THE MOBILE CENTURY

Life and Work in the Digital Era

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Welcome to the Fourth Edition of The Mobile Century (TMC)

The Mobile Century (www.themobilecentury.com) is a publication of the Global Telecom Women's Network (GTWN). GTWN began as a small network of senior women in the telecommunications industry more than twenty years ago, and has grown and changed as the industry it represents has also evolved. It now represents the interests and thoughts of women, and their male colleagues, in all of the ''t'' industries – including telecommunications, information technology and TMT.

In this edition of TMC, we examine the many factors determining the success or otherwise of digital transformation – the process of evolving business models, markets, customer interactions and cultures in response to the impact of digital technology. The message from our experts is clear – technology adoption alone is not sufficient; we also need to focus on the human factors that drive the process, and how we can identify and best make use of those amongst our colleagues who can 'change the game'. We also look at the latest thinking on opportunities and threats facing the industry, including how to deal with space debris, network optimization and Moore's Law, fintech, predictions for digital media in 2016, and how digital technology is transforming the global aid agenda. We acknowledge the generous support of our sponsor, iTalent Corporation. Many personal thanks also to our expert authors, who have given their time and expertise. We hope you enjoy reading TMC and look forward to continuing our collaboration.

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DIGITAL TRANSFORMATION: A MANAGEMENT ROAD MAP

by Carla Cico
Member of the Board, Alcatel-Lucent

Innovation, the search for talent and reorganization: these are three topics that nowadays we hear about again and again, as if they are new concepts in the corporate world. This is not true. Companies have always created success through searching for and implementing innovation, by attracting and retaining the best talent, and by reorganizing themselves according to the demands of their market.

So what is different today? Firstly, the speed of change each company is facing, no matter what industry sector they are in. Secondly, financial and operational barriers to participation in that industry, that once also acted as protection from outside competition, have fallen rapidly and in many cases no longer exist.

The cause of all of this change is the impact of digital platforms and technologies, that are reshaping many, if not all parts of the business in each industry - from marketing to supply chain, from IT services to the time to market of new products, as well as the impact of new entrants to the market.

But while digital transformation is the real innovation that all businesses are facing today, it is not only about technology, otherwise most companies could easily succeed in this process. Digital transformation starts with a simple yet sometimes difficult question for companies to answer: "What business are we in?"

This is actually the key question all businesses are facing. It is the most significant impact of digitalization: it has reshaped the environment for every business. If as a CEO or senior management team you do not understand where you stand, what your consumers want, how can you reach them in a more efficient way, and if you do not constantly check for new competitors and how they act and react, your company will quickly be out of that market. This applies to both B2C and B2B companies.

Change can always be a threat or an opportunity: it depends on how you react to it.

Burberry, the fashion house, was facing a very tough financial situation and was quickly losing market share. It was able to overcome this by reinventing itself, going digital and becoming a leader in digital transformation of the retail and fashion industry.

For Kodak, however, the impact was the opposite: management did not understand that digital was the new frontier and would make or break their entire business. Even though they had been the first to develop a digital camera back in the 1970s, they failed to bring it to market, and in the end their direct competitors (Sony and Canon) did and Kodak lost their entire business. Once you have decided what business you are in, then you have to start to reshape your

company accordingly. It is of course human nature to resist change, as individuals don't like to be forced to leave their comfort zone. So this transformation needs the full engagement of the company as a whole, from the Board level down, including all employees. The "Project Leader" of this transition has to be the CEO, with the support of all the "C" Executives. As the entire organization will be affected, it requires the commitment of every person in the company.

The role of the CEO in this process is pivotal to success. It is to engage and motivate each part of the organization and each employee during the change and to make sure that the right tools are available to reach the final destination: to bring the company into the digital era. It is much easier said than done.

Establishing a road map for digital transformation

Here are some of the variables which companies need to take into consideration:

1. Do you need to change your line of business?
2. Should you change the organization of the business?
3. Do you need to change your supply chain?
4. What is your current time to market and how can you speed it up?
5. What is your real competition and how do they behave and react?
6. What IT / Technology and systems do you have and do they need to be upgraded?
7. How can you manage the transformation within your budget constraints?

There is no easy or right way to go about the process: each company and management team has to work it out, based on their own resources, capability and market reality. However, there are some pillars than can be taken into consideration by any company in order to be a winner in this game:

- ***Do you want to attack or defend?*** Due to much lower entry barriers in most markets, companies are facing competition from unexpected directions and from newly created entrants. Do you want to continue to defend your position or do you want to go on the attack? This is a dilemma that most of the incumbents, in any industrial sector, are facing, because they have to balance their position as market leader and thereby not cannibalize their profitable business, and at the same time they have to offer new, cheaper products, or to offer entirely new services.

- ***Will the transformation be organic or achieved through acquisition?*** Some companies find it easier, cheaper and less time consuming to buy a small competitor and/or a company that has the right technology and /or the right business model, rather than develop the technology in-house or to set up a new business unit from scratch. This way you get new technology and new talents in one go. Others set up a completely new Digital unit, hiring people from outside. While both approaches can be a short cut and can give results in the short term, nevertheless if there isn't strong leadership from the top to make sure that this new venture will become part of the company and that its capabilities will be spread through the whole company, the two entities will compete with each other, creating problems rather than solving them. It is important to balance the old and the new parts of the business, to make sure that the competences you already have are not lost during the transformation, but are blended with the competences brought into the organization from outside, thus creating a stronger overall culture and stronger skill base.

- ***Make the entire organization part of the transformation.*** Digital transformation requires culture change. Like any change of culture, it needs nurturing on a daily basis, making sure that each employee understands what the changes are, what the benefits are, and which role he/she will play in the new organization. The transformation needs to be explained over and over again. This can be done by webcast by the CEO. The Chief Digital Officer (CDO), if he/she is appointed, will need to reach out to the entire organization, running company-wide training programs. As said above, digital transformation it is not only

about technology: technology is the tool that allows the company to interact with its customers and suppliers in a different and more sophisticated way. It is also transforming the hiring process as well, among other functions. In essence, it is about how you will deal with all the information and data that is generated.

- Appoint a ***Chief Digital Officer***. The CDO is important to driving the transformation. He/she is a senior executive who sits at the right hand of the CEO and is seen as instrumental to the future of the organization. The CDO needs to be someone who not only has digital acumen but also is a seasoned general manager who can operate within a large-scale business and influence effectively across the organization. This is a relatively new type of leader and one who is hard to find, attract and retain.

- ***Be obsessed with the customer.*** Whether you are in a B2C or B2B industry, in the new digital environment customers are more knowledgeable and have access to more information than ever before. Customers are now reached through new channels, especially social media, and the company has to be able "to read" and to make the most of all the data available. The entire organization needs to understand the needs of the customer, their preferences, and which products they want. Time to market of new products has shortened, meaning that the new organization has to be agile and ready to adjust to changes in the market quickly, both in terms of supply and demand.

- ***Think about new business models.*** In this new environment, most if not all relationships are changing. Opportunities for new alliances and new partnerships are being created, which enable companies to reduce costs and to maximize revenues. Partnerships can be formed with a direct competitor or with one or more suppliers.

- ***Project control.*** Companies have spent billions to try to achieve the successful digital transformation of their businesses, and in many cases the results did not match expectations. Digital transformation is a project and it has to be treated as a project: with appropriate attention to actions, timing and costs. Check points need to be built into the implementation of the project, so that corrections can be made if needed.

Digital transformation is a lifetime project: it has to become the new culture of the company, and above all an entirely new way of doing things. The goal for a company from the process of digital transformation is to be an important player in the new digital environment - maintaining its position in the market, while not losing its skills and talent during the process, but rather adding new ones, controlling costs, and importantly not only protecting its existing revenues, but also growing them.

Carla Cico, born in Verona, Italy, earned her MBA at the London Business School. Carla is a former CEO of: Brasil Telecom, S.A., (the third largest Brazilian fixed-line operator); Ambrosetti (Beijing), China, (part of the Ambrosetti Group, an international strategic consultancy company headquartered in Milan, Italy); and Rivoli S.p.A., (an infrastructure Company, based in Verona).

She was the first female CEO in the South American telecoms sector. Carla has strong M&A experience, having listed Brasil Telecom on the New York Stock Exchange, making it the first, and still the only, Brazilian telecommunications company listed abroad. She was ranked 25th in Fortune Magazine's "The World 50 powerful Women in International Business" (October 2004) and 32nd in Forbes Magazine's "The World's 100 Most Powerful Women" (August 2005). In 2003 she was elected best CEO in the Latin America Telecommunications Sector (Reuters Institutional Investor Research).

Carla is now an Independent Director on Boards of both listed and not listed companies: Alcatel-Lucent, (listed on the New York and Paris Stock Exchanges); Allegion, (listed on the New York Exchange Stock Exchange); and Epta a privately owned company. Carla is a sought after speaker at many industry summits, with a focus mainly on telecommunications, management strategy and developing countries.

DIGITAL MEDIA DEVELOPMENTS AND PREDICTIONS FOR 2016

by Ingrid Silver

Partner, Dentons

2015 was an interesting year in the UK media industry and we are already well into the first quarter of what is expected to be a very fascinating and busy 2016. I would like to share with you a number of legal developments which we expect to happen in 2016 and an explanation of what we think these developments will mean for the UK media industry, and more broadly for the digital media sector as a whole.

Advertising Standards: a recording-breaking year for complaints

Expect yet another record-breaking year for the Advertising Standards Authority (ASA), in terms of complaints received from members of the public. Advertisements that infringe ASA codes (the BCAP Code and Cap Code) are being more readily reported on in the mainstream press (rather than just on the ASA website), and, with this increased prominence, both public awareness of the ASA and, therefore, the number of complaints will increase. If, as predicted, the number of complaints rises in 2016, media companies will want to ensure that their campaigns are not subject to ASA review and are not adversely reported on in the mainstream press. Two areas that are attracting a lot of ASA attention at the moment (and with which media companies will need to ensure compliance) are rules surrounding comparative advertising and advertising targeted at children (particularly with regards to "in-app" purchases).

Regulation of On-demand services

As of 1 January 2016, the responsibilities of ATVOD (the UK regulator of television on-demand services, such as ITV Player) have been taken over by the information and communication regulator, Ofcom. ATVOD will no longer exist. The decision to bring regulation of these services back "in house" comes at an interesting time for the regulation of on-demand services. The European Commission has started a review of its Audiovisual Media Services Directive and amongst the issues it will be considering is whether the Directive should reach beyond the TV and "TV like" services that it currently captures. ATVOD found itself constantly dealing with disputes as to whether services were or were not captured by the current definitions and it is likely that Ofcom will need to grapple with these same issues in its newly-expanded role.

Cybersecurity and data protection

Following the highly publicised cyber attacks of 2015 (such as the TalkTalk hacking), this year cybersecurity will continue to dominate not just media companies' boardrooms, but boardrooms of

all organisations. We expect to see an increase in companies: (a) purchasing cyber liability insurance; (b) introducing and testing more robust cybersecurity response plans; and (c) increasing expenditure on technology contracts. With the draft General Data Protection Regulation being published in late 2015, 2016 will be the year that the European Parliament finally passes the regulation. Similar to other industries that hold large amounts of personal data, media companies need to familiarise themselves with the regulation and begin the process of ensuring that their companies are compliant with it before it comes into force (anticipated to be in 2018).

Of more immediate concern to media companies will be how data can be shared with the US in light of the Safe Harbor invalidity decision in late 2015. As companies continue to implement measures (such as by entering into model clauses with data processors in the US) to ensure that their data is transferred to the US in line with EU law, we expect more guidance from the regulators and also potentially a new "Safe Harbor 2.0 decision", which should provide greater clarity for companies that wish to transfer data across the Atlantic.

Digital single market

The draft cross-border portability regulation, allowing consumers to access content while temporarily present in another EU Member State, will be passed by the European Parliament in 2016. Media companies will be focused on addressing their legal, commercial and technical position in respect of the proposed changes. We expect to see further communications from the European Commission setting out its plans for the modernisation of the EU copyright framework. There will be a lot of debate about the extent of any further initiatives on cross-border access, and why the principle of territorial licensing remains a valid (and protectable) model. The Commission says it does not want to change the principle of the territoriality of rights and that the industry is against mandatory EU-wide licensing – but there will be concerns about any further initiatives on portability which are too loosely or too widely defined.

Later in the year we expect detail from the Commission about specific legislative proposals. Whilst its aims are laudable – unlocking regulatory barriers to exploitation of digital rights across the EU – many of its proposals are likely to conflict with established business models and exploitation strategies. Of particularly relevance is the extent to which rights holders should be able to license their rights on an individual country-by-country basis in order to account for local tastes and to maximise revenues. These practices are also the subject of legal challenge by the Commission in connection with its investigation under the competition law rules of movies on pay TV, on which a decision can be expected later this year. Outcomes here could impact on the models and strategies used by media companies for the inbound and outbound licensing of content.

Intellectual Property (IP)

IP law's application to new technologies will continue to remain a key legal concern for media companies, and particularly content owners. In the copyright arena a number of rulings are expected in relation to the important issue of whether and in what circumstances providing hyperlinks to protected content may amount to copyright infringement when communicated to the public. Several cases decided during 2014 and 2015 have considered hyperlinking and its copyright implications. However, none of these cases has dealt directly with the issue of linking to content not initially authorised by the copyright owner. The common-sense approach would suggest that hyperlinking to such content without the permission of the copyright owner should be an infringing act in and of itself. However, taking this approach would affect a vast number of entities providing hyperlinks and would therefore be very difficult to police. Additionally, entities wishing to provide hyperlinks to others' content would face a heavy diligence burden in establishing in each instance that the rights holder had provided consent to the initial communication. This burden would be on going as, whilst providing the hyperlink, they would need to continue to satisfy themselves that the rights holder had not revoked its consent.

Finally, the court may well decide that the primary infringer is the party against which the rights holder should bring any claims and the provider of the hyperlink should not also be responsible for infringement. The position is simply not clear cut at this stage, making

it difficult to predict the court's outcome. We will watch this space with interest during 2016.

Net neutrality becomes reality throughout the EU, or does it?

A new regulation which takes effect on 30 April will enshrine the principle of net neutrality – that ISPs should enable access to all content on a non-discriminatory basis – in EU law. The new rules declare throttling (slowing down of an internet service by an ISP) and blocking to be illegal. However, this is subject to various exceptions for measures that are in the "public interest" and, more controversially, to enable the provision of "specialised services" – being those that require better-quality access to the network to function properly.

When it comes to applying the new rules, all eyes will be on those who may seek to test their limits, including streaming service providers who have been criticised for taking advantage of similar loopholes in other territories where net neutrality legislation has been implemented. Proponents of net neutrality have noted in particular that any proliferation in loopholes/ exceptions will jeopardise innovation and potentially make it more expensive to provide media services to consumers (if it is necessary to pay more to get preferential treatment from ISPs).

The effect of ad-blocking on how we consume content

2015 will be remembered as a victory for "ad-blocking" software with penetration within the UK adult population at about 20%. This increase was due, in no small part, to Apple announcing (in September) that it would allow ad-blocking apps into the "App Store". 2016 will see publishers use a variety of methods to compete against the uptake of ad-blocking software, including: (a) putting content behind pay walls (whereby users have to pay to access what was previously free ad-funded content); (b) endeavouring to educate readers that ads fund content (The Guardian has already attempted to do so); and (c) preventing users from accessing content while ad-blocking software is enabled on that user's device (City AM has already started implementing such software on to its desktop site).

Media companies that rely on online advertisements as a major source of revenue will need to monitor the uptake of ad-blocking in 2016 and be prepared to implement measures, such as those listed above, if they see revenues dramatically drop. However, before such action is taken companies would be well advised to ensure that ads placed on their websites are relevant and not unnecessarily intrusive (which are two major reasons why we have seen an increase in ad-blocking software penetration).

Spectrum 5G

Last year saw mobile networks locking horns with the broadcast sector over access to spectrum, each side seeking to demonstrate why it was more deserving of priority access to what has become a scarce resource. Irrespective of the rights and wrongs of this debate, as consumers becoming more and more "data hungry", Ofcom is having to resort to ever more creative methods to free up spectrum to the mobile networks. One solution it has identified is spectrum currently reserved for usage by the public sector being transferable for commercial access. Shortly it will be auctioning certain portions of spectrum used by the Ministry of Defence. The bands that are set to be released are suitable for 5G and high-speed and high-bandwidth data services.

There will be no cap on the amount of spectrum bidders can buy in the forthcoming auction – Ofcom considers a cap would prevent bidders buying adjacent block which would be required to support very fast download speeds. More substantively, Ofcom will continue to need to make important policy decisions as to how to allocate spectrum. Expect to hear more talk of how best to use technology to employ spectrum more efficiently, whilst at the same time concerns are raised as to the concentration of "spectrum power" in the hands of a small number of providers.

Ingrid Silver leads Dentons' UKMEA Media and Entertainment group. She has been involved in the Technology, Media and Telecommunications sector for over 20 years and has extensive experience of advising established "blue-chip" corporates and multi-national companies as well as disruptive new market entrants and is an expert in the provision of transactional and regulatory advice to the media sector. Ingrid's practice deals with all aspects of media ranging from traditional areas such as film and television; advertising and marketing; music; and publishing; to innovative media such as gaming, social media and interactive content. Ingrid's list of global clients draw upon her in-depth international sector experience and expertise (and her multi-lingual skills), and is noted for the pragmatic and commercial advice she provides clients. Media Law International describe her as "extremely helpful to deal with and ready to go the extra mile for the client". Most recently, she is ranked in both Chambers UK, 2016 and Legal 500, 2015 and highlighted as "a highly skilled and experienced professional, who engages her clients with utmost dedication and collegiality". Ingrid is also listed in the Who's Who Legal, 2015 for Telecoms and Media and was recognised recently in the Expert Guides' Women in Business Law, 2015 in their Technology, Media and Telecoms expert listings in the UK.

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BUILDING A BRIGHTER, INNOVATIVE FUTURE REQUIRES BOLD STEPS

By Danielle Brown,
Vice President and Chief Diversity Officer, Intel[1]

Just over a year ago, in January 2015, Intel CEO Brian Krzanich stunned the tech sector with an announcement of Intel's Diversity in Technology Initiative[2]. This initiative committed Intel to reaching full representation of women and under-represented minorities in its workforce by the year 2020, and included a $US300 million investment to encourage more diversity at Intel and within the technology industry at large. This was followed on June 9 2015 by the announcement by Intel Capital of the Intel Capital Diversity Fund – to invest $125 million in technology start-ups led by women and underrepresented minorities. In this exclusive interview with The Mobile Century (TMC), Danielle explains the reasoning behind this impressive and unprecedented investment by Intel in diversity, and provides a report card on progress in the program's first twelve months of operation.

TMC: Congratulations, Danielle, on being selected to lead Intel's Diversity in Technology Initiative, as Intel's Chief Diversity & Inclusion Officer. Can you explain in more detail what the program is about and the thinking which led Intel to prioritise diversity as an area for major investment?

Ms Brown: Thank you, my team and I are thrilled to have the opportunity to lead this important work for Intel.

Our goal with this initiative is to deliberately and intentionally diversify our workforce while also extending our reach to impact the industry and innovation ecosystem. Intel is evolving, and we firmly believe that diversity & inclusion are driving forces behind Intel's growth and relevancy.

Intel's Diversity in Technology initiative seeks to increase diversity and inclusion at Intel and in the technology industry. A year ago, our CEO, Brian Krzanich announced Intel would lead by example, starting with a bold new goal to achieve full representation of women and underrepresented minorities in Intel's U.S. workforce by 2020. This means that Intel's workforce will be more representative of the skilled talent available (market availability) in the U.S. in the positions for which we hire. We believe that diverse teams, thinking and leadership styles create more opportunities for innovation, creativity and strategic thinking.

In addition to Intel's own workforce goal, Brian said Intel would also invest $300 million to help build a more robust pipeline of technical women and under-represented minority talent, to support hiring and retaining more women and underrepresented minorities, to invest in women and minority-owned businesses, to diversify our supply chain and fund programs to support a more positive representation of women and

underrepresented minorities online and in the smart, connected world.

TMC: Silicon Valley and the US Tech Sector is often criticised for its lack of diversity, which in turn will lead to a reduction in Silicon Valley's leadership in innovation and creativity. What do you see as the real link between diversity of workforce and innovation?

Ms Brown: It's true that the technology industry has tended to be less diverse than the world at large with respect to the types of people, experiences and backgrounds that they represent. We believe diversity and inclusion brings new ideas, offers different perspectives, and invites fresh insights to our business challenges and market opportunities. Intel is evolving, and we see diversity and inclusion as a driving force for our future growth.

At Intel, we must grow our new and emerging businesses while keeping our core business strong and relevant. To do this, we need a village. And not a village of "like minds," we need individuals and teams with different backgrounds, new perspectives, diverse ways of thinking and problem solving. It's this diversity of thought, experience, and styles that will drive more creative, more innovative and faster solutions to the complex challenges and opportunities required for our growth.

Besides simply driving for diversity, we must foster an inclusive environment. Inclusion is essential for innovation and growth; it means employees feel free to bring their full selves to work, offer unguarded, authentic perspectives, and find a respectful place for those ideas. We believe that real change comes from both diversity and inclusion. We are thrilled that a 2015 Pay Parity audit showed that we achieved 100% gender pay parity across U.S. job types and job levels for 2015. This means that in the US men and women at the same level of the organization are paid the same for their work. We look forward to maintaining parity.

Beyond our fundamental belief in diversity and inclusion, the business case is solid. Startups that have more women in senior positions are more successful than those that do not, according to several studies. And private firms led by women achieve a 35 percent greater return on investment. Meanwhile, McKinsey predicts more people will need to enter the U.S. workforce to sustain the country's historic rate of GDP growth. Women graduate with college degrees at rates greater than men; Hispanics will account for most of the country's future growth for the next 35 years, according to Nielsen. Nielsen also reports that African-American buying power will top $1.3 trillion by 2017. And the United States is expected to reach minority-majority status by 2043, less than two generations from now. That means the economy of tomorrow is likely to be driven in greater part by women and underrepresented minorities.

But although diverse teams and companies create more opportunities for innovation, creativity, and strategic thinking, only 15 percent of venture capital-funded companies have a woman on the executive team, and woman CEOs and founders, receive only 3 percent of total venture capital dollars. Furthermore, fewer than 1 percent of the founders of Silicon Valley companies are African American or Hispanic.[3]

At Intel, we see improving our workforce representation as critical to keep us at the forefront of a fast-changing and evolving technology industry. We want to ensure we are delivering products and solutions that meet the needs of all our customers.

TMC: Intel Capital also set up a Diversity Fund last year. What is the focus of this fund, and how will it serve Intel's overall diversity objectives?

Ms Brown: The Intel Capital Diversity Fund, the largest of its kind, identifies and invests in women and minority-led technology start-up companies. The fund will invest $125M over five years on a broad spectrum of innovative companies to ensure that funded entrepreneurs enjoy the access to business development programs, global network, technology expertise and brand capital their talents deserve. This fund further underscores Intel's broad commitment to diversity and inclusion in all aspects of its business.

Our CEO, Brian Krzanich, nominated Intel Capital Managing

Director and Vice President Lisa Lambert to lead this fund, applying the same intent and effort to our investment portfolios by investing in high-growth companies led by women and underrepresented minorities. These groups are powerful consumers and influencers whom we expect to play a greater role going forward in the technology industry as creators and leaders. Lisa is herself a software engineer and accomplished tech investor who leads Intel Capital's investments in software and services. She also knows from experience that the biggest hurdle for such entrepreneurs often isn't the quality of their ideas, but the connections, experience and funding to make them scale.

Intel Capital is committed to investing in the best talent from a myriad of backgrounds to cultivate brilliant innovations that serve the needs of a diverse public. This fund enables Intel as a company, and Intel Capital as one of the largest sources of venture capital, to chart a new approach to diversity in an industry that desperately needs one; expand the market for Intel products and services, and help sustain the long-term strength of the U.S. economy.

TMC: What does Intel Capital hope to achieve from the fund? Is this good business strategy, or just good PR? What are the goals and metrics for success?

Ms Brown: While we believe the recent debate about and attention to the lack of diversity in tech and venture capital is healthy and timely, our Diversity Fund is not a reaction to those events but rather a sign of Intel's desire to lead on this important issue. The fund enables Intel as a company, and Intel Capital as one of the largest sources of venture capital, to chart a new approach to diversity in an industry that desperately needs one; expand the market for Intel products and services; and help sustain the long-term strength of the U.S. economy. It will have a meaningful impact on making the start-up workforce more reflective of our broader society and economy.

We hope over the next five years to achieve a significant increase in the number of women and underrepresented minorities who enter the start-up pipeline, build successful companies and, where appropriate, make exits. Intel Capital Diversity Fund enables us to demonstrate to the venture industry that backing diverse entrepreneurs isn't just the right thing to do – it's good business. While we are open to considering start-ups from any and all sectors, we are focused on investing in companies that demonstrate a strategic alignment to Intel Corporation's business units and primary sectors of focus.

We expect to invest roughly one-fifth of the $125 million each year for the next five years. However, in some years, we may invest more than others. For the foreseeable future, we expect that we will focus on the U.S. market.

TMC: Besides this fund, what else is Intel currently doing to support and drive workforce diversity and thereby to drive innovation and creativity?

Ms Brown: We are making a range of investments and introducing a number of initiatives focused on creating an inclusive environment, retention, and on supporting the pipeline in our local communities.

For example:

- Hiring and Retention- We will continue to raise the bar on our hiring and retention goals, and we will drive accountability by making progress to these goals a part of all of our employees' annual bonus.

- Launching our enterprise-wide GROW program. GROW is Intel's approach to building an inclusive, high growth culture. Based on the latest neuroscience, it is focused on action, creating a seamless, cross-company method of making new habits and learning together. GROW engages every single employee, simultaneously, in creating the same level of breakthrough for inclusion that we do with our technology.

- We plan to do in-depth research on both internal and external drivers of progression and retention for our underrepresented minority populations in the U.S. and share findings with the industry in our 2016 mid-year report.

- Inclusion Online: Hack Harassment. In January, Intel partnered with Vox Media, Re/code and Born This Way Foundation to co-create Hack Harassment, a new, collaborative initiative to fight online harassment and provide safer, more inclusive online experiences. After a series of hackathons and growth in partnerships, findings, recommendations and progress

will be announced at the Code Conference in June 2016.

•Family friendly benefits for Intel employees will be increased. From 2016 we are quadrupling and expanding our fertility coverage, and creating many benefits to support working mothers and fathers.

•We are collaborating with the Oakland Unified School District on a $5 million investment to help build the pipeline of diverse engineers in the tech industry.

•Finally, we are committed to transparency. We will continue to share publicly our goals, our progress to them, and our detailed workforce data, including how many employees left the company.

TMC: Finally, how can others become involved in and support this great diversity initiative, for the benefit of the whole industry? Would you welcome offers of support from the GTWN membership, and if so, how could we support your efforts, not just in the US, but more broadly?

Ms Brown: At Intel, we welcome the input and contribution of the GTWN membership and its supporters in this important work. It is wonderful to know that an organization such as the GTWN exists, to support senior women in the tech sector, and that the organization has many male champions as well. As we take Intel's Diversity program forward into 2016 and beyond, we will be reaching out to as many women as possible in our ecosystem, including the GTWN, and keeping them abreast of opportunities to get involved. Together, let us make 2016 a great year of achievement for diversity in the technology industry.

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[1]Danielle Brown is Intel's Chief Diversity & Inclusion Officer, leading execution of the company's 2020 Diversity & Inclusion goals announced in early 2015. She has been involved in Diversity & Inclusion work throughout her career, including the past seven years at Intel.

[2]http://www.intel.com/content/www/us/en/diversity/ -at-intel.html

[3]Sources: Babson College Diana Report on Women Entrepreneurs; CB Insights Venture Capital Human Capital Report.

TAKING LESSONS FROM SILICON VALLEY TO END EXTREME POVERTY[1]

by Ann Mei Chang
Chief Innovation Officer and Executive Director at U.S. Global Development Lab at USAID [2]

Over the past 20 years, the number of people around the world living in extreme poverty has been cut in half. This past September, 193 of the world's leaders came together to adopt the **Sustainable Development Goals (SDGs)**, with a headline target of ending extreme poverty by 2030. For the first time in the world's history, this looks possible.

But it won't be easy. To start, China's economic growth has been responsible for three-quarters of these gains. And, as poverty rates continue to fall, the remaining poor -- concentrated in fragile or failing states -- will become harder and harder to reach. Additionally, the world is not even close to deploying the estimated $3 trillion a year needed to achieve the SDGs. To address these realities, we must work faster and harder to ensure the world's most vulnerable are empowered and served. We must apply the insights of innovation communities like Silicon Valley to find new, more effective ways to reach the very poor. Over the almost 25 years I worked in Silicon Valley, I saw how the world's most powerful innovation ecosystem not only continuously reinvented itself, but also transformed how we live -- with inventions like the world wide web, smartphones, and social networking. The technologies themselves are only the tip of the iceberg; even more powerful is the underlying ingenuity, incentives, and discipline that has made them possible. I'm confident that by harnessing such approaches, we can help the remaining 700 million people who still live on less than $1.90 a day lift themselves out of poverty.

At the United States Agency for International Development's **U.S. Global Development Lab** (the Lab), we seek to create a new model for 21st Century Development that borrows from some of the best practices of Silicon Valley. Our goal is to identify those innovations that can bend the curve of progress by increasing impact, reducing costs, accelerating progress, and/or extending sustainability. Six of the core approaches we are exploring include:

Open innovation: Galvanize top talent globally to address some of the toughest problems in the world through challenges, prizes, and venture-style risk funding. The reward is saving and transforming lives, rather than receiving stock options.

Data and iteration: Take a page from agile and lean methodology by driving rapid, incremental, and iterative improvements to development programs. Seek data through surveys, polls, and sensors from the local environment and the customers themselves. Create feedback loops that continually increase effectiveness.

Evidence: Use hard evidence, like proven development outcomes and impact to end users -- similar to how Silicon Valley might use web traffic or revenues -- to determine what interventions should receive greater investment.

Scale and sustainability: Scale to the size of the problem. Don't be satisfied with programs that only reach a small fraction of those in need. Insist on business models that continue to expand when grant funding runs out. Learn from the dot com crash that planning for sustainability is essential.

Enabling technologies: Build on the tools of the digital revolution where they are appropriate and can deliver development impact more effectively and efficiently.

Partnership: Capitalize on the talent, expertise, infrastructure, and reach of companies, universities, nonprofits, and other development agencies to accomplish a degree of impact that we could not achieve on our own.

Since we launched the Lab less than two years ago, we have invested in 362 new solutions for food security, health, climate change, energy, and economic growth challenges. Among these is **Off Grid Electric**, a great example of how we are taking approaches from Silicon Valley to discover and invest in development innovation that has the potential to change millions of lives.

Off Grid Electric provides affordable and reliable energy to 10,000 new households each month in Tanzania. Off Grid has been able to scale through an innovative leasing model, which charges rural households only a few cents a day through a mobile payments system. This has enabled families who are unable to afford the upfront cost of a solar system to transition from kerosene to a cleaner, more affordable energy solution. Our Development Innovation Ventures (DIV) has partnered with Off Grid since 2012, providing three rounds of venture-like tiered funding to test and prove its operations. This funding has been catalytic and attracted several times our investment in equity and debt from private and public sources. In early 2015, Off Grid Electric partnered with the Government of Tanzania with an aim to bring access to affordable electricity to one million Tanzanian homes -- five million people -- by 2017.

Off Grid Electric is just one example of this new model of 21st Century Development. To achieve our audacious goals by 2030, we believe we need to do development differently. We need new approaches, tools, and solutions. We need to be customer focused and data-driven. We need to work in coordination with partners. And we need to start now.[3]

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[1]*This blog first appeared in The Huffington Post on 27 January 2016. http://www.huffingtonpost.com/ann-mei-chang/taking-lessons-from-silic_b_9081804.html*

[2]*The Lab is the newest bureau at USAID and aims to transform global development through science, technology, innovation, and partnerships.*

[3]*This blog kicks off a series on the Huffington Post about tackling extreme poverty through 21st century development approaches.*

Ann Mei has more than twenty years of engineering and leadership experience in Silicon Valley. She served as a Senior Engineering Director at Google for eight years, where she led worldwide engineering for Google's mobile applications and services. She oversaw 20 times growth of Google's mobile business in just three years, delivering over $1 billion in annualized revenues. At Google, she also led the product development team for Emerging Markets, with a mission to bring relevant mobile and Internet services to the two-thirds of the world's population that is not yet online. Ann Mei has held leadership roles at several other leading companies including Apple (leading engineering for the initial release of Final Cut Pro), Intuit, SGI, and a few startups.

Ann Mei Ann Mei is a member of the Board of the GTWN. She was recognized as one of the Women In the World: 125 Women of Impact for 2013 by Newsweek/The Daily Beast. She is a member of the 2011 class of Henry Crown Fellows at the Aspen Institute and holds a BS degree in Computer Science from Stanford University.

Follow Ann Mei Chang on Twitter:www.twitter.com/annmei

INNOVATION AND DIVERSITY DRIVE THE DIGITAL ECONOMY

by Renee LaLonde
Founder and CEO of iTalent Corporation

2015 saw a major shift in the digitalization of many traditional sectors of the economy and society, including education, health and social services. Online classes in the form of MOOCs became markedly more available, health records began to go online, online retail made significant inroads into bricks and mortar businesses.

New digital trends, such as cloud computing, mobile web services, and smart grids, are radically changing the business landscape, reshaping the nature of work, the boundaries of enterprises and the responsibilities of business leaders. Social networks have expanded their reach even further into all areas of our lives.

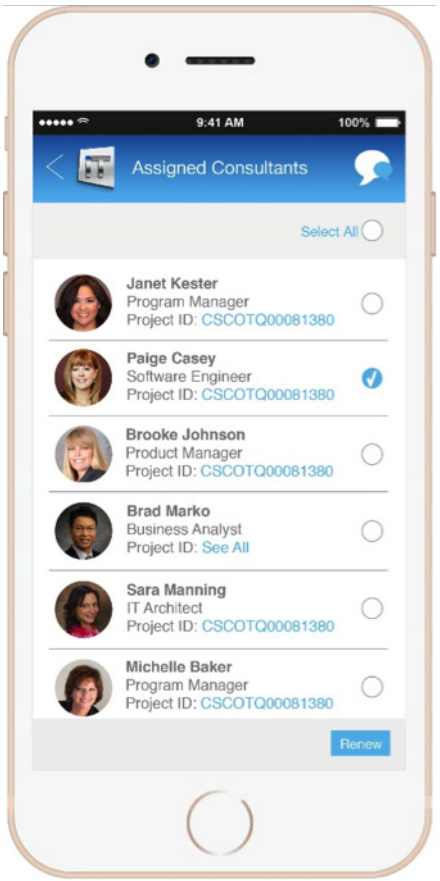
These trends enable more than just technological innovation. They spur innovation in business models, business networking and the transfer of knowledge and access to international markets The digital economy is now the single most important driver of innovation, competitiveness and growth, and it holds huge potential for entrepreneurs and small and medium-sized enterprises (SMEs), in both developed and developing economies.

At the same time, this rapid process of digitalization has brought with it a number of significant challenges. There has been a growing awareness of the importance of cyber security to the digital economy, and of the necessity of balancing security with personal privacy. In a world where it is estimated that there are currently ~8 Billion 'things' connected to the Internet, ranging from a wide variety of products to services developed in order to ease transactions, the industry is flooded with opportunities; for both growth, but also for failure. It is the responsibility of all business leaders to acknowledge these challenges and to familiarize themselves with the various solutions available. As industry digitizes, management must also shift their focus to help companies transform their businesses, their thinking, and their resources, to meet the new digital world. It is no longer sufficient to be a "one trick pony" in the digital economy, nor enough to be a single solution provider.

More than three billion people are currently connected to the internet – almost half of the world's population. The challenges of digital transformation are being felt by economies and businesses the world over, but there are still significant regional differences. For example, according to the European Commission , about 40% of European enterprises are still non-digital, while only two percent of European enterprises are currently taking full advantage of new digital opportunities. In contrast, over the last five years, mobile applications development alone has created nearly 500,000 new jobs in the US. It is clear that small businesses can grow two to three times faster, and create new jobs when they embrace digital technologies. Once beyond their limited means, using digital platforms small businesses can now go global from day one, reaching overseas markets and talented potential employees.

But at the same time, success in the digital economy requires more than just maintaining a conscious awareness. It requires a proactive approach, collaboration with your business partners and your whole ecosystem, and an open innovation approach, to allow for greater involvement by all your stakeholders. It is important that companies know how to access the support they need, when they need it. Managers need to be offered the most up-to-date solutions and services based on accurate forecasting and a corporate memory of proven strategies. In this way, businesses will see the benefits of their dedicated investment in digitalization, and be able to demonstrate the overall success of their efforts, which in turn will spur everyone on to even greater achievements.

One area that is often overlooked in the process of digitalization is the workplace environment itself. We are driving innovation at iTalent through digitalization of our own workplace. By implementing our own new mobile solution, we are demonstrating the power and effectiveness of real time collaboration, that streamlines the interaction between our clients and our operations team. Where once we used to rely on emails and phone calls, we have been able to take advantage of technology to drive innovation and efficiencies in our consulting practice in a way that no other firm is doing today.



Driving performance excellence with Social Knowledge Management (SKM) for one of our biggest clients has transformed their organization from "sharing in

silos" to having shared Finance knowledge across the enterprise, whether in the office or on the move. Now it is easy for everyone in the company to exchange ideas or decisions which would otherwise be buried in email or documents. This knowledge and data is identified as assets that are tagged, shared and followed by the group or anyone else who is interested. The business as a whole is empowered, as more workers become experts across functions, and as knowledge maturity accelerates from the individual to the small team to the broader organization.

Globalization is generating an overwhelming excitement in the industry, and it is easy to get swept away by the hype. The amount of information received by management is overwhelming and the potential is never ending, and there is a clear need for a change in approach to resource management. The value in diverse solutions and collaborative efforts cannot be understated. The opportunity for growth has never been more prominent. It is the responsibility of all companies, and the innovators that lead them, to capitalize on the opportunities presented by digitalization, all the while retaining their corporate memory as well as keeping a keen eye on industry forecasts.

Technology may be the key to success in the digital economy, but it is ultimately our people who will make it happen. Our success would not have been possible without the many people that make iTalent the kind of company it is. As businesses grow and strengthen in the digital economy, it becomes even more important to define the core values which inform the company's brand, culture and business strategy. For us these core values are: exceptional customer service, open communication, trust and integrity, humility, resourcefulness, giving back to the community, and work-life balance.

Renee La Londe is Founder & CEO of iTalent, a woman and minority-owned global technology consulting and system integration services company. Her company assists Global Fortune 500 companies with their digital transformation initiatives, from achieving millions in cost savings to enhancing workforce productivity that impact thousands of employees.

Ms. La Londe is well-versed in digitization trends having achieved impressive results prior to starting iTalent. Not only did she drive digital transformation for NetApp's support organization, she also was instrumental in Cisco's B2B commerce strategy where over 90% of the company's customers moved their paper-based transactions online to create greater efficiencies and millions in savings. Renee was recently named to the prestigious 2015 CRN Women of the Channel List, won the bronze Stevie Award for Female Entrepreneur of the Year, and participated as an expert speaker at GSMA Connected Women conference and Mobile World Congress. She also co-wrote the book, Social Knowledge: Organizational Currencies in the New Knowledge Economy. To add to her accolades, Renee has been recognized as one of Silicon Valley Business Journal's Women of Influence 2015, was nominated as a Women 2.0 Founder to Watch, and was honored on CRN's 2015 Women of the Channel's list.

iTalent is a women owned, global business enterprise technology consulting services and cloud system integration firm. iTalent helps companies such as Cisco, Veritas, and Sephora do what they do better through a wide variety of offerings such as digitizing operations and increasing collaboration, business intelligence and analytics, optimizing system processes and change management consulting, cloud and software development, and mobile application development.

All of these solutions and the diverse, unique, and effective team makes iTalent the best fit for businesses looking to streamline and improve business operations. The team has numerous awards to its name, including three APAC Stevie Awards, three Best in Biz Awards, five Stevie ABA Awards, two Stevie Awards for Women in Business, and a WRMSDC Rising Star Award.

INNOVATION AND CULTURE CHANGE: TAKING THE LONG VIEW

by Kate McKenzie
Chief Operations Officer, Telstra Corporation

As part of the Senior Management Team at Telstra, I and my colleagues spend a lot of time thinking about and discussing innovation and culture change. We do this because we know innovation is a key driver of growth – not only for companies, but also for our customers, the economy and society as a whole.

I have formed the view that to succeed, an innovation strategy must be multi-pronged and multi-dimensional. It must be integrated into the company's core processes, the senior leadership's strategic agenda, as well as the behaviour of both individuals and teams. By its very nature, then, innovation requires a root and branch process of culture change, which in turn means it cannot happen overnight. It demands patience, optimism and a ten to twenty-year horizon.

Telstra began its journey of evolving from a traditional, fully integrated telco to a modern digital technology company several years ago. To remain sustainable in the longer term, we must simultaneously keep growing our traditional businesses, while staying up to speed with the debate and experience of our colleagues and peers around the globe, and investing in new partnerships and up-and-coming young start-ups. We can no longer remain in our silos, expecting to rely solely on home grown ideas. We must actively seek out and apply the best approaches that we can find around the world.

As part of this strategy, in late 2015 I travelled to Estonia and Israel to meet the key players in two of the world's fastest growing tech hubs. Here I met and exchanged views with a variety of companies and individuals on how we can further join forces to enhance our individual innovation and culture change processes. And in both countries I found parents who are no longer encouraging their children to become doctors or lawyers – they are now getting their kids to study science and information technology and become entrepreneurs, as a way to build and also take advantage of opportunities in the digital economy.

I am now more than ever convinced that we as an industry need a three pronged innovation strategy, which focusses on:

- People and their individual characteristics
- Systems and environments
- Business models and processes.

I am happy to say that at Telstra we have made great strides over the past 12 months in our people strategy, and an important component of that is the work we've done to diversify our workforce. We have established a new community of women and men across all business units, who are passionate about championing the values, experiences and careers of everyone in the Telstra community, particularly our women. We are making Telstra more welcoming and more supportive for women in tech, while also giving them a space to collaborate and support

other women across the company. Brilliant Connected Women, as the group is called, has been a great success. This is in no small part thanks to the drive of Telstra's Group Executive for International and New Businesses, Cynthia Whelan, and her team. Our 'All Roles Flex' policy has also helped managers across Telstra change the way they work so we can hire and promote people who bring different backgrounds, life circumstances and skills to the table. We have also stepped up our efforts to encourage more young people, including young women, to study STEM subjects and to enter the tech sector. We want to make parents in Australia see the opportunities for their children in digital tech, just like those I have met overseas. It is vital, if we are to remain a driver of innovation in the economy, that we attract the brightest minds to our industry.

The physical workplace environment is often overlooked as a key element of corporate culture. However, if you want people to think differently, question the status quo and collaborate on new ideas, you have to give them an appropriate space in which to do so. Last year we opened Telstra's new Gurrowa Innovation Lab in Melbourne, which is a space that allows different teams from across Telstra and our customer and partner network to come together and drive the new wavof innovation of Telstra. [1]

Gurrowa, which means 'interchange' in the local Aboriginal Wurung language, has been designed specifically as a co-creation environment, and at the moment we're working on projects to connect haptic robots to rural ultrasound equipment, to design portable systems that can locate lost children in remote areas, and to develop sensor applications to predict when equipment or structures may fail.

TELSTRA: City of Melbourne Chief Digital Officer Michelle Fitzgerald addresses competitors on the first day of the IoT Challenge, co-hosted by Telstra.

And to be truly innovative, we need to design new processes, systems and business models that will deliver speed at scale for new and enhanced products and services for our customers. For example, with Gurrowa we can develop a fully integrated and iterative design process. It provides a space for the design and prototype IoT devices, the network services to connect them, and the software developers to bring the services to life. We have also partnered with Pivotal to bring Pivotal Labs to Australia, which is a fantastic extension of Telstra's innovation network and our capacity to deliver world-class technology solutions to our customers. We believe this will create a pipeline of skills in a range of areas, which in turn will further our innovation and culture change agendas. I am also very pleased that our start-up accelerator, Muru-D[2], which since 2013 has seen 100 start-ups accelerated, 34 successful companies launched, and now operates also out of 4 locations including Singapore and Brisbane, and has partner agreements with other start-up incubators in key markets.

But of course truly innovative cultures are innovative everywhere. We're working hard to encourage all of our people to develop, share and bring ideas to life in every part of the business. It's about supporting people to be creative, to take calculated risks, to speak up and have the courage to solve problems in new and different ways. We do that partly through

good leadership across the company, but also through specific initiatives such as our Innovation Hub and Pitch Nights.

In summary, then, to be truly innovative companies, we can no longer just focus on the technology driving the digital revolution. We need to look at the culture, people, environment and processes that influence our everyday work. We need a holistic approach, based on collaboration, networking and idea exchange. This is why I value my interactions with the membership of the GTWN. Let us continue to work together to keep our industry the driver of social and economic innovation around the world.

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[1] *For more detail see http://exchange.telstra.com.au/2015/08/04/welcome-future-innovation-telstra-gurrowa/*

[2] *https://muru-d.com/*

Kate McKenzie Is GTWN's President for Australia. Kate has been Telstra's Chief Operations Officer since October 2013.

Kate says that she loves her job, as the Operations team is the backbone of Telstra's business and because the Innovation, Technology and Networks teams are leading Telstra's evolution as a world class technology company.

Before this role, Kate led teams overseeing product, promotion and pricing, strategy marketing, and Telstra's regulatory, policy and communications activity. Prior to Telstra, Kate was Director-General of the Department of Commerce in New South Wales. She is also a Director of Pay TV operator FOXTEL and Allianz Australia. She is also a self-confessed big science fiction fan.

DIGITAL TRANSFORMATION: A NEW FORMULA FOR SUCCESS

by Mosiri Cabezas
Director of Digital Transformation and Business Acceleration at Telefónica

Everyone alive today will have the opportunity to experience what it is like to move from one era of human development to another. This new era will be one where we love, work, learn and age in a completely different way to our forebears
.
This year is going to be a critical one for the process of digital transformation of society and the economy. Individuals and companies have already realised that change, and in particular digital change and digital transformation, is a necessity that needs to be made a top priority, so that we can all learn to overcome our present challenges and survive the future ones.

Last year I co-authored a book entitled "The Great Opportunity. Keys to leading the digital transformation of enterprises and technology" in which I defined a new formula for success of digital transformation. Twelve months on, I would like to share a refreshed version of that formula, which has benefitted from experience and discussion with clients, as well as further consideration and research.

$$TD=((Ve \times Va \times N \times H) + (T \times C \times FH)) \times Com$$

DT= (Ve x Va x N x H) + (Human Factors x customers x technology) x Com

This formula is intended to help everyone understand the elements that, in my personal view, are critical to tackling the key elements of a profound, and necessary, process of digital transformation.

The formula has 3 parts. Firstly, human values and characteristics that are essential to this process; secondly, the agents of transformation; and thirdly communication. In other words, the formula encompasses both "soft" and "hard" skills, if you want to view it that way.

In the end, what we are all going to experience is a profound social and economic change which is strongly impacted by digital technology. Therefore, this thinking will also apply to many other changes taking place in society and the economy, which are not directly associated with digital transformation.

THE FORMULA

PART 1 – HUMAN VALUES AND CHARACTERISTICS

Let's start our understanding of the formula driving this transformation by recognising the values and the intrinsic reasons that lead us to this change. Digital transformation is primarily a challenge and a "human" experience and therefore we must understand the human values and characteristics that we need to promote, if we want to succeed in this complex process.

Velocity: We have to be quick, because we live an age of exponential change. A rapid start

will be needed, to encourage everyone to learn, experiment and explore, but also so that we can gain a competitive edge and arrive before others.

Valour: We also have to be brave; we must make decisions without all the necessary information and data. So at a certain level we must trust our instincts and be brave, turning the challenge of the unknown into an opportunity. We need to be aware that change is a necessity, not an option. No turning back, no alternative is possible, except change.

Need: A team's level of motivation and morale is of vital importance in a time of rapid and constant change and transformation, both of the workplace as well as of the business model and competitive environment. A successful team leader needs to understand how his/her workers feel and help them expect success, so that they can act successfully, and ultimately succeed.

Humility: Speaking about humility in corporate environments may seem too "soft" an issue. But humility is increasingly important, reminds us that do not know everything and we have to be willing to learn. Arrogant attitudes of the past, giving way to a leadership style closer and open to hear and learn are the pillars of the new leaders.

PART 2 - THE AGENTS OF TRANFORMATION

There are three main agents of transformation. The main ones, which are also the most complex, are related to people, that is our own teams and clients. Within the processes of change the organization itself can become our own worst enemy. The cultural change that is required by digital transformation involves talent renewal processes, organizational changes, learning to work differently, while also mixing generations and areas of expertise. All of this must happen at once, so it is vital to speed up and put in motion the machinery of internal change.

Above all, whatever we do, the customer has to be the 'raison d'etre' of the organization. Today we have tools to know our clients better and be ready to deliver what they need at all times, thanks to technology.

You might be surprised that technology has been placed almost last in our formula. Although technology is part of the means by which we have to achieve change and also the main reason why everything is changing, we cannot put it at the center of everything we do. Technology should be a tool that allows us to adapt our business to the changing needs of our clients, but technology must always be viewed against what really makes sense for our market and our business and above all, to our clients.

PART 3 - COMMUNICATION: LET THE WORLD KNOW

Whatever we do, let us not forget the importance of communication, both internally within our organisations and externally with the market. We have to share what we want to achieve, as well as the reason for the changes. Our clients need to feel that we are up to dealing with a reality where, as the philosopher Bauman says, "everything is fluid" and there are no boundaries between the physical and virtual realms. A world that surprises us every day and that will surprise us in the future even more.

I encourage you to develop your own formula. Use it. Change it. Evolve it, improve it and share it again. This iterative learning process will make our industry, our societies and our economies stronger, and more competitive. It will allow us to be better prepared for a future and a world that is even closer than we previously imagined.

Mosiri Cabezas is Director of Digital Transformation and Business Acceleration at Telefónica, with over 16 years' experience in the development and deployment of digital services for Europe and Latin America. Previously she held senior positions in various business areas and Telefonica Moviles and brand marketing for Telefonica SA. She is an Economist from the University of the Basque Country, completed her training in France at the University Pierre Mendes France and did an EMBA with a specialization in e-business at the Instituto de Empresa.

UNLEASH THE GAME CHANGERS

THE GC INDEX – A NEW SOLUTION TO THE CHALLENGES OF CULTURE CHANGE

by Nathan Ott
CEO eg1

Companies in all sectors of the economy are facing the same dilemma: how to respond to the enormous challenges confronting them in a time of digital disruption, rapid evolution of businesses and the demands of clients. Organisations have to somehow transform their businesses whilst at the same time keeping their shareholders happy with 'business as usual' and delivering expected returns on investment. Similarly, for governments, they must somehow transform their modes of service delivery whilst meeting the expectations of politicians and the community at large.

The solution to these challenges does not lie in ever bigger expenditure on technology. "We have the technology" -the solution lies in understanding and recognizing the characteristics and strengths required in your workforce. Of those you already have and those you need to attract and ultimately retain.

To set the scene: five years ago, I was watching a documentary about a young aboriginal woman, Gina, in one of the less well known aboriginal communities in Australia. Her community was at risk of a forced displacement by the government and a global mining company. Gina decided that enough was enough and came up with a way to change things. She set about providing for her community through building a haulage business and contracting services back to the mining company at a profit.

On the face of it everything was against her: there were no open doors, but she saw a better way and she was going to see it through. As a result of her efforts, Gina's community became more affluent, crime rates dropped, schooling and other basic services improved and all because one woman had the drive and determination to get there against all the odds.

Why did Gina do this? Why didn't anyone else? What qualities did Gina have over and above the leaders of the community?

This got me thinking differently about how we approach sustainable step-change in our organisations, particularly when faced with adversity, disruption and the need to adapt.

What much of industry is facing in digital transformation can be viewed as a process of natural selection - "adapt or die". We cannot rely solely on the notion of continuous improvement and incremental change. At some point, we have to take a large step forward to succeed.

Whilst the mobile industry has always been, and will continue to be, at the forefront of innovation at a technology level, the approach to its greatest asset, its people, is

still dominated by theories and processes that haven't much changed in nearly 40 years. Instead of seeing our co-workers in terms of their titles, their backgrounds and career paths, we need to learn how to "genuinely" view and value people for what they actually bring to the table.

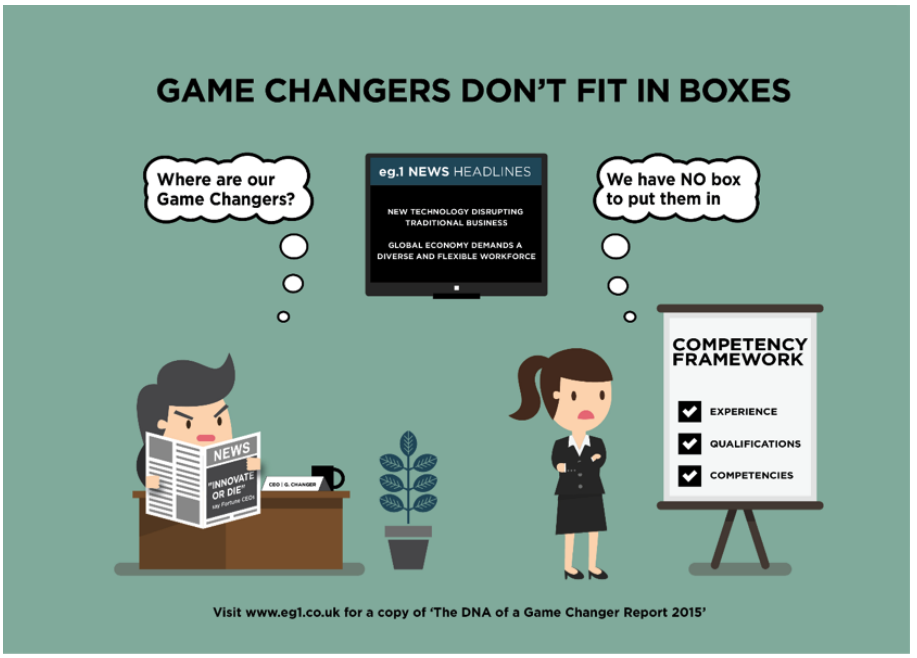
With some notable exceptions, game-changing behaviours and traditional corporate culture have been relatively incompatible. The classic entrepreneurial story is of an employee growing frustrated with not being able to get management to see the value in their new product suggestion or ideas. The consequence? They become disillusioned and leave to do their own thing or even worse, join a competitor.

Time to unleash the Game Changers

Last year we published **THE DNA OF A GAME CHANGER STUDY 2015**. This focused on the premise that organisations are neglecting a special group of talent, just like Gina, which has the potential to 'change landscapes' in their world and for those around them. **The**

Game Changers.

Our 2015 study demonstrated that



Game Changers are fundamentally different from 'High Potentials' and 'Traditional Leaders' and are difficult to define with traditional talent assessment frameworks. It identified the characteristics of the Game Changer – as having an uncommon combination of obsession and imagination, which often leaves them being referred to as eccentric and 'difficult'.
Leaders need game-changing individuals at every level across their organisation, who can see 'ahead of the curve', are willing to take risks, and have the drive to make change. They are the individuals who ensure businesses do more than just survive in today's fast paced digital world. Game Changers often have the unique ability to 'see around corners' in ways that most of us cannot. They do not fit in to our traditional people metrics, talent frameworks or nine box grids. However, they are very often hiding right under our noses and at ALL levels in the organisation.

Now is the time to change recruitment, talent management processes and organisational culture in order to avoid future high potential people being clones of what has gone before. We need now to break the cycle of creating risk averse and innovation-stifling cultures with vision and action.

The traditional approach to talent recruitment and development has created a very one dimensional, individualistic, hierarchical view of leadership, that creates forced and at times highly discriminative processes and, with it, inflexible and stifling organisational cultures. Our cultures need to move away from being "fail safe" and ones where people feel "safe to fail". In the modern world of business, it can be hugely frustrating, even futile, being an imaginative and innovative thinker unless you have a team around you to help achieve the possibilities that you see in your world. Long-term transformational change, and the success that comes with it, depends on game-changing

teams and environments.

Game Changers as we know them today

There are many examples of how industries and business models can be changed by hidden talent, if we recognise it and let it flourish.

In 2001, Google engineer Paul Buchheit started using his '20% time' (the one day a week Google allows staff to work on new projects) to develop a new product. Initially codenamed Caribou, the product was, after nearly three years of development, released as Gmail and would reinvent the entire web-based email category, capturing 53% of the market.

When Ken Kutaragi, a junior Sony employee, presented a modified version of the Nintendo and suggested Sony consider developing a more powerful game console of its own, many senior managers were enraged and tried to kill the project. Thankfully calmer heads prevailed. The result was the PlayStation.

But equally there are many examples of Game Changers who are unable to realise their potential within an organisation, and have to start out on their own to do so. Take Natalie Massenet, founder of Net-a-Porter, a website in magazine format for selling designer fashion. Credited by many as changing the way designer fashion is retailed, she began her career as a fashion journalist at Women's Wear Daily and then moved on to Tatler in the UK, where she worked as assistant for the fashion director. What drove Natalie to leave Tatler in 1998 and

GAME CHANGING TEAM ROLES
(www.thegcindex.com)

start working as a freelancer before setting up Net-a-Porter in 2000?

One can surmise that it was because she saw the potential of online fashion retailing well before her colleagues did.

Apple got it right with their 1997 Think Different commercial...

"Here's to the crazy ones. The misfits. The rebels. The troublemakers. The round pegs in the square holes. The ones who see things differently. They're not fond of rules. And they have no respect for the status quo. You can quote them, disagree with them, glorify or vilify them. About the only thing you can't do is ignore them. Because they change things. They push the human race forward. And while some may see them as the crazy ones, we see genius. Because the people who are crazy enough to think they can change the world, are the ones who do."

Almost 20 years later, we are still struggling to make the fundamental change in our businesses to embrace the game-changing talent at all levels that has the potential to get us there.

The Future: How do we recognise this special talent and make the best use of it?

Our latest study, The DNA of a Game-Changing Team 2016, delves into the mind of a Game Changer in order to really understand what makes them 'tick'. It looks at how organisations can get the best from Game Changers and how to realise their potential within the context of teams and organisational culture. We know that the key to success is to transform individual action into collective power.

Remember: not everyone is a Game Changer, but everyone can make a game-changing contribution!

Nathan Ott, CEO at eg.1 and Director at The GC Index.

Nathan is a founding member of eg.1. Inspired by years in the industry seeking that "je ne sais quoi", Nathan is the author of THE DNA OF A GAME CHANGER and co-developer of eg.1's THE GC INDEX – the only assessment instrument to identify, assess and develop corporate Game Changers. Prior to eg.1 Nathan began his career in research working for a growth accelerator specialist within the technology and professional services sectors; after three years he joined an international consultancy providing business and technology solutions. Nathan holds a degree in International Business & Economics from the University of Westminster and Universitat d'Alacant respectively.

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WHAT WOMEN (STILL) WANT

by Guy Pattison

CEO Long Run Works

Twenty years ago, about the same time that the GTWN was being established as a leading group of women in tech, a group of campaigners for women's rights came up with a simple idea to capture a **female vision for society.**

It was to ask the question **"What do you want?"** on a postcard. No lists. No prompts. No limits. The founder of The Body Shop chain of cosmetics stores, Anita Roddick (later Dame Anita Roddick), personally backed the campaign as part of her ongoing campaign for various social and environmental issues. The Body Shop distributed the cards along with the Co-op Bank, Cosmopolitan magazine and many others. With complete freedom to say whatever they liked, in their own words, women sent replies from all of the UK and from all parts of society. More than 10,000 women filled out a postcard, giving over 46,000 answers that generated newspaper headlines and debate, from the UN to across the UK in a town hall tour, book and festival.

The responses offered unprecedented insights into women's thoughts, opinions and needs that had a significant impact on the gender debate at the time. The survey also showed that while women may had won so-called equal rights, women were far from having equal influence in society.

March 8, 2016, which is International Women's Day, we are launching What Women Want 2.0 and this time we aim to reach over one million British (and hopefully other) women. 20 years on, we will take advantage of digital technology and social media, to involve as many women as possible in rich and robust debates that make change irresistible here in the UK, before launching globally.

- We are using a ground-breaking digital tool called Appgree to generate a level of data and insights that wasn't possible in 1996 and has yet been seen today.
- Our aim is to capture and share the insights with businesses, not-for-profit and communities so that they can use the data to help make the changes that we're still waiting for.
- Partners already on board range from vInspired and City & Guilds to The Women's Institute and The Fawcett Society.
- Over 50 high profile supporters are on board to help us spread the word in the worlds of business, politics, sport, science and culture, ranging from Dame Tanni-Grey Thompson, Justine Roberts and Layla Hussein to Gina Yashere, Maddy Hill and Hayley Atwell.
- This not-for-profit campaign is being driven by a collaboration between We Are Women, led by Sue Tibballs OBE, who was part of the team 20 years ago and Long Run Works. They are being supported by a number of inspirational volunteers.

The other major benefit and where this campaign could be truly transformational, is in the data that we can capture and how that can be used to support change. With Appgree, millions of women can share their ideas and

reach consensus in a matter of seconds, thanks to their algorithm DemoRank. For me, what's really exciting is that by removing lots of the bias that exists in social media, Appgree starts to deliver some of the promise that digital connectivity holds, and it turns the campaign into a platform for true democratic expression. With the scale and scope of the data that the technology allows us to capture, the findings will also represent a powerful mandate for change. If you are a political party, public authority or issues-led organisation you could have a new level of insights and data that can give you the confidence to change a policy, strategy or activity. If you are a business, this could be an incredible opportunity to gain insights into the needs, wants and desires of women.

So come on, get involved and tell us **What Women Want** at www.thisiswhatwomenwant.org, through social media or by sending us a postcard.

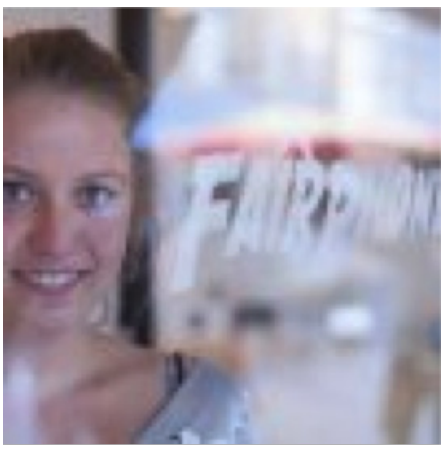
As CEO of Long Run Works, **Guy Pattison** sees his mission as bringing together innovation (a new way of doing things) with purpose (having a positive impact on the world) to create powerful new stories and opportunities for change. Long Run Works is about taking a long run view of issues, so his other drive for this campaign is thinking about the world that his two young boys are growing up in. He hopes that this campaign will be a small but significant step in getting everyone – men and women - to listen, take a more balanced perspective and do things differently.

CIRCULAR ECONOMY:

BUILDING A PHONE TO CREATE A FAIRER ECONOMY

by Bibi Bleekemolen

Impact Development, Fairphone



Fairphone is a social enterprise that is building a movement for fairer electronics. We open up supply chains to understand how things are made and build stronger connections between people and their products.

The Fairphone 2 was were shipped to buyers in December 2015 and aims to shake up the industry and change how people interact with their devices. Its groundbreaking architecture and design make it the very first modular phone to hit the market. This unique design approach extends the life of the phone by focusing on repairability, while at the same time increasing Fairphone's influence over partners and practices within its supply chain. One recent example of the benefits of supplier collaboration is the creation of the first-ever Fairtrade gold supply chain within the electronics industry.

We developed the Fairphone to help us tell a much bigger story. Our phone serves to uncover production systems, address challenging problems and stimulate discussions about what is truly fair. We're making a positive impact across the value chain in mining, design, manufacturing and life cycle, while expanding the market for products that put ethical values first. Together with our community, we are changing the way products are made. Fairphone has over 40 employees with 20 different nationalities and 17 languages spoken. It is 100% independently financed (no donations or venture capital) to preserve our social values. We are supported by an enthusiastic community of Fairphone owners, over 91,000 Facebook fans, over 20,000 Twitter followers and over 45,000 newsletter subscribers. We are based in Amsterdam, the Netherlands.

Fairphone started in 2010 as a project of Waag Society, Action Aid and Schrijf-Schrijf to raise awareness about conflict minerals in consumer electronics and the wars that the mining of these minerals is fueling in the DR Congo. The campaign and related research ran for three years. In 2013, Fairphone was officially established as a social enterprise to help us expand the reach of our goals. By creating a smartphone, we are using commercial strategies to maximize our social impact at every stage of the value chain, from sourcing and production to distribution and recycling.

Fairphone is completely independently financed. We started as a project within Waag Society, a research institute that invests in creative technology projects for social development. At that time, Fairphone received funding from Waag, Stichting Doen and the NCDO (about 300,000 euros over two and a half years).

We also received 10,000 euros as winner of the ASN Bank World Prize. After becoming a social enterprise and working to produce the phone, we received 18,000 euros from Bethnal Green Ventures to participate in a startup boot camp in London and develop our business proposition, plus 400,000 euros in private funding to cover operational costs until the start of pre-orders in May 2013. Since that point in time, our operations have been funded by the sales of our phone, apart from a loan from Rabobank for industrial design and engineering of the Fairphone 2.

We want to source materials that support local economies, not armed militias. We're starting with conflict-free minerals from the DR Congo. We're focusing on longevity and repairability to extend the phone's usable life and give buyers more control over their products. Factory workers deserve safe conditions, fair wages and worker representation. We're working closely with manufacturers that want to invest in employee wellbeing. We're addressing the full lifespan of mobile phones, including use, reuse and safe recycling. We're working to create a new economy with a focus on social values. By operating transparently and sharing the Fairphone story, we're helping consumers make informed decisions about what they buy.

Our starting point was more ethical products in general. We decided to focus on phones simply because they are ubiquitous – nearly everyone owns or frequently uses one. The Fairphone is a storytelling device that provides a useful metaphor for complex, interconnected supply chains. This symbolic product guides our journey as we open up the processes behind production, one step at a time, and work to put social values first. We want to change the relationship that people have with their products and contribute to an economy based on different values. Our phone is just one result of that.

Is Fairphone the first fair mobile phone? In short, the answer is no. Our aim as a social enterprise is to use commercial strategies to create social impact. The Fairphone is still far from "fair", but it's a starting point for our step-by-step journey. There are literally thousands of social and ecological standards that can be improved in the production of smartphones, and we have defined interventions to gradually address some of them. But they can't be overcome all at once, and some things are simply impossible to achieve right now. We want to be completely transparent in all of our achievements, including the areas where we have not yet made progress. Part of our goal is to stimulate discussions about fairness and what it means. As the definition varies from person to person, a 100% fair phone is in fact unachievable. But it is certainly possible to make products fairer than they currently are.

The successful production and sales of the first Fairphone gave us financial foundation we needed to take our ambitions for fairness even further. In 2014, we decided to invest in a completely original design for our new phone, with a specific focus on increasing product longevity and supply chain transparency. This design approach gives us greater oversight of the supply chain, increasing our ability to select (sub)suppliers and build stronger relationships with those that share our goals. We sold 60,000 of the original Fairphones and we're aiming to have 150,000 Fairphone 2 owners in 2016.

Producing the Fairphone 2 is another step to develop the projects we started with the first phone further, including incorporating conflict-free tin and tantalum and financing a worker-controlled welfare fund, as well as contribute to a variety of new projects throughout the value chain. The Fairphone 2's inventive modular architecture gives users more

control over their phone, including the ability to easily open and repair the most commonly broken parts. To help it last longer, the phone also features high-quality components and innovations like an integrated protective case.

Fairphone is driving a movement to change the electronics industry from the inside out. By producing a smartphone in a way that puts social and environmental values first, we're starting discussions and stimulating demand for fairer electronics. Our goal is to increase awareness and motivate the entire industry to act more responsibly. We're tackling issues within our supply chain by focusing on four core areas: Mining, Design, Manufacturing and Life Cycle. We're influencing positive change one step at a time by developing various projects in each of these areas.

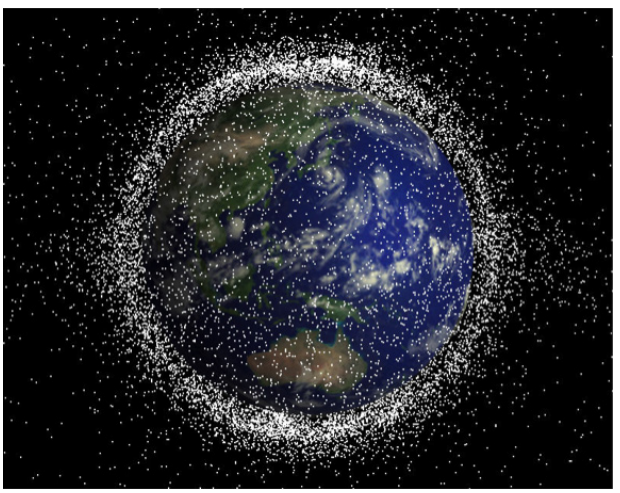
THE GROWING PROBLEM OF SPACE JUNK[1]

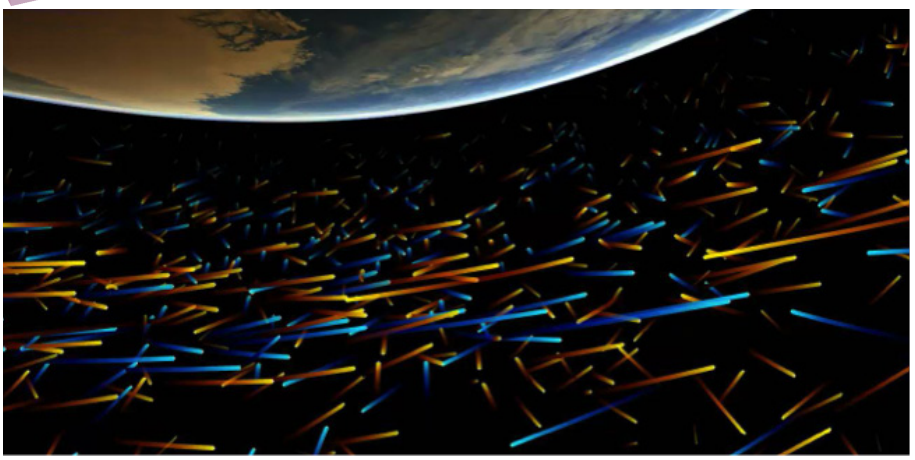
by Dr Hugh Lewis
Senior Lecturer in Aerospace Engineering, University of Southampton, UK[2]

Space junk, or orbital debris as NASA refers to it, is a growing problem with immense significance for the future of the digital communications industry and the users of its products and services.

In 2014, the International Space Station had to move three times to avoid lethal chunks of space debris. The problem also threatens crucial and costly satellites in orbit. So what is the scale of the space junk problem, and what can we do about it?

Forty-five years ago the associate director of science at NASA's Marshall Space Flight Center, Ernst Stuhlinger, an original member of Wernher von Braun's Operation Paperclip team, was asked by Sister Mary Jucunda, a Zambia-based nun, how he could suggest spending billions of dollars on spaceflight when many children were starving on Earth.
Today, Stuhlinger's response still provides a powerful justification for the costs associated with space research. "It is certainly not by accident that we begin to see the tremendous tasks waiting for us at a time when the young space age has provided us the first good look at our own planet," he said.





"Very fortunately though, the space age not only holds out a mirror in which we can see ourselves, it also provides us with the technologies, the challenge, the motivation, and even with the optimism to attack these tasks with confidence."

In the intervening years, the maturing space infrastructure has supported our new and ongoing efforts to tackle global health, hunger, poverty, education, disaster risk reduction, energy security and climate change. Indeed, we have made great use of Stuhlinger's "mirror" to meet many of society's biggest challenges.

Sadly, the space environment has borne the brunt of our increasing reliance on satellites and our long-lived belief that "space is big". More than 5,000 launches since the start of the space age, each carrying satellites for Earth observation, or communications, for example, have resulted in space becoming increasingly congested and contested. The issue has been examined for a BBC Horizon documentary on BBC Two.[3]

Now, the US Space Surveillance Network is tracking tens of thousands of objects larger than a tennis ball orbiting above us, and we suspect that there are one hundred million objects larger than 1mm in the environment. Due to their enormous orbital speed (17,000 mph), each one of these objects carries with it the potential to damage or destroy the satellites that we now depend on.

The US has a network of sensors, including a 3.67m telescope in Hawaii, to track satellites and debris.

Red Conjunction

Perhaps the most visible symptoms of the space junk problem are the regular collision avoidance manoeuvres being performed by the International Space Station (ISS), and the increasingly frequent and alarming need for its occupants to "shelter-in-place" when a piece of junk is detected too late for a manoeuvre.

The systems on the ISS that provide vital life support are also responsible for its unique vulnerability to a debris impact - a pressurised module in a vacuum might behave like a balloon if punctured.

The recent "red conjunction" (where a piece of debris comes close enough to pose a threat to the space station) involving a

The 2013 film Gravity directed by Alfonso Cuarón, and starring George Clooney and Sandra Bullock, showed what it is like to experience a red conjunction call.

Photograph: Sportsphoto Ltd/Allstar

fragment from a Russian satellite on 17 July 2015 was yet another demonstration of the growing threat from space junk.

Thanks to the hit film "Gravity", and the Oscar-nominated performance of Sandra Bullock, we can now readily appreciate the anxiety that must be felt by the astronauts and cosmonauts aboard the International Space Station whenever they receive such a "red conjunction" call.

In spite of these occurrences, the space station is actually orbiting at an altitude where the number of debris is relatively low. At higher altitudes the amount of space junk is substantially greater, but only robotic spacecraft are exposed there. Nevertheless, these satellites are some of the most valuable for understanding our planet. Due to this congestion, there is an increasing chance that the space junk population could become self-sustaining.

That is, more junk could be created by collisions than is removed through the natural decay caused by atmospheric drag. Indeed, we already have some experience of this: in February 2009 two relatively small satellites collided over Siberia creating about 2,000 new fragments that could be tracked, with many still orbiting today and regularly passing close to other satellites.

The Kessler Syndrome

Self-sustaining collision activity is something else that the film Gravity showed us. Dubbed the "Kessler Syndrome" after the NASA scientist Don Kessler (now retired) who recognised and described this process with Burton Cour Palais in 1978, such a scenario is a real - albeit often exaggerated - possibility.

Concerns of an uncontrollable growth of the space junk population and the loss of key satellites that enable us to address our society's problems have prompted scientists to look for ways to remove junk from space: If we can remove the problematic junk, then we can stall or even prevent the Kessler Syndrome.

This is no easy task, however, requiring new technologies, potentially new laws and - crucially - financial investment. The European Space Agency (Esa) is taking the lead, working on a mission it calls "e.Deorbit" that has the objective of removing a large European satellite from space.[4]

The mission is ambitious; numerous technologies have been developed and assessed, including a solution based on a harpoon proposed by UK engineers from Airbus Defence and Space. It is also not without risk, but a successful outcome will surely show the space-faring world that a technical solution to the space junk problem exists, even if the political, legal and financial issues have yet to be solved.
The e.Deorbit mission will face key hurdles in 2016: its systems requirements review and the Esa Ministerial Council meeting, where approval (and funding) to proceed with the mission will be debated.

Small satellites: the future?

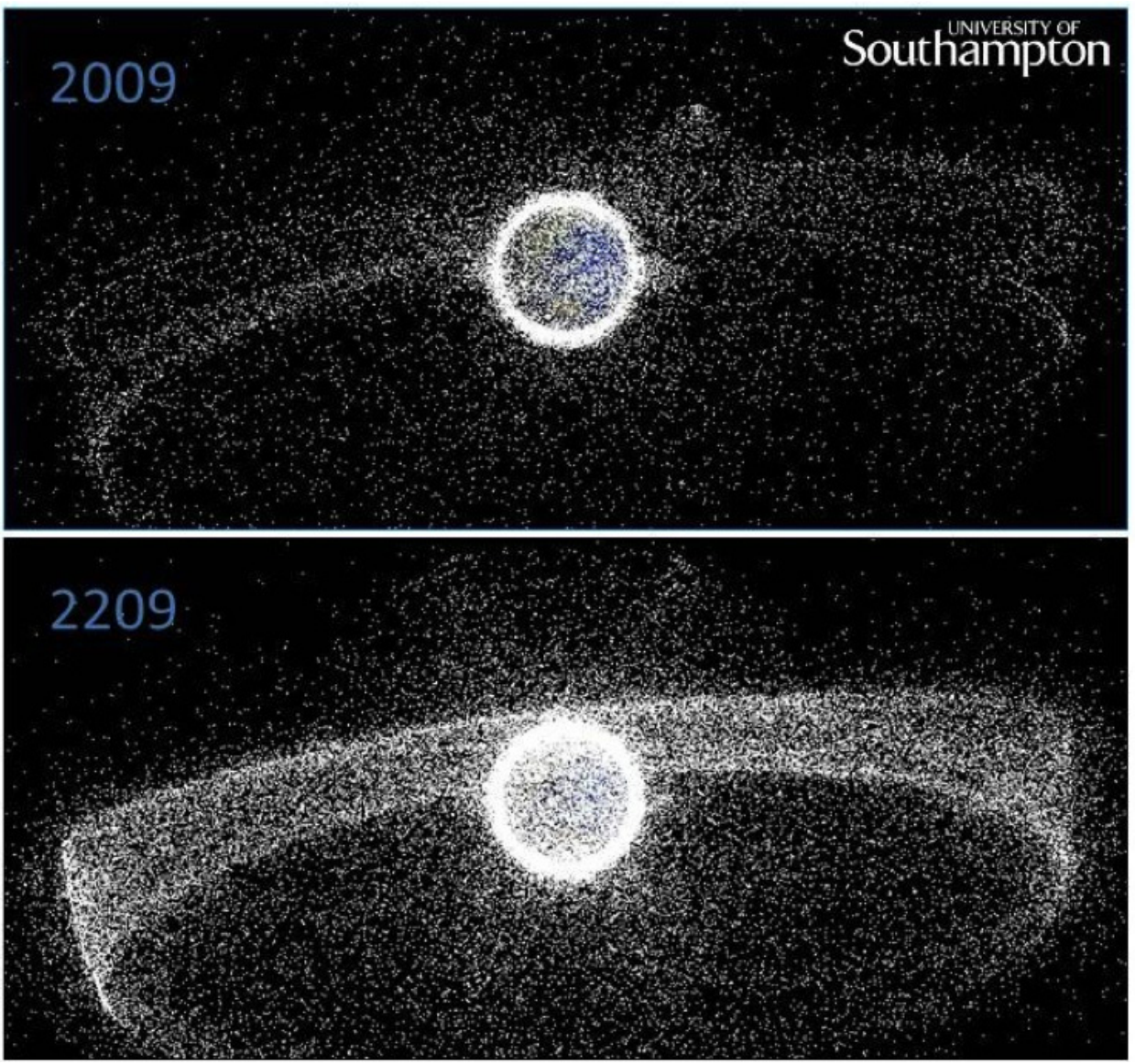
Against the background of an increasing space junk problem, a renaissance is now taking place

The proliferation of small, low-cost satellites could exacerbate the problem

in space; what was the principal domain of governments and space agencies, with their large, multi-billion dollar satellites, is becoming the province of an emerging industry that is revolutionising the use of space.

Diminutive companies and start-ups, in particular, are showing how small budgets do not necessarily mean small ambitions. For example, San Francisco's Planet Labs, are using "cubesats" to redefine the market for Earth imagery. Their Dove satellites are smaller than a briefcase, yet have the capability to deliver high-resolution images of the Earth for a multitude of purposes.

With plans by other companies, including SpaceX and OneWeb, to develop large constellations of small, low-cost satellites, there is some concern within space agencies about the long-term consequences of the ubiquitous and rapid commercialisation of space. In particular, these concerns focus on the abrupt increase in the number of satellites orbiting the Earth, which could substantially increase the need for collision avoidance manoeuvres and hasten the onset of the Kessler Syndrome.



Super wicked problem'

In 2014, Brian Weeden, a technical adviser for the Secure World Foundation, described space junk as a "super wicked problem." Such problems, he explained, are particularly challenging to solve because time is running out, there is no central authority providing guidance or support, those seeking to solve the problem are also causing the problem, and the solutions are left for future generations to find.

The critical first step in tackling super wicked problems is to expand the group of people who support measures that reduce the risk. Indeed, there are encouraging signs that both old and new space actors understand the need to mitigate negative impacts of their activities in space and to limit the consequences for other space users.

Several companies, including Planet Labs and OneWeb have affirmed their commitment to tackle the space junk problem in the public domain. However, much work is still needed to fully understand the problem, develop technologies (such as e.Deorbit), remove legal and political barriers, and to increase awareness. The Kessler Syndrome remains an ever-present threat.

The space age has enabled global solutions to some of society's biggest challenges, just as Ernst Stuhlinger described in his letter to Sister Mary Jucunda. It has also held out a mirror and shown us that a continuing disregard for the space environment will surely affect our ability to deliver these solutions, with potential consequences for millions of people worldwide.

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[1]This is an edited text of an article which was first published 5 August 2015 on the BBC website; http://www.bbc.com/news/science-environment-33782943. Reprinted with kind permission of the author.

[2]Follow Hugh Lewis on Twitter @DrHughLewis

[3]HORIZON: The Trouble With Space Junk was first shown in the UK on BBC Two at 2000 on Wednesday 5th August 2015

[4]See the European Space Agency (ESA) video from 2013 describing the origins of space debris. http://www.esa.int/spaceinvideos/Videos/2013/04/Space_debris_story

Dr Hugh Lewis is a Senior Lecturer in Aerospace Engineering at the University of Southampton. He is also a member of the UK Space Agency delegation to the Inter-Agency Space Debris Coordination Committee and a member of the UK delegation to the United Nations Committee on the Peaceful Uses of Outer Space.

FROM TRASH TO TREASURE - CHANGING THE ECONOMICS OF SPACE JUNK

by Dr Patrick Neumann

Chief Scientist, Neumann Space

Whether it's piles of empty oxygen tanks on Mount Everest, or dead satellites in orbit, exploration leaves messy footprints behind. While this detritus is bad enough on Mount Everest, in space the effects could be disastrous. While space is mind-bogglingly big, the space around our planet is limited, and filling fast. In order for an object to stay in orbit, it needs to move at about 8 kilometres a second, which is literally 'faster than a speeding bullet.' At these speeds, if two objects collide, be they operational satellites, spent rocket stages or something else, the collision will create a cloud of smaller debris which can create yet more debris through future collisions; dubbed the Kessler Syndrome, after NASA scientist Donald Kessler[1]. If we don't take action to reduce the Kessler Syndrome, the chances of a satellite colliding with a disabling piece of debris will be so high that new launches may not be feasible.

Most proposed plans for active debris removal (ADR) campaigns centre around the disposal of large items of debris such as spent rocket stages and defunct satellites. By removing these larger items, we can prevent their collision and fragmentation into many smaller, un-trackable pieces of debris, which can be just as hazardous[2]. The question then becomes one of logistics, with the key problems being first, how to capture debris massing several tons, and second, what to do with the detritus when captured. Many ADR campaigns share the same basic structure: match orbit with the debris, capture it, and then de-orbit the debris with a chemical rocket to allow for control over impact location. There are a few inherent difficulties in this process - a debris-hunter can't use chemical rockets, as they're too inefficient for long-term use in this way, and any plan that involves crashing detritus into the Earth comes with the risk of crashing somewhere problematic.

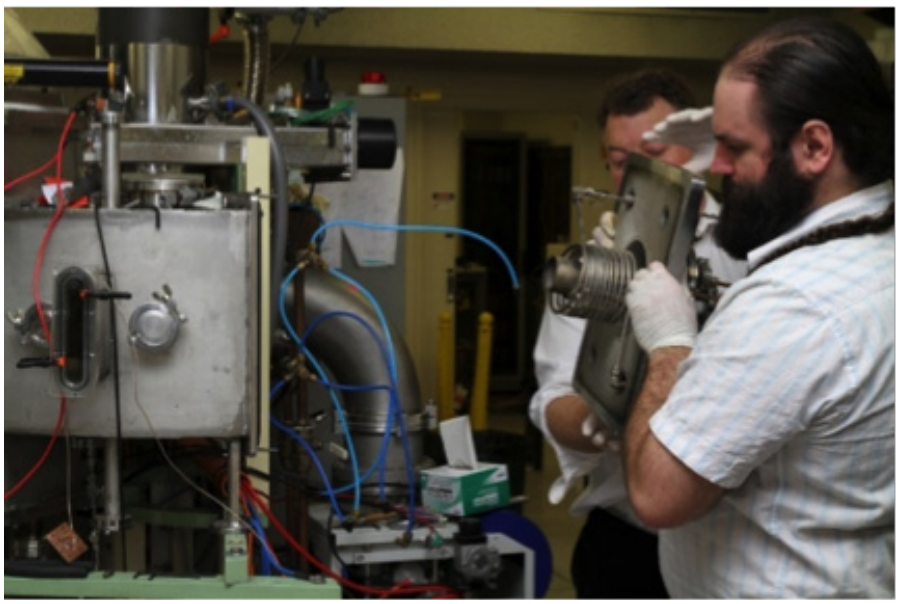
This is where we come in. At Neumann Space we are developing a solid-fuelled electric propulsion system that can use common metals as its "fuel," can be powered by solar panel arrays and is very fuel efficient. In fact, we believe our system is the sort of low-thrust, high-efficiency engine that would allow a properly designed spacecraft to fulfil the same sort of role as a tugboat, as it enables the marshalling and collection of uncontrolled debris or end-of-life satellites.

Our drive works on similar principles to an arc welder, and, like a welder, can work on nearly anything conductive. This flexibility of fuel is unique to our product, and vital to changing the economics of orbital debris, as a Neumann Drive is proven to work well with the common 'aerospace metals' - titanium, magnesium, and aluminium. For example, a spent rocket stage might mass 5 tons, and if 4 tons of that is present as aluminium fuel tank and structural ribbing, then that is 4 tons of

salvageable fuel for a debris-hunter.

We believe that our system can not only be used to move debris to orbits with faster decay times, but that our system can change the perceived value of space junk. We envisage a semi-autonomous debris-hunter that can match orbits with debris, capture it and then bring it back to a refinery for reprocessing and recycling. If we can process defunct satellites and spent rocket stages into raw materials for the next stage of space exploration, we can help to make the economic ecosystem of space more circular and less linear. That is to say, rather than single-use, hand-crafted artisanal spacecraft, we can move towards more standardisation and mass-production in the space vehicle supply chain, as well as encouraging the recycling of materials in space. After all, someone has already spent around $10,000USD per kilogram to launch that material into orbit, so it is only sensible that it gets used more than once.

Recycling space debris would allow us to refuel vehicles using our technology with reprocessed space junk. Since our system utilises solid conductive fuel rods, refuelling our system would be much easier than refuelling a liquid or gas fuelled system, such as envisaged by Dr Bryan Benedict of Intelsat, among others[3]. A Hall Effect thruster system typically uses xenon as its "fuel," and this xenon must be brought from Earth while stored as a pressurised gas. Thus, transferring the xenon fuel across would be challenging, as the systems would need to line up the feed hose with the inlet valve carefully, ensure a good seal for the fuel transfer, and then ensure that everything is properly sealed up after the transfer to prevent leaks. If the satellite uses a liquid hypergolic fuel, such as hydrazine, then things are even more complicated; liquids slosh about, they must be pumped, and in microgravity there will be cavitation, meaning "bubbles" of vacuum will form inside the liquid fuel.



Dr Neumann removing the testbed from the vacuum chamber, assisted by CEO Ian Whitchurch

Meanwhile, this all assumes that the satellite is designed to be refuelled; the problem is that none currently are. This means that the process is even harder; a system would need to drill into the satellite, hoping that it is aimed at the fuel tank rather than something more sensitive, and be able to deal with the thrust of any dregs escaping from the fuel tank.

Since hypergolic fuels have a tendency to decompose when heated, a hot drill bit entering the fuel tank is not likely to be a good thing. For these legacy devices, we'd propose a semi-autonomous tug that is designed to be refuellable from the beginning. When the tug is getting low on fuel, it can visit a fuel depot and have fresh fuel rods installed quickly, easily and safely; simply screw in new rods of metallic fuel, test the connections, and the tug is ready to continue. After being refuelled the tug can then undock and return to its allotted tasks. Similarly, these tugs could remove end of life, defunct, uncommunicative or otherwise undesirable satellites from valuable parts of space or from certain designated "graveyard orbits" for reprocessing. This would allow the tugs to open up satellite slots in geosynchronous orbit, lower hazards for satellites in these environments and recycle materials that are already in space.

Refinery-sourced recycled debris would allow a tugboat or

Dr Neumann with a triple cathode-anode assembly

junk-hunter to operate for as long as its solar panels and electronics can remain working, thus the total mission cost of lifespan extension and ADR campaigns can be lowered and amortised over longer periods. Excess fuel rods can also be sold to third parties that require refuelling, be they existing vehicles or vehicles launched from the surface with minimal on-board fuel that can rendezvous with the fuel depot. In the longer term, this will create markets in space for space derived materials, as well as enable the testing of refining and fabrication techniques in space.

These are a couple of the many exciting applications for our system, and we look forward to developing it further with assistance from others in the aerospace industry. Hopefully, someday soon, the first garbage truck will drive around Earth's orbit, collecting the junk that has been left to accumulate for far too long already.

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[1] *Kessler and Cour-Palais, Journal of Geophysical Research, 83 (1978) A3*

[2] *White and Lewis, Advances in Space Research 53 (2014) 1195–1206*

[3] *http://www.intelsat.com/wp-co ntent/uploads/2014/09/Space_2014_Bryan_Benedict_Investing_in_Satellite_Life_Extension.pdf*

NEUMANN SPACE

Dr Patrick Neumann, Chief Scientist, Neumann Space Pty Ltd.

Having grown up reading a lot of science fiction, Patrick decided to study science fact by undertaking his undergraduate studies in aerospace engineering and physics at the University of Sydney. After completing his undergraduate thesis on electric propulsion, Patrick followed the same project through his master's and doctoral studies, which includes the work he describes in his article. As a keenly practical individual, Patrick has formed a company, Neumann Space Pty Ltd, to develop and commercialise his invention for the greater benefit of humanity.

WHY THERE IS NO MOORE'S LAW FOR NETWORKS

by Martin Geddes

Founder and Principal, Geddes Consulting

A common misconception in telecoms is that there is an equivalent of Moore's law for networks. Whilst it is true that we have seen exponential growth in data transmission bitrates –driven by past rapid improvements in opto-electronics – no such property holds for networks as complete systems

What is Moore's law?

Just over half a century ago, in 1965, then director of R&D at Fairchild Semiconductor, Gordon Moore, speculated[1] , that by 1975 it would be possible to contain as many as 65,000 components on a single quarter-inch semiconductor. Later that year, Moore revised the forecast rate. Semiconductor complexity would continue to double annually until about 1980, after which it would decrease to a rate of doubling approximately every two years. Shortly afterwards, Caltech professor Carver Mead popularized the term "Moore's law". This forecast of an exponential increase in the density (and hence performance) of integrated circuits drove the technology plans for semiconductor manufacturers. Each aimed for the presumed increase in processing power that their competitors would soon attain. It therefore became in many ways a self-fulfilling prophecy.

This is of significance for society as a whole. Whilst the impact of IT on labour productivity is a matter of some controversy[2], Moore's law factors directly into product and service innovation that has unquestionably benefitted us all.

The nature of Moore's law

"Moore's law" should be considered an observation or projection, not a physical or natural law. Moore himself predicted that Moore's law, as applied to integrated circuits (ICs), will no longer be applicable after about 2020 – when IC geometry will be about one atom thick. On the other hand, many believe that advances in 3-D silicon, single-atom and spin transistors will give us another twenty years of conventional doublings before the electronics limit is reached. New technologies, such as biochips and nanotechnology[3], may mean that Moore's law will continue inexorably forward[4].

But in more recent times, there have been increasing indications that Moore's law is nearing the limit of its relevance. Intel confirmed in 2015 that the pace of advancement has slowed, starting at the 22 nm feature width around 2012, and continuing at 14 nm. Brian Krzanich, CEO of Intel, announced that "our cadence today is closer to two and a half years than two." This is scheduled to hold through the 10 nm width in late 2017. He cited Moore's 1975 revision as a precedent for the current deceleration, which results from technical challenges

and is "a natural part of the history of Moore's law"[5].

The value bottleneck shifts to networks

It is hardly a secret that the dominant trend in IT over the past two decades has been the shift from stand-alone mainframe and desktop computers to networked services. Every smartphone and tablet is a client for a multitude of cloud application.

The overall ability of this infrastructure to deliver value is thus limited by the performance of distributed computing applications. This performance limit is not the product of single data links, but of complete networks (or in the case of the Internet, a "networks of networks").

There is a widespread belief that there ought to be a Moore's law for networks. It is a pernicious one, since it perpetuates the idea that broadband networks are somehow like 'pipes'. In this belief system, all we need to do is to keep increasing the rate of flow – i.e. supply ever more 'bandwidth'. This false metaphor leads us into irrational design, marketing and operational decisions that are damaging both the telecoms industry and its customers.

So, why is this common belief wrong?

Reason #1: Performance is driven by latency, not bandwidth

With Moore's Law, we are creating ICs of ever more complexity, to maximize the computational capabilities of a device. To the best of our knowledge, there is no intrinsic upper bound to this process, bar those ultimately imposed by the physical resources of the universe.

Conversely, with networks the opposite is the case: we are aiming to minimize the latency[6] of communications. The smallest possible latency occurs at the speed of light. One of my colleagues heard a telco CTO instruct his staff that they were to reduce latency on their network by 10% every year. A moment's thought tells you that can't happen!

Reason #2: It's not just about link speeds, but also about contention for backhaul

Technology improvements decrease the time it takes to 'squirt' a packet over a transmission link. (The technical term is to 'serialize' a packet.) However, when packets contend for that link, there is a delay whilst they wait in queues. This delay can easily offset any improvements in transmission technology. Indeed, networks are changing structurally, making them more sensitive to contention delay. One reason is that the ratio between the capacity of the edge and core is changing.

For example, in the past it might take a thousand users of dial-up modems offering a typical load to saturate their backhaul. Today, a one gigabit home fibre run may have a shared one gigabit backhaul, which means a single user can easily saturate it with a single device running a single application. Wireless technologies like beam-forming also work to increase contention on mobile networks, by allowing more users to operate concurrently on a single piece of backhaul. We are moving from a world where it took multiple handsets to saturate the backhaul one cell, to one where a single handset may be able to saturate the backhaul for multiple cells – simultaneously!

There is no technological 'get out of jail free' card for contention effects, and no exponential technology curve to ride.

Reason #3: As demand grows, QoS declines

When we increase supply in a broadband network, demand automatically increases to fill it. That's the nature of protocols like TCP/IP and modern (adaptive) applications: they aggressively seize whatever resources are available. Improvements in technology don't automatically result in corresponding improvements in application performance. If the network is "best efforts", the customer experience may well decline accordingly.

Indeed, in some cases adding more supply can make things worse – either by over-saturating the contention point, or moving it around. This isn't a new phenomenon: data centre architects have long known that adding more CPUs to a server constrained by storage performance can in fact make performance regress, rather than improve.

Reason #4: Applications need 'stationarity', or steadiness

Computation can be measured by the number of logical operations performed, which is a simple scalar. Data networking requires low enough latency and packet loss, and those have to stay sufficiently steady for applications to work. This 'steadiness' is called stationarity, and is a statistical property that all applications rely on. When you lose stationarity, performance falters, and eventually applications fail.

Hence the resource we are trying to create isn't some simple scalar with a hyper-growth curve. We also need the absence of variance, which has no technology-driven improvement like Moore's law. Indeed, growing demand acts to destroy the stationarity of statistically-multiplexed networks. Furthermore, this happens earlier in the life cycle of every new generation of access technology!

Reason #5: Physics is not on our side

Even increasing link speed isn't an endless process. As the head of Bell Labs Research says in Scientific American[7]:

We know there are certain limits that Mother Nature gives us—only so much information you can transmit over certain communications channels. That phenomenon is called the nonlinear Shannon limit. ... That tells us there's a fundamental roadblock here. There is no way we can stretch this limit, just as we cannot increase the speed of light.

Both fixed and mobile networks are getting (very) close to this limit. We can still improve other bottlenecks in the system, such as switching speed or routing table lookup efficiency, but there are severe decreasing returns ahead.

The bottom line

Moore's law is driving hyper-growth in volumetric computational demand, but the nature of network supply does not have a corresponding hyper-growth decline in cost. That is because volumetric capacity is not the only concern – latency matters too, and this is constrained by both the speed of light as well as the schedulability limits of the network.

There is no magic technology fix through increasing link speeds. Application performance is increasing dominated by latency, not bandwidth. That is why Google has a "Round trip time Reduction Ranger", whose job is not to reduce the speed of light, or cause technology miracles to occur, but to chop up and rearrange data flows, trading (self-contention) delay around, in order to get better overall application outcomes.

Similarly, the future of telecoms in general is firmly centred on managing latency due to the contention between flows created by competing applications and users. This means scheduling resources appropriately to match supply and demand. That in turn allocates the contention delay to the flows that can best withstand its effects. To believe otherwise is just a big fat pipe dream.

[1]in a brief article entitled "Cramming more components onto integrated circuits"fFor the thirty-fifth anniversary issue of Electronics magazine, published on April 19, 1965.

[2]https://en.wikipedia.org/wiki/Productivity_paradox

[3]In 2011, researchers at the University of Pittsburgh announced the development of a single-electron transistor, 1.5 nanometers in diameter, made out of oxide based materials. Three "wires" converge on a central "island" that can house one or two electrons. Electrons tunnel from one wire to another through the island. Conditions on the third wire result in distinct conductive properties including the ability of the transistor to act as a solid state memory

[4]In 2015, Intel and Micron announced 3D XPoint, a non-volatile memory claimed to be up to 1,000 times faster, up to 1,000 times higher endurance and similar in density compared to NAND. Production is scheduled in 2016

[5]Bradshaw, Tim (July 16, 2015). "Intel chief raises doubts over Moore's law". Financial Times.

[6]The term latency refers to any of several kinds of delays typically incurred in processing of network data.

[7] http://www.scientificamerican.com/article/when-will-the-internet-reach-its-limit/

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EMBRACING MOBILE PAYMENTS WITHOUT THE RISKS

by Michele Merrell

North America President, GTWN and President, Merrell Consulting Group

For many years, payment industry experts have discussed the rise of mobile payments, claiming that the ease of use of mobile payments would mean that the technology would become widely adopted among consumers. Many major technology players such as Google and Samsung have launched or enhanced mobile payment services. But it was the earlier launch of Apple Pay that proved to be a game changer, pushing mobile payments to the forefront of many people's minds, particularly in the United States.

Mobile has found itself at the center of financial technology innovation, with many consumers seamlessly using online banking and peer-to-peer payments on their mobile devices. The simple user experience and effective design of mobile payment applications is likely behind their increase in popularity, as many consumers like the idea of being able to pay for products with a 'tap', which is far simpler than having to search for the wallet, pull out a card and type in a PIN number.

This is evidenced in the 81 per cent of users that rated the general experience as "good to excellent" according to a recent Telecommunications Systems (TSYS) report[1]. This positive reception has opened up a world of opportunities for banks and retailers who, after significant investment, can provide tailored services that keep up with the changing needs of their customers. Now that consumers have become accustomed to simply 'tapping and going', Visa predicts this will impact over 3 million Visa transactions per day, a total of more than $76.4 million, demonstrating the extent to which mobile devices has become ingrained in the way we make our purchases.

Innovation Brings New Security Requirements

Innovation often arouses suspicion and can lead to questions around security issues – and mobile payments are no different. Even though the adoption of mobile payments has increased significantly, some users still have yet to come to terms with the fact that they are using a phone, a device they normally just text or call with, to make a payment.

Mobile payment users often feel apprehensive regarding their security when making a transaction, and this is usually due to the link between security and consumer trust. Any business has to ensure they build and maintain their customers' trust and this is particularly true within the payments industry. The payments sector faces the pressure of innovation as well as needing to balance a sense of security so consumers won't feel that their personal or financial data is in jeopardy. The industry now faces the challenge of convincing consumers that their mobile has the same level of security as the bank card that they are accustomed to using.

How can this be done? Mobile

has expanded the payments ecosystem in an unprecedented way, with untrusted devices now communicating over untrusted networks. This has resulted in a whole new challenge for security professionals. Mobile payments providers are looking to emulate the EMV cryptographic security of an EMV chip that can be found in payments cards, in a virtual environment. A recent arrival on the scene, Host Card Emulation (HCE) is making it simpler for banks to provide safe contactless mobile payments without the need to depend on mobile network operators (MNOs) or Trusted Service Managers (TSMs).

What Solutions are Out There?

In the past, tokenization has mainly been used by acquirers to help merchants reduce their PCI DSS scope, as well as devalue data stolen by criminals. Many solutions have come on to the market to assist issuers with isolating sensitive account data between various payments channels, such as the EMVCo tokenization standard, which is being actively promoted by the global card schemes as part of their mobile payment initiatives.

The process of tokenization means that the 16 digit number used for the transaction process has different values for each mobile payment transaction or an ecommerce transaction, but there is one constant aspect in the process – the real PAN (primary account number) is maintained and held by the issuer. Tokenization makes it practically infeasible for criminals to create counterfeit magnetic stripe cards from stolen data.

Tokenization not only protects the user but it also protects the back end infrastructure that communicates with the phone to set up payment accounts and approve transactions. Apple is an example of a major household name that has made tokenization an integral part of its security infrastructure. The company ensures that only temporary 'tokens' are stored on a phone, and these tokens are rendered useless for hackers when they are stolen as they are only used in transactions to represent a user's account. These same tokens can be easily deleted without impacting a user's bank account or credit card.

Even though many companies have realised the positives of tokenization, there is the one challenge that security professionals will have to concentrate on to ensure it is a success – the storage of the tokens. The security team that handles the tokenisation service will have to focus on storing the tokens and their correspondent PANs, in a 'token vault' and they will have to guarantee that the vault is secure at all times to prevent it from becoming an easy target for criminals.

Mobile Payments vs Bank Cards

One of the main barriers preventing mobile payments from becoming completely main stream is that credit and debit cards are still primarily used. We are familiar with bank cards and when it comes to our finances, many would prefer to stick with the tried and tested than take what seems to be a potential risk. The efficiency of mobile payments is also competing against the ease of contactless card payments, with some consumers wondering why the need to make the switch, when their trusted cards are just as quick whilst maintaining a sense of security.

However, if payments providers would like mobile payments adoption to continue grow, they should steer away from comparing the technology to bank cards. Instead, payment providers should concentrate on which payment method is best for each individual transaction environment. Only then will payments providers be able to deliver services that are appropriate for different scenarios while guaranteeing that they satisfy their customers' requirements for efficiency and security.

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[1] *http://216.139.227.101/interactive/tss2014/*

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Michele's achievements have earned her dozens of awards and recognition over her carer spanning 23 years in telecommunications and technology. In 2014, Michele was the recipient of the Florida Achievement Award from the Florida Commission on the Status of Women, part of the Office of the Attorney General. In 2013, she was also named by the Diversity Journal as a recipient of their "Women Worth Watching" award. The South Florida Business Journal named Michele in 2012 as their "Business Woman of Influence" recipient. She was also a featured executive in the November 2010 edition of March Magazine, a women's executive magazine. Michele has won numerous other awards for business and leadership acumen.

Michele is a member of the Board of Directors for Cable Bahamas, a publicly held international telecommunications company headquartered in Nassau, Bahamas, with subsidiaries in the United States. She is on the international board of directors for the Global Telecom Women's Network (GTWN), and is also the North America President for GTWN, an organization that actively promotes and mentors women in the telecommunications and technology industries. She is a member of numerous local and national professional organizations. Michele speaks regularly on topics ranging from technology, marketing, business leadership and women's issues.

TV IS DEAD.

LONG LIVE TELE-VISION

by Vicki MacLeod

Secretary-General, GTWN

2016 will be the year where watching TV where you want it, when you want it and on whichever device you want it goes mainstream and mass market, thanks to over-the-top (OTT) services and the market response from traditional players.

Since its invention, television has gone through a number of stages,

The reports of my death have been greatly exaggerated [1].

with ever increasing rapidity, (from monochrome, to colour, to time-shifting through video recorders, to widescreen, to digital, to HD to 3D) that have radically changed the way viewers consume broadcast content. In recent times, despite these rapid developments, many in the tech sector have asked how TV can still be relevant in a tablet and smartphone age. Well, although the "one family TV in the living room" may indeed have reached its use-by date, we are about to enter a new era, where TV will finally become true tele-vision[2] to be viewed by anyone, anytime and anywhere.

The change is being driven by the young. Children under five are watching about 2.6 hours of TV a day, accessing on-demand content through tablets and other devices[3]. Their older siblings, five- to 15-year-olds, (sometimes now referred to as "screenagers") are spending more of their time online than watching live TV. They are place-shifting their content, watching TV online through devices at a time that suits them. This year will see the next stage in the evolution of TV - the continued rise of on-demand and the launch of new services[4] ***which allow all television to be place-shifted.***

2016 will be the year of TV anywhere, as Sky Q and its peers and rivals around the world will likely bring place-shifting to the mass market, beyond the tech savvy. At first, this may not look like a big deal. We know from personal experience that TV viewing time has already become very fragmented—the result of overly busy lives that see viewers recording programs that other commitments forced them to miss. Everyone knows that "screen time" today is shared with laptops, phones and tablets, often all at the same time. And coupled with the widespread availability of high-speed wireless Internet, and the influence of social media, today's viewing experience is more interactive, more consumable and far more sharable in real time.

What is different now, is that users will be able to place shift their content at will. Everyone will take their TV with them,

downloaded or streamed to tablets and smartphones, place-shifting content including recordings from their satellite box. Other place shifting devices, including BBC's iPlayer, or Australia's FoxteliQ2 and others also do a similar job in a less sophisticated fashion, meaning that almost anyone will be able to consume content (both free-to-air and subscription) on their own terms.

Like time-shifting before it, place-shifting is an important evolution of the television experience and crucial for it to stay relevant in the on-demand era, when competing with so many other instant forms of entertainment. Take, for instance, the pressure the cable companies are facing from so-called over-the-top (OTT) providers, such as Netflix and Hulu, which send their content through the Internet. In short, we're now seeing the collapse of the walls that previously excluded new entrants to the TV business.

But the regional content licensing agreements of movie and television studios remain the biggest obstacle to the next wave of place shifting – where content will be available globally, in real time, to anyone around the globe. This will be the ultimate in time and place shifting, but it must wait until the content rights holders, like the music industry rights holders, can sort out new business models.

Responding to concerns of content owners about the use of VPN technology to get around their regional controls, Netflix has recently announced that those using proxies and unblockers[6] will only be able to access the service in the country where they currently are. Netflix also announced that its service is now available in an additional 130 countries, bringing the total to 190. But, thanks to geographical licensing restrictions, the content being made available to Netflix customers in Canada, for example, will still look dramatically different to the catalogue available to subscribers in Germany or Australia. This move by Netflix comes despite the statement at the January 2016 Consumer Electronics Show (CES) in Las Vegas, Netflix chief product officer, Neil Hunt, acknowledged the futility of trying to limit the use of proxies:

"Since the goal of the proxy guys is to hide the source it's not obvious how to make that work well. It's likely to always be a cat-and-mouse game. [We] continue to rely on blacklists of VPN exit points maintained by companies that make it their job. Once [VPN providers] are on the blacklist, it's trivial for them to move to a new IP address and evade.[7] "

So the longer term answer is clearly to negotiate global licensing agreements. According to Hunt, Netflix's *"ambition is to do global licensing and global originals, so that over maybe the next five, 10, 20 years, it'll become more and more similar until it's not different"…"We don't buy only for Canada; we're looking … for all territories; buying a singular territory is not very interesting anymore."…"When we have global rights, there's a significant reduction in piracy pressure on that content. If a major title goes out in the U.S. but not in Europe, it's definitely pirated in Europe, much more than it is if it's released simultaneously."*

Finder[8] has released a breakdown and map of what percentage of the US catalogue is available in what country. The data clearly demonstrate just how fractured Netflix content availability is around the world, and is sure to provide added momentum to the call for global, real time availability of content. Perhaps then the true promise of television – to overcome time and space barriers - will be fulfilled.

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[1]*American author, Mark Twain, the pen name of Samuel Clemens.*

[2]*The word television comes from Ancient Greek τῆλε (tèle), meaning "far", and Latin visio, meaning "sight".*

[3]*http://www.theguardian.com/society/2015/sep/16/survey-records-rise-in-under-fives-watching-tv-and-using-tablets*

[4]*Such as SkyQ in the UK, which will allow you to watch programs on 3 TVs and 2 tablets at once, or record 4 programs simultaneously.*

[5]*Place shifting actually started with devices such as the Slingbox in 2005, which allowed users to watch TV streamed from their homes anywhere they have an internet connection.*

[6]*Unblockers are tools that allow a customer in one geographic regions to access content from the US library, bypassing restrictions, put in place by content licensing agreements.*

[7]*https://www.techdirt.com/articles/20160112/04573333303/netflix-pretends-it-will-crackdown-vpns-just-days-after-admitting-futile-to-do-so*

[8]*http://www.finder.com/global-netflix-library-totals.*

Vicki MacLeod is owner and principal of her own digital technology and innovation consulting company. She is also on the Board of Directors of OWNSAT (Oceania Women's Network Satellite Pty Ltd), a Singapore-based satellite investment arm. She has also been Secretary-General of the Global Telecom Women's Network (GTWN) since 1998. In addition, she is Senior Advisor, Global Strategy for UK based digital media consultancy, Perfect Limited. Vicki has had a considerable career in the telecommunications industry. Most recently she was Senior Advisory, Innovation Culture at the Chief Technology Office (CTO) of Telstra. She previously represented Telstra at the OECD's Business and Industry Advisory Committee (BIAC) for more than a decade. She is a former Executive Director of the London-based International Institute of Communications (IIC).

FINTECH – A GOLDEN OPPORTUNITY FOR MOBILE OPERATORS?

by Victoria Hernandez

Global Advisor, TMT and FinTech

While the last three decades of financial innovation have already led to massive changes in financial services, we believe that a new wave of innovation will continue to transform the industry. Innovation, through what has been called FinTech, is already disrupting the ways financial services are being offered, promising to provide access to underserved markets in new ways[1].

The Euro banking system is the largest financial market in the world, with consolidated assets three times of US and near four times that of Japan. Despite the many national differences across European countries, in terms of size of territory, population, GDP, legal system, as well as the significant differences in development between Western and Eastern Europe. The European banking sector today employs 3.2 million people, represents 6,5% of the EU28 GDP and 17% of the total corporate income tax. Two main factors that are fostering significant change in the European financial services market are digitalisation and regulation.

Digitalisation and dis-intermediation are speeding up

Digitalisation of financial services is a well-established phenomenon in Europe, with many younger

people never experiencing face to face banking. Online digital platforms have brought about a disintermediation of many of the services that banks used to offer exclusively, including mortgage lending, saving, bill paying and insurance. The dual trends of digitalisation and disintermediation will continue into 2016 and beyond, as mobile payment systems become even more dominated by open cloud and host card emulation.

Payment services is a highly transactional business and in the past, the volumes involved have been quite predictable for the banks. Banks are coming under pressure by a range of new players, who have successfully disintermediated the conventional banking system, and undermining some areas of their profitability. While banks have had the upper hand in terms of stability, government regulatory protection and established credit rating systems, all of these areas are coming under increasing pressure. The established credit cards are stagnating to the benefit of debit card and prepaid card profitability.

A single EU financial market is needed

While digitalisation will continue to put pressure on the banks at the national level, new regulation is forging a path for a single financial market in Europe. Few industries are as heavily regulated as the financial services industry, so for FinTech to realize its full potential, coherent action by several players is required. Governments need to set the right incentives and provide direct support to help their national FinTech industries to blossom. Regulating bodies need to keep abreast of developments in the sector and create a positive and cooperative environment that promotes innovative solutions.

Some of the pre-requisites for an innovative environment for a thriving FinTech sector in the EU include:

- Establishing a single market for financial services
- Harmonisation of bank regulation and supervision across EU borders
- Putting the DSA (Digital Single Market) amongst top 10 priorities for the EU
- SEPA (Single Euro Payment Area)5 allows more than 500 million citizens, over 20 million businesses and European public authorities to make and receive payments in Euro under the same basic conditions, rights and obligations, regardless of their location.
- Removing the obligation for many retailers to accept cash for small purchases, as proposed in Denmark, where nearly half of the population uses MobilePay, a Smart phone payments app.
- Global anti-money-laundering (AML) initiatives such as Know-Your-Customer (KYC) and Counter Terrorism Financing rules.

Response by Financial Institutions and Payment Providers

Today's retail and wholesale banks face unprecedented operational pressures that test the efficiency, effectiveness, and agility of their business processes. Since the global financial crisis, increased regulation combined with the zero cost of money has decreased interest rate spread and lowered margins, elevating the importance of fee-based and account-based income and forcing financial services players to look for new revenue streams.

The typical banking business process often struggles to adapt to shifting marketplace demands and regulatory requirements. Lending institutions of all types are looking to build a better banking business process, intelligent enough to successfully balance business objectives with customers' needs, and agile enough to keep pace with a dynamic operational environment. In today's market often banks concentrate on cost reduction, as opposed to value enhancement, thus leading to further erosion of their business.

Payment providers are now facing an increasing threat from new and simpler mobile payment systems. Banks' interchange fees have a complex pricing structure based on the card brand, regions or jurisdictions, the type of credit or debit card, the type and size of the accepting merchant, and the type of transaction (e.g. online, in-store, phone order, whether the card is present for the transaction etc.). Further complicating the rate schedules. Interchange fees are typically a flat fee plus a percentage of the total purchase price (including taxes). Major branded card payment networks

such as Visa and MasterCard are entering into the mobile payment community to address the competition to plastic cards from virtual cards. For example, Visa has co-invested with Samsung Pay to acquire LoopPay (which developed MST6 technology). But despite this increasing competition, main Payment Providers remain the biggest card holder community in the world.

Small banks are dying out, as a result of squeezed profit margins, declining fee income, the need to invest in ever improving technology, requirements for branch upgrades, and the need to comply with new regulations.

At the same time, consumer behaviour is rapidly changing. Whereas ten years ago consumers would enter a bank to deposit their funds, they now only need to venture into their bank to resolve an issue that they can't do themselves online. Thirty percent of Europeans now use on-line banking. Trusted non-traditional entities, including OTT players and mobile operators, are now seen as viable providers of banking services. A recent study showed that 50% of consumers would consider banking with Square, 41% with PayPal and 31% with T-Mobile.

Online providers offer the consumer speed and ease of access, that the traditional providers cannot yet match. New lending companies, such as Kabbage, offer small business loans of up to $100,000 in minutes. Other offers are available through crowdfunding and crowd-lending providers, such as Crowdcube. Bitcoin and the blockchain protocol offer an entirely new type of decentralized, virtual financial system that has been called a renaissance for money.

Opportunities for Mobile Operators

The EU has over 400 Mobile Operators, 106 of these own network infrastructure (generally about 3 to 4 per country). There are also 309 Mobile Virtual Network Operators (MVNOs). Germany has more MVNOs than the USA! European Mobile Operators have approximately 667 Million subscribers at the beginning of 2016 (with market penetration of over 100% in most European markets) for a total population of 400 million European citizens.

Mobile operators around the world are working with retailers, loyalty providers, equipment vendors and various ecosystems to rollout mobile services designed to support retailers' digital commerce activities. In many cases, mobile operators are providing a mobile wallet – a specialist application that can store digital versions of payment cards, loyalty cards, vouchers, tickets and other items normally found in a physical wallet. All Mobile Operators already have arrangements with several financial institutions: banks, credit cards and payment services for their revenue collection from their customers that is fully on-line and automated (with lower CAR rates than Banks). Consumers are also keen to engage with retailers through their mobile phones. According to research firm Latitude, 60% of the UK and American smartphone owners are spurred on to shop or make a purchase at least once a week because they've received a mobile alert (such as an email, text message, or app notification) from a brand or retailer. Latitude found that these alerts work best when they are location-based and related to a product or service the consumer has professed an interest in.

FinTech opportunities for EU mobile operators

Mobile operators are recognizing the opportunities of FinTech, as commercial banking is a proximity business for them. Just as some banks are offering mobile telephone services, operators are proposing banking services to their customers. Here the telco or mobile operator may have an advantage, as they own the existing online relationship with their customers and can easily build on this relationship to offer financial services as well.

Incumbent operators could enter the banking business by making good use of their operational infrastructure and extensive branch networks, while also increasing their revenue sources. These cross-industry plays are not new in Europe. For example, in the 1990s electricity & water utilities and banks entered into telecommunications. It could also make sense, as mobile operators are concentrating their efforts on increasing ARPU not just per user but per household, by sharing their network infrastructure and adding layers to their services through IoT, Big Data, etc).

Since the GFC, banking as an industry is not well respected by consumers in Europe, as compared to Mobile operators. French Telecoms Group Orange is reportedly in talks for the acquisition of 65% of French financial group Groupama to open Orange Bank, a mobile only banking and insurance services provider to cover France, Belgium and Spain in 2017.

On the other hand, operators should carefully consider all of the obstacles and regulations which make financial services a difficult industry to enter in Europe.

In Europe, services must be offered in a number of languages, cultural differences and comply with various local regulatory requirements. Negotiations will be complex and long. It takes a strong plan of action, the right team with the right cultural sensitivity, together with detailed banking and telecommunications industry knowledge. There is also a reputational risk that needs to be considered when partnering locally, and what can happen if things go wrong (see YoUnique and PayPal scandal in Spain). These risks need to be factored into the cost of acquisition for each customer. The European banking industry is large, growing and it is profitable; on-line payments are set to explode. However, in many cases, for a mobile operator, a joint venture or an acquisition may be the best approach to the Fintech market.

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Victoria Hernandez is a highly recognized senior executive with more than 25 years' experience in building, launching and managing multinational enterprises in the EU and globally, primarily in the TMT and more recently the Fintech services sector. She is a former Alliance Director, Mergers & Acquisitions Europe for BT (British Telecom), and implemented expansion strategies in Europe for both fixed and mobile operators through Joint Ventures with local partners. With Orange Spain (a JV with Financial Group Santander), she defined and implemented a successful full turn-around of the company which integrated the Spanish operation into the Group. At present, Victoria is advisor to several TMT and Fintech multinationals on strategy, change management, multi-country services launch and operational efficiency. Victoria has acted as a non-executive Board member of well-known Multinationals, including Orange, Wanadoo, StepStone, and others. She is a long standing member of the Global Telecommunications Women's Network.

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GTWN HOLDS FIRST MEETING IN ROME

by Maria Pia Rossignaud[1]

Editor of Media Duemila

(L to R): Candace Johnson, Founding President of the GTWN; Carla Cico, Board Member, Alcatel-Lucent and GTWN; Lucy Lombardi, SVP Telecom Italia and Maria Pia Rossignaud, Editor, Media DueMila at the first GTWN meeting in Rome.

The inaugural meeting of the GTWN's Italian Chapter took place in Rome on 2 October 2015. Generously hosted by Telecom Italia, and chaired by Lucy Lombardi (pictured), the one-day workshop drew senior delegates from government, industry and academia.

Lucy Lombardi praised the work of the GTWN in supporting women in tech. "What I found in GTWN are people of great talent and great depth. A network for discussing technology, innovation, digital transformation. A place where we can not only discuss new trends that affect our work, but also a place where talented women achieve great things.

Women who, despite the commitments of career and family, with a smile devote their valuable time to this network." She explained the progress made by Italy in terms of gender equality over recent years. "In Italy, implementation of the EU gender equality directive of 2013 , made it mandatory for companies to work towards equitable gender representation on their boards. Italy should be very proud of the fact that it took up this challenge seriously." The number of women managers with board positions in Italian companies increased from 88 in 2013 to 119 in one year.

GTWN Founding President, Candace Johnson, called on everyone to use their knowledge and understanding of mobile technology to address the many problems facing the world, including poverty, unemployment, disease and lack of education. "We've got the whole world in our hands".

Many speakers highlighted the challenges facing women in ICT, and the need for companies to be more flexible in terms of enabling both women and men to combine their work and life responsibilities. Several speakers also referred to the growing amount of data

that clearly shows how women executives and managers increase the performance of a company, compared to those companies with fewer women at top levels. There is therefore both a moral as well as a business imperative behind these issues.

Special guest and host of the meeting, CEO of Telecom Italia, Marco Patuano, then set out his perspective on how the ICT sector, and mobiles in particular, can be used to address many of the world's problems. For example, 15 years ago more than 50% of the population in Brazil were at or below the poverty line, living on one dollar per day. In 15 years 30% of the population have been lifted out of poverty.

"Those who think big like this are often accused of being dreamers, but it is very important to set out a vision to work towards. No one person is enough to change the world, but one person must start. Change is possible. Change has no gender; it needs skills and talent, so we must use all the skills of all of the population. "

Marco highlighted that the biggest challenge facing the ICT sector is not ideas, it is lack of skills, especially in terms of big data analytics. We need to work together with our government and academic partners to identify and address the reasons for this. So while we acknowledge the challenges still facing many women, it is important to look beyond gender and other differences and to find those who can contribute their talents to growing the business in these new areas so we can make the world a better and more inclusive place.
Lucy Lombardi asked participants to identify areas where they can work together to make a difference to the industry and to the lives of women in the industry and in society in general.

MARIA PIA ROSSIGNAUD

She is Editor of Media Duemila, a magazine which deals with ICT and informatics culture. She has also been editor in chief of the on line version www.media2000.it, since 1995. Vice President of Osservatorio TuttiMedia (www.osservatoriotuttimedia.com), Franco Siddi CDA Rai, has been President since July 2014.

RECOMMENDED READINGS

How Estonia Became One of the Most Digitally Innovative Nations
http://www.bbc.co.uk/programmes/p03hhzs7

The Future of Wearable Tech
http://cicret.com/wordpress/#theproject

StardustGVW2
http://livestream.com/UniversityofSouthampton/StardustGVW2

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