Making it Digital:
How the BBC and its partners unleashed the UK’s Digital Creativity
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Over the last three years Make it Digital has inspired a generation to be creative with digital technologies. A million children have learned to programme with the BBC micro:bit, distributed for free to 11 year olds. Others have shared weather reports and photographs with Weather Watchers and had the excitement of seeing their images used on TV weather forecasts. And thousands have benefited from Make it Digital traineeships, enhancing their skills and helping them into work.

We’ve achieved this – and a lot more – by working in new ways and in close partnership with others. Make it Digital exemplifies the BBC’s goal to work collaboratively, to be open to the opportunities offered by partnerships, and to achieve things none of us could do alone.

This is most clearly shown by the BBC micro:bit, the successor to the much-loved BBC Microcomputer and a project of enormous ambition that could only have been delivered through the concerted efforts of a coalition that brought together hardware and software skills, educational expertise, marketing and branding, and legal and financial understanding – all able to benefit from the BBC’s unparalleled access to audiences, and our overriding focus on our public mission. Together the thirty organisations that made the micro:bit possible show us just what we can achieve when we work together to serve the public, and offer a model for future development of the UK’s creative capacity.

The BBC micro:bit may stand out because of the complexity of designing, manufacturing, delivering and supporting a million computers, but the other Make it Digital projects also had a significant impact on audiences, and similarly relied on partnerships. You can read about them all elsewhere in this ebook.

I set the BBC a challenge to unleash the UK’s digital creativity, and I believe we have delivered. But we’ve also learned a lot along the way and you’ll see that reflected in the way we cover technology in our programmes, in the way we build and nurture partnerships, and in the ways we engage with our audiences in a world that will be increasingly shaped by digital tools and technologies.
Introducing Make it Digital
Over three years, Make it Digital has drawn on the wealth of BBC brands to produce informative, educational and entertaining content on this theme across TV, radio and digital. We have worked with services across the BBC including Radio1, BBC One, BBC Three, BBC Four, English Regions and Nations, CBBC and Weather to create news stories, documentaries, drama and children’s shows, each tailored to specific audiences. Overall, the audience has been over 23 million.

Make it Digital also worked with BBC programmes and services to motivate millions to go further and build their skills in partnership with outside organisations. The prime example of this was the BBC micro:bit, a small computer developed and delivered by a coalition of 31 partners led by a team in BBC Learning.

One million were manufactured and almost every 11 and 12 year old in state schools received one free in 2016. It has been hugely successful, and used widely in schools across the UK. It has been used to write code 17 million times. Girls report they are 60% more likely to study computing after using it. 88% of all children say it shows them coding is easier than they thought.

Our partners told us only the BBC could convene an alliance of this ambition, because the BBC is trusted by them as an honest broker, and by our audiences.

Our on-air talent played an important part in promoting the BBC micro:bit, on children’s and sports shows, and on social media. Trusted BBC faces can inspire our audiences to action in their millions.

It is seen as a bold innovation by the BBC abroad - Iceland has distributed BBC micro:bits to all its 11 and 12 year olds, and other governments and organisations from Norway to Singapore are using them. The BBC micro:bit is on sale across the EU, US and Canada.

In addition to programmes, partnerships and hardware the BBC has worked in skills development and outreach via the the Make it Digital Traineeship. Around 2,500 young people have gone through a potentially life-changing 6 to 8 week course which was designed by the BBC Academy and drew on BBC programme brands to teach basic digital and digital production and employability skills.

Another example of Make it Digital’s innovation around trusted BBC brands is Weather Watchers, a crowd-sourced weather club where members upload weather reports and photographs.

Uploaded audience photos are now used to tell the story of the weather across all our weather reports UK-wide, and in the Nations and Regions. 1.7 million photos have been uploaded, and Weather Watchers is the first continuous interactive service where audiences shape our editorial offer.

Those with low digital skills have been encouraged to become Weather Watchers - and to get help to get started at one of hundreds of partner libraries across the UK.

These are just a few examples of how Make it Digital has inspired millions to get creative with digital technologies.
In 2013, Tony Hall said he wanted the BBC in 2015 to ‘inspire a new generation to get creative with coding, programming and digital technology’, and to do that with a new approach to partnership for the BBC. To deliver this level of ambition, Make it Digital became a multi-year initiative involving many areas of the BBC including BBC Learning and the BBC Academy.

Behind this lay an understanding that digital disruption was changing all of our audiences’ lives, and looked likely to continue to do so – but none of us could predict exactly how. So giving everyone the ability to understand this changing environment and then giving specific groups the skills to create in the digital world was the best way to help them to thrive.
We are going through a revolution every bit as profound as the industrial revolution over a century ago, which altered our landscape and transformed the lives of almost everyone in the UK.

Digital change is giving way to what those in Silicon Valley are calling hyper digital change – where computers are linking us together in new networks and are even figuring out how to complete tasks in ways you could almost describe as creative.

This is changing our lives and our communities profoundly. From transport to education, and the jobs we do to the way we communicate with each other, change is here, or it is around the corner.

We want to inform, educate and entertain our audiences, as we always have, so that these changes work for all our audiences. In the midst of change that every one of us finds bewildering at times, nothing could seem more relevant.

The BBC is for everyone – we reach 95% of the UK population every week – and we are trusted, but our desire to make change work for everyone is shared by lots of different organisations. That’s why partnerships have been at the core of Make it Digital from the very beginning.

Make it Digital has been a huge experiment: it has been about what we wanted to do, and there are fascinating contributions in this ebook about this. But it has also been about how we have done it. We have worked with all parts of the BBC. We have worked with the teams leading our most popular shows and programmes, and asked them to think about how working with us can be relevant to their audiences. There has been huge faith and enthusiasm amongst senior management and their teams to do something new.

And our partners have shown faith and open mindedness to go on the journey with us, to work in a new way, and recognise that a highly unusual coalition can work towards something very precious: helping our audiences work out how they and their families can be successful in a new world.

Working in a different way means we have created capacity in the BBC to do something original and important, as well as developing new ways to work with partners to deliver something that could not be more timely, relevant and important.

Thank you to everyone who took part, inside and outside the BBC.

Jessica Cecil is Controller, Make it Digital
The Editorial Mission

Make it Digital’s editorial strategy really had two main functions: to ensure the many initiatives for all of our audiences across the UK had relevant homes across our broadcast platforms; and perhaps more importantly, to develop bespoke content that complemented these initiatives and drew an audience in, who at first glance may not think the topic of coding or digital disruption was of interest or relevant to them.

The key question our editorial approach had to keep asking was ‘why should our audience care?’ We needed to show that this was for them in an entertaining and informative way. Key to making any headway with this huge ambition was to identify the key audiences, the tonal fit for each of those audiences and the platform approach.

We also had to decide what content was stand alone with a sole job of raising awareness and entertaining to bring us that less engaged audience, and what was going to be connected to initiatives with the purpose of getting our audience active.
A great early example of the get active approach was a fantastic commission from CBBC called Technobabble - a magazine style show for the CBBC audience that focused on tech news and featured the games made by its watching audience via the Mixital Game maker – a tool which allows people to make games based in BBC brands like East Enders and Doctor Who - whilst explaining the basics of computational thinking.

An original example of standalone content was Girls Can Code, a talent show where the contestants didn’t know they had talent! It was a two part documentary for BBC Three that saw four girls who were big tech consumers but never tech creators dropped into the world of idea creation, investment and app making, with support from strong female role models who were hugely successful in the digital world – which at the time of broadcast were not massively represented on our screens.

This I think reflects what has turned out to be the most interesting part of the Make it Digital journey. It is obvious that the digital world is moving very fast and therefore as content creators wanting to tell the stories and reflect the impact on our audiences life we have to keep moving it to remain relevant and trusted.

Make it Digital has played an incredibly important role in giving content creators at the BBC the opportunity to experiment with different approaches to storytelling in this space and I believe we leave our colleagues in a strong place to continue entertaining and informing our audiences about the ever changing world.

Claire Rice was Editorial Lead for Make it Digital until 2017
Partnerships

‘Great things happen when we work together’ was a phrase that Greg Dyke used to describe the power of collaboration across the BBC, and never has it been more true than when you think about the diverse companies, organisations and institutions that came together to form the Make it Digital Partnership.

From digital start-ups to global tech firms, charitable trusts to local libraries, they all contributed their expertise to help UK audiences to learn how to code, improve their basic digital skills, or understand the new digital opportunities available to them. And what a partnership!

Whenever the BBC needed a contributor, a connection or even a venue, the partnership came through with expert on-screen contributors, high tech facilities and a contact list which even Bill Gates would marvel at.
That’s what Make it Digital was all about: helping to inspire new tech talent; the need to grow the next generation of digital innovators; and supporting older audiences to get online and get involved. All working together to have a bigger impact. And there truly was something for everyone.

It included local libraries helping pensioners get online and upload pictures of the weather where they lived for Weather Watchers - with over a million reports sent in within a matter of months - and Barclays Digital Eagles running code playgrounds in branches up and down the country, providing a high street location to help children to understand the value of coding and learning how to use the BBC micro:bit.

Make it Digital helped to bring the history, the present, and the future of computing to audiences. Whether that was through TV and radio shows such as Girls Can Code, The Gamechangers, Live Lessons, Appsolute Genius, Radio 1 Teen Awards, The Doctor and the Dalek, or actually bringing the history of computing to audiences through a partnership with the Centre for Computing History as part of our nationwide Make It Digital roadshow.

The initiative helped to make coding something that you could do near you, thanks to our partnerships with Coder Dojo and Code Club. Providing local support and encouragement to children.

The Make it Digital Traineeship sits at the centre of the campaign, a partnership between government and industry to deliver nearly 2,500 traineeship places with businesses across the country. This gave thousands of young people a chance to gain training and work experience in digital skills, developed by the BBC and delivery partners across the country.

Hundreds of young people gained new jobs, making the most of their social media skills, to kick start a new digital revolution.

And of course, let’s not forget the BBC micro:bit - the device that many will look back on as their entry point into computer science and coding which relied on a close internal partnership with BBC Learning as well as a wide range of external partners.

Andy Wilson was Partnerships Lead for Make it Digital from 2014-2016
Make it Digital Projects
The BBC micro:bit

Andy Wilson

The BBC micro:bit was something that very few organisations would, or could take on.

Build a new hardware platform, aimed at 11 year olds, in an incredibly short time, with the world watching. Most companies would run a mile.

But then most companies lack the support of ARM, Barclays, element14, Lancaster University, Microsoft, Nordic Semiconductor, NXP Semiconductors, Samsung, ScienceScope, Technology Will Save Us and The Wellcome Trust or the internal resources of BBC Learning and the engineering skills of BBC Research and Development.

And support is exactly what the project needed - to make a million pocket-sized micro-controllers that would inspire the next generation of digital makers takes some doing. And every company, group and individual that was involved always went further than we could ever have imagined to make the BBC micro:bit a truly brilliant learning device and prototyping platform.
Building on Howard Baker’s brilliant idea to reinvent the BBC Microcomputer for a new generation, with a bit of inspiration and advice from Eben Upton too, BBC Learning and BBC Research and Development came up with a prototype device that children loved - even if it was a rather basic breadboard with lots of wires and lights hanging off it. It put the child in control. They could be the inventor, and the possibilities were only limited by their imagination.

The next challenge was to take this prototype and make it mass market. Led by a team in BBC Learning, the partnership really came into its own. Building on the hardware development brilliance of ARM, the user experience and design was created by Technology Will Save Us, components supplied by Nordic and NXP, manufacturing by element14, software and coding environments from Microsoft, Samsung, Lancaster University, with support from Barclays, The Wellcome Trust and Sciencescope.

Through multiple revisions of the hardware, to make the device more user friendly we solved the many problems needed to ensure that the BBC micro:bit was ready distribute.

It was unveiled to teachers at Bett 2016 and the response was overwhelming. Hundreds of teachers clamoured to see the new device and have a go.

And it wasn’t only teachers that were interested. Small educational companies were keen to get involved, making accessories or kits to enhance the device. Kitronik, one of the BBC Make It Digital partners, were the first to make an edge-connector so children could connect multiple devices to their micro:bit.

Then they took apart a remote controlled crane and rebuilt it using the micro:bit as the controller. It was a huge success. The great thing was that everyone who saw it was impressed and wanted to get involved.

We started a micro:bit loan scheme to enable companies big and small to borrow the devices to develop their own accessories and add-ons - from cardboard robots to plastic cases. And some of the creations blew us away.
One of our first loans went to Artronix, who posted a video of using the micro:bit to make a Star Wars inspired cardboard headset. Set to very loud dubstep music, we knew it was going to be a hit with kids.

Support didn’t stop there - Bright Future, CISCO, Code Club, CoderDojo, Code Kingdoms, Creative Digital Solutions, CultureTECH, Decoded, Institution of Engineering and Technology, London Connected Learning Centre, Open University, Python Software Foundation, STEMNET, TeenTech and the Tinder Foundation all provided support and tools.

But of course the device needed to be delivered to the schools, which is much harder than you might imagine! With the help of the Scottish and Welsh government and all distribution being managed by Findell Education from their huge automated distribution centre, the rollout day finally arrived.

Thousands of devices arrived at the Findell warehouse for launch day. In the coming months two million batteries, a million USB cables and of course a million micro:bits all made their way into the hands of children up and down the country.

And that’s where the story really starts. What happens next? We just don’t know. Will we have the next Tim Berners Lee, Martha Lane Fox, or Ada Lovelace in our midst who was inspired by the BBC micro:bit? We hope so. Because the future of the device is really the future of hundreds of thousands of children across the UK, and now a growing number globally. And that’s all thanks to the micro:bit family - the passionate individuals and organisations who made it happen.

Andy Wilson was Partnerships Lead from 2014-2016
Weather Watchers

Olivia Lockyer

We’ve done a range of different things as part of BBC Make it Digital, many of which have focused on inspiring children, teens and young adults - who are fairly used to using technology in their day to day lives - to create things and increase their digital skills, thinking of future careers. We recognised though, that there are still many people who aren’t so digitally savvy and perhaps don’t feel a need to get online at the moment – but with everyday services increasingly going online, this can pose difficulties for those less experienced.

We know how much British people love talking about the weather and after some conversations working with our amazing colleagues at BBC Weather, we decided to combine people’s favourite topic of conversation with a gateway into the world of digital.
In 2016 we developed BBC Weather Watchers, an online weather club aimed at getting older people more confident with digital technology, where members share photographs and other weather data on a trusted BBC platform.

Since launch it has been really popular and has given us a brilliant chance to directly connect with our audiences.

Users can upload photos of the weather in their local area with details about the temperature and conditions, enabling people all over the UK to see the picture of weather across the country and giving the audience a chance for their photo to be featured on BBC programmes, as Weather Watchers pictures are used across BBC television – locally and nationally.

There have been almost two million reports so we’re thrilled at how many people have joined the conversation, but we felt that there was still work to do to get more people online and enjoying BBC Weather Watchers as much as our current users do.

Local libraries have been partners in Weather Watchers right from the start, and they’ve been a great way for people to get online, sign up and share weather reports. Some libraries have used Weather Watchers as part of their strategy to help their visitors learn digital skills, using our packs with displays, posters and activities around the topic of weather. We felt we could use our relationship with libraries to do more across the country for those with lower digital skills using Weather Watchers so decided to create a small booklet which has information about BBC Weather Watchers alongside various how-to guides, including how to sign up to be a Weather Watcher and how to post your reports. We also included handy guides for aspiring Weather Watchers to get onto email and use search engines.

Copies of the Guide have been sent to many local libraries, but you can also download a printable version and print your own. We hope people will use it to increase their skills and become Weather Watchers. Our aim is to get people enjoying the internet and being able to explore their hobbies online so hopefully Weather Watchers and the guide can do that.

Olivia Lockyer was Digital Content Producer for Make it Digital, 2014-2017
“Hi, my name is Chris – I’m alpaca lady on Weather Watchers. I only started to use my tablet from January this year and joined Weather Watchers straight away: before then I had never used a computer!

I have great fun taking photos for Weather Watchers as I do not have a camera, all of my photos are taken with my tablet. When I get an editor’s pick I am delighted. First thing in the morning can be fun as if the sky looks good I will put my wellies on whilst still in my p.j.’s and pop out to the field to take a photo or two after climbing over the next door neighbours fence!

Weather Watchers has helped me enormously with using my tablet, people who know me can’t believe I use a computer let alone write emails and post photos as in the past I refused to go digital. I would encourage anyone to join as it is great to learn about the weather from around the country and see the lovely photos people put on, and sometimes see your own photo on T.V.

Thanks BBC for helping me go digital!”
Build it Scotland

Marcus Herbert

Few things represent the opportunities – and quirks – of the digital age better than the phenomenal success of 3D modelling games like Minecraft.

Those simple blocks have spawned a global community of builders, bloggers and YouTubers, and introduced millions of children to digital creativity. Nothing quite sums up the generational digital divide as pithily as the eye-rolling condescension that accompanies a seven year old trying to explain his or her Minecraft project to a clueless parent (and I speak from personal experience here).

So what better tool to use to excite those children about the wider possibilities of the digital world?

That was the insight behind Build it Scotland, a Make it Digital project during 2016 that encouraged primary-level children
to use 3D tools to recreate local landmarks, as part of Scotland’s 2016 Year of Innovation, Architecture and Design, and the Festival of Architecture. The idea was that all the creations would be uploaded to a virtual map of Scotland, to form a permanent digital resource for schools and organisations to utilise and contribute to, while a selection of designs would also be 3D printed and put on display at locations across the country.

Teachers told us they would welcome a project that helped them tap into their students’ existing passions, and connect these to wider learning outcomes like research skills and organisation, as well as encouraging an understanding of geography and the built environment. And of course, the underlying principles of coding.

But some also told us they felt ill-equipped to manage a classroom full of Minecraft-masters (that generational divide again), and we also needed to ensure that the project was open to schools and children using the full range of available modelling programmes, such as Tinkercad and Sketchup. So we worked closely with teachers and technical partners to develop a suite of online resources, and ran workshops across Scotland to help fire up people’s imagination, and demonstrate all the ways to get involved. And we partnered with Education Scotland and Scottish Libraries to spread the word.

The results far exceeded our expectations. Around 5000 children took part, from more than 200 schools. But it was the sophistication and the effort that had gone into the entries that most impressed. The complex architecture and engineering of structures like the Falkirk Wheel, or Glasgow’s “Armadillo” exhibition centre had been cleverly recreated. One school had exquisitely rendered their own building, complete with details like screen savers on desktop computers. And it was clear that many had been inspired to head out into their local community, sending models of town halls and sports centres.

Build it wrapped up in November 2016 with a finale celebration in Dundee. More than 100 of the 3D-printed model were on display at two locations, and a Minecraft map of Scotland, showing the pupils’ digital designs, was projected onto a city centre building as part of Dundee’s own Light Night celebrations.

And we’re pleased the project lives on. The Children’s University and libraries across Scotland are using the BBC online resources in workshops to encourage more children to explore their digital creativity through 3D modelling tools.

We’re inspiring another digital generation. Block by block.

Marcus Herbert is Head of Online and Learning, BBC Scotland
Olivia Lockyer

When we first began Make it Digital, one of the most shocking things I learned was that there would be over a million new jobs created in the tech sector and not enough skilled people to fill them. This statistic proved a huge motivation behind many of the projects we did and very much so with the Make it Digital Quiz.

Reports were still showing teenagers were being encouraged towards traditional career paths and girls especially were missing out on the early career development opportunities needed for technology jobs.

We wanted to open up the possibility of technology careers to young people by helping them to see the possibilities. It is not just those with a natural inclination towards logical, mathematical thinking that can succeed in this world.
There really are options for everyone with job roles ranging from robot technician to meme editor (much to the delight of many of the teens we’ve done workshops with)!

We know that it can be a bit daunting when it comes to thinking of your future so we wanted to make starting the journey a bit easier.

The main idea behind the quiz was helping young people to see the variety or jobs available to them and to also be able see people who looked like them succeeding in the tech sector. We wanted a fun way for people to find out what may be a good option for them and what skills they may want to improve on.

Although we kept the quiz fun and easy to use, the questions are actually inspired by a behaviour assessment tool called DISC. This tool is based on the work by a US psychologist called Moulton Marston. We tried out a wide range of different questions, designs and types until we settled on the current version.

Thanks to the BBC Taster team we were able to build a quiz using the DISC tools as a base while asking easy questions about what you do at the weekend and how you like to organise your study area. Users are given one of ten “type” profiles, for example ‘Creator’, ‘Entrepreneur’ and ‘Experimenter’.

Attached to each profile is a video interview with a young inspirer, as well as links to courses and information to help young people increase their skills to hopefully help them see their potential in a digital career. The links were assessed for us by students at Ada Lovelace College, to ensure they were interesting and relevant to the target audience.

We brought on board some great young people to feature in our videos, who’ve done some really cool stuff in the world of tech and digital, as inspirers. They told us how they got where they are now and give a bit of advice about how others could follow in their footsteps. It was inspirational to see the cool jobs these mentors had and we hoped that their enthusiasm would be contagious.

Everyone has talents, it’s just a case of finding out what they are!

Olivia Lockyer was Digital Content Producer for Make it Digital from 2014-2017.
The enormous success of the BBC Two television series Big Life Fix, screened at Christmas 2016, prompted a lot of interest in the team of ‘fixers’ who worked so hard to solve the challenges posed. These ranged from helping a photographer who can no longer use his hands to operate a camera, to trying to stop sheep rustling, to developing a pen that can be used by someone with Parkinson’s Disease, and the resulting stories of how leading designers found solutions that could change people’s lives touched millions around the country.

Make it Digital worked closely with the Big Life Fix production team to find ways to share their amazing work more widely, and even made one of the designs - the camera mount developed for James by Jude Pullen - available as an openly licensed product you can print on your own 3D printer.
In 2017 we went behind the scenes to talk to some of the fixers about their inspiration, their interests, and their work as designers and developers. In four short films on the Make it Digital website, Yusuf Muhammad, Ruby Steel, Jude Pullen, and Haiyan Zhang explain what led them to become designers, where they get inspiration, and how they work.

Each film explores the working life, creative inspiration and design practice of one of these inspirational figures and uncovers the processes they use on a daily basis to deliver a wide range of projects and products.

As the BBC’s initiative for digital creativity, Make it Digital worked to create a level playing field when it comes to digital tools, and we think these films are relevant to any budding designer, engineer or technologist.

We’re also eager to support organisations that are doing so much to raise awareness of the creative potential of the computers in our lives, especially makerspaces, fab labs and other organisations that offer access to tools like 3D printers, laser cutters and electronic components, so we’ve licensed the four films to be used at events and shared with members and users. In this way, we hope that the digital message can be spread more widely.

We kicked off this process with a special screening at Barclays Eagle Lab in Brighton, attended by guests from the local digital scene. Jessica Cecil spoke about the importance of the mission and the achievements to date, and there was a wide-ranging discussion about the importance of digital tools in society, what makes a good designer and how the education system can best develop people who are able to express their digital creativity.

Bill Thompson was Partnerships Lead for Make it Digital, 2016-2017
Radio 1 Teen Awards

Claire Rice

Make it Digital and Radio 1 have worked really successfully together over the years and the pinnacle came in 2016. Following conversations with some of our partners, including TeenTech and Apps for Good, it was clear that we needed to find a way of shining a light on the amazing young people these organisations and others were supporting to explore their digital creativity and help them see how it can be life changing at a personal, community and international level!

Radio 1’s Teen Awards celebrate incredible young people that have shown real courage, made an impact on the lives of those around them, and inspired people.

In 2016 we were thrilled to partner with them with a very special Make it Digital Award, celebrating young people that have used their digital skills to either inspire people or make a big difference in the lives of their peers.
As we started on the journey we knew this was going to be exciting and it quickly became apparent that we could use the very high profile event to capture the imagination of a teen audience with inspiring stories and encourage them to get hands on too, and promote the Make it Digital Quiz.

The event and the support of Radio gave us an incredible platform to push the quiz; Grimmy and Clara Amfo, Radio 1 DJ’s even completed the whole quiz live on air a few days before the actual event which meant we reached millions of young people with the message.

The day of the event was incredible, our winners Lauren and Lucy were presented with the award in front of 10,000 teenagers by Greg James, Radio 1 DJ. It was an incredible and refreshing moment to hear young female engineers celebrated as heroes and we hope a sign of things to come!

This project was a real example of what the BBC can do when its component parts work hard together for a focused audience need. A real success story!

Claire Rice was Editorial Lead for Make it Digital until 2017
Lauren’s Story

BBC Radio One’s Make it Digital team have offered so much support in everything that I have done, even after the Teen Awards. Remembering how it felt to even find out that we’d been nominated to actually winning the award made all of the hard work worth it, it made me feel as if the message we’d been trying to spread had been received.

I love seeing other pupils enter the world of STEM and am so excited when more young people, especially girls, step forward to show an interest in engineering. Although more females are entering this sector there is still a gaping hole that needs to be filled. For the BBC to acknowledge this issue and to recognise and praise the work put into making sure more leading members in industry understand this problem is incredible! They gave so much encouragement to spread our concern for women in the world of STEM and helped to share this message across a variety of platforms.
They also gave a great insight into the BBC itself and I was shown the endless opportunities available within the company. It is such a vibrant place to work and to be shown this amazing workplace and to meet the people that make it that way was so much fun! Everyone went out of their way to give us the best experience possible. From having a wild day with other Teen Heroes filming around the BBC studios to meeting Benedict Cumberbatch, it really doesn’t get any better!

The award ceremony itself was the icing on the cake for me! I was so honoured to be presented this award by Greg James and to just be there soaking up the atmosphere. I was so proud of all of the other Teen Heroes as we had all become friends very quickly. We have stayed in contact and as we were all kindly given the chance to go Radio One’s Big Weekend this year we managed to see each other again!

The whole team made me feel very welcome and wanted to know how Lucy and I had got to where we are and our individual stories outside the Teen Awards. They were interested in my school career and Teen Tech Ambassador role, as well as my Arkwright Sponsorship and my future hopes and dreams.

I will never forget my time with Radio 1 and all of the fascinating people I met, thank you for making it such a special time for me - I have incredible memories that I will treasure forever thanks to you.
Lucy’s Story

With a previously small focus on STEM subjects at school, the Teen Tech Awards and BBC Radio 1 Teen Awards brought a huge amount of vibrancy to not only the lives of Lauren and me, but to our whole school as well as surrounding schools. All in all, I’m hugely grateful for the experiences that we were able to have- never did I expect to be standing in front of 10,000 people in Wembley arena alongside my childhood crush Joe Jonas or Greg James!

It all came as a bit of a shock that we were even nominated for the Award, let alone being told that we were going to win it! I remember receiving what I thought was a phone call from Maggie Philbin about new opportunities and further expanding our project for TeenTech, but instead was faced with the voice of Greg James on the end of the line telling us that we would be visiting Radio 1 and Wembley Arena to receive our award. To be honest it was all slightly surreal and at first I was so shocked I told Greg we were expecting a phone call from someone else, only to be told by my mum that there was in fact no other phone call- this was the surprise they had been holding in for weeks!
From there on, we were so well looked after by the Make It Digital team; we went to record a piece with Lemonade Money in Borough Market about our journey, we got to spend an incredible day at Radio 1 itself meeting members of the team, other winners and nominees, being part of the whole Wembley experience, meeting Benedict Cumberbatch (being a VIP at the Doctor Strange Premiere!) and even being recognised by DNCE.

Getting to visit the BBC headquarters was fascinating because I got to explore so many departments and have numerous discussions with everyone from the broadcasters to the technical producers and editors, as well as seeing iconic things such as The One Show set and the BBC Weather area.

The whole team at the BBC was very accommodating and not only gave us a great insight into working there, but also were genuinely interested in our story. We met so many inspiring people and being able to share the adventure with awe-inspiring people our age was just brilliant, many of whom we are both still in contact with now!

Being a part of the whole journey was eye opening, and so many things have come from it. Since becoming a Teen Hero and TeenTech ambassador, I have been able to work with international students promoting STEM and also within our school, as well as helping at other teen tech events to inspire young people, particularly girls, to get involved in Science and Technology.

Being able to receive such an amazing award really has been incredible but the thing that has made me more proud than ever is being able to say that we have been the inspiration for at least some young people out there looking to pursue a career in whatever they want to do - without barriers.

A massive thank you from me to Radio 1 and TeenTech for allowing us to have a platform on which we were able to share our hopes and aspirations - I am forever thankful for the unforgettable memories!
Can Robots Love Us?
Claire Rice

There are many rich stories to tell around the digital and technological changes we are all currently seeing and experiencing. However, finding ways to ensure these stories feel entertaining for a broad audience (and convincing commissioners of the same) has not always been so easy. When we first started looking at how to approach this in 2014 many of the dramas and documentaries took a historical look, which delivered some fascinating content but it would also be fair to say that they probably spoke to an audience that was already interested.

My biggest challenge was always to find the content that would be entertaining in and of itself to reach an audience that did not consider themselves interested in the topic. Big Life Fix, made for BBC Two by Studio Lambert, was a big turning point in this crossover with many, many, millions watching the incredible clip when Emma, who suffers from Parkinson’s was first given the “Emma Watch”, to help with her tremors, created for her by Haiyan Zhang, one of the Big Life Fixers.
Make it Digital worked with the Big Life Fix team to create inspirational content for makerspaces across the UK, but it was also the catalyst to revisit a longer form documentary that tapped into the emotion the series had shown was about tech but worked for a younger audience.

Working with the Digital Story Telling team in BBC Studios we started to develop an idea that we thought would work for BBC Three. Because from the beginning we were clear the objective of this content was to be entertaining and raise awareness and in doing so create debate of the ever growing impact of tech on our lives, as opposed to driving people to get active themselves, we had great scope to dig into the best stories and talent.

Getting James Young on board as the presenter was key, as we knew he was passionate about the topic and had the ability to turn complex tech into accessible language. Then followed the stories about sex, relationships, mental health and carers.

BBC Three wanted to emphasise the heart and emotion of the stories and we at Make it Digital also needed to emphasise the tech sitting behind a lot the developments in this space, in particular AI and the implications of this. It was an incredibly tricky thing to balance but the results speak for themselves and the stories definitely stoked debate amongst our key audience, with over 4,000 comments around one clip on BBC Three’s Facebook page alone – very high engagement.

The success of the documentary yet again demonstrates how as a topic this can be of real interest for a younger audiences.

Claire Rice was Editorial Lead for Make it Digital until 2017
Most of us, I’m sure, have dreamt of taking control of the Tardis to explore new worlds with the Doctor. Games are a brilliant medium for storytelling, entertainment and adventure. So, making it possible to create games with the Time Lord in the blue box seemed a no-brainer. Make It Digital had already identified how important creativity was to young people trying to make the most of the opportunities of the digital economy. So, asking fans to get creative with one of the BBC’s most-loved brands seemed the perfect commission.

At its heart, the Game Maker is a simple proposition: a kit to enable users of all abilities to make games; a set of beautifully designed assets of heroes, monsters, props and worlds to play with; and a place for fans to publish their games so that others could play them.
We knew there was a huge appetite among young people to make games. The key challenge, though, was to build something all ages and abilities could enjoy. It would need to be easy enough for young fans to create simple games but have the depth and sophistication to allow for more complex games.

It was a terrific collaboration between BBC Digital Creativity, Aardman Animations and BBC Digital Wales – all under the Make It Digital umbrella.

It launched on September 15th, 2015. Young fans of the show, with no technical knowledge, were able to create games on their tablets or desktop. It was simple enough to make a great game in minutes using drag and drop from a set of pre-made templates.

As users progress, the choices become increasingly broad, introducing logic, sequencing and computational thought. The variety of games that could be made was enormous. Digging deeper into the inner workings, it was possible to influence how items and characters interacted, to add special effects and to animate objects. The sophisticated logic system was a great introduction to the principles of coding and game design.

A specially built arcade enabled users to post completed games and share them with players around the world. The best games posted could be ‘featured’ by editorial teams. The game maker was a huge success. More than 250,000 games have been made so far. Makers and players have spent an average 18 minutes per session.

But the most exciting aspect of the project was the creativity it inspired. Game makers started to develop new games that we never imagined possible when the tool was designed.

The Doctor Who Game Maker was awarded Winner at the Broadcast Digital Awards in 2016 for Best Children’s Content. The judges praised this ‘innovative way to engage children.’ They were particularly impressed by the BBC’s decision to open up one of its flagship brands to such experimentation.

It was a huge step in Make It Digital’s ambition to create a generation of digital creators and help meet the UK’s need for software developers and game designers – and it remains online for you to have a go yourself!

Martin Wilson is Head of Digital Creativity, BBC Design & Engineering.
Make it Digital Partners
Access to inspirational role models in the digital world has always been an important way for Apps for Good to engage students who may not have previously taken an interest in tech. It’s one of the key stepping stones in breaking down the barriers some young people face to accessing technology education and particularly important for girls who often lack young role models inspiring them to pursue study in the male dominated STEM field. Role models are also important to encourage young people to create technology which solves problems that are important to them and the world around them.

The Apps for Good courses have always enabled our students to help inspire younger generations to take an interest in learning important tech skills. Collaborating with the Make it Digital programme in 2016 was a fantastic way to showcase some of our inspirational students to an even wider and relevant audience. The creators of the app I’m Okay aimed to help young LGBTQ people see that they’re not alone - and get answers and information they need. In their selflessness, the team created a youth-led movement driven by peer support and encouragement.

The app has had thousands of downloads, in the UK and beyond. Since their nomination for the Make it Digital Teen Awards the girls have been working independently to challenge stereotypes in tech and encourage more girls to follow a career path in technology. They have spoken at events, such as Oxfam’s Women in IT Day, to show that girls can be just as successful in the digital world as boys.
The other young team who were nominated for the Make it Digital Teen Awards created an app called WeKonnekt to help young carers. Many of the young people they spoke to said they felt isolated and did not know where to turn for help. “We wanted to show them that there were people and resources that they could connect to. Our app helps them socialise with each other, get the support they need and feel less alone.” The app gives users access to peer support as well as practical information, like emergency numbers and pharmacy opening times.

WeKonnekt is free to download, making it readily accessible to teens who can have all the information directly on their phones. Through exposure in the Make it Digital initiative many students from the Luton school the boys were from and far beyond have been inspired to create technology for good causes and consequently signed up to the Apps for Good course. Emma Darcy the teacher from the boys’ school had the following to say: “Luton, as you know, sometimes receives negative (and very undeserved) coverage in the press and it has been so wonderful to have an inspirational and aspirational programme that proves to all of our pupils, regardless of age or ability, that they can achieve whatever they want to, as long as they believe it.”

The exposure these young, relatable role models had through the Make it Digital campaign has been invaluable in helping our mission to inspire young people to take an interest in technology; not only technology for technology’s sake but to use it to make a social impact. With the work from teachers and graduates of our course, such as those mentioned here, young people up and down the country have been inspired to create their own tech for good ideas. Closing the huge digital skills gap in the UK has long been an impact goal for Apps for Good and our students’ involvement in the Make it Digital campaign was only just the beginning of making this happen.

Sarah Wisbey is Communications & Events Manager at Apps for Good
In April 2015, I spent a lunchbreak searching my local supermarket for the cheapest thing I could cannibalise to finish a demo for the BBC.

What they saw that afternoon was the battery clip from a £1 alarm clock, glued onto an early BBC micro:bit prototype. I was building a demo as one of the 31 partner organisations that the BBC had recruited to help them deliver a bold and audacious project, to give a coding device to every year 7 in the UK, for free.

However, the BBC micro:bit wasn’t designed to be just another programmable ‘development board’, but a seamless plug and play tool that puts creativity, learning and ease-of-use for teachers and young people first.

As an engineer on the project, the most compelling thing about working with the BBC micro:bit is seeing the exciting (and sometimes ridiculous) things these new audiences choose to do with this technology: build a team game based on a teleporting duck, measure a rocket car’s acceleration, tell the interactive story of pizza, build a portable heart-rate-monitor, or invent a ‘rain detecting hat’.

These ideas capture the exhilaration, simplicity and creative potential of the BBC micro:bit, and I’m sure it will help many more people become a coders and inventors.
Part of the magic of the micro:bit is how effortlessly it brings the virtual and physical together. Within minutes, things you’ve made with the computer start controlling the real world. It’s this physicality and immediacy that create the ‘micro:bit moment’.

It’s amazing to see people of all ages have that empowering experience when they realise the potential of the device in their hands, and want to make something new with it; the moment people start to feel excited about playing with technology, instead of nervously holding back from it.

The micro:bit isn’t really about learning to code—it’s about learning to do things that you care about with technology. Learning to code happens along the way: you learn about loops almost by accident because you’re making your micro:bit dance, and the song has a verse and chorus that repeat.

This approach helps engage new coders of all ages. Independent research tracked the progress of micro:bit in the UK during its first year and found that that 85% of teachers who used the micro:bit agreed that it made Computer Science more enjoyable for their students, and 90% of the children who used the micro:bit said it helped show them that anyone can code.

The cool design, broad appeal and technological simplicity of the micro:bit comes as a direct result of the diverse backgrounds, outlooks, communities and interests within the micro:bit partnership. This broad, interdisciplinary team has shaped the device, the editors, the learning materials, and the concept of the micro:bit itself into a truly unique ecosystem.

Jonny Austin was technical lead for ARM on the BBC micro:bit project and is CTO of the Micro:bit Educational Foundation
Barclays

Louise Pancott

Barclays was thrilled to be a key partner to Make It Digital including providing support to manufacture and distribute the BBC micro:bit. It was such an obvious partnership for us building on our Digital Eagles programme and our Code Playground initiative to inspire children up and down the UK to get into coding, programming and digital technology, helping everyone build digital skills and confidence.

At a personal level it was especially pertinent given I am of an age to remember the BBC micro and the impact it had on a whole generation in the early 1980s.

We felt privileged to be able to incorporate the BBC micro:bit into our digital education programmes such as Code Playground, where children, parents and teachers can learn coding online or in branch – and LifeSkills, where young people can learn the skills to land their dream job in the digital economy.

Especially rewarding was working with all of the different micro:bit partners – pooling all of our strengths and resources to create the micro:bit and inspiring young people to get coding. Only the BBC could bring everyone together and lead this initiative from day one.

We have 17,000 colleagues trained as Digital Eagles, many of whom got involved, supporting young people to explore the BBC micro:bit as part of our desire to help them learn to code both online and in branch.
The BBC micro in the 1980s was a ‘once in a generation’ intervention to make sure the UK stays ahead. The BBC micro:bit was the next intervention for this generation of children. History will judge its impact, but I think we all feel proud to have been part of wanting to make something happen.

The launch was a big celebration - our Digital Eagles ran a number of events to get the BBC micro:bit off the ground – to demonstrate the technology and bring it to life in a human way and it was wonderful to see such a positive public reaction. Just a few examples bring this to life.

Liverpool Digital Eagles helped our code playground team create a Pedometer for Wellbeing Week using their micro:bits. There were children walking around the session and showing off how many steps they’d done and one girl realised that if she skipped everywhere it was more steps!

We also brought the BBC micro:bit to a community and school in Scotland - St Mungo’s Roman Catholic Primary School in Glasgow - that hadn’t seen anything like it before. We had loads of fun showcasing some simple games and putting the children head to head with each other (and us!) - and it was the start of a great partnership in the area with the school and community centre to be able to build the children’s skills using the micro:bit. It didn’t take long before the children were miles ahead of us with their skills and knowledge and were really putting us to shame!

Another success story came from Salford where we had 7 schools attend an event with 12 students from each to think about some of the issues in the local community. These particular students were thinking about accessibility and how they could use a BBC micro:bit to sense movement of elderly people which could be connected to Amazon echo and call for help if required from either the carers or ambulance crew. The students thought about using the micro:bit as a form of panic button to be able to call for help – genius.

Just a few of the many stories. At the heart of them all though is how the BBC micro:bit became a means of engaging children and the wider community with technology and coding in a way that wasn’t threatening (or boring), but was useful and fun.

Who knows how we may have inspired the next Dyson or Branson for the digital revolution...

Louise Pancott is Director of External Communications, Barclays UK
Liz Williams

Technology is shaping every aspect of our lives. It’s changing how we think and how we learn; how governments govern; how society’s problems are solved; and how news is shared. Our ability to tap digital technology’s potential depends on having a very broad base of people who understand how to harness and use tech well. Both BT and the BBC have recognised that this isn’t just about having a highly skilled workforce – important though that is – but about setting young people up for personal and professional success in a world shaped by tech. This is more fundamental than knowing how to use an app – it means being fluent in computational thinking and problem solving.

BT and the BBC share a vision that digital creativity is of critical importance for young people. In 2014 computing was introduced to the curriculum in primary schools in England and the Department for Education, working with BCS (the Chartered Institute for IT), BT, Raspberry Pi, and teachers, put in place a one year intervention, the Barefoot Computing Project, to help teachers with the new subject. Make it Digital, also in its infancy, supported the project with access to BBC brands.

The following year, BT took up the baton to fund and manage Barefoot, in partnership with BCS, and has developed and expanded the project across the UK.
Barefoot is now active in all 4 nations, and had reached more than 1.25 million children by the end of the school year in July 2017. A study by Ipsos Mori has shown its impact, with primary school teachers now more confident with the computing curriculum. 99% said that computational thinking helps pupils solve problems, 82% said it helps pupils work together more collaboratively, while 96% said it improves pupils' numeracy and 69% their literacy skills.

It’s part of BT’s long term commitment to build a culture of tech literacy for the nation, with an initial goal to reach 5 million young people by 2020. That means helping young people to become curious about how technology actually works, confident and in control of it, and ultimately moving towards becoming active creators. It’s all about preparing the next generation to thrive in a digital world.

We’ve designed our programme around three crunch-points in young people’s lives. The first is in primary school, where tech literacy needs to be a foundation skill as important as English and maths – and we’re making strides towards that ambition through Barefoot. The second is the early teenage years, where we must inspire mainstream teenagers to want to build their tech know-how, and support them to live their lives online safely and confidently. We’re working on plans with BT Sport and 5Rights to make that a reality.

The last crunch-point is the transition to work, where we must show young people that tech will be in every job and is the new way to get ahead. We’re focusing on disadvantaged young people through work placements and reaching the hardest to reach in partnership with the Rio Ferdinand Foundation.

Tech literacy is a shared challenge and can only be cracked by working together across sectors, scaling up what’s working well and sharing learning. It is not a one-off corporate social responsibility initiative, it’s a long-term business critical agenda that has to be part of what we do and engage all our employees. Make it Digital is doing just that as it becomes embedded across the BBC.

Liz Williams is Director Tech Literacy, BT Group
The BBC are brilliant at combining entertainment with education. However, unlike mainstream subjects from Astronomy to History where there is plenty of experience in how to educate, entertain and inspire, Computing is a new challenge. It involves intangible concepts, separated from the real world. Attempts to turn it in to successful TV can degenerate into just enthusing about technology. There is minimal experience of how to teach it to kids, even in schools, and it is often treated as indistinguishable from programming. It is actually much broader, and more exciting than that. That broader subject needs exposure.

Queen Mary University of London’s ‘Computer Science for Fun’ (www.cs4fn.org) project faced these problems. Our solution was built on two foundations: telling contextually rich stories about computing research, and unplugged methods.

Much computing research is naturally fun. It has tentacles in whatever discipline interests a person, and there are stories there to tell. Computational techniques have changed the way other disciplines are done, providing novel virtual ways to run experiments, for example. Once one realises that computing is about computation not computers, and that computation occurs in many forms, new hooks can be found.
Make It Digital used the link between dance and algorithms in the Strictly Micro:bit Live Lesson that we were involved in, for example. Algorithms also have a deep history stretching back millennia with lots of scope for rich stories to be told. The important thing with any story, though, is not to gloss over how the technology works but use the stories as an opportunity to explain. Otherwise technology is just reinforced as ‘magic’.

Unplugged explanations and activities involve getting away from computers and explaining concepts with physical computation using ‘Blue Peter technology’ of rope, card, tubes and sticky backed plastic.

You can act out computation, dance it (as in the Strictly Live Lesson), play games, do puzzles and even use magic tricks to illustrate invisible computing concepts in fun ways. This approach is successfully being used to explain complex topics even to primary school kids. Combined with fun stories it makes for powerful lessons.

Computers may not have been around long compared to other subjects, but Computing is still rich with fascinating and fun stories waiting to be told, whether by unplugged or other means. Make It Digital has been up for the challenge, but there is plenty of scope, and certainly a need, for more of the stories to be told in the future.

Paul Curzon is Professor of Computer Science at Queen Mary University of London
Lucy Lyall Grant

For everyone at Freeformers, the BBC’s Make It Digital campaign was an exhilarating initiative to be part of. But it was also an amazing series of events to be involved in personally.

This is a time when technology is massively disrupting all sectors, resulting in the need for a huge change in mindsets and skillsets from the 21st century workforce.

For the BBC to throw their weight behind that was so crucial. In my role of Business Strategist at Freeformers, I know many of those working in business would have experienced this shift, but what about all of those who were not working such as the unemployed, students, those under 16, and even the retired?

They do not deserve to be excluded from this fast pace of change. That is why the purpose of the Make it Digital campaign - to ignite digital confidence, knowledge and awareness - struck such a chord for me because it aimed to do this across the entire country, regardless of age, educational background, gender or job.

We had no doubt at Freeformers that Make it Digital was going to change perspectives nationwide and create the momentum needed to drive the motivation for, and an understanding of, the need for people to upskill digitally.

So as a company dedicated to making a social impact, fostering a diverse, young talent pool and creating the future workforce now, we jumped on board running various projects and programmes.
These included coding workshops to targeted groups of girls and those socially excluded. We were even featured on the BBC Three programme Girls Can Code.

From the pool of those we trained, we also helped select young people for the chance to be a part of the BBC Youth Panel, running intergenerational workshops with people from the BBC and creative and ambitious 16-25 year olds. One young man impressed so much, he went on to get work experience at the BBC.

We also spent time coaching DJs and producers from BBC Radio 1, including Greg James, in digital skills and knowledge.

But by far, the most impactful and eye-opening initiative we ran at Freeformers as part of Make it Digital was participating in the UK tour. Held during the summer of 2015, it aimed to boost digital skills across the UK by inspiring people of all ages to see why the changing digital landscape was so exciting and important.

The tour lasted around three months from June until September and took in 13 locations with Freeformers playing a role in Blackpool, Hull and Lewisham. Through tech talks and immersive workshops, we wanted to get audiences to think about the positive possibility of digital-led careers, whether for people now or in the future or for their children or even grandchildren.

Back-to-back sessions such as our ‘How to develop an app in 20 minutes...’ event showed how digital can be fun and interactive. It was really special seeing grandparents with their grandchildren, couples, families and friends learning together - that was the moment it all clicked for me and proved Make It Digital was a success.

Everyone at Freeformers was so proud to have helped make Make It Digital a success and remember the impact made and the reactions on people's face still now. The campaign proved that when partners work together united in a common aim, everyone benefits. And the UK certainly benefited from being helped to Make It Digital!

Lucy Lyall Grant is a Business Strategist at Freeformers
When the BBC first told us about Make it Digital, I knew it would be an initiative that FutureLearn and its partners would want to get behind. The team at FutureLearn was all too aware how big a role digital skills played in their own professional and creative lives, so knew first hand how important these skills were to being able to imagine and shape the future of our world.

Similarly, our Higher Education partners had always expressed a clear sense of the importance of supporting young people and professionals to develop their digital understanding in flexible and relevant ways, so they were also happy to lend their support to the campaign.

To get started, I set up some group calls that brought together many universities, where we explored how we could create online courses that connected and expanded on the big themes that the BBC was focusing on. The level of debate, collaboration and coordination was truly inspiring and showed how working with a much-loved national broadcaster can really act as a catalyst to develop exciting new ways of working.

From those initial workshops, all sorts of great course ideas were developed, tweaked and delivered.
The University of Reading created a fantastic introduction to mobile game development, and a course to help learners start to make and program robots. King’s College London created a groundbreaking introduction to the world of Internet of Things. And the University of East Anglia created a course aimed at teachers to help them build their confidence about the new computing curriculum that had just been introduced in primary and secondary schools.

The UEA course was a fascinating example of how Make it Digital could help build excitement, momentum and trust around a critical digital skills issue. The university collaborated closely with the BBC to relaunch this teacher training course, integrating brilliant new online resources the BBC had created for Make it Digital to give teachers lots of options for how they might approach classroom activity.

The BBC then promoted the 6 week course which helped it reach a new audience of over 3,000 teachers, who created over 7,000 comments that enriched the course, comments and discussion being one of our key measures of whether a course is successful.

We got a lot of positive feedback from teachers including some reassuring messages about how useful the course was including:

‘It has given me more confidence and some useful ideas, especially on planning and assessment. I now would like to learn more about coding. Thank you.’

and about how the collaboration had unlocked some new ideas:

‘Great resources to use. I hadn’t even thought of BBC Bitesize before it was flagged up here.’

FutureLearn were proud to be part of a national moment for digital skills and creativity and we have continued to build on the energy and excitement it generated.

Justin Spooner leads on the development of the digital skills portfolio at FutureLearn.
For me, the BBC micro:bit was magical: like the last piece of a jigsaw puzzle – or the keystone in an arch. Of itself, it was the most wonderful little gadget but it also changed the game for computing at school by bringing parents, families, clubs and everyone into the story, along with schools and educators.

With Simon Peyton-Jones in Microsoft’s Research Lab in Cambridge, and colleagues from BT, Google, Raspberry Pi and across Microsoft, I’d been part of the campaign to introduce a computing curriculum for 5 – 16 year olds in England. Conscious of the need to help teachers, Microsoft had also invested in developing the Computing at School (CAS) community and co-funding Quickstart professional development with the Department for Education, to give a bigger pool of teachers the confidence to enjoy the new curriculum.

Our passion for computing had helped to lay a good foundation across the education sector. But it was still true that parents – and many students making GCSE and/or life choices - were unsure about the merits of computing versus Information and Communication Technology (ICT).

Despite great evangelism by Code.org and others computing was not yet seen as delightful and critical to almost any job which would be available when the students of 2015 move from education into the world of work.
That changed when the BBC micro:bit came along – and started a national conversation about these issues, involving families, clubs, and businesses, as well as academia.

Around the world, there was a great deal of excitement about the internet of things and small board “physical” computers, with many organisations designing little devices like the BBC micro:bit. It was very special, even as a prototype and one of the two precious samples that Jessica Cecil and I took on a tour of the Microsoft campus in Seattle in early 2015 ended up with Bill Gates - and it was thrilling to get the message back that “it looked like a winner”.😊

The decision to join the BBC's partnership was easy because it was a great idea; we had much to contribute; and our entire business model is based on partnership! Microsoft Research (MSR Redmond) built the coding platform: great kudos to Tom Ball, Peli de Halleux, Michael Moskal and Jonathan Protzenko for a design which allows ALL students to code.

Tom also introduced me to Steve Hodges, from MSR Cambridge, and his experience of building prototype hardware was invaluable to the Farnell, Nordic and ARM team who were shuffling the sensors and design elements to give the half-credit-card-sized BBC micro:bit the most astonishing functionality.

Others who saw the idea in development got swept along too. Eric Anderson integrated it with Kodu Gamelab, so that it could be used as a games controller for Kodu – programming it to race and shoot – or eat apples in the Kodu world of 3D visual programming.

Back at home, the UK Education team commissioned a Quickstart Guide for teachers, written by a professor, a teacher and a student, as well as delivering a roadshow to introduce the BBC micro:bit to over a thousand CAS Master Teachers, starting a cascade of training across the country. The roadshow was a brilliant moment in time because, up till then, we had been working together frantically to deliver what looked like the right solution in the light of all the research.
Some partners were hardware experts, some funders, some software and some were teacher engagement specialists. Together, though, with the BBC, we produced something that none of us could have delivered on our own – and none of us was sure how it would land with friendly sceptics like the CAS Master Teachers. I will always remember the buzz of the first training day – and the tweet that told us we were on the right track “I really already see the hype for the #bbcmicrobit is absolutely well founded. Totally game-changing.”

Microsoft’s then very new CEO, Satya Nadella, along with the BBC’s Director General, Lord Hall, joined a hands-on class with the students at Eastlea school in Newham and, like me, was blown away by the ambition of their ideas. With just a few weeks to explore the BBC micro:bit they had working models of robotic arms to handle dangerous chemicals; wristband maths challenges and a micro:bit powered blimp using the compass to take letters to the North Pole for Father Christmas.

Great teachers, like Stephen Richards, were the springboard for the micro:bit to take flight right across the country.

Restless minds at Microsoft also kept micro:bit ideas bubbling along and it’s wonderful to see MSR and the Visual Studio product team develop a global, learn-to-code platform for physical computing – Microsoft MakeCode (www.makecode.com) – with the micro:bit at its heart and freely available around the world in every country with a passion for the micro:bit.

So many new friends. Maybe one day we’ll all get an invitation to meet again for Sue MacGregor’s Radio 4 programme “The Reunion”? I hope we might inspire others to embark on ambitious partnerships like this one: it was so worthwhile and so much fun!

Clare Riley is STEM and Computing lead for Microsoft Education in the UK

And one-time journalist and film-maker at the BBC
Nominet Trust

Vicki Hearn

Nominet Trust’s purpose is to transform lives with tech. As the UK’s leading funder of socially motivated tech, we want all young people, regardless of background or circumstance, to have access to the skills and opportunities that will enable them to thrive in our digital world. Nominet Trust is proud to have been a member of both the Make it Digital Partners’ Forum and the BBC’s Digital Advisory Council.

Our experience over the last ten years has amply demonstrated the strength of working in partnerships that bring together cross-sector expertise and resources, particularly when it comes to digital skills delivery. By convening a diverse range of organisations with a shared goal, Make it Digital has made a significant contribution to young people’s lives, to the capabilities of the UK's digital workforce and the future success of our digital economy.

For Nominet Trust, the Make it Digital connection was born out of our Make Things Do Stuff initiative – a pioneering campaign and website we launched with Nesta in 2012 to encourage young people to become creators of technology, and not just consumers. The website created a unique, non-commercial space for young people to engage with digital making opportunities, and to share easy-to-digest tutorials for digital projects.
During the two-year campaign, more than 70 organisations provided 100,000+ digital making experiences for young people nationwide. Our parallel Digital Makers Fund supported innovations boosting the number of young people participating in digital making activities. In total, 14 ventures received funding, including CodeClub, Technology Will Save Us and Makerversity. From the end of 2014, the success of Make Things Do Stuff was championed and scaled through the BBC’s Make it Digital campaign.

The Trust’s founder, Nominet (the public benefit company responsible for running the .uk domain infrastructure) has also been part of the Make it Digital story. In 2016, Nominet’s research team collaborated with the BBC to develop the connectivity that turns BBC micro:bits into Internet of Things devices. Nominet is also a founding partner of The Micro:bit Educational Foundation.

At Nominet Trust, we continue to support initiatives working to make the full benefits of digital technology accessible to all. In partnership with Creative England, our £1million iAMDigital fund invests in organisations tackling barriers that are limiting people’s digital capabilities. iDEA, founded by Nominet Trust and The Duke of York, KG, is equipping young people with digital and entrepreneurial skills.

Our co-funding of Wavemaker with Comic Relief, has created a community makerspace in Stoke-on-Trent. We’re also providing grant funding to youth organisations supporting the hardest to reach young people in the UK through our Digital Reach programme. There is still more to be done, but as Make it Digital has demonstrated, by working together, we can transform more lives with tech.

Vicki Hearn is the Director, Nominet Trust
Tech London Advocates

Russ Shaw

Make it Digital has been an ambitious project and a real success for young people and media veterans alike. In particular, I think that the campaign around distributing BBC micro:bit computers to year 7 pupils across the country was something that will make a pronounced and lasting difference on the next generation of coders and tech entrepreneurs.

Britain's technology sector faces a serious shortage in skills. Research shows that tech companies create jobs at three times the rate of the rest of the economy, and are central to economic growth. This makes campaigns such as Make it Digital not just ambitious, but imperative. I believe this initiative is a crucial step in cultivating the young tech minds of the next generation.

The campaign ran smoothly throughout, despite the logistical difficulties associated with the design and development of the BBC micro:bit, as well as the creation and distribution of the devices and their learning resources, all on a nationwide scale. This success can be attributed to the unprecedented collaboration of the many separate partner organisations.
At the heart of the campaign was the female-led startup Technology Will Save Us, which creates educational kits to teach children how to use technology.

The startup designed the shape and feel of the micro:bit device, which was designed to be fun, easy to use and aesthetically appealing, as well as being available in a range of colours.

The company is a British manufacturing success story, run from the unlikely location of East London, and is the perfect example of the kind of entrepreneurship we are trying to instil in these year 7 students.

It is also a testament to Make it Digital’s ambition that the campaign was hardware rather than software-led. Using software would have probably meant supplying login details to all year 7s. Not only would this restrict students that don’t have their own computers or Internet access, it would also be competing for their attention with other platforms such as Facebook and online gaming sites.

Giving students a piece of hardware such as the BBC micro:bit meant that it was far more tactile and easy to play around with. This catered to different kinds of learning styles, and gave the students a greater degree of ownership over the project. This was a slightly riskier and more expensive strategy, but one that paid off and made for an excellent campaign.

The Make it Digital campaign is a great British success story that will have repercussions for generations to come. Technology is a source of wonder and joy for young people, as well as a driver of the British economy. Tech London Advocates was proud to support this fantastic endeavour.

Russ Shaw is CEO of Tech London Advocates
TeenTech were an enthusiastic partner in Make It Digital. From a personal point of view I felt very proud of the BBC for embarking on such an ambitious project and bringing so many creative and diverse organisations together to make it happen.

TeenTech’s role was to provide some context for where digital skills could take you. Our mission for the past 9 years has been to help all young people, their teachers and families understand opportunities in contemporary industry and the skills needed – personal, practical and academic - to take advantage of them. Digital skills underpin every job and cut across every industry and it’s never been more important to ensure that everyone has access to the tools of the future.

I often say it was only when I started work on Tomorrow’s World that I had any idea of just how big the world of tech really was, the many different roles and pathways which lead people into fascinating and rewarding careers. We recognised Make It Digital as a powerful platform to help more young people understand careers in technology are open to everyone, irrespective of gender or social background. It’s not about tech per se, it’s about teamwork, creativity, people and having a stake in the world.

We began by making a short film at Bristol Robotics Lab illustrating some unexpected aspects of robotics and then ran workshops with hundreds of young people helping them and their teachers understand the potential of a small device which seemed to capture the imagination of everyone who held one. When we filmed in the Bristol lab with one of the first ten prototypes for the BBC micro:bit, the engineers and students were crestfallen when we said we had to take it away and we only got it back on condition they were sent some as soon as they went into production.
The most significant aspect of Make It Digital was the way it not only encouraged everyone to have a go but provided a piece of kit with which they could do this. I particularly liked the way they belonged to the child not to the school, so they were free to take them home and develop their own fun projects.

It was only matter of weeks before we saw the BBC micro:bit being used within projects entered for the TeenTech Awards and TeenTech City of Tomorrow—from devices to ensure you brushed your teeth properly to ways to ensure less time was wasted in schools by queuing. It was thrilling to watch this happen. Many teams who might previously have lacked resources to go beyond a concept idea to ‘make life better, simpler, safer or more fun’, were now able to build a prototype.

For TeenTech it was especially gratifying to see many students, previously with little interest in tech, now wanting to become TeenTech Young Ambassadors. Many went into primary schools to share their experiences. After listening to one team of girls talk about their project, a young lad put up his hand and asked ‘Can boys do this too?’ One team skyped schools in Spain, Colombia, Finland and Hungary encouraging them to enter the TeenTech Awards and then mentored them through the process. We were incredibly proud when Radio 1 crowned Lauren and Lucy ‘Teen Heroes’ for this work.

I’m looking forward to the game-changers of the future saying, ‘It all began when I was given a BBC micro:bit’!

Maggie Philbin is Chief Executive of TeenTech
Towards the end of 2013, in my capacity as the BBC’s Head of Strategic Delivery and with a background in both broadcast and digital content production, I was asked to develop the initial strategy for what was to become BBC Make it Digital. I began with desk and interview research among the digital community to conduct gap analysis and ask what tech insiders thought the BBC could usefully do for the public in the digital world.

As I was researching who to speak with, the task snowballed and I grew to love and respect the incredible educators, inspirers and makers of the digital ecosystem.

It became clear very quickly that there was so much good stuff going on that the BBC needed to ensure whatever it did was not duplicative or patronising. We decided that the centrepiece of the strategy should be the idea that our role at the BBC should be to ‘shine a light on the wonderful world of digital’.

Core to this was an appreciation that partnership would be key to our success.
With that in mind, we identified a range of influencers and proposed that we should start a series of roundtables where we could engage people, involve them as both stakeholders and shapers of what we were doing; and hopefully build a community of advocates.

An amazing innovator from BBC Learning called Howard Baker heard about the hunt for the digital age equivalent of the BBC Micro. He came to London from BBC Manchester and gave a demo of an early version of the BBC micro:bit. It reminded me of the Raspberry Pi... but smaller, more compact, and with the capacity to be easier to grapple with as a learner with no prior knowledge.

It had LED lights, little toggle buttons, and small holes for crocodile clips. You could make it spell messages and use it to programme tech like a mini server. It was brilliant.

At the end of the demo, I promised him I would get this idea looked at by the higher echelons of the BBC. Meanwhile, my inner strategist leaped with excitement, thinking this might be not just the digital age Micro, but a way for us to deliver something that could deliver the project’s ambition to reach a large group of people.

In the end, BBC Learning delivered a million BBC micro:bits and gave one to every year seven in schools that asked for one - a remarkable achievement.

This meant the tenets of the strategy were genuinely informed by the people who operated within the digital community, and in many cases, ran it. One of the key lines in the original strategy was: ‘We want to channel the spirit of the BBC Micro for the digital age.’

At the time we had no clear idea what that would be, but I was very conscious of the impact the BBC Micro personal computer and the BASIC language had on me personally, and wondered what the equivalent would be in the digital age when every single one of us carries a personal computer in our pocket - our phones.

The impact Make it Digital has made and is continuing to make will live on. The aim was to shine a light on the wonderful world of digital; channel the spirit of the BBC Micro for the digital age; and bring digital home. I hope, and feel, that we managed to do all of that.

Kerensa Jennings was BBC Head of Strategic Delivery from 2010 to 2016
Creativity is a core strength of the UK and gives us an edge as a nation. The UK excels at creating original Intellectual Property. Celebrated around the world, UK music, television, film, games, fashion, publishing, theatre, art, design, advertising, crafts and architecture is the by-product of a long history of culture - and counter-culture. Modern Britain is an open, multi-cultural society, a rich talent pool where ideas stream from diverse free-thinkers collaborating to create innovative new products and services. However, beyond giving immeasurable pleasure and enjoyment, the creative industries are vital to economic success. They are an important driver of growth. In the UK they provide almost 2 million jobs and contribute £84.1 billion to the economy – that's £9.6 million an hour. It's also a very dynamic sector, currently growing three times faster than other industry sectors. And, like most industry sectors, it is becoming exponentially reliant on digital creativity.

I’ve been privileged to work in the UK’s world-beating videogames industry for over three decades. Videogame development exemplifies the marriage of art and science, requiring a combination of technical expertise and creative flair. The industry relies on a skilled workforce that can adapt to furious rates of technological change. Unfortunately, the education system has not kept up with this change and is not meeting the needs of children who seek careers in the digital and creative industries.
Of course not every child will want to become a software engineer, but it will help them if they know how code works in order to become able digital citizens. They need to be in the driving seat of technology, not the passenger seat. In the 21st century, digital literacy is almost as important as literacy and numeracy. The solution is not just to give every child a computer or tablet and think ‘job done’.

Computers are a tool to enable digital creativity. And computer science is not just about coding. It’s a discipline; a broad mix of computational thinking, problem-solving, decision making, intuitive learning, logic, analysis and creative thinking to be used cross-curricula to solve problems in multiple ways. It is a vital, analytical discipline that is as relevant to the modern world as physics, chemistry or biology. It is the combination of computer programming skills and creativity by which world-changing companies such as Google, Facebook and Twitter were built.

Indeed, in a world where computers define so much of how society works, from how we do business to how we enjoy ourselves, computer science should be regarded as ‘essential knowledge’. 21st century children are born digital natives, but they need to be creators of digital technology as well as consumers of it. They need to be given digital-making skills to enable them to create their own digital content.

Education needs to reflect the world around us. A digital economy cannot be built with a nation of digital illiterates. Therefore it is important that the Computing curriculum inspires creativity in children. It requires a mind shift from using proprietary technology to being creative with technology. A code club in every school in the country would help to accelerate the learning process, encouraging children to collaborate and hack their knowledge with the help of their peers and teachers.

Digital-making skills should be seen as a priority investment in children in post-Brexit Britain to power the knowledge economy. That is why I’ve been proud to support the Make It Digital initiative, and both the BBC micro:bit and the Raspberry Pi as enabling platforms for digital creativity and contextual learning.

Ian Livingstone CBE is Chairman
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