Lab. She is a tech industry veteran who leads the Lab, and who previously worked for HP from 1995 to 2005. She rejoined HP in 2015 after co-founding Kindoma, a company that enabled children and grandparents to read and play together even when they were apart. She also founded and directed the IDEA team at Nokia Research Center in Palo Alto, a team that developed ground-breaking ideas in augmented reality and mobile technology.

The Immersive Experiences Lab works inside HP to drive the “people first” message in a variety of ways. For example, the Lab hosted industry experts from People Rocket who led a design thinking workshop for members of the Office of the CTO. The first workshop was all about helping a diverse audience learn more about user-centered design. The response was extremely positive: Participants got their hands dirty with prototyping materials as they became familiar with some of the methods that members of the Lab use on the job. The Immersive Experiences Lab also worked through follow-up sessions to explore new ideas, some of which led to field studies of novel technology concepts that will be described in future issues of this Journal.

**Working with the best and brightest**

The Immersive Experiences Lab has an all-star team of designers, researchers, prototypers, and free thinkers who push the boundaries of what HP can do next. Lab members are trained to look several years ahead and design the interactions and experiences that people will want to have with new technologies. Megatrends and signals of what lies ahead from a technology perspective inform research perspectives.

However, researchers cannot simply ask people, “How much virtual reality will you want in the year 2026?” Instead, Lab team members apply tried-and-true methods and techniques to dig into the details of people’s lives. The results of those inquiries drive design decisions about next-generation interactions and experiences.

Specifically, they use various qualitative and quantitative research methods, cutting-edge design skills, and a mix of modern and traditional prototyping techniques. Lab members develop these skills through academic programs that focus on human-computer interaction (HCI), user-centered design, and other related disciplines.

For example, the Human Centered Design and Engineering (HCDE) department at the University of Washington teaches a variety of courses on HCI design and research. These courses teach critical skills such as how to conduct ethnographic field research, how to design and run interviews, and how to analyze different kinds of data. Alex Thayer, PhD is the Senior Manager of the Immersive Experiences Lab and an HCDE PhD graduate, while summer intern Mia Suh is entering her fourth year in the HCDE PhD program.

Tight connections with academic programs and professors provide a vital way for the Lab to stay ahead of the technology curve. By sponsoring the annual CHI conference in 2016, the Lab became even more visible beyond HP. CHI is one of the premier venues for professors, students, and industry experts alike to publish and discuss their work. The Lab worked together with the HP Sprout organization and ran
a booth throughout the conference, which drove significant interest in Sprout as a tool for academic research labs.

The day after CHI, the Immersive Experiences Lab hosted an all-day summit at HP for a select group of “VIP” guests from academia. The summit included a tour of the Customer Welcome Center, presentations from key HP technologists, and invited talks from the distinguished guests. The sessions included a live demo of the ShareTable application (pictured below), which uses Sprout to connect people across distances more effectively. By the end of the summit, the professors and students who attended had a clear understanding of why HP is uniquely poised to deliver on the promise of a Blended Reality future.

Understanding people to drive business value

The members of the Immersive Experiences Lab understand the value of being connected to the latest developments in the academic world. However, they also understand how to help HP succeed by applying radical ideas and cutting-edge techniques on the job. Patents and publications are important products from an industry research lab. But the Lab also works with HP business units to drive results. What makes this Lab special is the focus on people first. Rather than starting with a promising technology and finding applications for it, the members of the Immersive Experiences Lab ask questions about how and why real people might benefit from new tools, new interactions, and new devices. This means asking lots of “how” and “why” questions that illuminate interesting habits and beliefs, rather than asking “what” people might want to incorporate into their lives.

Importantly, researchers in the Lab conduct studies in the real world. They investigate how real people live their lives in all of their messy glory. Again, by starting with people and their practices, the Immersive Experiences Lab determines how technology can improve the lives of people around the world. As researcher and Lab member Mithra Vankipuram says, “We need to get out there, get our hands dirty, and really understand how people deal with all these technologies. We want to know how people handle it all.”

This is what it looks like to “design for innovation.” It requires empathy for real people, their real-world challenges, and how to resolve their pain points in innovative yet useful ways. It also takes years of experience to develop the sensitive observation skills required to translate information into insights. Basically, it takes a lot of hard work.

Exploring the “wacky edge”

As a result of placing so much importance on people first, the Immersive Experiences Lab is pushing the boundaries of what an industry research lab can study. The lab operates at the “wacky edge” of how humans and technology will coexist in the future. And it is certainly true that some Lab projects are quite unique.

For example, members of the Immersive Experiences Lab are currently exploring everything from new content creation tools in virtual reality to kinetic jewelry that can crawl across your clothing. This Lab has brought together an exceptional team of people who have the skills to answer this question, even in the context of jewelry that can crawl up your sleeve. But the Lab remains focused on a central question: “How could this idea improve people’s lives?”

Defining three areas of focus

The Lab leadership wrangles all of this potential chaos by focusing the team on three topic areas. The first area is “Shaping Future Experiences,” which is all about exploring next-generation interfaces and interactions with technology. For example, people are using so-called “chat bots” in a variety of ways today. Slack is popular partly because...
anyone with a phone can chat with a Slack bot and order food from Taco Bell, for example.

But the members of the Immersive Experiences Lab wanted to look beyond ordering tacos and consider what it means to shift from “device” to “contact.” In the print world, that shift could help people have timely, useful interactions with their printers. The Lab recently studied how people might interact with their printers using text messages as a more conversational way to connect. As Mithra points out, “We knew we were onto something when HP released the HP Print Bot while we were in the middle of our own study!”

The connection between labs and business units is extremely important, which is why the Lab presented their research on this topic to the Pilots and Incubations team within the HP Print business unit. A member of that team produced the HP Print Bot, which is built on top of Facebook Messenger. As their work in this area proceeds, the Immersive Experiences Lab has looked at ways to extend the value of products like the Omen X VR PC Pack. Original studies continue to generate valuable insights that the lab can bring back to business stakeholders, who recognize the significant benefits that can be drawn from these insights.

All of these threads come together because the lab members have a knack for spotting and hiring top talent and eager collaborators. With a team of diverse, talented people as well as top-flight interns from around the world, the lab is working hard to drive real results that matter to the rest of HP.

Inventing the future of experience

So what’s next for the Immersive Experiences Lab? Without revealing too much right now, it is safe to say the future is a fascinating playground for radical explorations. Future editions of this journal will showcase exciting projects and innovations from the Immersive Experiences Lab as its members tread that “wacky edge” between what is technically possible and what is actually helpful to real people.

As we look back at 50 years of HP Labs, it is important to emphasize the continued relevance and value of HP’s investment in HP Labs. Not long ago, Labs inventions such as LED and the pocket-sized calculator seemed like pure science fiction. HP clearly depends on Labs to help invent the future, which means the members of HP Labs continue to share research results and insights with business owners and stakeholders. HP needs to address the markets of today as well as the markets of the future. The internal partner- ships between HP Labs and business owners are crucial to the success of HP, and to the continued relevance of HP Labs as a potent driver of applied innovation.

To learn more visit: http://bit.ly/ij4_immExp

Mirjana Spasojevic is Head of Immersive Experiences Lab at HP. She is a recognized expert in Human-Computer Interaction and Ubicomp, and has a PhD in Computer Science from Penn State University.

Alexander Thayer is Senior Manager of the Immersive Experiences Lab at HP. He has a PhD in Human Centered Design & Engineering from the University of Washington, and is a 20-year veteran of the tech industry.
PARTNER CORNER

Eat change for breakfast, opportunity for lunch

HP Channel Partners transformation

by Jon Flaxman, Chief Operating Officer, HP; Jos Brenkel, Global Head, Sales Strategy and Operations, HP; Vincent Brissot, Global Head of Channel Marketing & Operations, HP

HP Channel Partners around the world are navigating change in their business. No industry is immune to disruption, and no business can risk standing still as global innovation radically transforms the landscape. The evolution of HP’s own channel program dramatically strengthens our ability to support partners in healthy growth, rapid decision-making, and deeper customer relationships.

And, as more and more business activity moves into the digital and social realm, the sales landscape is changing dramatically. A recent Forrester report projected that $1.1 trillion in business-to-business sales will be conducted online by 2020. This is a massive shift, and the options available to businesses are clear: adapt or be prepared to lose valuable market share.

Customers today expect the companies they do business with to be more engaged, efficient, and consistent across every sales interaction. Business leaders are increasingly aware of the strategic importance of their technology infrastructure decisions. Technology providers are becoming trusted advisers, helping customers invest wisely to compete in a shifting landscape. Transactional sales may be the foundation of a partner’s business today, but opportunity for growth lies in deeper, more solutions-oriented customer relationships over time. This is essential to growing existing customers and attracting new ones.

HP Partner First: a name to live up to

Entering 2016 as a new company, HP strived to enable partner success by being first in driving growth and profitability, first in speed and agility, and first in simple and consistent operations. The HP Channel leadership, took the opportunity as a new company, to implement program improvements aimed at making it easier for partners to align to the program that best suited their business needs—providing a clear path for growth, while at the same time retaining much of the solid, core compensation model and membership structure partners have come to know. We made a commitment to being first and best in the
industry at helping partners deliver value to their customers, grow profits, and maintain momentum in transactional sales while moving toward more contractual business.

The three cornerstones of our redesigned channel program, HP Partner First, Focus on Sales (driving partner growth and profitability), Speed (immediate access to decision-making tools, information and sales resources), and Simplicity (streamlined operations across markets and geographies).

According to a recent report from Boston Consulting Group studying the most successful companies worldwide, embracing technological advances was the single most important factor driving innovation in the most successful companies.

It’s an omni-channel world

What if you could clone your best sales rep to be everywhere at once, with instant access to all the information and tools they needed? When sales was largely a face-to-face affair, this was little more than a dream. In today’s connected and virtualized world, a world class sales experience can—and arguably must—be available to your customer, wherever they seek you out.

In recent years, sales-enabling technology and dramatic changes in the purchasing journey have rewritten the rules for sales organizations.

Business-to-business customers research, compare and buy products and services from multiple channels. They expect that any vendor they buy from will deliver a consistent sales experience across all channels—in the physical or online store, in the chat room, on the phone, or in person. Your sales rep and customer service agents need to access and present decision-making information, made consistent real-time via back-end integration.

In an omni-channel sales environment, a virtual sales force is key. Demands on the sales force are greater—but so is the opportunity to deliver excellence at scale.

HP Sales Central is built for the omni-channel world. Channel sales teams enjoy simple, quick access to the same array of marketing and sales resources we provide our own sales teams. Tools include a new resource called Social Media Center, a variety of case studies, and a tool called Presentation Builder. Social Media Center enables partners to easily connect and share thought-leadership content with their customers through Facebook, Twitter, LinkedIn and other social vehicles. And, the case studies, ies and Presentation Builder both allow sales teams to quickly and easily build customized marketing presentations linked to topics covered in the social world and that their customers are discussing today—enabling them to address their customers’ unique and most pressing IT challenges.

The early results show promise: sales people using Social Media Center see profile visits increase by up to 3000 percent... yes, that’s 3000 percent!

Innovating from the inside out

Some organizations within the enterprise may not see themselves (or are not perceived) as innovators, because they are not engaged in “visible innovation.” Visible innovation often takes the form of new products or services springing from R&D that are easily understood and promoted. Invisible innovation is an unsung hero of business transformation. It’s about inventing new business processes, retooling for new demands and adopting new skills to become more competitive and create a better customer experience.

We’ve lived and breathed process innovation building the new HP Channels organization for the past 15 months. It’s true that some big challenges are created by disruptive technologies. It’s an equal-opportunity disruption, though, and as customers in every business look for help retooling to compete and thrive, our partners will depend on HP to help them deliver value. And we wouldn’t change that for the world.

Jon Flaxman
Chief Operating Officer
at HP leads the Strategy and Business Management team. He is responsible for Sales Strategy & Operations, Customer Support, Corporate Strategy, transformational initiatives and infrastructure.

Jos Brenkel
leads Global Sales Strategy and Operations across HP. Prior to this, he led Worldwide Sales for HP PPS after serving in geographies including APJ and EMEA.

Vincent Brissot
as Global Head of Channel Marketing, drives planning, development and execution of HP’s marketing initiatives—channel marketing programs, Market Development Funds (MDF), campaigns and metrics.
In 1985, Stephen Hawking—the famous English theoretical physicist, cosmologist, and author—lost his ability to speak following an emergency tracheotomy. Since then, Professor Hawking has relied on computer hardware that turns text into speech to be able to communicate.

At a conference in 1997, Intel’s co-founder Gordon Moore met the Professor and promised him that Intel would provide computer voice assistance and wheelchair control technology in perpetuity. Intel has been designing custom computer and audio systems for Professor Hawking’s wheelchair ever since.

The chance of a lifetime

In 2003, Ticky Thakkar (now Head of the Emerging Compute Lab and Chief Technologist of Personal Systems at HP), was Chief Systems Architect with Intel. Early that summer Ticky was contacted by Professor Stephen Hawking’s assistant about two issues with the Professor’s voice equipment.

The first and most pressing issue was portability. The voice equipment was bulky and was powered by his wheelchair battery and various power supplies. Consequently, whenever he was away from the chair, he was without any means of voice communication. This situation was exceptionally acute when Professor Hawking had to fly for any length of time, as the wheelchair was stored in the hold of the airplane.

The second issue concerned the lack of replacement “current” technology for the hardware voice synthesizer. Professor Hawking’s distinctive synthesized voice had been created in the early 1980s by Dennis Klatt, an engineer at MIT, but in the intervening years since Professor Hawking began using his “CallText 5010” synthesizers, most of the electronic components were no longer being manufactured and Hawking’s three remaining voice synthesizers could not be repaired if they failed for any reason.

Over the next several months, Ticky’s team spent countless hours working on a variety of software solutions utilizing the latest technology. The majority of their time was spent trying to overcome the hardest challenge of all: reproducing Hawking’s signature voice.

Finally, after almost a year of effort, Ticky was ready to present his team’s work to Professor Hawking in person.

“Hello Ticky, nice to meet you. I am Stephen Hawking.”

Those were the first distinctive words heard by Ticky when he finally met Professor Hawking for the first time in the spring of 2004.

“I remember it as if it was yesterday,” Ticky recalled. “...sufficient decibels to be heard at a cocktail party—although perhaps not Glastonbury!” In response, David Rittenhouse and Travis Bonifield of Intel contacted Sound Research with a challenge: collaborate with Intel to create a far-field voice speaker that would: mount unobtrusively on Hawking’s existing wheelchair; be able to amplify Hawking’s voice at sound levels approaching 100 decibels, adjust the sound field to match Hawking’s exact audio quality “ear-tuning” requirements, project Hawking’s voice with a hemispherical dispersion pattern (or “2π”) and run using the same voltage as a PC. Without hesitation, Sound Research accepted Intel’s challenge.

Stephen Hawking masters his own voice

In 2013, Professor Hawking asked Intel to provide him with a next-generation, portable speaker design that would enable him to give understandable lectures to larger audiences, easily talk with friends and family at social gatherings, and provide (as Hawking later said to Tom Paddock, CEO of Sound Research) “...sufficient decibels to be heard at a cocktail party—although perhaps not Glastonbury!” In response, David Rittenhouse and Travis Bonifield of Intel contacted Sound Research with a challenge: collaborate with Intel to create a far-field voice speaker that would: mount unobtrusively on Hawking’s existing wheelchair; be able to amplify Hawking’s voice at sound levels approaching 100 decibels, adjust the sound field to match Hawking’s exact audio quality “ear-tuning” requirements, project Hawking’s voice with a hemispherical dispersion pattern (or “2π”) and run using the same voltage as a PC. Without hesitation, Sound Research accepted Intel’s challenge.

Tom had been working on a next-generation portable speaker with HP’s Jon Dory, Program Manager, called “HP Roar+™” which featured Sound Edge™ tuning and smart amplifier optimization.
Sound Research achieves Hawking voice loudness goal with excellent clarity at 99.7 dB.

software running on the HP chipset. This technology could be easily ear-tuned by Professor Hawking to his own sonic tastes in real time. The main challenge was reaching Hawking’s 100 decibel loudness level, portability requirements, and wide voice dispersion angle (or “2π”) goals.

Dr. Charles Chin, Senior Audio Architect for Sound Research, performed extensive power supply and custom processor modifications to the Roar+ system. Paul Kitano and Kristin Kosak, Sound Research Audio Systems Engineers, doubled Roar’s two speakers to four to achieve Professor Hawking’s far-field loudness requirement and Dave Rittenhouse created a speaker industrial design to achieve Professor Hawking’s 2π dispersion goals. Their efforts paid off; Professor Hawking’s 2π voice speaker now measured 99.7 decibels at 0.5 meters with exceptional far-field vocal clarity and 2π sound field dispersion. Combining the HP Roar+ technologies with updated industrial and acoustic designs from Intel and Sound Research, Hawking’s 2π voice speaker was quite loud at a great distance and over a wide sound stage. The speaker was now ready for Professor Hawking’s ear-tuning.

Tom and Sue Stallcup, Administrator for Sound Research, traveled to Cambridge, UK to meet with Professor Hawking and his local support team which included Jonathan Wood, Teaching Assistant to Professor Hawking, and Mark Green, Technical Marketing Engineer for Intel Corporation. Two PC computers were connected to Professor Hawking’s 2π voice speaker. One computer adjusted the Sound Edge® and smart amp optimization software to Professor Hawking’s exact sonic taste. The other computer adjusted the smart amplifier with custom HP speaker drivers. Professor Hawking supervised the ear tuning session by advising our team as to his perception of the 2π voice speaker’s tonal balance and overall loudness, although Hawking’s high frequency perception was challenged by an ear infection during our tuning session.

Later on, when Professor Hawking recovered from his ear infection, his aide requested that Sound Research set up a second ear-tuning session in Cambridge. Dr. Chin traveled from Taipei City, Taiwan to Cambridge, UK to readjust the tonal balance for the 2π voice speaker.

The next challenge

The tuned 2π voice speaker was installed onto Professor Hawking’s wheelchair. Unfortunately, an electrical hum from the wheelchair system was amplified by the voice system. After Paddock added a Jensen isolation transformer and Canare Star-Quad audio cabling to decouple the noisy audio system components, the hum completely disappeared from the voice speaker. Paddock had previously designed similar circuits for the Grateful Dead’s Jerry Garcia and Bob Weir as well as for Mickey Hart’s percussion instrument known as “The Beam.”

A unique experience

In the summer of 2016, Ticky and Tom met for the first time. As they swapped stories and learned of each other’s efforts over the years to help Professor Hawking, a bond formed. “Ticky and I have had a unique set of experiences,” said Paddock. Both men agreed that giving Professor Stephen Hawking a clear, portable voice was one of the most challenging and rewarding tasks they had ever undertaken.

So what’s in the technology future for Stephen Hawking?

Professor Hawking’s 2π voice speaker algorithm running in legacy voice synthesizers since the 1980s was transferred to a pure software algorithm running on an Intel processor within a PC. This upgrade, along with the ultra-tunable and portable Reality Amplifier system, designed by Sound Research’s Dr. Chin, Paul Kitano and Kristin Kosak, will eventually provide Professor Hawking with his distinctive voice in a fully-portable system that will allow him to communicate without requiring his wheelchair.

Intel is now making Hawking’s voice technology available to the public. This technology is called “Assistive Context-Aware Toolkit” or ACAT.

Intel decided to make the source code freely available so that anyone with a Windows PC and a webcam for tracking facial movements can modify the code in an effort to help Professor Hawking and others with similar disabilities. Ticky and Tom have shared important contributions toward the evolution of ACAT technology from the early days of “walled garden”, one-off hardware solutions of the 1980s to the PC-enabled, Windows-based programmable solutions of the 1990’s and early 2000’s, and finally to today’s “open source” development environments—making possible rapid, differentiated, and powerful solutions to address disabilities in the future.

“Our hope is that, by open sourcing this configurable platform, developers will continue to expand on this system by adding new user interfaces, new sensing modalities, word prediction, and many other features” said Sai Prasad, Intel’s Program Manager for ACAT.

Ticky Thakkar is Head of the Emerging Compute Lab, Chief Technologist of Personal Systems, and an HP Fellow, leading efforts relating to the convergence of technologies and bringing customer insights and new thinking into product development efforts.

Tom Paddock is CEO at Sound Research Corporation, and has 40 years of experience in audio product architecture and audio software design. He has designed hundreds of audio products. See more at www.soundresearch.com.
Transforming the medical diagnostic experience with EchoPixel

Despite being one of the most complex fields in the world, the healthcare industry shares one unifying goal: improving patient outcomes. That means helping folks get better, faster, with as little disruption to their daily lives as possible. It’s a lofty, often elusive aspiration. Innovations in medicine are powered by this goal, and they lead to such impactful technologies as the brain scan and the pacemaker.

Every day, healthcare professionals and companies are exploring uncharted territory, but you’d be surprised by how difficult it can be to push new innovations through. The majority of medical imaging, for example, still requires that doctors imagine what a patient’s insides look like, as they mentally piece together hundreds, sometimes thousands of 2D images taken from MR and CT scans. It is a taxing, tedious process—and it’s far from perfect.

HP has partnered with EchoPixel to pioneer a potential solution to this problem, using EchoPixel’s cutting edge virtual reality imaging and HP’s leading virtual reality technology. Virtual reality is hugely popular at the moment, especially in entertainment. But EchoPixel—a startup based in Silicon Valley—saw beyond these applications, and adapted the technology for a totally new purpose: medical imaging.

EchoPixel’s technology turns standard medical scans (think: CT or MRIs of your brain, heart, or colon) into lifelike, interactive virtual reality scenes. When viewed, the images appear to float in midair, in full 3D form. It feels a bit like Star Wars, but the potential impact for medical professionals is enormous.

EchoPixel found an ideal partner in HP, a leader in hardware and Blended Reality, with one of the most advanced virtual reality display technologies on the market. By combining EchoPixel’s technology with HP’s Zvr Interactive Virtual Reality Display and workstation, the two companies now offer a complete system that is positioned to revolutionize patient care.

Using the True 3D and HP Zvr system, doctors can actually practice. They can cut, turn, and dissect images as if they were real human tissue. The technology can be used to help plan surgeries, identify internal conditions, and better understand patient anatomy. Dr. Judy Yee, MD, Vice Chair of Radiology and Biomedical Imaging at UCSF, proclaimed that she hadn’t seen a game changer like this in a long time. Another surgeon specializing in image-guided surgery told us that “half the time I am guessing” when navigating 3D anatomy using 2D images.

EchoPixel has partnered with HP to accelerate the adoption of this technology in clinical and research settings worldwide. HP’s established relationships open up a significant distribution channel, allowing EchoPixel to reach even more sites where they partner with medical professionals to conduct clinical trials and research. Now it’s being tested in everything from aneurysm treatment, to heart surgery, to medical education and research. By coming together, HP and EchoPixel have brought us one step closer to a world where communication is easier, diagnoses are more accurate, and, most importantly, patients are healthier.
**SPECIAL REPORT**

**HP steals the show at Panorama!**

The ultimate integrated experience powered by HP

The first festival of its kind, Panorama’s emphasis on linking technology with creative industries such as music and art has pushed forth more innovative thinking. Laden with HP technology infused installations, HP technology is inspiring and enabling young creators to do things they could not have done before.

The festival, which is in its inaugural year, takes its name from the Panorama of the City of New York, a nearly 10,000 square-foot-to-scale model of the city located in the Queens Museum.

The ancient Greeks thought that both divine intervention and a collection of female muses inspired the creation of poetry, music and art. Today, we at HP believe that technology can inspire creativity at the deepest level, enabling consumers to channel their innate drive to seek out novel sensory experiences and make new things.

That was the idea behind the spectacularly successful special showcase called The Lab at this summer’s Panorama music and art festival, held July 22–24 at New York City’s Randall’s Island Park.

**The Lab**

Presented by The Verge and powered by HP, The Lab—described as a “playground of music and technology”—was comprised of three elements: a façade, the exhibition space and a massive dome that housed a 360-degree virtual reality theater.

The façade—a geometric architectural marvel by day, and a mind-blowing ultra-high-definition projection-mapped experience by night—encompassed the entire exterior of The Lab creating a sense of mystery and intrigue which served to heighten the visceral experience for the attendees by creating a visual journey throughout the festival. Volvox Labs, a new media design studio working at the intersection of the digital and the physical, used HP Z Workstations to create the generative projection-mapped content.

The exhibition space was shared by, ‘The museum of Reinvention’, a group of seven interactive installations created by New York-area artists, and four HP branded experiences. The seven artist installations, powered by HP, skillfully combined technology, artistry, interactivity and design. Artists who designed the installations included Emilie Baltz, Future Wife, Dave & Gabe, Gabriel Pulecio (AKA Lustix), Mountain Gods, Red Paper Heart, and Zachary Lieberman.

The HP branded experiences included interactive stations where festival-goers received hands-on experience with HP’s most innovative products, including the company’s high-performance computing products—HP Z Workstations—used by Volvox Labs to create the generative projection-mapped content.

“The relationship between art, music and technology is blurring in ways unimaginable. HP is helping creators push the boundaries of innovation and art—and our core technology is enabling these artists to create things they could have not done before by turning inspiring ideas into reality and ambitious challenges into memorable achievements.”

—Antonio Lucio, Chief Marketing Officer, HP

HP brought the ultimate integrated experience to life at Panorama NYC, a music and art festival.

A festival goer explores the interactivity of HP Sprout

The relationship between art, music and technology is blurring in ways unimaginable. HP is helping creators push the boundaries of innovation and art—and our core technology is enabling these artists to create things they could have not done before by turning inspiring ideas into reality and ambitious challenges into memorable achievements.”

—Antonio Lucio, Chief Marketing Officer, HP
The Museum of Reinvention

Artist: Dave & Gabe
Experience: ‘Hyper Thread,’ consists of 7 silk suspended “cocoons” and each acts as interactive AV musical instruments that users can play by sitting in or touching.

Artist: Emilie Lucie
Experience: ‘Cotton Candy Theremin,’ a cotton candy spinning performance at the intersection of food, design, performance and technology.

Artist: Mountain Gods
Experience: ‘Gigantic Gestures,’ allows visitors to act as a giant hand using their entire body as an input device that interacts with a life sized touch sensitive phone.

Artist: Red Paper Heat
Experience: ‘Pinball Performance,’ allows players to step up and take control of the display to create.

Artist: Zachary Lieberman
Experience: ‘Reflection Studies,’ an installation by which guests can manipulate light patterns with a light table.

Artist: Gabriel Pulecio, Artist
Experience: ‘Infinite Wall,’ an interactive mirror wall equipped with a motion sensor, the sculpture can capture one or more person’s position triggering a ripple in real time response to the change of position generating ripple in the lights.

Artist: Future Wife
Experience: ‘Visceral Recess,’ will be created by installing an inflatable structure that encourages bouncing, hugging, rolling and squeezing.
Artist: **Dave & Gabe**

Experience: *‘Hyper Thread,’* consists of 7 silk suspended "cocoons" and each acts as interactive AV musical instruments that users can play by sitting in or touching.

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Artist: **Emilie Lucie**

Experience: *‘Cotton Candy Theremin,’* a cotton candy spinning performance at the intersection of food, design, performance and technology.

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Artist: **Mountain Gods**

Experience: *‘Gigantic Gestures,’* allows visitors to act as a giant hand using their entire body as an input device that interacts with a life sized touch sensitive phone.

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Artist: **Red Paper Heat**

Experience: *‘Pinball Performance,’* allows players to step up and take control of the display to create.

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Artist: **Gabriel Pulecio, Artist**

Experience: *‘Infinite Wall,”* an interactive mirror wall equipped with a motion sensor, the sculpture can capture one or more person’s position triggering a ripple in real time response to the change of position generating ripple in the lights.

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Artist: **Future Wife**

Experience: *‘Visceral Recess,’* will be created by installing an inflatable structure that encourages bouncing, hugging, rolling and squeezing.

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Artist: **Emilie Lucie**

Experience: *‘Cotton Candy Theremin,’* a cotton candy spinning performance at the intersection of food, design, performance and technology.
lineup of Workstations, its Premium family of laptops and Sprout by HP, a fully integrated desktop 3D scanning solution that lets you grab something from the real world, manipulate it in the digital world, and bring it to life in physical space.

The massive 70-foot dome enclosed a fully immersive, 360° 4k screen that surrounded up to 400 festival attendees at a time in a soul-shaking experience that included artist creative content as well as a NASA video that concluded with the phrase, ‘NASA is sending 120 HP Zbook workstations to the international space station.’ Invisible Light Network and Dirt Empire produced the immersive video experience using HP Z840 workstations, ZBook Ultrabook Mobile Workstations and HP Dreamcolor 30” displays.

Local students design event wristbands

HP partnered with a group of artistic-focused students to introduce them to Sprout through a “create-a-thon” to design the exclusive wristband given to festival goers who participated in the Lab activation. Each day, a new band design granted access to the HP VIP Auxiliary Space.

Bronx Academy of Letters (grades 6-12) is located in District 7 in the South Bronx, an area with few, if any affluent residents, The Bronx is the city’s poorest borough, with 94 percent of students living in poverty.

All participating students were invited to attend Panorama, see the winning wristbands in action and enjoy the live music—an opportunity that was completely unique and special for these kids who ordinarily wouldn’t be able to afford this experience.

This contest was an amazing way to incentivize students to get their hands on Sprout and a great opportunity to learn what functions and capabilities are resonating with the kids to enhance future education-based activations.

An event to remember

Panorama was the first sponsorship of this type for HP. With festival attendance of over 100,000 (over 24,000 festival goers enjoying the interactive and immersive experiences in The Lab), the event was a great success. With HP experiencing a significant response to its social media efforts. Over 21 million social media impressions were garnered from the festival; delivering ~438,000 engagements, a 2.1 percent engagement rate, and over 870,000 video views. Exposure of this type is important for a company which is reinventing its brand for a new generation of technology consumers, many of whom view their devices as integral to their creative sides.

As the exclusive technology sponsor, HP had the opportunity to connect with consumers directly and offer up a surprising new experience with the brand. Panorama was a key venue to show the world how HP is reinventing itself and focused on making innovative, immersive and impactful experiences through its technology.

“This program is about emotional connections and a reassertion of HP’s place in the market,” said Antonio Lucio Chief Marketing and Communication Officer, HP. “We are inspired by the opportunity to reinvent this iconic brand.”
SPECIAL REPORT

Printing peace: HP at the Olympics

During the 2016 Summer Olympics visitors were able to view the “Making Peace” exhibit in the metro stations of Rio de Janeiro, Brazil, with giant posters printed using HP technology.

12 August 2016


Three memorable glimpses of peace, reconciliation, democracy and justice—unforgettable experiences for those who lived them in the moment. And now unforgettable for many of us who didn’t, as well.

They are just three of 125 historic events and people from a century’s worth of photographs on display now in the General Osorio metro station in Rio de Janeiro, Brazil.

The photographs, accompanied by descriptions in several languages on large-format posters, comprise an exhibit called “Making Peace.” The exhibit has been hosted by cities around the world since 2010 and seen by an estimated 1.2 million people. Its timing during the 2016 Summer Olympics couldn’t be more appropriate.

The posters tell the stories of large and small peacemaking efforts toward conflict resolution, nonviolence, social justice, human rights, and sustainability—the five essential elements of peace, according to the International Peace Bureau, the exhibit’s sponsor.

Partners print posters for peace

Rio is the 11th host city of “Making Peace.” In every city, what brings the arresting images to life—and in nearly life-size format—is an HP printing partner and its HP Latex printer.

In Rio, HP print service provider Geka relied on its HP Latex 360 printer. The posters were printed on recycled paper with environmentally friendly, water-based HP inks. With HP Latex technology, the prints emerged completely dry for immediate lamination and same-day delivery to their venue. (The quality of HP Latex prints is so vivid, they’ve been known to go missing.)

The local Graphics Solutions Business (GSB) team worked closely with Geka, Metro Rio, and professional photographer and International Peace Bureau member Ashley Woods to get the posters mounted in time for the Olympics. Everything was ready to go by August 1, four days before the Opening Ceremony.

The Rio exhibit is unique in being the first on display in a metro station. Riders can view the photographs throughout the Olympics and until September 21, the International Day of Peace.

HP has been a sponsor of “Making Peace” since its 2010 debut in Geneva, Switzerland. After Rio, the exhibit will tour nine more cities before closing in Manchester, England, in 2018.

“We’re so proud to participate in the Olympic spirit in our own way and showcase HP Latex technology at the same time!” said Renato Barbieri, GSB country manager for Brazil.

Historic photos

The General Osorio metro station in Rio de Janeiro, Brazil during the 2016 Summer Olympics.
MAKER SPOTLIGHT

Roboheads unite

Creating a community for makers and robotics enthusiasts

The Maker Community has transformed the way people collaborate at HP, enabling them to innovate, build and allow employees to explore additional passions outside of their day jobs. Will Allen, HP Fellow, shares how the Maker Community has removed inhibitors to innovation and offered employees to gain new skills and experiences.

What does the Maker Community mean for innovation at HP?

It gives all HP employees greater access to innovation and group collaboration. Multiple sites have MakerSpaces with equipment so people can create and explore on their own. Thanks to HP’s enormous resources, we’ve been able to do some amazing things. The level of technology and people that we have access to is phenomenal, so it allows passionate people to come together to innovate.

The Maker Community provides a link into HP’s vast technical organization. It provides hands-on learning for local employees; and an opportunity for employees all over the world to volunteer and get involved in large-scale projects they might not participate in.

What project are you currently working on in the HP MakerSpace?

We’re exploring the possibilities of modular robotics. For example, one module could add a telepresence component. Telepresence robots allow you to be somewhere else. Instead of simply being a voice on the phone, you have coordinates in the room, a view of people’s facial expressions, and a better interaction.

Another module could be a pill reminder and dispenser, addressing the needs of the growing aging populations around the world and personal computers. In fact, we can use the motor system in a printer that moves paper to move the robot. It’s fun to take elements that we already have and put them together in a way that’s new to us to find a solution to improve people’s lives.

How does your maker spirit manifest itself in your everyday life?

I play bass guitar in a band and there are a lot of similarities between innovating at work and making music. When good musicians get going, one person will take a solo and the next person will take what they hear and incorporate something else and lift the song to a new level. In our Maker Community, people contribute and riff off one another to expand ideas and make better innovations.

What does Keep Reinventing mean to you?

Invention is standing on the shoulders of giants, and then you get to add another little layer or tile on the stack for somebody else. The innovative energy at HP is amazing, and I can’t imagine myself anywhere else. I feel like I’m sitting on top of an Apollo rocket going to the moon.

Visit HP CTO’s YouTube page: http://bit.ly/hpctoyoutube to learn more about the HP Maker Community and see Will and his fellow Makers in action.

To learn more visit: http://bit.ly/hpmakerspace
Almost 80 years ago, encouraged by their professor, Frederick Terman, and benefiting from one of the earliest exemplars of university-motivated “tech transfer”—Bill Hewlett and Dave Packard started what later became HP in a Palo Alto garage close to the campus of Stanford University.

As the company grew, HP strategically developed centers of engineering excellence in communities with a great “quality of life”, were welcoming of HP, and were also near universities and flight hubs. Examples of HP sites with strong university community relationships in the US include: Corvallis, Oregon State; Ft Collins, Colorado State; San Diego, UCSD and SDSU; and Boise, Boise State.

As Baghai et.al. described in their book “The Alchemy of Growth” innovation may be partitioned into three horizons of: <18 months (H1), 18-36 months (H2); and > 18 months (H3). In the context of university partnerships, H1 may be viewed as extending R&D capability (e.g. through sponsored research); H2 as exploration of new technologies (e.g. through membership in research consortia); while H3 is more about open innovation and imagining the future (e.g. through gift funded research).

HP University community relationships are strengthened by staff alma mater networks, input to curriculum, student project mentorships, internships, research collaborations, and business connections. Strategic HP-university relations boosts:

- R&D capability
- Talent acquisition
- Exploration of the future

Around the world, HP technical experts connect with university scholars to research problems of mutual interest. Collaborative research projects provide a fertile landscape for recruiting and complements internal R&D. University research labs complement HP resources and brings increased diversity to thought leadership. University ecosystems also provide an insightful view of the future through academic research and the early adoption and adaption of emergent technologies, processes, and applications by the student body.

In future issues of the Innovation Journal we plan to outline HP’s University strategy to:
- Leverage an internal “university relations” community to share best practices and results
- Complement internal R&D capability through university research partnerships
- Recruit the best university talent worldwide
- Learn more about future trends and emerging technologies

In the interim, for HP staff we welcome your participation in our internal “University Relations Social Network” on Yammer, and for both external and internal audiences, we draw your attention to our recently published paper at IEEE’s ICSE workshop on company–university collaborations.

Steven Fraser joined HP as Lead, Global University Programs in February 2016 and was previously the Director of the Cisco Research Center, a senior member of staff at Qualcomm’s Learning Center, and a senior manager of Nortel’s Global External Research Program. In addition to a year as a Visiting Scientist at CMU’s Software Engineering Institute (SEI) he has organized over 80 software engineering conferences, panels, workshops, and tutorials. Steven holds a doctorate in Electrical Engineering from McGill University in Montréal, Canada and is a senior member of both the ACM and the IEEE.
In the previous issue we highlighted the recent launch of HP Tech Ventures. As a follow-up, we recently sat down with HP’s Chief Disrupter, Andrew Bolwell, to learn more about the team’s focus and investment strategy.

HP Tech Ventures is focused on funding early-stage companies that are aligned with emerging technology areas that we believe will be the building blocks for the future, including: 3D transformation, immersive computing, Internet of Things, and smart machines.

According to CB Insights, venture capital funding rose to over $27.4 billion in the 2nd quarter of this year even with changes in valuations, and market uncertainties around Brexit and the upcoming U.S. presidential election. A quarter of that investment came from corporate venture capital, as startups look for the added value in manufacturing, supply chain, distribution, and go-to-market that corporate investors provide.

For HP the move into corporate venturing is a strategic, long-term play, as we leverage these investments to identify new, disruptive, and high-growth business opportunities for the company; as well as accelerate expansion into markets where we have an existing foothold.

“We are investing in tomorrow, and targeting early-stage startups, allowing us to get in at the ground floor,” shared Bolwell. “We intend to be active investors—working with these amazing entrepreneurs when they need help, and giving them full access to HP’s breadth of resources.”

HP’s initial investment areas are focused on key technology growth areas—3D transformation and market they are intending to address.

- In-market product with established distribution and growing sales of at least $1M current year run-rate.
- Deal priced by 1st or 2nd tier institutional investor, with at least half of the round committed.
- Strategic potential for HP to be a customer, referrer, reseller, or original equipment manufacturer for company’s products, data, and/or services.

While HP’s new venturing arm was only recently launched, they are already seeing traction from the accelerator and incubator relationships they have in place, and from partnerships with top institutional and corporate VCs.

“We’ve hit the ground running and see huge potential with these types of investments,” added Bolwell. “This will pave the way for HP and our investment partners to create new markets faster, and in ways never before imagined. I can’t wait to see where it takes us.”

To learn more visit: http://bit.ly/hpTechVentures
COMMUNITY VOICE

The women who power the Channel

What will the sales channel of the future look like?

Marie Cheung-Ong
Americas Partner Sales Development Manager, HP

“Omni channel is the way of the future. To be successful in the new omni-channel era, the sales channel needs to focus on delivering a consistent buying experience. We must provide services and solutions that are relevant to our customers, leveraging customizable sales materials. And we must focus on our customer demographics; millennials require ‘speed to answers’ and more socially-driven purchasing options.”

Stephanie Dismore
VP and General Manager, Americas Commercial Channel, HP

“The sales channel of the future will be fluid enough to address omni-channel, SaaS and transactional models. Consumerization of IT has already prompted the marriage of commercial/consumer channels (Amazon, Staples), and this is just the beginning. Outcome-based models are driving demand for SaaS expertise and varied skillsets. At the same time, transactional business will remain a critical part of the equation.”

Heather Kent
Director, Americas Channel Marketing, HP

“At HP, we are focused on helping prepare our channel partners with the tools they need to sell and market in the new digital and social sales environment. We recently launched HP Sales Central, which gives our partners quick and easy access to a host of marketing and sales resources; the same ones our HP employees use, including a very robust social media platform.”

Florence Sullivan
Channel Marketing Strategist, HP

“The future holds a lot of promise. We have the technology and the means to bring incredible solutions to customers anywhere in the world, and to create and deliver new ways of doing business that would have seemed impossible a few years ago. A new generation of tech workers is stepping up and bringing fresh ideas, enthusiasm and thought leadership to the table. It’s an exciting time to be working in channels!”
If you followed the Olympic medal count, you like to know who’s winning. HP is, and we’re not even breaking a sweat.

Computer Reseller News (CRN) connects technology suppliers like HP with channel partners and end users, offering crucial IT insight and field intelligence. It recently honored three HP leaders on its lists of the best of the best.

Dion Weisler ranks #6 on influential executives list

Dion Weisler “Weisler is doing what it takes to drive a PC, mobile, and printing channel renaissance,” CRN wrote of our chief executive officer.

Less than a year after separation, Dion ranks closely on the heels of industry giants like Dell CEO Michael Dell, Cisco Systems CEO Chuck Robbins, and even Hewlett Packard Enterprise’s Meg Whitman.

CRN noted Dion’s ambitious goals: “Weisler is aiming to increase the percentage of channel sales at the $55 billion company from 80 percent to 87 percent of total sales by the end of the year.”

Stephen Nigro named a top disrupter

Stephen Nigro CRN recognized President of 3D Printing Stephen Nigro as its fifth biggest disrupter of 2016.

“For partners, he’s become the go-to source for information on technology that’s reinvigorating the old school printing market, as well as partner profitability,” CRN wrote. “Few HP employees have seen more change at the company than Nigro, and partners value his wisdom.”

Thomas Jensen makes top sales leaders list

Thomas Jensen Head of Worldwide Channel Sales Strategy earned the No. 8 spot on CRN’s Top 25 Channel Sales Leaders of 2016 list. CRN credits Jensen with stepping up to create HP Inc.’s channel program after separation.

“Jensen answered the call with Partner First, which is targeted at getting partners to focus on selling solutions, not products,” CRN wrote.
HP Introduces World’s Only Notebooks with Integrated Privacy Screens

HP Sure View, a new option on the HP EliteBook 1040 and HP EliteBook 840, helps protect against visual hacking with the press of a single button.

Source: HP
Learn more at http://bit.ly/ij4screen

Inc Direct upgrades with Indigo buy

Digital printer Inc Direct has purchased an HP Indigo 7800, as part of its ongoing three-year investment strategy.

Source: Print Week

What will future classrooms look like for India’s poor?

HP Future Classroom provides a platform for delivering world-class skills training to students and job seekers in India, all in a space the size of a shipping container.

Source: Global Citizen
Learn more at http://bit.ly/ij4news1

HP Inc. Unleashes Domination-level Gaming with OMEN X

Delivers extreme performance and unprecedented PC customization for gamers who crave the best.

Source: HP
Learn more at http://bit.ly/ij4news4

Pureprint to beta test Indigo 12000 in new dedicated digital site

Pureprint Group has taken delivery of an HP Indigo 12000 as a beta test site for the machine, one of just two companies in the UK and 12 globally.

Source: Print Week
Learn more at http://bit.ly/ij4news2

Two HP Directors land Savoy’s Power 300 list

Board members Stacy Brown-Philpot and Stacey Mobley listed among Most Influential Black Corporate Directors

Source: JustMeans
HP’s youngest brand ambassadors
Building buzz all summer long

This past summer HP asked interns and recent graduates to share a behind-the-scenes look at what it’s like to be part of the world’s largest start-up. Through its HP Insiders social media contest and HP Interns Snapchat account, HP’s newest workforce members shared stories, photos, and videos of what working and innovating at HP is really like.

The HP Insiders contest was sponsored by Shane Wall, HP Chief Technology Officer and head of HP Labs. Shane invited current graduate and intern hires from all three HP geographic regions to compete for social media influence. The first round involved submitting short videos that highlighted their passion for HP, the team, brand, and what HP represents. Seven lucky finalists were then selected to compete in a three-week contest on Twitter and Instagram answering questions and sharing stories about their time at HP.

These HP brand ambassadors had a lot of fun sharing insights and representing their fellow interns. When all was said and done, Randy Sanders from the HP Americas team came away with the win. The contest proved to be a great way to help graduates and interns grow their communication and marketing skills, connect with mentors, and broaden the HP community.

Telling the HP story is a snap

Another group of enterprising interns created an HP Intern Snapchat channel to reach youth and students interested in how HP innovates. Snapchat—a social media platform that allows you to post pictures or videos for up to 10 seconds—was a great way to inspire more students to seek out opportunities at HP. “We know that there are millions of users on Snapchat and many of them are millennials or from Generation Z who use the service daily.” stated Amani Javaid, HP intern whose idea inspired and who led this Snapchat effort.

The HP Intern Snapchat team highlighted their work at HP through events such as the intern fair or Bring Your Kid to Work Day, and through updates on their intern projects. Their goal was to cultivate a story about interns, by interns. One of their favorite stories involved the telepresence robots that roll through the HP’s Office of the CTO. The telepresence bots attract a lot of attention and they make for a great visual.

“In order to measure success, we are looking at how many users have added us and are watching our stories. Any sort of positive buzz around the intern program would be great to see amongst this audience,” said Swetha Revanur, fellow intern.

“Putting out creative messages about my work helps when other HP employees ask me what I do. Now, I may not be able to show them the Snapchat channel, but because of Snapchat I am able to readily share something that is attention-grabbing and quick to the point. Much like an elevator speech. It also helps me at science, technology, engineering and math (STEM) volunteer events to share the HP Intern Snapchat channel. This could potentially be a way to hook students who are interested in technology and get them interested in HP too,” commented Camille Eddy, the third intern on the team.

After this summer you might not see much on this Snapchat channel but tune in to the hp_newsroom Snapchat channel where interns will continue to make frequent appearances.

Both the HP Insiders and HP Interns Snapchat social media programs are just another example of how HP continually strives to develop a culture of innovation and empowerment. Enabling a new breed of HP innovators to make their mark on our future.
EMPLOYEE PROFILE

Meet Veronique Baudon, Head of Partnerships for Wearable and IoT. She is enjoying an amazing 20 year journey with HP. She has been managing partnerships from startups to Fortune 100 companies for 15 years. Now, within the Chief Technology Office (CTO) at HP—where innovation is culture—she experiences a different spin on partnership, and with the “Engineered by HP” brand, Wearable and IoT team she has demonstrated the ability to partner and launch smartwatches with fashion designers and famous brands. Veronique is married and a mother of two, and passionate about education and volleyball.

Why do you like working at HP?

Born and raised in Paris, I received my Masters in Computer Science and my MBA in France. In my last year of college I received an internship with HP Grenoble and was hired right out of college.

HP opened my mind to the rest of the world. I experienced different countries, cultures, and perspectives. I’ve seen the split with Agilent, the merge with Compaq, and the separation with Hewlett Packard Enterprise. Through all of these changes, there has been a constant which made it special to work at HP: amazing and inspiring colleagues. Currently I am part of the CTO team where innovation is culture—engaged in different ways of thinking and creating—and enjoying every minute.

What is your favorite topic?

Women—because there are so many “firsts” happening around us—first female mayor of Rome, first female mayor of Tokyo, first US female presidential candidate. Women are coming into the spotlight around the world!

In the technology industry, women have been a minority—but this is changing too. Women bring a unique perspective to innovation. Teaming up with my friend and colleague Prianka Srinivasan, who has been tracking Megatrends—future socio, economic and demographic trends—for HP, we decided to investigate. We gathered data on the state of women in all geographies, in politics, business, and in sport. What we found is eye-opening. With gender gap decreases, women’s participation increasing in the workforce and women’s buying power magnitude being in the trillions of dollars, the female demographic could be the next rising economy.

How do you overcome challenges?

It helps me to use similar techniques at work and in my personal life. When there are conflicts at work, I solve them using the same method I use with my kids—listening to the different perspectives and trying to stay fair. I’m very competitive and I also use a lot of sport analogies. For example for partners, like a sports team, I motivate them with common objectives. If we don’t win, we learn. Giving it our best shot is already a victory.

What is your favorite quote?

One of my favorite quotes is from Helen Keller, American author and the first deaf and blind person to earn a Bachelor of Arts degree. “Alone we can do so little, together we can do so much.” It explains why partnerships are key for success. For example, HP Wearable and IoT team is partnering with fashion designers and brands to blend style and technical innovation together. The team created the “Engineered by HP” brand under this umbrella and is offering beautiful smartwatch solutions, helping people stay more connected.

In the next issue:

Amp up product innovation with design thinking

The intersection of creativity and innovation has produced some of the greatest products of the past two decades. Design thinking—applying a creative solution to a challenge or need in order to produce a better future outcome—has become the cornerstone of successful technology and consumer innovation. According to the Design Management Institute, design-led companies have outperformed the S&P 500 over the past 10 years by an amazing 219%. In our next issue we will deep dive into design thinking methodology, and how HP, our partners and customers are applying it to products, infrastructure, user experience and channel advancements. Explore how science, art and design can come together for creative problem-solving and best-in-class product innovation.

Veronique Baudon
Head of Partnerships, Wearables and IoT, HP
Innovation Journal

INVENTING THE BLENDED WORLD OF TOMORROW

ISSUE 4 · FALL 2016

Crafting a bolder future. Together.

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