
HACKing
the BBC
a Backstage retrospective

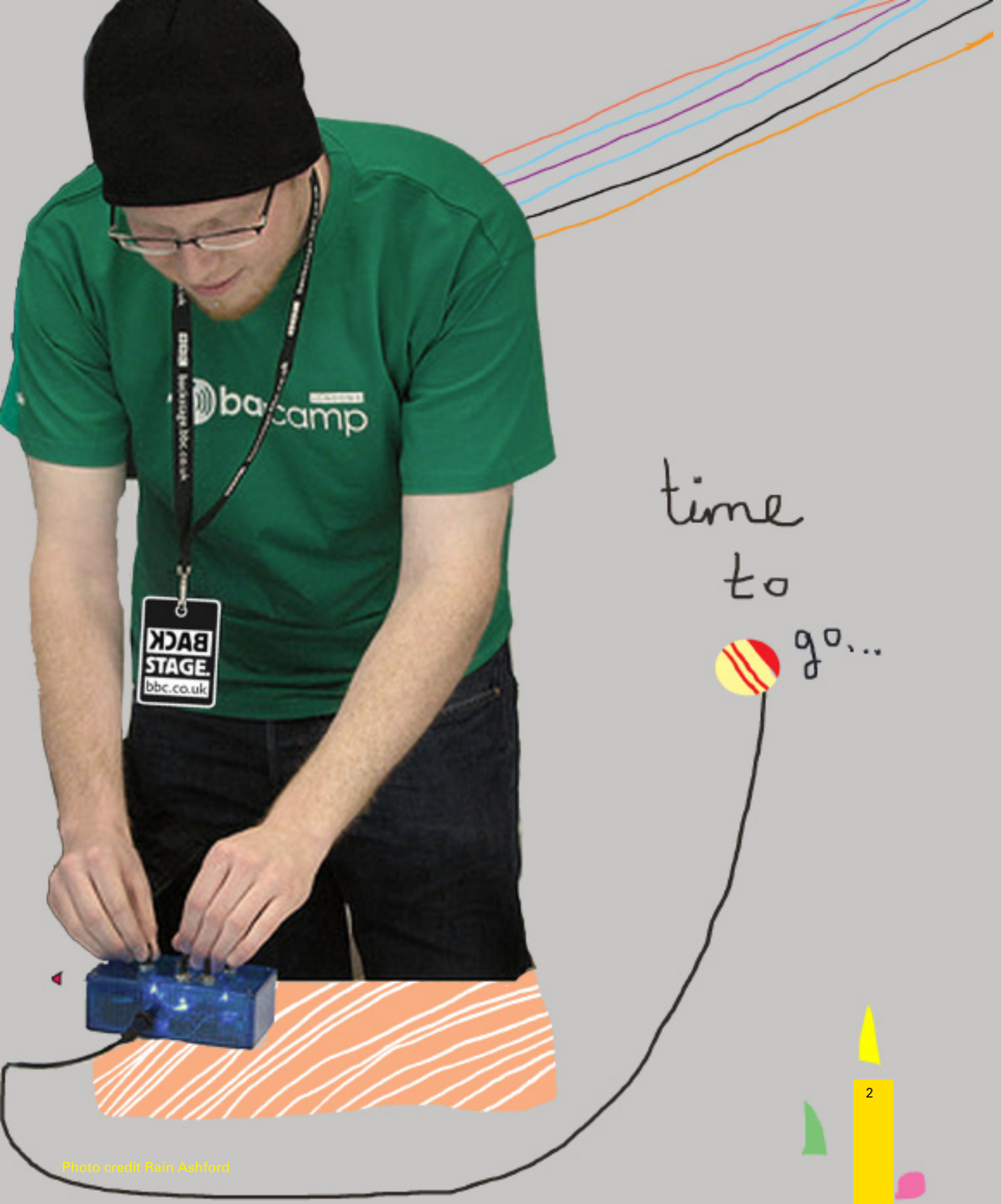

Photo credit Rain Ashford

BBC Backstage was a five year initiative to radically open up the BBC, publishing information and data feeds, connecting people both inside and outside the organisation, and building a developer community. The call was to "use our stuff to make your stuff" and people did, to the tune of over 500 prototypes.

This ebook is a snapshot of some of the projects and events that Backstage was involved in, from its launch at Open Tech 2005, through the triumph of Hack Day 2007 and the shot-for-web *R&DTV*, to current visualisation project *DataArt*. We take a diversion to Bangladesh to see how a Backstage hacker helped the World Service keep reporting through the horrendous Cyclone Sidr, and look at the impact of the 'playground' servers, used inside the BBC.

Backstage's mandate, throughout its history, was for change. It changed the way people think, the way the BBC interacted with external designers and developers, and the way that they worked together. So what remains, now Backstage is no more? The legacy isn't just a few data feeds and some blog posts. Backstage brought about permanent change, for the people who worked there, for its community of external developers and for the BBC. What better legacy could one ask for?

Contents

Access All Areas – Having Fun Backstage 6
The birth of Backstage was about more than just APIs. It marked the point when the BBC began to take the net seriously

Use Our Stuff To Make Your Stuff – The basics of Backstage 8
Meet four people who got their hands dirty with the BBC's data and built some cool applications

Opening up the Web - the Backstory of Backstage 12
The dot-com crashed cleared the way for a new version of the web and Backstage was there when things opened up

Moving out of Beta – Backstage and Open Tech 2005 14
What happened on the day the BBC went public with a new idea of public service fit for the twenty-first century

Only Connect – Mapping Backstage 16
It was all about networks and connections, between data, ideas, people and organisations – how Backstage joined the dots

Lightning Does Strike Twice – Backstage and Hackday London 18
Taking things to the next level with 48 hours of heavy weather and hard core hacking at Ally Pally

Backstage Gets Around 22
Backstage brought people together in the real world as well as online, helping to stage a series of unfestivals and hack days across the UK

Anatomy of a Hack – Backstage and Channelography 26
So what do developers actually do with the BBC's data? A step-by-step guide to an attempt to visually explore the corporation's output

Backstage Q&A – Ian Forrester 30
The man who became the face of Backstage and spread the word about open data, inside and outside the BBC

Backstage Q&A – Rain Ashford 31
The woman who kept Backstage running smoothly, both in London and when it hit the road and the producer on R&DTV

A New Frontier – Backstage and the Wild West Servers 32
Backstage wasn't just about open data - it freed up development spaces in the BBC for hackers and producers to run code and try things out

Weathering the Storm – Backstage and the Bangladesh River Journey 36
Covering climate change in the eye of the storm – how Backstage helped put a new kind of journalism on the map

BBC Unleashed - Backstage's new communication channels 42
From podcasts to remixing TV, Backstage found new ways to engage and involve the BBC audience

So long and thanks for all #tags – Life after Backstage 46
So what did it all mean really? Backstage's legacy, inside and outside the BBC

Acknowledgements 47

Photo credit Matthew Cashmore

These People Made this Book:

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Jim is a journalist turned hackademic and specialises in writing about new media and its effects on society and culture. In the past, he's written for the Face, i-D, The Guardian, The Observer and the BBC. He started reporting on the net back in the early 90s, writing a regular column for The Observer then going on to write several books on the subject for The Guardian. He worked as a consultant for BBC R&D and was the editor of '8', a one-off newspaper about the corporation's research collaboration with the Arts and Humanities Research Council. He is currently Principal Lecturer in Journalism at the University of Westminster.

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Kevin is a freelance journalist/digital strategist with more than a decade of experience with the BBC and the Guardian. He has been a digital journalist since 1996 with experience in radio, television, print and the web. He joined the BBC in 1998 to become their first online journalist outside of the UK, before moving to The Guardian in 2006 where he focused on evaluating and adapting digital innovations for journalism use. He left the Guardian in 2010 to pursue his own journalism projects. Journalism.co.uk listed Kevin as one of their "leading innovators in journalism and media in 2010". He blogs at Strange Attractor and can be found on Twitter as @kevglobal.

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Bill has been working in, on and around the Internet since 1984 and spends his time thinking, writing and speaking about the digital world we are in the midst of building. He appears weekly on *Digital Planet* on the BBC World Service, writes a regular column for the BBC News website and advises a range of arts and cultural organisations on their digital strategies. He is currently working with the Archive Development group at the BBC on finding ways to make the BBC Archive more accessible. He is a Visiting Fellow in the Journalism department at City University. You can find him online here.

Nicola Rowlands - Designer
A designer and illustrator, Nicola was born in Wales, raised on Chicago deep-dish pizza and trained in the jungles of Borneo. Nicola's involvement with the BBC started with an accessible font design project which lead her to further design work within R&D. She produces a range of cards and textiles which are stocked in shops worldwide, and facilitates animation workshops for young people at 21CC. Currently living and working in Manchester, Nicola can usually be found drinking a range of teas and daydreaming of a life that might one day allow her to accommodate numerous cats and dogs. See more of her work on her website or find her on twitter as @nicolarowlands.

Access All Areas

Having Fun Backstage **Words: Bill Thompson**

Open Tech 2005 will go down in geek history. It saw the launch of two key organisations that have shaped the UK technology scene and its influence around the world: the Open Rights Group (ORG) and BBC Backstage. ORG continues to campaign for digital rights in the UK while Backstage is no longer a core part of the BBC's engagement with developers. Both matter enormously however.

I have a photograph, taken at Open Tech, of Ben Metcalfe and Jem Stone at the Backstage stall and remember their enthusiasm and excitement as the project finally saw the light of day. Like most other Open Tech attendees, I had no real appreciation of the political machinations that had taken place behind the scenes to get the project off the ground, but I could see from the start just how important it was.

Backstage marked the point when the BBC started to take online seriously. Although it had an extensive web presence in 2005, especially around news, there was no real sense of any radical agenda behind the corporation's online presence. Back then, I'd written for the *Teletubbies* website, told people that 'Computers Don't Bite' and taken part in early experiments with interactive broadcasting for The *Big Byte* on Radio 5 and *Outlook* on the World Service. But none of these had really stretched the technological boundaries and the iPlayer beta didn't begin until October that year.

Two good friends of mine, Matt Locke and Tom Loosemore, were the main movers behind Backstage. They had strong support from Tony Ageh, who was the BBC's Controller of Internet in those far off days, and relied on James Boardwell and Ben Metcalfe to pull it off.

Later, Ian Forrester and Matthew Cashmore took things to a new level with a series of events: the astonishing BBC/Yahoo! Hackday at Alexandra Palace, the TV Unfestival in Edinburgh in 2007, the mobile-oriented Over the Air in April 2008 and Mashed, a second hack day back at Alexandra Palace, in June 2008. Such events were instrumental in developing strong and enduring links with the wider developer community.

This wasn't a matter of jumping on a bandwagon. Back in 2005 very few technology companies were releasing anything approaching structured data to the public. To a certain extent, the BBC was leading the way. Backstage put the corporation in the same class as Google, Amazon and Flickr and had a major impact on the way this area developed, while the way James, Ben and Ian built support and networks within the corporation allowed new services to emerge without too many questions being asked.

Backstage was never going to have the reach of *EastEnders* or *Strictly Come Dancing*, but it touched many in the developer community and managed to win the New Statesman 'New Media Award for Innovation' in 2006. Over the years around a thousand people signed up for the mailing list and thousands more read material online, listened to the many podcasts or took part in events. By the end there were over 500 prototypes, built by developers who took advantage of the opportunity they were given by the BBC to tinker with live data feeds.

Backstage also had a wider impact that shouldn't be ignored. Together with other initiatives like the Yahoo! Developer Network, it helped developers explore what they could do with structured data released under generally permissive licences, which in turn gave fuel to campaigners who saw open data as the logical extension of freedom of information. They include groups like MySociety, the Open Rights Group – with whom Backstage shares a birthday - and, of course, the current government. That impact will last long after the last playground server is turned off, and everyone involved with Backstage can feel a sense of pride at the progress they made and the direction of travel they set.

Photo credit Paul Downey

The basics of Backstage

Words: Suw Charman-Anderson

"Use our stuff to make your stuff" ran the Backstage mantra, an exhortation to developers to get their hands dirty with the BBC's data and build cool applications. And build they did: over 150 prototypes were listed on the Backstage blog, hundreds more were built at events, and many more developers experimented with BBC data in private. But the impact of Backstage went far beyond simple technical hacks. Backstage touched people's lives and changed the way they thought.

From A-Level students hacking about with radio metadata to university students finding out about the real world applications of web technologies, Backstage was a learning experience for everyone involved. From developers being inspired to start their own business based on Backstage prototypes to BBC employees discovering a new direction for their career, Backstage encouraged innovation and invention.

It gave them insight, understanding and opportunities that would otherwise have been absent. Access to a community of peers, willing to help, to explain and, sometimes, just to provide moral support can sometimes be more important that access to data feeds and APIs. It may sound hyperbolic, but Backstage really did change people's lives.

Here are four Backstagers' stories.

Luke Dicken

"Backstage was launched while I was a Computer Science undergraduate student," says Luke Dicken, who joined the mailing list early on. "I heard about the group from other students, and recent graduates working at the BBC, that I knew. I didn't have time to get too involved, but I knew I was watching something innovative and exciting grow.

"Backstage allowed us to share ideas and brainstorm new ways of using content that, as techs, we'd never had access to before. Some really interesting projects came out of that early time along with some very insightful and inspiring debate on the email list."

The value in Backstage for participants wasn't always in the end product. Sometimes, it was the mind-expanding discussions with fellow hackers that really ticked the box.

"There was one project that I was involved with brainstorming that stands out," says Dicken. "We wanted to take TV listings data and make a recommendations engine by analysis of the show description, based on previous viewing habits or 'liking' things. As an AI student, this was pretty much right up my street but I'm not sure if anything ever came of it."

And working with others in such an open community influenced the way that Dicken thought about development processes.

"It was an experience that helped cement the very open approach I bring to most things now. The university system conditions you to be protective of your own work - plagiarism is a major issue, but so too is trying to beat the grading curve. Backstage was a different culture. It was my first real introduction to open working, and I think that's probably influenced me quite heavily in how I approach problems.

"Backstage really was my first exposure to how a lot of web technologies can be used in the real world. It illustrated the power of the tools we have now to repurpose data, shove it into a different format and get it in front of more eyeballs. More than anything I think that Backstage's biggest effect was to reinforce that absolutely anything is possible, you just need to figure out how."

Mario Menti

Backstage frequent flyer Mario Menti was working as a solutions architect for an online business intelligence company when he stumbled upon Backstage. He "quickly hacked-together" a number of prototypes as proofs of concept, including an SMS service that texted users with what was on TV now and next, an IM bot that sent users hourly news flashes, and a BBC News Twitter bot.

Backstage wasn't just a geek playground for Menti, but was be instrumental in shaping his career.

"When Twitter was still pretty young, I set up a few BBC news accounts such as @bbcnews, @bbctech and a handful more," he explains. "I wrote a simple script that would update the accounts whenever there were new items in the corresponding RSS feeds. Because the BBC provides feeds for many niches, e.g. Premiership football teams, I started getting lots of requests like 'can you set up a Twitter account and a feed for Arsenal.' I thought it would make sense to build a site where users could set up these accounts and feeds for themselves, and so http://twitterfeed.com was born."

Menti ran Twitterfeed.com in his spare time, but as it and Twitter became more popular it became expensive and time-consuming. He decided to turn it into a business.

"I found some initial funding for it via TAG in London and Betaworks in New York. Today we have more than 800,000 users and process more than two million feeds, posting four—five million messages a day to Twitter and Facebook. Two and a half years later, Twitterfeed.com is now one of the most used third-party Twitter tools."

Tim Coysh

An avid BBC Radio 1 listener, Tim Coysh found himself frustrated when he missed the name of a song he liked. He searched online for more information about it, but was disappointed to find that there was no single website that gave him what he wanted.

"After a few days I found a few sites," he explains, "both supported by this unknown program called 'Backstage'. They didn't provide me with everything I wanted, so decided to try and make my own site and get involved with this new BBC Backstage team."

Coysh built *Radio 1 Now* in his spare time. Pulling together recent play data for Radio 1, Radio 2, 1Xtra and 6 Music, his mash-up also pulls in webcam feeds, band information and links, and a list of similar artists. It carries data not just for currently playing songs, but details of all cached songs played since 2005.

"Backstage provided great support in setting up the prototype," says Coysh. "With the Backstage team backing me, I successfully set up my website publicly and have since had a respectable amount of users view it. The Backstage mailing list has also been very useful in finding out information about other BBC subjects, especially the iPlayer. And the fact that I am 17 doesn't seem to matter!"

A full-time A-level student, Coysh now uses Backstage resources regularly, both at home and at college, and the benefits of being part of the "friendly, supportive" Backstage community have gone beyond simple access to data feeds. Backstage has, Coysh says, helped him to confirm his future career direction, that of web programmer.

Jonathan Tweed

In October 2006, Jonathan Tweed had just joined the BBC as a software engineer on PIPs, the programme metadata platform that powers iPlayer and BBC Programmes. He had moved to London from Leeds, and wanted to meet people.

"Not knowing anybody I was keen to make some new friends," explains Tweed. "I'd heard of BBC Backstage before I moved down and thought it would be a good thing to get involved with. Two weeks in, at the start of November, I went to a Backstage meet-up in the back room of a bar near Liverpool St. Everyone was so friendly and made me feel so welcome. I was hooked."

Tweed was one of the many developers that went along to Hackday at Alexandra Palace and, along with friend Ben Smith, put together an iPlayer Facebook application.

"It was a full implementation of iPlayer embedded inside Facebook," Tweed says. "You could search for and watch programmes, see what your friends were watching and add comments and ratings. Later versions added Last.fm-style social recommendations, showing your TV compatibility with each of your friends and showing who you had most in common with.

"Right from the very top levels of Future Media & Technology (FM&T), the BBC was very supportive. Ashley Highfield [then director of FM&T] had a video made of Ben and I to show the kind of thing that Backstage was making possible and I was given the odd day here and there to keep it running.

"When iPlayer v2 was released I took it down, as the changes required at that point were more significant than I had time to work on. Its legacy does, however, live on. iPlayer v3 added many of the same social features into the core product."

Building such a high-profile app helped Tweed not just settle into his job, but also to develop his career.

"Backstage helped me rediscover that I was interested in more than just writing code," he says. "I wanted to be involved in all aspects of product development. It gave me the confidence, and visibility within the organisation, to pursue a career in product management, first on PIPs and now in Knowledge."

Four years later Tweed is now a product manager in News & Knowledge, "working on the next generation of knowledge products from the BBC," and is often held up as a great example of what happens if you give people data and the freedom to tinker with it.

Backstage is important, Tweed believes, because "the BBC has a duty to be as open and engaging as it can be, with everyone. On the web, serving the needs of the community means open data and that's something I've always pushed for through Backstage. It has not always been easy, but I hope that things are getting better. There's been a renewed interest recently in linked and open data, especially public data, and as a publicly funded organisation it should just be part of what we do. Backstage has always been key to helping promote that."

Tweed has many fond memories of Backstage:

"Undoubtedly the highlights for me were the first Hackday at Alexandra Palace and going up to Edinburgh for the TV Unfestival. The first Hackday was like nothing I've been to before or since. It was just one of those moments when everything was right and something special happened, something one-off. Ben and I demoed iPlayer to 400 people before it had actually launched, without asking for permission. We were very lucky we got away with that, but I have no doubt that the occasion, the people involved and Backstage were the reasons why. It was certainly a defining moment for Backstage. Long may it live on in spirit."

the backstory of Backstage

Opening up the web

Words: Kevin Anderson

When the dot com boom turned to bust, many in the mainstream assumed that the net was over. But a new more open web was to rise out of the ashes of the dot com crash.

Wall Street and the media may have left the Internet for dead at the turn of the century. But their departure was a blessing in disguise. It gave developers and hackers the space they needed to come up with new ideas. A new kind of web began to evolve. Instead of simply offering linked pages, sites began offering APIs -- application programming interfaces that allow developers to call on the data, e.g. friends lists, product catalogues or maps, collected and held by websites.

Google launched its first APIs in April 2002, allowing developers to directly query its index of more than two billion web documents, using Java, Perl and Visual Studio. Amazon launched its Web Services three months later. Both companies gave developers a way to build applications with their content and integrate those applications easily on their sites.

This was the beginning of what Tim O'Reilly, in autumn 2005, called the "web as a platform". APIs grew throughout the decade and they helped drive the success of many web start-ups such as photo-sharing site Flickr and, later, micro-blogging platform Twitter. APIs meant that services like Twitter could become the hub at the middle of an online ecosystem, i.e. networks of applications built on web services.

In March 2005, Yahoo! bought Flickr and launched its own web services, along with a developer network to help promote its APIs and highlight the best applications that people built using them. In June 2005, both Google and Yahoo! released APIs for their mapping service in a move that coincided with O'Reilly's Web 2.0 conference.

The mapping APIs gave rise to the map mash-up: combining two or more data sets and showing that data geographically. Some of the early map mash-ups, such as Adrian Holovaty's chicagocrime.org which was launched in May 2005, clearly showed the value that could be created by bringing two or more datasets together and illustrated the mash-up's potential.

The shift from static web pages to APIs and applications was not lost on developers or strategists at the BBC. At the time, Matt Locke, then the corporation's Head of Innovation was taking a long look at its future.

According to Tony Ageh, the then BBC Controller of Internet, Locke's review was intended to be a realistic assessment of where technology was going and what technologies would soon have significant impact.

In the first years of the new millennium, Locke was part of a team that explored possibilities for the future state of broadband in 2014 and how it might affect the BBC. Ageh recalls that the report found "the BBC, which is very focused on control and broadcasting and one-to-many communications, was unlikely to be able to adapt enough to get the full affordance of network connections, social media, and so on." Despite this, he added, Locke had the notion that the BBC could become a development platform.

Locke believed that the BBC should enable open innovation by working with 'lead users' to spur new developments. MIT professor Eric von Hippel coined the term 'lead user' in 1986 and said:

- They face needs that will be general in a marketplace - but face them months or years before the bulk of that marketplace encounters them
- They expect to benefit significantly by obtaining a solution to those needs

Hippel's research found lead users' innovation was "almost twice as fast as traditional ways of identifying promising new product concepts and less costly as well."

When Google launched its APIs, Rael Dornfest of O'Reilly wrote: "The Google Web API opens a dialogue with the developers and researchers inventing the next Internet and quite possibly shaping the future of Google itself." Similarly, visionaries inside the BBC hoped that by re-inventing the BBC as a platform, they could allow lead users to help shape the future of the broadcaster in the age of broadband.

Locke was focused on working with teams inside the BBC. Tom Loosemore, then Project Director, BBC 2.0, was working with developers both inside and outside the BBC. Around the time that Google and Amazon were beginning to open up and offer APIs, the pair met at Bush House, then home to BBC Online, in late 2003 and went out for pizza at a nearby Italian restaurant.

They sketched out a model for innovation to engage four groups: independent production companies, corporate partners, academics and lead users. The project to work with lead users was to become Backstage.

"The original idea was to create an environment where they would put as many of the BBC's assets as possible, with complete freedom and permission, and allow anybody to do literally anything they wanted to do with them," Ageh says. But it wouldn't be entirely open: As a developer community, they needed some specialist knowledge to access the material. "It wasn't just roaming around the public internet", he adds. The community would be self-selecting, possessing not only unique skills but also focused passion about digital technology and the future of media.

Locke asked a member of his Innovation team, James Boardwell, to manage the project. The first step was to see what feeds already existed at the BBC. "A lot of data was available without anyone actually knowing it, especially around news," Boardwell says. Many BBC sites were already producing RSS feeds but Boardwell says that, while people were aware of them, the knowledge and understanding of them was limited. "Certainly rights people and Legal people weren't aware of what people could do with it."

Instead of going to management and asking for permission for the data, Metcalfe would speak directly to other BBC developers, "have a word in their ear" as Boardwell puts it, and ask them to expose a feed. It was often possible, but wasn't always being done.
News was their first early win, with Metcalfe working with many of his former colleagues. "That was what we launched with," says Boardwell. "The whole idea was to do it quite slowly and quietly, don't have a big fanfare, do it under the radar. Make it look quite geeky so it wouldn't raise the hackles of anyone in editorial policy particularly."

Metcalfe remembers Backstage then having the atmosphere of a start-up, rather than that of a large organisation. "In the early days it was just James Boardwell and myself working full time on the project and so we both did anything that needed to be done – from working with ops guys to set the server up through to liaising with the Legal department on the creation of the licence Backstage made the data available under."

The initial challenges weren't necessarily technical. The real challenge, one that would remain throughout the project, was the tangle of issues around rights and licensing. Much of Boardwell's early work was with Legal teams working on developing a licence acceptable to the BBC but not frustrating to the external developers they hoped to engage.

"the whole idea was to do it quite slowly and quietly, don't have a big fanfare, do it under the radar"

BBC News was already producing an abundance of feeds, so Loosemore went to them to find a developer with the right skills to work on the project. Ben Metcalfe had already been doing a lot of work similar to the type of thing Backstage was to do.

"In 2003 Neale Patton (now at Apple) and myself gave a presentation to Richard Deverell and the BBC News Website management about what a 'BBC News API' might look like," Metcalfe says. Nothing came of the meeting, but he continued to build small prototypes in his spare time from data that he scraped from the BBC News website. One of his prototypes, the *BBC News and Sport Printable Digest*, caught Loosemore's eye, and he asked Metcalfe to join the Backstage project.

As it developed, the project had an informality and a sense of daring to it that was quite uncommon in the BBC. Boardwell says: "[Ben] and Tom were quite renegade and quite maverick. Tom Loosemore's mantra is 'seek forgiveness, not permission', and that was definitely his approach to this."

"At the time, there was a massive thing about alternative use, not allowing reuse, which obviously for developers was a nightmare," Boardwell says. They spent a lot of time introducing the Legal teams to the idea. He remembers Ria Matysek from the BBC Legal department who worked with him to convince the rest of the department: "People from Legal are all about locking things down, and we said: 'Look, this is about opening things up, seeing what happens and persuading people of the benefits.'"

Finally, according to Boardwell, Loosemore asked Ashley Highfield, then the Director of Future Media & Technology, to persuade Matysek's manager, who was quite wary, to "run with it for a while." They agreed on a form of words that was sufficiently vague enough to allow developer use, with one important caveat. The use had to be non-commercial. With the licence in place and with feeds and data that they could free up for developers, they were ready to launch Backstage.

moving out of beta...

Backstage and Open Tech 2005

Words: Suw Charman-Anderson

It was a sunny day in west London on 23 July 2005. London was still reeling from the horror of the 7/7 terrorist attacks and a second wave of attempted bombings but the mood in Imperial College's Reynolds building was chirpy and excited. People had travelled from far and wide to attend Open Tech 2005, a conference organised by the UKUUG (UK Unix User Group) and NTK (Need to Know, the then weekly tech newsletter). The event was sponsored by BBC Backstage, Yahoo! Search and O'Reilly.

The day would be auspicious for a number of reasons. It saw the founding of a digital rights NGO that would later be named the Open Rights Group, the unexpected shuffling of a box of iPod Shuffles and the official launch of BBC Backstage. After years of behind-the-scenes graft and a couple of months nurturing the internal and external developer communities, it was time to take 'beta' off the BBC Backstage home page.

Ben Metcalfe, BBC Backstage's project lead, took to the stage in the main auditorium and told the audience: "Backstage is a developer network. We saw that Yahoo! was about to launch one, Google had one, Amazon had one, and we looked at the benefits those companies were obviously getting from opening up a dialogue with expert users and developers who were interested in their products, and we were quite keen to do the same.

"BBC Backstage is a platform for us to share some of our content with you guys," Metcalfe continued. "I like to think of this as public service for the 21st Century. It is in the BBC's public service nature to be doing this kind of stuff."

The project launched with a number of data sources that developers could play with, including BBC News and BBC Sport RSS feeds, a comprehensive XML feed of travel data including things like train delays and traffic jams, "threads from BBC message boards", and RSS feeds from the BBC podcasts.

Backstage had actually been running for a couple of months before the Open Tech official launch and had tapped in to the existing developer community at the BBC. About 50 prototypes had already been submitted.

"There's already some people doing cool stuff with [Backstage]," said Open Tech attendee Neil Turner in a blog post, "like taking the BBC's travel news feed and plotting the problems on a Google map, or a 'changelog' of the BBC News Online home page. Ben Metcalfe, who was presenting, used the archives from July 7th as a good example of why this was so cool."

In an attempt to inspire the developers in the audience, Metcalfe showed three of the prototypes developed by BBC employees and already up and running:

The 'changelog' Turner mentioned was actually called the BBC News Front Page Archive. Developed by Matthew Somerville, it showed every change made to the front page of the BBC News site over time. Metcalfe demonstrated it on the day by running through the archive from July 7th, a day which started with the announcement that UK would be hosting the Olympic Games in 2012. As reports came in of the four bombings, so the BBC News front page changed with the Olympic news making way for the more tragic reports and photographs from traffic cameras.

Dom Ramsay's Local Knowledge took different sources of data — such as road closures from BBC Travel news, local news, Flickr, weather data —- and plotted them on a map. Ted Gilchrist's Rebotocast was a podcast of a text-to-speech converter reading the BBC News. When iTunes launched their podcast service, only a few weeks ahead of Open Tech, this was one of the most popular podcasts.

With the launch, the Backstage team also announced its first competition for prototypes using newly available TV scheduling data. A week or two before Open Tech, the BBC had released the BBC TV and Radio schedule data for the next seven days, which provided developers with all the information they would need to create their own electronic programme guide. The data was released in the TV Anytime format, a rich XML schema that included schedule and genre information.

Metcalfe told the BBC News website at the time: "We want people to innovate and come up with prototypes to demonstrate new ways of exploring the BBC's TV schedule."

Pictured: Ben Metcalfe **Photo credit Matt Locke**

At Open Tech, he provided some inspiration for developers, suggesting they could "combine schedules with web services," which would open up programmes to external annotation. Alternatively, they could focus on different genres to provide vertical search. Perhaps, he added, a social element such as rating or voting, or collaborative filtering could be introduced.

With a Dell server as a prize, this wasn't just any old competition, but had some serious "geek bling" on offer. The eventual winners were Leon Brocard and Leo Lapworth for MighTyV.

"It's a fantastically impressive prototype," said the BBC Backstage blog at the time, "with such a wealth of features and innovative ideas already implemented that we were almost overwhelmed. That said, the simplicity of the user experience meant that it was easy to use out of the box. There is a lot of different findability here; tagging, ratings, recommendations as well as the basic grid format with innovative and different ways of navigating your way through thousands of hours of TV and radio."

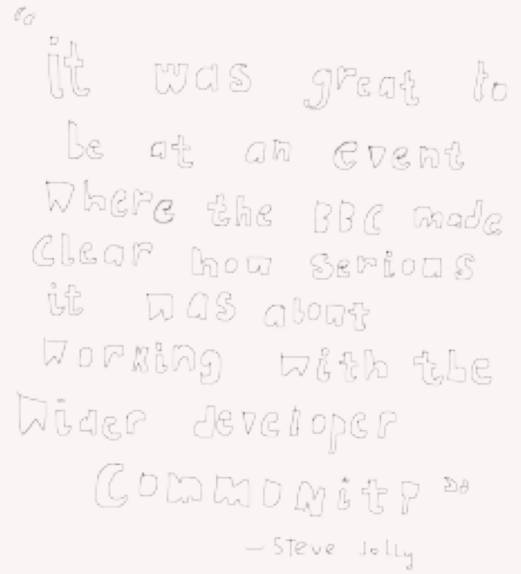
Open Tech 2005 is still fondly remembered by many who were there. "Open Tech 2005 was, of course, the official launch of Backstage," says BBC Research & Development engineer Steve Jolly. "I went there to give a talk with George Wright (also of the BBC) in which we tried to inspire people with the potential of hacks and mash-ups that treated our digital television broadcasts as a 'feed'. I took along a prototype that plotted the social graph of Formula 1 races, based on a simple textual analysis of the subtitle stream. Unsurprisingly, building applications that pull data from our TV broadcasts has never been as popular as pulling data from our web APIs and feeds, but we certainly inspired a few people. It was great to be there, at the event where the BBC made clear how serious it was about working with the wider developer community."

Ben Metcalfe concurs: "[Open Tech] was an opportunity for people to demonstrate their side projects and follies. In many ways it was an age of innocence that was sympathetic to Backstage's non-commercial ethos where people hacked stuff for fun and pleasure. I think that approach and mentality is just about gone. Dazzled by the Web 2.0 era of the years leading on after Open Tech 2005, developers in the London tech scene began to work on more commercially orientated projects - some of which became proper startups in their own right.

"If an era can be defined as the post-crash, pre-Web 2.0 era for the London tech scene, then Open Tech 2005 probably marked its high point," he continues.

"It was exciting times and really made my brain switch from being a developer who expected to have a 'safe' career with big companies to being a developer and product person that wanted to work on start up projects and get much more involved with the community - which of course is where my career has since taken me." Metcalfe is now based in San Francisco and describes himself as a 'hacker-turned-consultant'.

As with any project, taking the wraps off BBC Backstage was a key turning point. For the BBC, it represented a public commitment to openness and collaboration, and for the community it was an opportunity to access and work with some of the BBC's data. It's easy to take APIs and open data for granted now — although there remains a lot of work to do in opening up yet more data. But in 2005, BBC Backstage was revolutionary.



Only Connect

Mapping Backstage
The scope of Backstage's reach and influence is hard to describe in words. Over the last five years, the team has been involved in too many different projects to cover in this book.

For example, *Tweetstore* was an archive of all BBC Twitter activity, years before the rest of the BBC caught on to the power of social media. Backstage also reached out to the educational community with a tour of universities. "We felt Backstage could bring a lot to educational establishments," says Ian Forrester, who organised meet-ups at Manchester Metropolitan, Ravensbourne College and Newcastle College, amongst others.

But the heart of Backstage and the community was the mailing list, which had over 2000 subscribers at one point and leaves an archive of 12,545 posts. "Love it or hate it," says Forrester, "it just worked."

LIGHTNING DOES STRIKE TWICE

Backstage and Hackday London

Words: Suw Charman-Anderson & Kevin Anderson

'Expect the unexpected'. According to Yahoo!'s Chad Dickerson that's the ethos of Hackday. And he should know - he's the man behind the company's first public hacking event, held in September 2006.

When you bring together a bunch of hackers, ply them with pizza and tell them they can develop whatever they like so long as it's done in 24 hours, you never quite know what you're going to get. But when BBC Backstage teamed up with Yahoo! to bring Hackday to the UK everyone involved had to factor in another level of unpredictability – the British weather.

Cut to Alexandra Palace, June 16th 2007. After a lot of careful planning and preparation, Hackday London is beginning to get going. Hackers from across the UK and beyond are just getting started on a marathon 24-hour programming session. Outside, a storm is raging and lightning strikes are causing power outages. Typical British summertime weather. But since when did the British ever let a little rain put them off when they've set their minds to something?

The lightning crackles again – a huge bolt directly over the historic old building – and Ally Pally goes haywire. "It's raining indoors! It's raining indoors!' is the message passed along the volunteer radios as water starts to pour down from the skies onto the assembled hackers.

"Who would have expected not one but TWO direct lightning strikes on Alexandra Palace over a very short period just as our London Hackday was getting started? That's exactly what happened," Dickerson wrote on his blog at the time.

"The first bolt simply caused some electrical difficulties and sporadic power outages. The second bolt was, well, thunderous, and gave a jolt to Ally Pally's fire suppression system, causing vents in the roof to open up to let in torrents of that infamous English rain. I had been finishing up a media interview when the monstrous BOOM reverberated through the building and the chatter on the volunteers' radios became deafening: 'IT'S RAINING INDOORS!! IT'S RAINING INDOORS!!'"

What Dickerson called "the Dunkirk spirit" kicked in immediately. Shielding laptops with umbrellas, hackers helped each other relocate to the dry Palm Court area of Ally Pally. The main hall had to be cleared whilst the roof was closed, but the experience broke the ice and created a wonderful atmosphere.

Hackday London has its roots in a similarly charged, though rather dryer, event in America – the first Yahoo! Hackday organised by Chad Dickerson. As Tom Coates, an ex-BBC employee then working for Yahoo! in London, would later put it, Dickerson was hoping to "re-energise the engineers and get them to experiment and play."

The basic plan was to give developers at Yahoo! a whole day to build whatever they liked. At the end of they day they could present their creations to their colleagues and, perhaps, collect one of a number of light-hearted prizes. The first event was held at the Yahoo! campus in Sunnyvale, California and became famous for its piles of pizza and a surprise performance by Beck. Dickerson and Coates worked in the same team and after that first event they talked about how to get hack days going in Europe. Matt McCalister, the director of the Yahoo! Developer Network, said that something could be held London but Yahoo!'s offices there just weren't set up to host that kind of event. Whilst searching for a suitable venue Coates spoke to the BBC's Matt Locke who suggested that the BBC and Yahoo! join forces.

That made sense to Coates. Yahoo! was a big brand but its APIs were not well known in the UK developer community. BBC Backstage on the other hand had a huge presence but wasn't necessarily seen as on a par with technology giants such as Yahoo!. "The BBC made Yahoo! look cool and Yahoo! gave the BBC more technology clout," reasons Coates. Soon the Yahoo! team was working closely with BBC Backstage's Matthew Cashmore to get the event off the ground.

"Hackday is the thing that I'm proudest of," says Cashmore. He wanted to do an event much bigger than just getting a hundred people or so into office space at Yahoo! or the BBC. Going big meant finding the right venue though.

Photo credit Drew McLellan

Coates recounts how the discussion turned an important corner:

“It was one of those rare snowy days in London and Matthew Cashmore had said, ‘There’s this really great space in Alexandra Palace, we should go and look at that.’ Our reaction was, ‘This is madness, it’s in the middle of nowhere, the transport links aren’t that great, and Alexandra Palace is enormous!’ But a clump of us ended up trudging through the snow to Alexandra Palace one day and looking at the venue. We got completely overexcited, but then thought, ‘Hang on. This is ridiculous! Can we really pull off something of this scale?’”

Coates explained on his blog how this new event with the BBC was going to work: “It’s a two day event, starting first thing on Saturday morning and running through to Sunday evening. We’ll have a whole bunch of speakers from Flickr, Yahoo! and the BBC to start us off. We’ll have food—mostly flat—to meet the specialised needs of our guests. There may be booze. I’m not telling. If you want, you can stay awake all night or crash out in a corner in a sleeping bag. The only requirement or restriction (except for the Legal ones, which you should probably read) is that you come to the event and try and build something, ideally using some of the stuff that the organisations hosting the event have to offer. Did I mention it was free?

“You can build robots if you’d like, or things involving televisions or tagging or photos or smart dust. There will be prizes for the best stuff made. And judges! And probably a limited number of free Flickr badges! And yes, there will probably be a band. And no, it probably won’t be Beck.”

Photo credit above: Ben Ward

Once the decision had been made to run with Ally Pally, both teams pulled out all the stops. Anil Patel and Elaine Pearce from Yahoo! worked alongside Coates, Cashmore and Backstage’s Ian Forrester to make sure that everything was in place. “Backstage was Ian Forrester and me,” says Cashmore. “There were two of us. That was it. Neither of us had done anything like that before, Ian didn’t really like the event organising bit, but was amazing at talking to people and being the soul of the developer community, so we had a brilliant partnership.”

“Matthew Cashmore was absolutely extraordinary,” says Coates. “The stuff he pulled together was way above and beyond the call of duty.” The preparation had to be meticulous. Hundreds of developers were on their way, senior members of staff from Yahoo! were flying over for the weekend - including Yahoo! co-founder David Filo - and lots of volunteers from both Yahoo! and the BBC were in place to help run the day.

Anticipation for the event was high, not least because of the history of the venue. In the run-up to the event, new media journalist Ryan Morrison wrote on his blog: “The event is at Ally Pally (Alexander Palace), a venue with so much tech and media history it puts whole countries to shame. In 1936 Ally Pally became the headquarters of world’s first regular public ‘high definition’ television service, operated by the BBC... How incredible is it that the people working at the forefront of the next revolution/evolution of media and broadcasting will be getting together at such a historic venue.”

Arriving at Ally Pally and starting to set things up brought home to Tom Coates just what they were attempting. “That was the moment the scale of it really hit us - when the volunteers came to help us arrange the space and put in all the tables and beanbags.”

Photo credit: Matt Locke

> “I remember sitting there at 5 to 9 and no one had turned up, not a soul.”
> — Matthew Cashmore

Cashmore confesses that the size of the venue and his big plans for the day were worrying him before the start. “I remember sitting there at five to nine and no one had turned up, not a soul. We had talks starting in half an hour and there was no one at Alexandra Palace apart from the staff. I was just crapping myself, because we’d organised this whole thing, I’d told everyone how amazing it was going to be, we’d spent all this money, and no one was there. That was the last time in the whole weekend that I was able to draw breath. I didn’t stop, I didn’t sleep, I just ran for 48 hours, and it was one of the most amazing experiences of my life.”

Coping with weather-induced chaos caused Cashmore and Coates more than few problems. There were nicer surprises in store though, as the day progressed into night and the assembled programmers hunkered down over their screens trying to beat the deadline. Many of the hackers were *Dr Who* fans and had missed that evening’s episode. Coates takes up the story:

“About 11pm, Matthew managed to find a copy of *Dr Who* and came bouncing up and said, ‘I’ve got it! I’ve got it! I’ve got it!’ We projected it on the big screen, and there was an arc of creative technology people just completely shushed, watching this huge screen in blissed-out slumber-party mode. It was absolutely wonderful.”

The next day, after hours of hacking and very little sleep, it was time for participants to show the world what they had done. The range of hacks was impressive. One team, Supernova, put together *SLorpedo*, a physical game of Battleships where you move ships around in the real world and they automatically update in Second Life.

The New York Times’ Nick Bilton and Michael Young, who had flown over specially for the event, put together *ShifD*, which allows users to move notes, addresses and links between their mobile phone and their computer. ShifD is now a fully functioning free service.

Tech commentator/blogger Ewan Spence and developers Greg McCarroll and Gervase Markham worked on *Beagle III*, a ‘pneumatic bottle rocket’ with camera payload. Strictly speaking, such a hack wasn’t eligible for the final competition, but ever inventive, the team found a way around the rules, as Spence later explained on his blog:

“One of the keys to Hackday is the usage of the programming APIs from either Yahoo! or BBC Backstage. While everyone can use whatever they like, to be eligible for ‘the competition’ you need to (and let’s pretty much quote here) ‘use the Yahoo! or Backstage BBC APIs inside your hack.’ Which leaves a rather interesting loophole that the *Beagle III* could use. By lofting up a printed copy of Yahoo! Maps API, and enclosing the rest of the APIs on a 1 GB USB memory stick, we would have the APIs inside our hack while it was in use. Our last flight of the day was ‘the qualifying flight,’ which took up the printouts and memory in the parachute recovery capsule. That flight was the one that made the numerous Sunday flights before that eligible for the competition.”

Developer evangelist Christian Heilmann, formerly of Yahoo! and now at Mozilla, compiled a comprehensive list of all the hacks submitted, which is still available online.

Once the hacking was complete it was time for the presentations. Coates recalls that it was a bit of a military operation. With 80 teams presenting, any delays could result in a massive run-on, even though each presentation was only 90 seconds long. After some deliberation, the winners were announced, with the New York Times team taking the ‘Best Overall’ prize and Beagle III picking up an award for ‘Best Hack of the Rules’. Developer/experience designer Frankie Roberto live-blogged the presentations and the Yahoo! Developer Blog has a list of all the winners. The event closed, as the original Hackday in Sunnyvale had, with a band. This time it was The Rumble Strips rather than Beck.

“It was amazing couple of days that I’m unbelievably proud of,” says Coates. “I think it showed off not only the really great work that both the BBC and Yahoo! were doing in terms of trying to open up their data and put it in front of developers, but it demonstrated again how passionate people can be about being given access to this kind of stuff. The people who came were just a joy. It raised the profile of the work that both companies were doing, and created a lot of energy and excitement about the APIs and what developers could do with them. It was a huge deal.”

“You’ve got to remember that Backstage was just some geeky little thing at the back of BBC Future Media & Technology,” explains Cashmore, who says the success of Hackday London led to many similar events around the country over the next two years. “Hackday made Backstage cool. We celebrated being a geek, we celebrated being cool and we did cool stuff.”

BACKSTAGE GETS AROUND

BBC Backstage had a rich history of organising, sponsoring and supporting events around the UK. From the conventional to the distinctly less so, Backstage used events to help bring people together not just to talk, but to learn and to make. Backstage was always interested in exploring new technology and the team had a talent for collaboration that often led them directly to the cutting edge. Whether it was stirring things up at the Edinburgh TV Festival, getting key mobile industry players together in the same room, or providing an historic opportunity for enthusiastic hackers to broadcast from Alexandra Palace, Backstage events were never dull, never predictable, and almost never went to plan!

Barcamp
September 2006, London
Often called 'unconferences', BarCamps sprang up in San Francisco as an open, ad hoc, attendee-organised alternative to formal conferences. BBC Backstage sponsored the first BarCamp in the UK which was held in London at Yahoo! Europe's offices. On the day, participants gave talks about website accessibility, the Agile programming methodology, and disruptive technologies.

Co-organiser Ben Metcalfe wrote on his blog 24 hours after the event that "most people found the unconference format to be enjoyable and rewarding once they got into it. This was the first BarCamp (and probably unconference) to take place in London and so for many it was something of an unknown.

"I [caught] some interesting discussions ranging from future web app archetypes (by Matt Webb) through to creating a near-real time train map (by Matthew Sommerville).

"What was particularly pleasing was the cross-section of attendees – from uber-techies through to usability specialists, designers, marketing people and even those not formally working in the IT industry. With that came an equally wide range of presentation subjects – from tech-focused introductions to XSL/T and Microformats through to better user-centred design and even MP3 DJing."

Edinburgh TV Unfestival
August 2007, Edinburgh
The Edinburgh TV Unfestival was an unconference run by BBC Backstage where, as Ian Forrester put it in a blog post, "the cost of entry is participation."

Running as an official fringe event to the Media Guardian's International TV Festival, the TV Unfestival explored the intersection of TV and the Internet. It featured talks about social television from companies such as Joost, cataloguing on-demand TV from TapeItOffTheInternet, and the possibilities of TV over P2P from Ian Clarke. Many of the presentations were ahead of their time, as proved by the success of iPlayer and other on-demand TV applications.

The unconference attendees had access to the main festival's Saturday evening event as well as a Sunday session where the highlights were presented to Media Guardian's TV Festival audience. It was an attempt to cross-pollinate the two very different communities, bringing ideas from the Internet world into that of the traditional broadcasters.

"I think we stirred up things at the TV Festival in a good way," says Forrester. "We brought real media innovators into the festival and gave them a voice. Although the session at the TV Festival was full of tension on both sides, ultimately we broke down the barriers and introduced the idea that hackers can show you the way forward."

Photo credit, above: Drew Mclellan

Over the Air
April 2008, London
After the runaway success of Hackday, BBC Backstage got together with Mobile Monday to organise another 48 hour hackathon. Over the Air featured a day of talks followed by intense hacking on mobile and wireless technologies. It was described on the Backstage blog as "the world's largest non vendor specific mobile developer event to date" and proved to be a turning point for the mobile community which was expanding rapidly as more and more tech companies came to understand the potential in the mobile space.

"It felt like mobile was emerging into the mainstream very quickly," said Matthew Postgate, then the BBC's Controller of Mobile. "There was a community — in London, but also across the country — who would really benefit from talking to each other. We had Sun there, we had Java, Nokia, Google, Yahoo!, all of these companies that were moving into mobile but were finding huge discrepancies between handsets, or that operators are treating data differently. There were all these problems, and it felt like having everyone in the same huge room for a couple of days could really make quite a big difference."

Alia Sheikh, a research engineer with BBC R&D, was a member of an Over The Air hacker team that decided to "build a location-aware mobile game from scratch, using the then-novel GPS capabilities of the Nokia N95 and the Imperial College campus as a playground. Gameplay would be kicked off when players got within 10 metres of each other, and would be entirely mediated by their phones". Over The Air was "the perfect place for do do this kind of rapid development. The crowd were just as interested in the architecture of what we'd built as how much fun it was to play."

Thinking Digital
May 2008, Gateshead/Newcastle
An annual event, the Thinking Digital conference describes itself as a place "where outstanding individuals gather to take part in an exclusive conversation about technology, ideas and our future." BBC Backstage partnered with Thinking Digital 08, videoing talks and archiving them on BlipTV.

"Not many people know this," says Herb Kim, founder and director of Thinking Digital, "but BBC Backstage have been one of the real unsung heroes of Thinking Digital. Long before anyone had even heard of it, Backstage understood its potential and helped spread the word. This quiet support and implicit affirmation made an absolutely critical difference in the early years of Thinking Digital. I can't thank BBC Backstage enough in helping to build the conference into a real asset for Northern England and the whole of the UK."

"Herb proposed the idea of Thinking Digital at an Innovation Lab in Newcastle," remembers Ian Forrester. After the lab, Ian offered Herb a bit of moral support and access to BBC staff who might be able to speak at the event. "We also recorded the talks and uploaded the videos to the web. The event was amazing. It was just great being there and supporting an event outside of London."

Mashed
June 2008, London
A second weekend hackathon, Mashed was held at Alexandra Palace in the thankfully lightning-free summer of 2008. Hackers had access to the BBC's short-range Freeview DVB-T multiplex and found themselves the first people to broadcast from Alexandra Palace since 1956.

This historic hack was an automatic translation system for live television, which translated digital subtitles and put the results through a speech synthesiser to provide a voiceover in a foreign language. Presentations included NASA's Pamela Clark talking about their ANTS technology - the Autonomous Nanotechnology Swarm - which may be used in future probes to Mars.

"The event was a massive success," says Matthew Cashmore, who organised it. "People came from all over Europe to take part - the list of partners was stunning - Microsoft, Google, Yahoo! BT, ARM to name but a few.

"The whole thing was awesome - I mean that literally. The number of times I saw things that took my breath away or talked to people about using tech in a way that hadn't been considered before blew my mind. 'Innovation is Cool People doing Cool Things' - what I wanted to do with Mashed and Hackday was create an environment where the only possible thing to do was make 'Cool Stuff'. I think we achieved that."

Blogging about the event at the time, Derek Gottfrid from the New York Times said: "We didn't really know what we were getting into, but wow, what an awesome event! We learned quite a bit from the talks and from our fellow attendees, including a lot about British geek culture. The BBC Backstage team really know how to get their geek on, from bean bags to the never-ending *Rock Band* performances to the pyrotechnics."

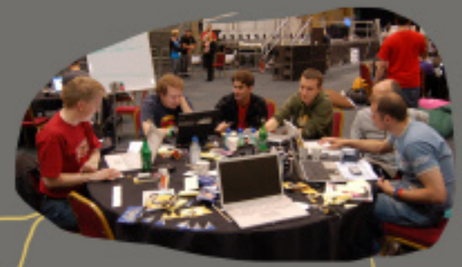
Photo credits (right, top to bottom): Jeremi Joslin (first), Rain Ashford (remaining)

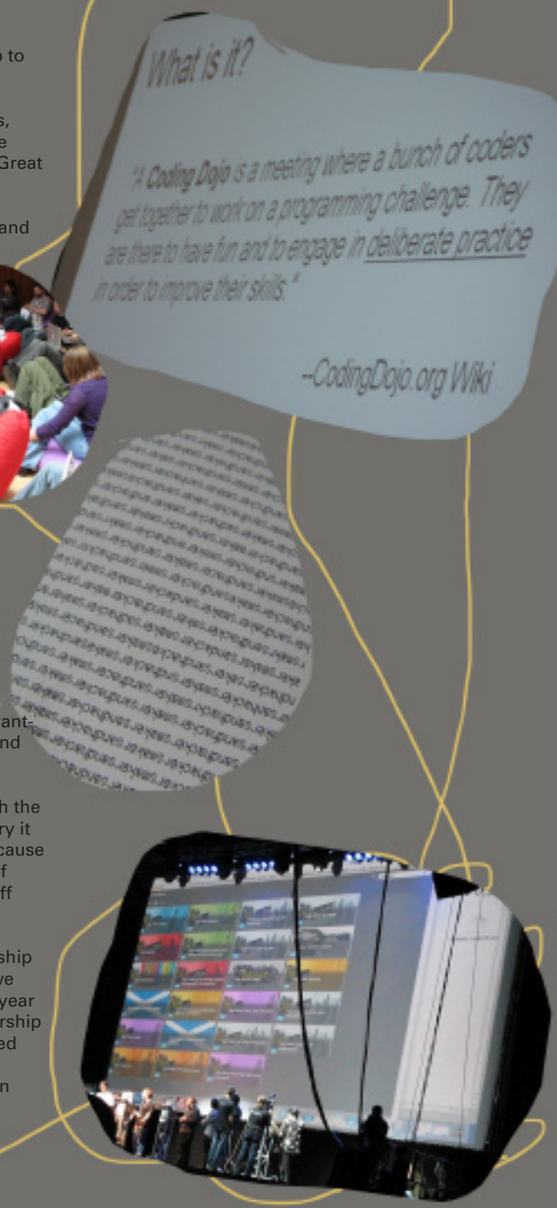
Maker Faire
March 2009, Newcastle
O'Reilly Media's Maker Faire, a spin-off from their MAKE magazine, came to the UK for the first time in March 2009 as a part of Newcastle ScienceFest 09, a ten day festival of creativity and innovation. BBC R&D, including Backstage, was invited by O'Reilly to participate, an opportunity that they jumped at.

"O'Reilly have a great reputation for not just publishing ideas," says Ant Miller, senior research manager at R&D, "but actually creating the community that generates ideas. Their MAKE magazine was like catnip to the developers and engineers we worked with."

The BBC team ran workshops and built a variety of technology projects, including a Weatherbot - a small tank-like robot that showed people the weather in the different cities it ran over as it roamed across a map of Great Britain hastily drawn on the floor.

"Over two days of showing our virtual steadicam, audio visualisation, and home brew multitouch games, the team met with thousands of show visitors, gave away hundreds of instructions for the multitouch interface, and broke the Weatherbot," says Miller. "The atmosphere is tremendous at these events - the public is really engaged and interested and there's a powerful sense of community amongst the makers. I hope we opened people's eyes to the enormous range of work that R&D does."





Futuresonic
May 2009, Manchester
Futuresonic described itself as "an annual festival of art, music and ideas" involving a "freeform mix of live events, exhibitions, workshops and talks in up to 30 different venues and spaces across Manchester UK." In 2010, Futuresonic re-branded as FutureEverything. Described by BBC News as "an annual gathering for the technology avant-garde" it attracted artists, musicians, engineers and hackers from around the world.

Ian Forrester remembers "working with Radio Labs at Futuresonic, with the idea of having the guys hacking away in full view of the public. In theory it worked, people kept coming up and asking what was going on, but because of the interruptions not much hacking got done! Futuresonic was full of artists and musical people, and having developers hacking away at stuff was intriguing."

"From FutureEverything's point of view, we have a supportive relationship with BBC R&D," explains Julian Tait from FutureEverything. "In 2009 we had sponsorship for what was then called Futuresonic. Later on in the year FutureEverything participated in TEDx Manchester which was a partnership between BBC, Thinking Digital and FutureEverything. The event featured a range of speakers at the forefront of their particular fields. The event attracted 350 people and was at the time the biggest TEDx event held in Europe."

Backstage and Channelography

Main words: James Boardwell, DataArt: Suw Charman-Anderson

Backstage was all about opening up the BBC, releasing data feeds and APIs so developers and hackers could dissect them and then discern interesting things to do with them. But how does this work in practice? What kinds of data feeds did developers use and what did they do with them? What problems did they encounter on the way and how did they overcome them? And what was the end result? Did it work and what does it tell us about where the BBC's online future might lie?

Perhaps the best way to answer these questions is to open up one particular hack and examine it from the developer's point of view. *Channelography* set out to 're-present the BBC' aiming to highlight in near real time useful patterns in the hours of content put out by the BBC each day. It was created by Rattle in month, 2009 and was intended to be a way of analysing and clarifying the BBC's output. James Boardwell, who played a key role in the development of Backstage but left the BBC in 2005 to become director at Rattle, describes how it all came together.

The BBC broadcasts an average of 273 programmes a day. A lot is known about these programmes thanks to BBC Archive and the /programmes catalogue. We're also starting to see how programmes and audiences behave together with the advent of Buzz, which lets people access and tap into online discussion about BBC output. However, it's difficult to get detailed information on what the BBC is putting out in near real time and see what almost 100,000 TV broadcasts a year look like. This observation was essentially the start of *Channelography*.

We wondered what you could do with subtitles as a way to explore the content of BBC TV programmes. Aware that 99.8% of programmes have subtitles (BBC figures), we created an application that took subtitle feeds from BBC iPlayer and analysed them using our concept extraction tool, Muddy. This tool uses DBpedia and a range of natural-language-parsing techniques to identify the people, places and things that are mentioned within the text - associating these with the relevant Wikipedia pages. *Channelography* also uses the existing BBC programmes ontology to retrieve data about formats, genres and other scheduling information to put the mentions in context.

All this together allows us to work out when somewhere like Burnley was mentioned on TV, how often it was mentioned and even the types of programmes that mention it most. As a data experiment this was pretty interesting. You could create a lens that offered a different view on the BBC, but it was a lens which could then be used to do things with. One of the first findings from this initial data research was that only 49% of programmes have subtitles available via iPlayer feeds, or 60% if you only take BBC TV channels One, Two, Three and Four (this is mainly due to many programmes not being available on iPlayer for rights reasons).

VERSION 1

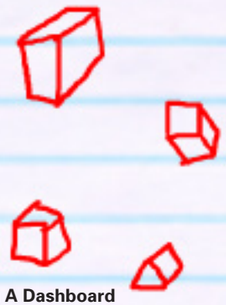
VERSION 2

Following our initial experiment, feedback from the BBC was two-fold. They said that the data was great, but what did it actually mean? They asked us to design some tools to help visualise the data more easily.

So earlier this year we started working on developing a 'dashboard' for *Channelography*. This would help us to tell stories about the BBC's output in a way that anyone could quickly scan and understand. We took out our sketchpads and got to work.

In the end, we designed not one dashboard, but two. In part, this was because we weren't completely happy with our first effort so we had another go. However, the BBC liked the first and asked us to keep both. The first dashboard is focused on time-scales as a way of organising the information. The second focuses more on the different types of information.

Images taken from the *Channelography* flickr stream



Designing A Dashboard

In his book 'Information Dashboard Design', information design theorist Stephen Few points out that effective dashboard design is "more science that art, more simplicity than dazzle". The important thing is not to indulge in "cute gauges, meters and traffic lights" but to stay focused on "informed design." Certainly we felt that when it came to defining a dashboard, you want something that communicates a selection of variables in a way that is easy to read or scan, and which is meaningful. In other contexts it would allow you to take action (i.e. a car or an admin dashboard). Dashboards should help to communicate key things about a subject by allowing you to easily discern patterns in data.

So our design was based on the following principles:

- Communicate data in a way that patterns can be easily discerned.
- Prioritise the variables that are more interesting in what they say about BBC output. For example, repeats are more significant than 'presenter-led' vs 'narrated' programming.
- Focus on data which is of better quality.
- Create different time frames for the data to highlight programming lead times (news is minute-by-minute, drama has a lead time of months if not years).

Technical Challenges and Solutions

The data used in the Dashboard comes from a combination of BBC schedule data, and entities extracted from BBC subtitles. One of the difficulties with concept identification is disambiguation. If the word 'sun' is mentioned within some subtitles - does this refer to the tabloid newspaper, or our closest star?

This is a tricky problem for a computer to solve, and it's difficult to get it right every time, but we try to improve the accuracy of our algorithm by having looking at other things mentioned within same file.

If Rupert Murdoch was also mentioned, then 'sun' is likely to refer to the newspaper. If 'Mars' was also mentioned, then it's likely to refer to the celestial body. How does the algorithm know this? Because those things were also mentioned in the relevant Wikipedia pages. This isn't perfect, but it works pretty well, and demonstrates the usefulness of Wikipedia as a data source!

With nine channels, hundreds of programmes being broadcast each day, and thousands of names being mentioned within them, the BBC produces a lot of data. Analysing it takes a little while. Calculating how many times each thing was mentioned across the month or year, on individual channels or across them all, takes even longer. Because no-one likes to wait for web pages to load whilst numbers are being crunched in the background, we pre-calculate all of these sums once a day, in the middle of the night. This means that, on the whole, we can only analyse the content of yesterday's programmes (as there's a substantial amount of live programming and non-repeats which can't be predicted in advance). However, we can calculate schedule based data for today - such as the number of repeats and a breakdown of programme by genre.

Providing a dynamic archive of the dashboard wasn't possible within the budget. However, we wanted to provide some way to compare the different daily dashboard views. The easiest way for us to do this was to provide a screenshot of the dashboard each day. It's not ideal, but it allows people to interrogate the change or 'diff' over time by eyeballing the screenshots. A daily screenshot of Dashboard v2 is uploaded to Flickr and can be seen in the Channelography Dashboard set.

The Design Process

This piece of research was exploratory but did have some explicit research questions:

- What can subtitle data tell us about BBC output?
- Does a dashboard provide a good way to tell stories about BBC output?
- What would help to improve the communication of BBC output?

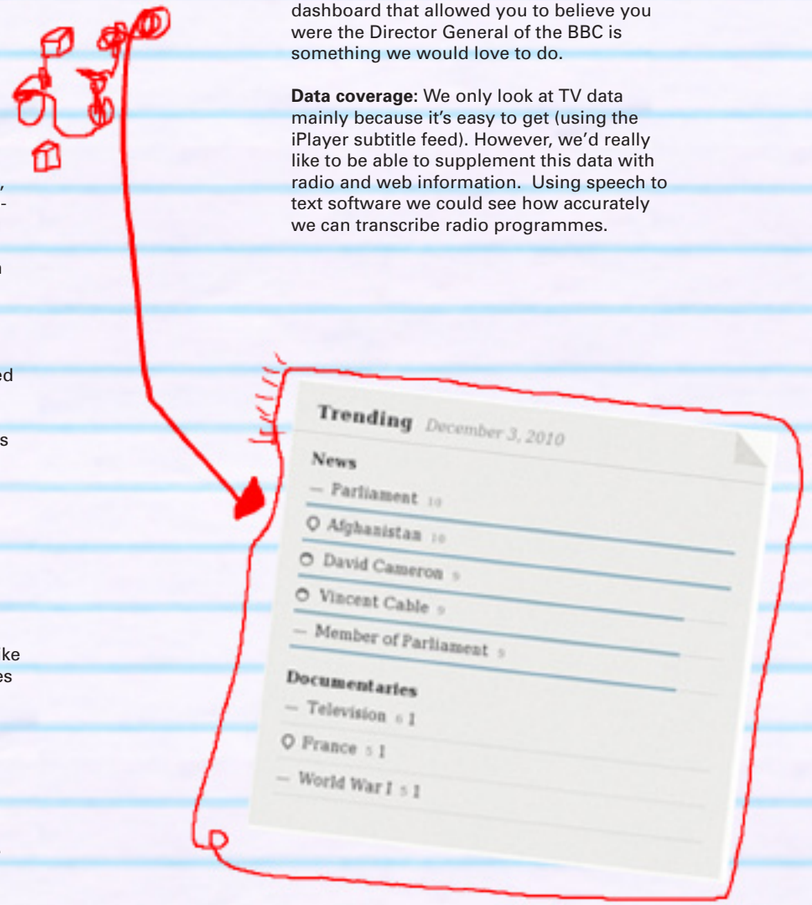
One of the aims was to try and tell stories with data and we think that it does allow narratives about the BBC to be discovered, be it the ebb and flow of different genre output across the week and month (sports particularly), the number of repeats across channels or the trending of people and places and topics.

The latter is of particular interest as BBC output has different production time frames. Some of it (e.g. news) is produced by the hour and minute; in contrast, drama and documentary have long lead times of between six months and a year. Reflecting these different times and rhythms of BBC output is something that we wanted to bring out more, hence the comparison between 'News' and 'Documentaries' in trending data.

But we also like the way data can tell stories. So, we highlighted cliches to see which appeared more frequently across the month. Similarly, we picked two related entities and measured them, framing them to appear to be a 'head-to-head' e.g. Afghanistan and Iraq. Playing with data to tell stories was something we wanted to do, but with the exception of "trending" entities, we're very much curating those stories at present.

Lastly, we wanted to nod to the programmes themselves. So we included an algorithm which picks out original programming on the BBC that day. 'Original' here is defined as programmes that are not repeats and that are not news, soaps or magazine shows. This is the 'Coming up' section. We found that after repeats and magazine shows and "diary" programmes such as soaps were taken out of the schedule there was little 'original' programming left (approximately five hours of programming per day across BBC TV). Focusing on the new, original stuff felt like a useful way to recommend programmes that might otherwise get buried in the schedule.

We felt the initial dashboard didn't communicate the daily BBC activity well enough. It felt more like a report than a dashboard, more like business intelligence than consumer information. So in Version 2 we set about stripping some of the information back and giving more weight to more significant elements.

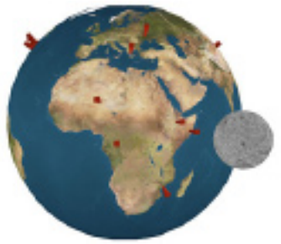


The two versions split opinion in the closed beta. Some prefer the more traditional, more formal version one whilst others prefer the sleeker version two. That's why we've kept both for public feedback. We're keen to get more feedback on how the dashboard could be improved and in particular the things people would like to use it for.

As a starter these are the things we would have liked to have done, with hindsight and more resources:

Pretending: We were inspired by Russell Davies talk at Playful 2009, which argued that we should create worlds that allow us to pretend, as pretending is a powerful way to engage people to do things. Creating a dashboard that allowed you to believe you were the Director General of the BBC is something we would love to do.

Data coverage: We only look at TV data mainly because it's easy to get (using the iPlayer subtitle feed). However, we'd really like to be able to supplement this data with radio and web information. Using speech to text software we could see how accurately we can transcribe radio programmes.



Visualising the BBC - *DataArt* and Backstage

As Channelography shows, one of the key challenges facing developers working on creating something with the BBC data freed up by Backstage is finding ways to visualise the information flows and patterns that their work reveals. Rattle spent a lot of time working on their Dashboard designs once they'd hacked the BBC programme data they were interested in.

Backstage's work also underlies other efforts by to visualise the corporation's multiple data flows. Take *DataArt*, a collaboration between BBC Learning Innovation and the Centre for Research in Education, Art and Media (CREAM) at the University of Westminster. It provides public access to interactive data visualisations of the BBC's online resources, such as news information from around the world, web articles, music data or video. Although it focuses principally on BBC web sources, it also cross-references with other publicly available data.

Visualisations are becoming increasingly common as a way to make it easier to understand large data sets. *DataArt* aims to reach newcomers, educators and developers with the goal of widening the visualisation community. It provides access to visualisations of BBC information resources as well as commentary text and video material that show how to use, interpret and explore them.

Recent projects include *NewsTraces 1.0*, which allows users to search through the history of BBC News headlines from the Americas over the last 10 years; *TV Related Content*, which could work on a web enabled set box to pull related web content into a live TV stream; and *Flared Music*, a simple Flash visualisation which shows relationships between musicians as stored in the BBC Music/Musicbrainz database.

"*DataArt* has a number of projects in the pipeline," says Gavin Baily, University of Westminster researcher. "Building on *TV Related Content*, we're looking at how television material can be integrated with social media. Using news datasets we're exploring approaches to visualise and structure large scale archives, and we're experimenting with the semantic web and BBC programme metadata to develop educational tools."

The larger-than-life face of BBC Backstage, Ian Forrester is a familiar figure to everyone in the UK tech scene. Ian was a software developer for BBC World Service when he first learnt about Backstage and over the last five years he has been instrumental in expanding the Backstage community and spreading the word on open data.

How did you first get involved with BBC Backstage?
Tom Loosemore and Ben Metcalfe came to a World Service meeting and showed us this internal project called Backstage. They needed different departments, including us, to provide data so I became the BBC World Service correspondent for Backstage. I was at Open Tech 2005 when Backstage launched to the public, and then Ben and I organised BarCampLondon at Yahoo!'s offices together. When Ben said he was leaving we talked about the chances of someone like me taking over. He felt I was the best fit for the job. After a series of talks with Jeremy Stone I was convinced I could do it, despite having little programming knowledge.

Tell us about BarCamp
BarCamp London was and still is amazing. It informed so many of the Backstage events. The first one, BarCampLondon06, we decided to do after the success of the first few in the States and Amsterdam. Ben had been close to Tara Hunt and Chris Messina, who had helped organise the original BarCamp in San Francisco. Somehow they had convinced him to run one in London. It was simply amazing and like nothing we had seen before. After that I was convinced this was the way to go in the future. Although BarCamp wasn't officially part of Backstage, it kick-started the notion of events and our sponsorship of them.

What do you think was the most important idea that BBC Backstage encapsulated?
Openness. At that point the BBC was a place where no one would talk to the outside world unless it was through PR/Press. From the outside looking in, the BBC was one solid thing and all the decisions were the fault of everyone inside. The BBC has become a massively more open place since then. The open data agenda became a core part of Backstage. The feeling was that if we could put out lots of open data and let entrepreneurial developers work with it, magical things would happen. And they did.

What impact do you think Backstage had inside and outside the BBC?
The BBC has become a much more open place. For a while it became the place to work and I had lots of people asking me how to get a job here. Within the BBC, it became a great place to share ideas across departments and sections.

How did Backstage influence you?
While I was working at Backstage, I felt that when I moved on from my role there I wouldn't want to go back to the old way the BBC worked: I would have to leave the BBC completely. However, Backstage has changed enough of the BBC that I'm going to stay and do equally challenging and innovative things at R&D. I am forever changed since working for Backstage, and I do have the urge to take the knowledge I have gained and transform another area.

Tag BBC Backstage with three words or phrases.
Openness. Hackers. Early adopters.

Photo credit Ian F: Bahi P

Originally a producer for BBC Learning, Rain Ashford became a technologist when she went to work for BBC R&D and Backstage. She was responsible for looking after Backstage's projects and business on a day-to-day basis, working alongside Ian Forrester.

How did you first get involved with BBC Backstage?
I first got involved with Backstage as part of the community, attending events. I was really enthused by the project and, as a girl interested in tech, wanted to meet other people with similar interests as well as learn and share tech knowledge and experiences.

Tell us a bit about the Backstage projects you were involved in.
I was the producer on *R&DTV* and wrote the scoping document for the project. Throughout the project I wrote scripts, filmed and interviewed people. I also uploaded and maintained the clips and assets for download as well as writing instructional material and the blog. I also helped organise Backstage events and represented the BBC at other events, giving help and advice on careers, feeds and APIs. It was an exciting and groundbreaking project to work on. I was also involved in behind-the-scenes work such as scoping and strategy, speaking to people in various departments of the BBC about releasing their content, plus fun projects like organising the Backstage competition for a new t-shirt design.

What do you think was the most important idea that BBC Backstage encapsulated?
For me the most important idea was about being open and sharing. This worked on many levels with colleagues and departments at the BBC as well as the Backstage communities and I like to think it encouraged other organisations to do something similar. Also Backstage supported and encouraged all sorts of geek community activity and events, such as hack days, barcamps and the legendary Mashed events.

What impact do you think BBC Backstage had inside and outside the BBC?
I think Backstage got the BBC to begin to think differently about itself and how it could communicate and share content and ideas with others. Looking at what's out there now, I think it led the way for other institutions to be more open with their content.

Did BBC Backstage influence you in any way, e.g. the way you think or work or the direction your career took afterwards?
Yes, I'm very passionate about encouraging people to find out more about how they can share their content but do it in a way that suits them, i.e. using licences and contributing to projects in a way they're comfortable with. Plus I'm really into supporting our technology communities and thinking about how to encourage people to have fun and enjoy careers in tech. After working for Backstage I became involved with many interest groups such as the Open Source Hardware User Group, Hackspaces and Maker Faire. I also set up a 'Women in Technology' group at the BBC.

Tag BBC Backstage with three words or phrases.
Sharing. Open. Hacking

Photo credit Rain: Rain Ashford
Interviews: Suw Charman-Anderson

Wild West Servers

A New Frontier

Words: Suw Charman-Anderson

When Backstage first started it appeared easy to plot the links between the Open Data development community and the BBC. It was clear to see how the concept of Open Source could connect with the old idea of public service broadcasting. In practice however, Backstage's plan to build working links between the two cultures was always going to face significant obstacles.

Software hackers and open data programmers frequently develop through iteration. 'Release early, release often' is a common mantra. In contrast the BBC, like any large organisation, has its embedded rules, traditional practices and long-standing relationships. Mark Simpkins, a former technical project manager who worked with technical and editorial teams in BBC Vision explains:

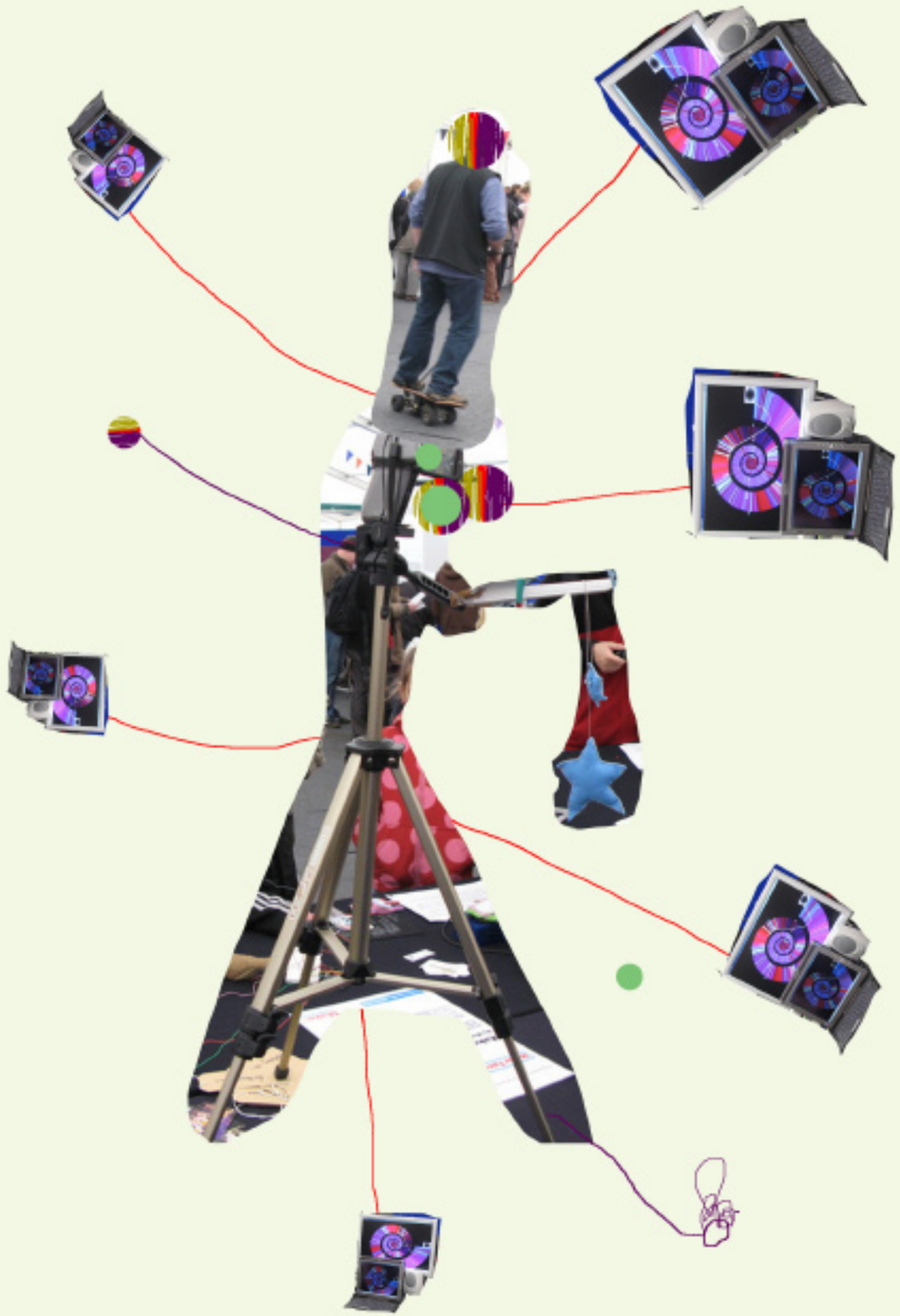
"Traditionally, the live environment and the standard development processes were all very interdependent, very strongly structured and tied into numerous different dependencies.

"You couldn't do anything quick with what we had in place before. You had dependencies, config files, which could only be written by people with the right permissions, even within the development environment. You couldn't just turn something around quickly by yourself."

The Backstage team recognised that this was a problem and in 2007 decided to do something about it. "It was very difficult to move a prototype to the BBC servers because of the way that they were set up," says Backstage's Ian Forrester.

Ian wanted to create a process by which developers could get their prototype to a point where they could assess whether it would work on the live servers. To do this, they set up 'Wild West Servers' or 'Playground Servers' which allowed developers to run their code on virtual machines.

"Virtual machine technology at the time was quite new and a lot of people didn't get it. We took the risk and it paid off greatly. Every developer within the BBC could, and probably has, played with a playground server at some point. This means that all those little boxes under people's desks have all gone, they're all running on proper servers on proper infrastructure."



These playground servers were not just about making life easier for developers; they also supported some of the core aims of the BBC and the Backstage project.

"A number of people within the BBC wanted to experiment a lot more," says Simpkins. "They wanted to do things like the prototypes, which the Backstage model promoted externally. There was a marked keenness within the BBC to do that inside the business as well. It made us look at what we did in a different way to work out, 'Is this something you could make into a feed or and API which could be used in other ways?'

"We ended up using the playground servers for internal development. I had one server set up which a number of technical project managers used for very small prototypes. It meant that we could quickly prototype an idea, using whatever framework or tools we wanted to, just to show if the idea was valid."

It wasn't just Open Data development geeks who used the playground servers. Their impact was felt in some unexpectedly mainstream places in the BBC, according to Forrester. "I've had people phone me up from *Children In Need* at eight in the morning, saying 'We need a playground server to upload camera footage to, just for a day' and it's like, 'Yeah, no problem.'

The playground servers have changed not only development but also the way that BBC generally works with server technology. That's fantastic."

Although there are still a lot of the old dependencies, Backstage showcased a different way of working. Many developers have since found out just how useful it is to have a place to experiment. Equally, the BBC is learning that giving people time and space to experiment and develop their ideas is invaluable. Slowly but surely, the development environment is changing.

"That's all grown from Backstage," Simpkins concludes. "Backstage gave people a precedent."

All photos used in this article's illustrations: credit Rain Ashford

Weathering the Storm

Backstage and the Bangladesh River Journey

Words: Suw Charman-Anderson

Backstage was often about behind-the-scenes technology, clever stuff the mainstream audience was never really aware of. But there were times when Backstage's work was much more visible. Take the BBC World Service's *Bangladesh River Journey*, which brought technical and editorial creatives together for the benefit of both parties and delivered a new kind of journalism to the BBC's global audience.

"The original purpose of the project was to look at the impact of climate change," says Ben Sutherland, a World Service journalist who played a leading role on the project. "Specifically, the impact that a rise in sea level would have on Bangladesh, a flat country built entirely on the mud discharged from the mouth of the Ganges. If the sea level rises, these people will be some of the first affected."

In 2007 the BBC World Service began working on a story exploring the way global warming was affecting the people of Bangladesh. The plan was to send a team of journalists on a boat journey along the country's many rivers so that they could see how bad adverse weather conditions could make things for ordinary Bangladeshis. The journalists would use the net, in particular social media, geotagging and real-time updates, to bring home the reality of climate change to the online audience. What they didn't expect was first-hand experience of exactly the kind of extreme weather event that climate change predicts: a tropical storm called Cyclone Sidr.

Road trips - or boat trips - are a familiar story template in journalism. They have the advantage of providing a fresh flow of new content but the constant updates can be confusing for audiences who aren't following them regularly. The *Bangladesh River Journey* team had been watching sites like Flickr and Twitter grow and wanted to explore what could be done with them in terms of pulling together disparate sources of information and providing continuity.

"We wanted a way to both visually represent our journey across Bangladesh," says Sutherland, "and show, on one page, all the different ways we were producing content. [Flickr and Twitter] had never been properly brought together on one site before - and certainly not together with the traditional radio reporting that the World Service's reputation is founded on. Thanks to the site, all the reporting could be displayed in a neat way. Every stop on the way, a new marker could be added to the map which contained within it a mix of tweets, stills from Flickr, and highlights from the blog entries. The audio reports were all there too."

James Sales, at the time a BBC World Service studio manager, came up with the idea in the first place. He went on to be the overall project manager and worked with Sutherland, and Alastair Lawson (also a BBC World Service journalist) amongst others to make it a reality.

One of the key challenges they faced according to Thomas Leitch, a software engineer at the BBC World Service, was how to get information from the boat to the project website.

"There was particular interest in having Ben geotag his tweets using the format 'L:XX.XX,YY.YY' so they could be plotted onto a map," he explains. "This was, of course, before Twitter Location APIs and phones that could do this automatically. Ease of updating was key. Ben had to do everything from a boat."

The BBC World Service team needed someone to help them put together the web side of the project in time for launch. The links and networks established by BBC Backstage were to prove crucial in this. Contacted by the BBC World Service journalists, Backstage's Ian Forrester suggested that Premasagar (Prem) Rose and his team at Dharmafly, a Brighton-based web agency, might be able to help.

Prem had attended Hackday London 2007 with some friends and colleagues and together they created *HackHUD*: a Greasemonkey script that performed a keyword analysis on BBC News articles and pulled in related content from Flickr, Technorati, Newsvine, Wikipedia and Twitter to display next to the original content. Hackday was the first time that Prem had become aware of Backstage, but the hack that he and his team worked on won the 'Should Have Been in the Product Yesterday on BBC' prize. The experience of pulling together a mash-up overnight turned out to be good preparation for the Dharmafly team when it came to working on the Bangladesh project.

Just a few months later, in October 2007, Prem found himself in a meeting with the BBC World Service journalists and technical leads, helping them to refine their plan. After pitching in with some ideas, such as posting the GPS co-ordinates via Twitter, he then went home and worked through until 5am the next morning to get the project specification and costs done ahead of further discussions the next day. End to end, they took just 12 days to put the site together.

"One really clever thing Dharmafly did was allow us to geolocate each tweet, long before Twittter itself was able to do that," says Sutherland. "I took a GPS device and, by including the co-ordinates in a tweet, the map would automatically create a new marker."

The *River Journey* mash-up logged each new set of GPS co-ordinates and used them to locate all subsequent photos, tweets and diary entries on the map until the next GPS location data was received.

Behind the scenes the mash-up used Microformats to specify events, contacts, locations and bookmarks and hAtom to create an RSS feed of content including the relevant geodata for each post. An API, hosted by BBC Backstage, included KML data so that users could view the entire journey in applications such as Google Earth.

Then on 15 November 2007, mid-way through the trip, Cyclone Sidr hit, killing thousands and making millions homeless. "It turned the whole operation on its head," says Sutherland. "Suddenly we were no longer talking about a potential threat, but a huge disaster that we were right in the middle of."

Winds of up to 240 km/h and tidal surges several meters high wiped out crops, destroyed villages and brought down power lines. The weather could have thrown the whole project into disarray but although the technology that Dharmafly had developed was meant to be just a handy way to bring together different types of content and data, its lightweight and flexible nature meant the team could continue reporting throughout the disaster.

"The cyclone ended up being the first time the BBC had used Twitter as a way of reporting news live from the heart of the story," says Sutherland. "Reporting from remote locations usually involves finding a quiet and stable location, stopping, setting up the satellite dish, establishing a connection and then finally filing. No time to do that amidst the cyclone. But there was still enough of a mobile signal to use Twitter off the phones - so we did that."

The mash-up itself was important too. It takes time to build a following on sites like Twitter, but the website drew together content from all sources, including Twitter, putting key tweets right front of the web audience:

"At Daulatdia ferry terminal expecting bad weather as cyclone in the Bay of Bengal heads north."

Then:

"Evacuated! The BBC team had to leave the MV Aboshar after running aground in bad cylone weather."

And:

"A harrowing day for the BBC team reporting on villages that were totally destroyed in the cyclone."

The immediacy of reportage that the technology allowed enabled the journalists to make on the fly decisions about the direction the story should take. After the storm had passed, the team abandoned the scheduled route and headed to the areas worst affected by the cyclone - Mongla, Barisal and the communities in the Sunderbands jungle.

"Even before the cyclone," says Sutherland, "we had on some occasions had to abandon using mobile network modems as the way to file and use the satellite dish. This became more frequent after the cyclone, but we still carried on. As long as we had the satellite dish and the the generator on board functioning - which they both were, and admirably so - we were still able to carry on."

For Prem and Dharmafly, the broader effects of the *Bangladesh River Journey* project went beyond what was visible on the site. "It showed that you could have a successful campaign on the main website and offer a whole other side of the project [provided by] third-party developers."

Prem adds that on a personal level the project was a transformative experience. "It had a huge influence on Dharmafly. It expanded my mind. It allowed me to think further than I had thought before about what we could achieve, what we could work on. It was such a defining moment for me and for Dharmafly."

According to BBC software engineer Thomas Leitch, the project had a positive effect on the way the BBC does things. "The experience of integrating third-party applications and feeds into our site has certainly led to some on-going change to our processes.

"We have used some of what we learned whilst developing online packages and coverage like the *US Election Bus* trip and the *India Election Train*. And we have started to integrate Twitter feeds more regularly into our sites. It was pioneering in as far as we have become happier to embrace and host content on third-party services such as Flickr."

Sutherland describes the *Bangladesh River Journey* as "quite simply as one of the most extraordinary projects I've ever worked on.

"Even before the cyclone hit, the people we met and some of the stories they had to tell were astonishingly compelling, for example, the families who live on chars - bits of land that literally rise out of the river when mud gets washed downstream. After around three years the land becomes good enough to grow crops on. But soon the char itself is eroded - so they have to move on again. It's the most extraordinarily nomadic existence.

"After the cyclone, of course, the story completely changed. There was something about the fact that the BBC had been at the heart of it - and had continued reporting on it as it happened - that showed this was a relevant and important new way of covering stories."

Sutherland wasn't the only one to feel that this project was one worthy of recognition. In 2008 the Bangladesh River Journey won the inaugural 'Multiplatform Radio' award at the Sonys, and was given the title of '2008 Webby Awards Official Honoree'.

Beyond the awards, the project showed how the links developed by Backstage could help BBC journalists report more effectively on the key issues of the day and find new ways to engage and involve the audience. Backstage was never just about the back-end and with the *Bangladesh River Journey* it showed that it could be right there, making a difference on the journalistic frontline.

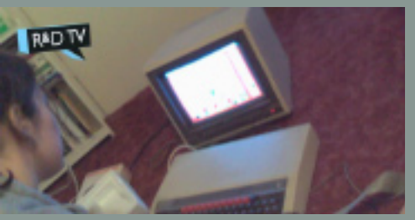
All photos in this article credit: Ben Sutherland

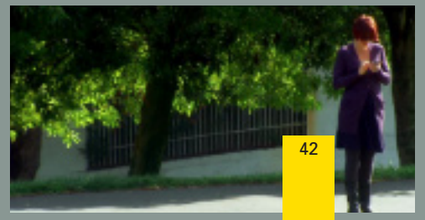
Backstage's new communication channels

Words: Suw Charman-Anderson

The push towards openness that Backstage, amongst others, championed at the BBC wasn't just about opening up data. It was also about creating a BBC that could fulfill its public service remit in a way relevant to the 21st Century. In a world of many-to-many networks and instantaneous communication where the cost of digital copying and distribution has dropped to almost zero, it's no longer enough just to broadcast.

Backstage, Prototyping (formerly Rapid Application Development) and Vision Multiplatform all played important roles in helping the BBC find new ways for its audience to interact with its staff, data, and content. From hosting full and frank conversations on the Backstage podcast, to the creation of remixable content by *R&DTV*, to involving the audience in researching and remixing TV series *The Virtual Revolution*, the BBC has not shied away from experimentation. Its innovators are extending public service into the Internet realm and helping to create a BBC fit for purpose in the Internet age.





The Backstage Podcast

Backstage wasn't just focused on opening up development processes at the BBC. It also worked to open up communications between the BBC and its audience. In the old world, any dialogue between those who worked at the BBC and its critics tended to be conducted via journalists. If they felt there was a story, journalists would interview the people involved and air their competing points of view. Fine in principle but in practice the chances of this kind of traditional approach leading to productive discussions around contentious issues are often minimal.

Enter the Backstage podcast. Publicly available online, but still flying a little beneath the media radar, it provided an opportunity to engage the Backstage community and the wider public in discussions that had previously been limited to the Backstage mailing list. One such discussion focused on the emotive issue of digital rights management (DRM) technology.

Many developers use and are vocal supporters of open source media and open source software, such as the Linux operating system. This open technology embodies the remix culture that Backstage championed. However, as the BBC moved from an over-the-air to an over-the-Internet broadcaster, it adopted DRM to satisfy the companies that it licensed content from.

When it came to explaining the BBC's position to the Backstage community, press releases weren't going to work. Instead the then Director of Future Media & Technology Ashley Highfield gave interviews to websites and blogs to explain the complex rights and licensing landscape that the BBC had to negotiate. In November 2007, as the first generation iPlayer became a reality, Highfield was interviewed by Groklaw, a blog that focuses on the Legal aspects of technology and open source.

In the interview, Highfield said that all the main public service broadcasters - the BBC, ITV and Channel 4 - were now making most of their content freely available for varying periods of time over IP. "That has required a very long-term negotiation with the rights holders who up until two or three years ago were in a position of just simply not allowing any of their content, apart from very short clips, to be made available over IP."

The Backstage podcast allowed members of the community and advocates of digital rights (not to be confused with digital rights management) to have their say. Earlier in the year, in August 2007, the Free Software Foundation's Defective by Design campaign organised a protest outside the BBC's Television Centre against the use of DRM by the iPlayer.

Open Rights Group executive director Becky Hogge had been one of the anti-DRM protesters. She argued that, after the BBC's work to build a Creative Archive, DRM and other content wrappers seemed to be a step backward, a threat to privacy and an expensive pipe-dream for the BBC and the content rights' holders.

The Backstage podcasts in which Hogge and many others participated gave people at the BBC the opportunity to engage directly with critics. Things could be said that would never have otherwise made it out into the open. It was an unprecedented move by the BBC to engage directly with critical members of the public and an essential step in moving towards a more open corporation.

R&D TV

In 2009, the BBC's Prototyping team began collaborating with Backstage to create *R&DTV*, a series of short films for online release in edited and unedited forms online made under a Creative Commons licence. The aim was to publish all the original assets including video, audio and metadata so that users could remix, mash-up and reuse the content in their own work.

The first episode included interviews with Nicholas Negroponte of One Laptop Per Child, Kevin Rose from digg.com, Graham Thomas from BBC Research & Development, and the BBC's Ant Miller and George Auckland discussing the BBC Micro. Episode Two featured entrepreneur Jason Calacanis and developer Matt Biddulph. In February 2010 *R&DTV* released footage from the TEDxManchester conference and a short interview with Stephen Fry recorded for the BBC's *Virtual Revolution* project.

Writing at the time, George Wright said: "It's a pilot show, designed to be sharable, remixable and redistributable." Produced by Hemmy Cho and Rain Ashford, *R&DTV* ran to three episodes, each one coming in three formats:

- A five-minute video of highlights
- A 30-minute video which went into more depth
- The Asset Bundle, containing all footage, whether used or not.

The asset bundle was an essential part of the project, providing users with every single element, including full-length interviews in Quicktime, Flash and Ogg formats, as well as audio, logos and metadata files. One lesson that was learnt very early on was the importance of having clean soundtracks so that music rights didn't cause problems.

Wright said on his blog that "releasing the assets as well as the five-minute and 30-minute versions is something that's new for us. We think this is an interesting and possibly important experiment in creating video and audio specifically to be shared and remixed, from a professional content provider's viewpoint."

"*R&DTV* was well received," says Rain Ashford. "It certainly got colleagues at the BBC thinking about how we could share video, scripts, music and other assets in the future, plus for many it introduced the notion of remix culture and licensing, such as Creative Commons. I think we pushed some boundaries!"

The project got a warm reception from the tech community, with write-ups by BoingBoing, Ars Technica, and Jemima Kiss on The Guardian's PDA Blog:

"Though it's not produced to the high-budget standards of BBC TV," wrote Kiss, "it's definitely not filmed on Flip cameras with bad audio. It's well-thought out, web-friendly subject matter and filmed in HD quality." Importantly, she added, *R&DTV* let the team "explore how the production and post-production process would be different when building a film designed to be taken apart," with the intention that the lessons learnt through *R&DTV* could then be applied more widely.

As with so many of Backstage's projects, the impact wasn't just felt at a business level but at an individual level too. Ashford explains how her involvement in *R&DTV* influenced her:

Screengrabs opposite page (In alternating pattern) from R&DTV and Virtual Revolution respectively

"Personally, I went on to make more video - I really enjoyed writing scripts and interviewing people who have made a difference. I enjoyed the immediacy, and I think we went some of the way to showing how anyone could make video simply, and without really expensive kit or high-level production values. I came away from *R&DTV* and Backstage with a new work ethic - 'seek forgiveness, not permission'. It's the way to get things done!"

The Virtual Revolution

The Virtual Revolution was a four-part documentary series screened in early 2010 to examine "how 20 years of the web has reshaped our lives". Presented by Dr Aleks Krotoski and co-produced with the Open University, the show was described on the website as "an open and collaborative production, which encouraged the web audience to help shape the series."

"We at Vision Multiplatform Productions had been wanting to do a project for some time where we got the web audience involved in the production process," explains Dan Gluckman, *Virtual Revolution's* online producer. "Then London Factual came along with the early ideas for a TV series called *Digital Revolution* about how the web has changed the world. They wanted to make sure that the first major BBC series about the impact of the web involved the web audience and used cutting edge platforms. We thought it was a great fit with our ideas."

Whilst the programme was still in production the team, and Krotoski in particular, used social tools such as Twitter, Flickr, Delicious and a blog to discuss the issues and test ideas with the public. The *Virtual Revolution* website described this as "a radical change for BBC documentary making - an open and collaborative production, which asked the web audience to debate programme themes, suggest and send questions for interviewees, watch and comment on interview and graphics clips, and download clips for personal use and re-editing, all months before broadcast."

The results were mixed. As Gluckman explains: "The TV format was quite traditional in some ways - it aimed to tell the story using the key players who were there or who are currently at the cutting edge. For me, the best bits were the discussions during production involving the web community, the production team and the potential interviewees e.g. with Jimmy Wales; the suggestions for interviewees that were picked up e.g. Google's Marissa Mayer; and feedback on graphics for the programme."

The rushes — unedited video footage — were all made available online under an enabling licence similar to Creative Commons as well as a transcript to aid editing. Unlike standard copyright, the *Virtual Revolution* licence encouraged people to reuse the materials provided, so long as the results were non-commercial, properly attributed, shared under the same licence, and neither an endorsement or derogatory. The licence itself was a crucial development without which, Gluckman explains, "the rushes couldn't have been released."

According to Gluckman, most people used the videos as "extended interviews", but several remixes were made, including Barry Pilling's trailer for a competition the team ran to encourage reuse. They had two categories — 'Short Film' and 'Series Trailer' — for which they had about 50 entries after 1200 downloads of the rushes. Krotoski summed up the ethos of the programme in a blog post, saying: "Get in, get downloading and get tinkering. 'Cause that is what the web is all about."

Winner of the 'Short Film' category was *Digital De-evolution* by Edward Sludden, which is described on the website as a film that "suggests that the real Internet revolution will be controlled by a secret, global cabal of simian overlords. They already own 98 percent of our DNA, and it's only a matter of time before they get the rest." Winner of the 'Trailer' category was *Young People* and *Social Media* by Dimitra Nikitaki, "based on the relationship between young people and the web from the point of view of an older generation."

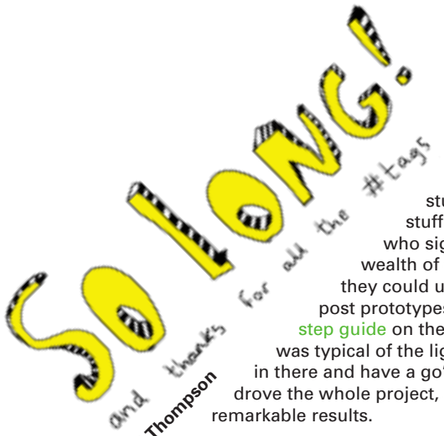
The research that went into each programme segment was made available to users via a Delicious bookmarks feed. Selected web resources were collected together in the *3D Documentary Explorer*, described as "an experiment in interactive storytelling - a mix of video clips from the series and web pages relevant to each clip packaged into one experience."

The 3D Documentary Explorer, first prototyped by Gideon Bradshaw in the BBC's Multiplatform Productions department in 2009, covered the first two episodes, each of which was cut down to a series of short chapters totaling 20 minutes for each episode. Viewers could watch the video straight through, or could use the *Explorer* to visit key web sites related to the subjects covered.

The Virtual Revolution wasn't without its complexities. Writing on her blog in February 2010, Krotoski said: "From the start of the process in early 2009, *The Virtual Revolution's* production team envisaged two audiences: the first would be an online community who would help to develop the themes we would explore, clarify hard-to-grasp technological concepts, tell us when we were heading in the right or wrong directions, and really put their stamp on the finished programmes. In the tradition of the new breed of wikinovels, wikiarticles and wikifilms, this would be an open and collaborative project within a larger old media landscape that hoped to engage an increasingly disjointed and distracted audience in a new media way."

The second audience was the one who would watch the finished documentary on BBC2 and who would ultimately be responsible for ratings and reviews. Balancing the needs to two very different audiences and two very different production processes was always going to be hard, but ultimately *The Virtual Revolution* succeeded, winning both a New Media BAFTA, and a Digital Emmy in the 'Digital Program – Non-Fiction' category.

Photos in this collage credit: Rain Ashford



Words: Bill Thompson

Backstage started and ended with a simple ideology: "use our stuff to build your stuff". It gave anyone who signed up access to a wealth of content feeds that they could use to create and post prototypes. The quick seven step guide on the Backstage website was typical of the light-touch 'just get in there and have a go' philosophy that drove the whole project, and it delivered remarkable results.

Over five hundred prototypes emerged over the five years it ran including such joys as *Mood Memories,* a *Second Life* version of the *BBC NewsReader* and the *Talking TV Guide.* The projects developed included a wide range of map-based offerings as well as some cool scheduling tools and a collection of social tools. Thousands of developers got to play with BBC data as a first step to working with other datasets, encouraging the sort of creative explosion around structured data that the original BBC Computer Literacy project encouraged around BASIC programming back in the 1980s.

Backstage succeeded partly because it happened at the right time in the development of Web 2.0 and the semantic web, feeding a demand for structured data and rich interfaces that was only just starting to grow. It gave those who believed that the future lay in open data a chance to build demonstrators, prototypes and working systems that used trusted data from a well-known source.

But building simplicity is always complicated and with Backstage there was the added complication of the preconceptions people had about the BBC.

In 2005 the organisation was seen as a broadcaster and not a technology innovator, even though the corporation had an eighty-year history of engineering brilliance. It had been behind the creation of both of the key media of the twentieth century.

Matt Locke, Tom Loosemore, Tony Ageh and the other early supporters of Backstage recognised that the BBC was more than just a programme-maker. They saw what they were building as a logical extension of public service media for the 21st Century. Taking on Lord Reith's original vision of the BBC to "inform, educate and entertain", Backstage unofficially added "and offer feeds" to the list and opened for business. Fortunately, as James Boardwell has noted, "a lot of data was available without anyone actually knowing it, especially around news," and those pre-existing RSS feeds gave the project some purchase in the early months.

However, Backstage engaged the developer community by offering more than just XML on demand, lovely though that is. Events became the backbone to the project, offering people a chance to meet, share ideas, work together and build the sort of strong social bonds that allow online interactions to flourish, from the inaugural BarCampLondon in September 2006 through to the massive – and massively successful – Alexandra Palace Hackday, and on through to BarCampManchester in November 2009.

Events complemented the blog and the mailing list as the cornerstones of Backstage's outward-facing aspect, providing a space for inspiration and debate and fostering innovation and collaboration between otherwise separate individuals.

The project had an important inward-facing role too. Application development was clearly affected by the Backstage model, and the deployment of the 'playground' servers in 2007 was an important step, allowing fast and lightweight prototyping and exploration. It's a model that has served the BBC's developers well over the years.

Backstage carved out a space for collaboration between developers inside and those outside the corporation.

It was an approach that encouraged more openness, made room for innovation and allowed proper conversations to develop, especially around contentious issues like rights management and the reuse of BBC-sourced datasets.

Of course, trying to do things differently resulted in additional benefits. The need to engage frankly in conversation with a highly articulate developer community, well able to use new media channels to express their views, had a clear and direct impact on the BBC's emerging social media policy. I'm pretty sure that the BBC bloggers would be far less open, entertaining or engaged had it not been for the Backstage experience.

The impact was also felt on-screen. When Backstage and Prototyping (formerly the Rapid Application Development team) worked together to release a series of short films online under a Creative Commons license, *R&DTV* was born. The project let users mash-up a host of material - footage shot for the BAFTA award-winning *Virtual Revolution* series, interviews with Nicholas Negroponte of One Laptop Per Child and content from Kevin Rose from digg.com. *R&DTV* has alerted TV producers to the new potential that online offers for creating a deeper engagement with audiences without compromising their own creative vision.

But to me the real impact of Backstage, and its real goal, was to change the way the BBC thought about online. Backstage helped the organisation get away from the idea that the its Internet presence was just a collection of websites there to support existing TV brands. It established that the BBC was a data provider as well as a broadcaster, and acknowledged that the BBC did not have all the good ideas about what to do with that data.

It also changed the wider world by encouraging a group of incredibly dedicated and creative developers to explore what they could do with structured data released under a reasonably permissive license. Backstage never campaigned like the Open Rights Group, or the Guardian's Free Our Data advocates, but its existence and success gave fuel to campaigners who saw open data as the logical extension of freedom of information.

'Use our stuff to make your stuff' may not sound like a political slogan. But now we live in a world in which the UK political establishment, via initiatives like data.gov and data.gov.uk, recognises the need for twenty-first century democracies to open up online. Just by letting people do their own thing with the BBC's data, Backstage played a part in making that happen.

Backstage was a success because of the hard work and support of many people across the BBC. Without them, it would have remained just an idea scribbled on the back of a pizza restaurant napkin.

Special thanks to:

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But of course, Backstage wouldn't have been the same without the thousands of people who built protypes, joined in discussions on the mailing list, and came to the many events with which Backstage was involved. Thanks go to all of you, too.

"BACKstage.bbc.co.uk attempts to ENCOURAGE and SUPPORT those who have provided much of the INNOVATION on the INTERNET - the PASSIONATE, highly SKILLED & public-spirited DESIGNERS"