TECHNOLOGISTS' PRACTICE CASE STUDY | DECEMBER 2011

DIGITAL TECHNOLOGIES / DESIGN IN TECHNOLOGY | YEARS 7-13

BIGLITTLEBANG

Founded by NZ entrepreneur Chris White, BigLittleBang is an online virtual world for children aged 5-12 years that features the ability for the players to collaboratively make and share music in a safe online environment. This case study looks at technical aspects of developing, maintaining and expanding a virtual world, and how standards and conventions around privacy, safety and security inform the decisions that the BigLittleBang team made to meet the demands of their international audience.

FOCUS POINTS INCLUDE:

Nature of Technology
- Socio-cultural considerations – privacy; personal safety; ethics.
- Design elements – physical and functional nature.

Technological Modelling
- Functional modelling; prototyping.

Specialist Knowledge and Skills
- Digital Media outcomes – tools and techniques; testing procedures; standards and conventions.

ADDITIONAL MATERIAL

Websites
- BigLittleBang
- Icehouse Business Incubator

YouTube videos
- BigLittleBang Tour
- Business Incubators
- Interview with Chris White

Articles
- Virtual worlds (Wikipedia entry)

TEACHING ACTIVITIES

Discussion starters (Years 7-10)
- Explain why both functional modelling and prototyping are needed to support decision making in technology.
- Identify the different forms of modelling that have taken place during the development of BigLittleBang.
- Discuss how the information gained from key stakeholder groups would help the design team to work out what could and should be done in developing the site.
- Explain the following terms in relation to the design and development work undertaken: functional and practical reasoning; user interface; cyber-bullying.

Discussion starters (Years 11-13)
- Discuss the interactions between socio cultural factors and the development of an online virtual world such as BigLittleBang.
- Explain why different forms of modeling were selected at different stages of the development work to inform what 'could' and 'should' be done.
- Explain the following terms in relation to the design and development work undertaken: collaborative creativity; market validation; legacy features; alpha/beta testing; business incubators.

BIGLITTLEBANG

BigLittleBang offers a virtual world for children to have fun and be creative with music, regardless of their musical background. Its objective is to encourage kids in the five to 12-year range to explore music via gaming in a 3D animated, futuristic space environment. Users can create their own unique avatar on the site, explore "planets" and make music with others online in real time.

Like earlier virtual worlds such as Club Penguin and Moshi Monsters, BigLittleBang is aimed at the teen and tween markets – kids who are looking to be social outside of school. It offers a wide variety of safe social networking features such as blogs, newsfeeds, chat and buddy lists.

On joining BigLittleBang, each user creates an alien avatar and is given a spaceship which acts as a home space. Users can then fly to various planets in the BigLittleBang galaxy, with themes such as Zombies, Junk Food, Haunted Houses and Tropical Volcanos.

On the planets, kids can explore, chat with other players, play minigames, or create music with their virtual instrument. On each planet sound icons can be found and added to their mixing desk, increasing the vocabulary of sounds available to them.

"The fundamental idea is that a song is a planet that you can land on and explore," Chris explains. "It's intended for an age when you may not have come across many different genres of music, so you can explore your musical tastes by participating in making the music.

Company startup

Chris White studied a Bachelor of Science, then later completed a Masters Degree in Creative and Performing Arts at the University of Auckland. During this period he entered the SPARK Entrepreneurship Challenge, an annual event run by The ICEHOUSE business incubator, where he was placed as a finalist with the original idea for BigLittleBang. Chris enjoyed the process of developing a business plan and decided to pursue the idea fulltime.

The first market research Chris carried out was a simple paper questionnaire given to extended family and friends that asked for people's opinions on the idea and whether they would use it. This helped to established market potential for BigLittleBang and also identified that the target audience was far younger than Chris had first thought.

This in turn gave Chris the confidence to pay a coder and visual designer to create a demo for the game.

"A demo lets you better explain the idea" Chris says "and the feedback we got from the demo gave us confidence to take that next step."

Chris presented the demo to Andy Hamilton from The Icehouse who recognised its potential and invited Chris to setup a hot desk at the businesses incubator's Auckland office. This gave Chris a space to work on the project as well as access to the mentorship and advice of business professionals.

"The main message you get from a place like the Icehouse is to validate your market, you need to prove that people are willing to pay for your product before you start pouring money, time and effort into making it a reality," Chris says.

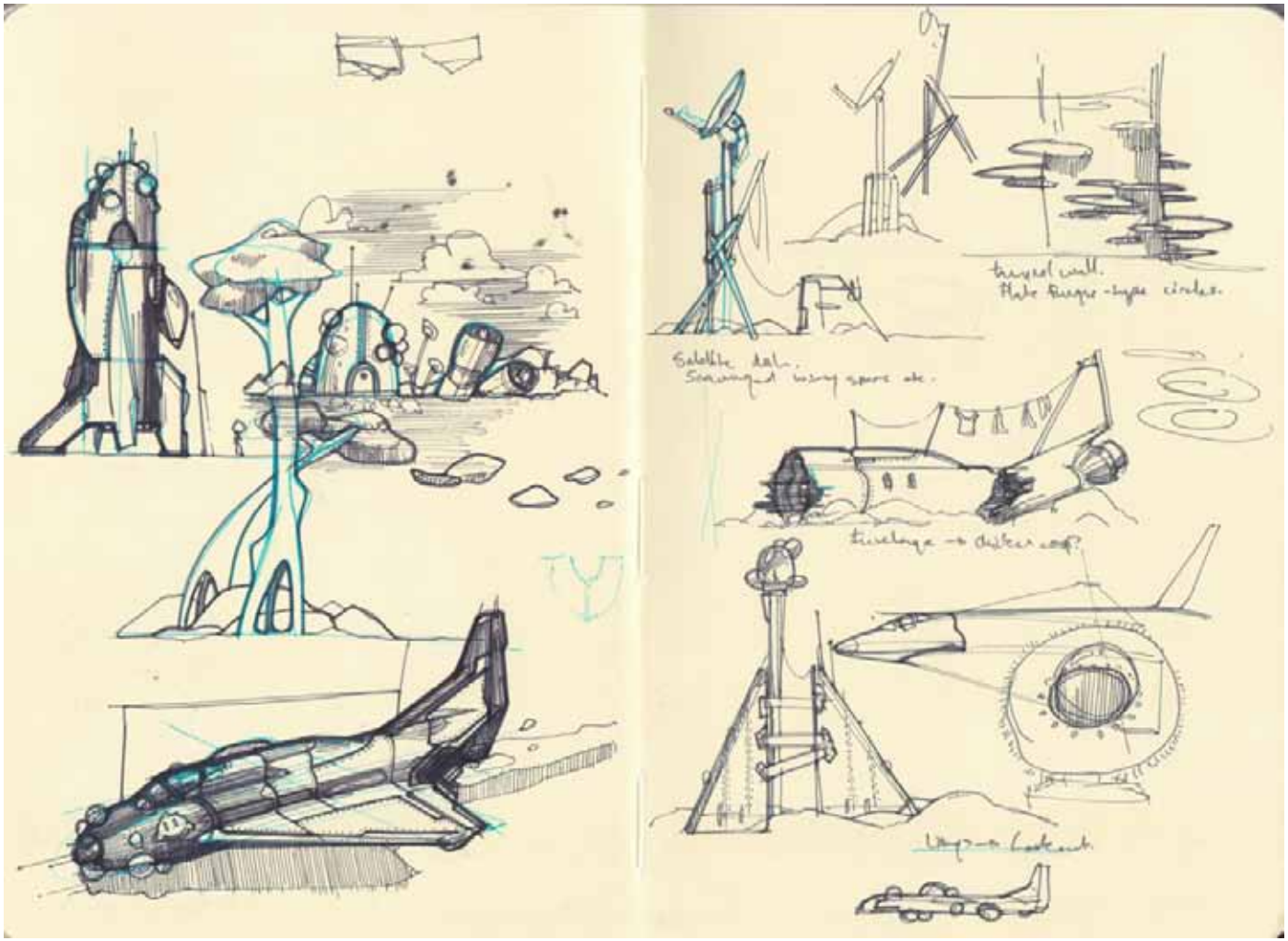
Chris took on this advice, carrying out increasingly involved research and testing at each stage of the project's development. For the proof of concept stage, a more complete version of BigLittleBang was taken to computer labs in schools around Auckland for students to trial. Feedback from these sessions was positive and led to the development of an Alpha version that had many of the proposed features of the site in place, although in a rough and unpolished form. Chris took this version to America where it was tested in a similar fashion in US schools.

"That process of market validation has continued all the way through our development. Producing a massively multiplayer online game is a very iterative process, and at each step we ask for feedback from our players."

As BigLittleBang developed Chris was able to build investor confidence in the project, a crucial part of continuing a virtual world beyond the development stage.

"Building a virtual world is a massive undertaking and launch is only the beginning. We knew from the start that investment finance would be critical to the company's success," Chris explains.

As investors came on board Chris was able to hire artists, programmers and live moderators to join the team in Parnell, Auckland.



Creating a virtual world

BigLittleBang entered the private beta stage in late 2010, with restricted access to New Zealand users. As much as any developer might try to determine how a virtual world will be used, much of the game is determined by the users themselves. This has had a huge influence on how Chris and his team have developed the site as it has transitioned from private beta – where access is restricted by invitation to select users – to public beta, where the public can access the site but understand that features some features may change or be removed as the site continues to be refined.

"BigLittleBang is like a sandbox or a virtual playground. What a child chooses to build in a sandbox is entirely up to them, and similarly how children use the BigLittleBang virtual world is entirely up to the children themselves. This makes developing the site a very collaborative process with our players. If kids like something they let us know about it and we continue down that track. Similarly if they don't like something we know we need to rethink our approach," Chris says.

Catering to audience- user interface/level of language

BigLittleBang's key point of difference is its collaborative music-making functionality, but when starting development Chris was careful to incorporate elements common to most virtual worlds to allow for a certain amount of intuitive play for first-time users.

"There are certain features that are common to all virtual worlds such as a home space, which is a spaceship for us, and the idea that you can customise your avatar. When a child plays a virtual world for the first time they expect those features."

In developing the user interface, one of the most important design decisions is being able to cater to a range of age levels in terms of literacy while still making the game enjoyable for all its users.

"We wanted to make BigLittleBang simple to use regardless of your age or what language you speak, so the user interface needed to be intuitive and we wanted to avoid text as much as possible."

Ethical issues/ advertising

Another important issue for parents, and one of the key decisions for Chris when developing BigLittleBang was its financial model – how BigLittleBang would make a profit.

The model that Chris has chosen for BigLittleBang is known as 'freemium'. Any child can sign up and play for free, with additional features available for a small fee. Chris explains that this is one of three models currently used to finance kids virtual worlds, the other two being advertising and real-life toys. The toy is purchased by the parent, and comes with a key code that can be used to access a virtual version of the toy online. Once that key code expires (in the case of WebKinz after one year) another toy needs to be purchased for the user to continue.

Perhaps the most contentious model is to use advertising on the site. On the one hand advertising would mean all of the users can access all of the game for free, however advertising to kids does raise ethical concerns, particularly if the virtual world is under pressure to promote products that they otherwise wouldn't recommend.

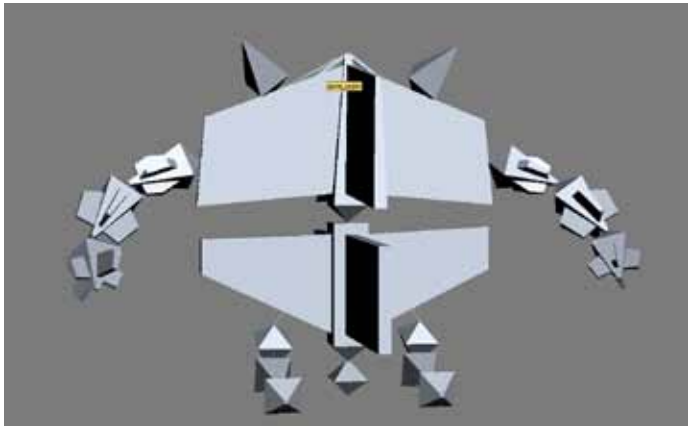
Technical challenges

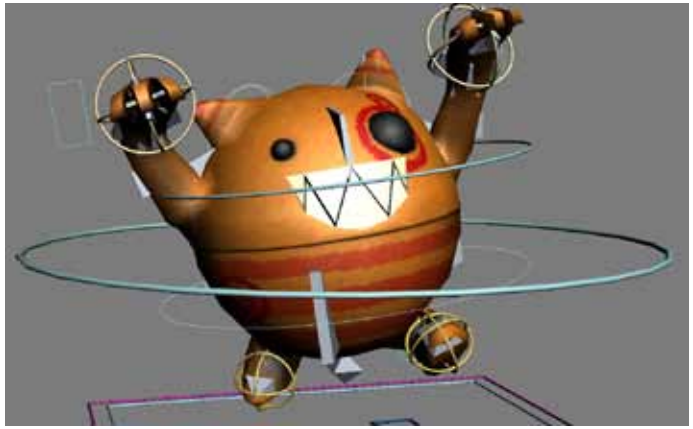
One of the biggest ongoing challenges for Chris and his team is to find the balance between creating a product with the best possible sound, graphics, and movement for their users within the technical limitations of a web browser.

As BigLittleBang is a high resolution 3D world, finding the right graphics engine to start was a crucial early decision in the sites development. "When we first started building the game we were using Papervision, which was an early Flash 3D engine with a relatively low capacity to render 3-D models and animations. It wasn't long before we decided Unity was a better solution for what we were trying to achieve."

Unlike stand alone gaming consoles like Sony PlayStation, Nintendo or Xbox that have their own hardware, the content produced by the BigLittleBang team has to cater to a range of different home computers and internet connections.

Designing a character and its movements





"In terms of the computer specifications needed to run BigLittleBang, we have tried to be as inclusive as possible", Chris explains. "And because we are browser-based we need to think about how long it is going to take for the kids to download the content. We are very strategic about what makes it into the game, to provide the best user experience for the most users."

As BigLittleBang continues to develop, responding to larger user numbers and user feedback, the site is continuously updated to meet user demand and stay up to date with trends in the market and technology. Chris explains that maintaining and updating a virtual world offers a number of challenges, particularly in a system where users are online 24 hours a day and expect a seamless experience. "In terms of maintaining the site on a day-to-day basis, the best analogy I have heard is that it's like 'changing a wheel on a moving bus,' Chris says. "A virtual world has a life of its own and we are constantly evolving the site to improve what we have and provide new content.

To help make these changes in the most seamless way possible, the BigLittleBang team has to thoroughly test any new features before they are transferred to the online virtual world the children are using. There are three versions of the BigLittleBang infrastructure to enable a smooth transition of updated features to the users: the office version, an online replica of the live version, and the live production version accessed by its regular users.

The first infrastructure is restricted to a series of networked computers in the BigLittleBang office, where Chris and his team can break and change the infrastructure at anytime, with no impact on the users, to develop and trial new content and improvements.

Once the team feels they have a candidate for how the updated online version should be, this is deployed to a replica network infrastructure which is online but not available to general users. As the office version does not access the internet, this second infrastructure provides a far more realistic testing ground for the team to assess the new candidate. The team then takes this candidate version through a thorough set of testing procedures.

"We have a document which lists every function and every way of engaging with that function in every browser in every operating system," Chris explains. "So there is a reasonable amount of complexity just going through that list and making sure all the legacy features still work before we begin testing new features."

Bugs can be triggered by a multitude of variables, and some that will not appear until many people are using the game at the same time. "In that event we need to go back and patch an earlier version of the game, which is frustrating for all involved so we work hard to avoid that outcome."

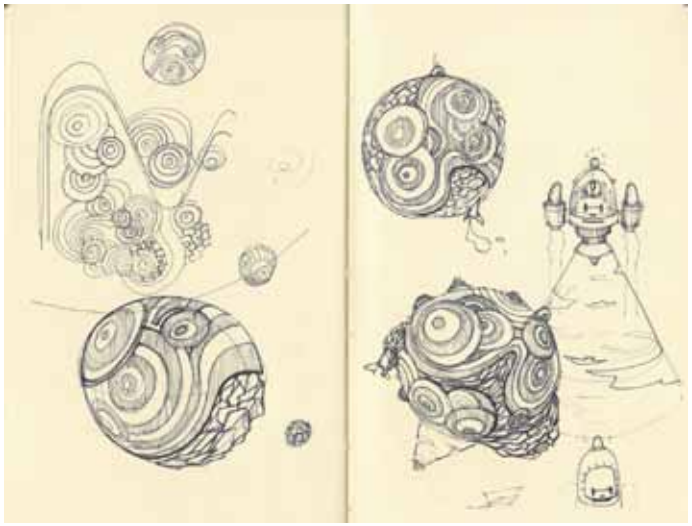
With in-house testing complete, the team may also ask volunteers to trial candidate versions out on the replica infrastructure, looking for any potential bugs that might occur and giving feedback on any elements that could be improved. "So we test it, ask people to have a go, and once we are confident that our players will enjoy the new additions we transfer it over to the public server," Chris says. "And there are numerous challenges in the administration and execution of that, not only in the technical side but also educating the users as to what has changed, how it has changed and often why it has changed."

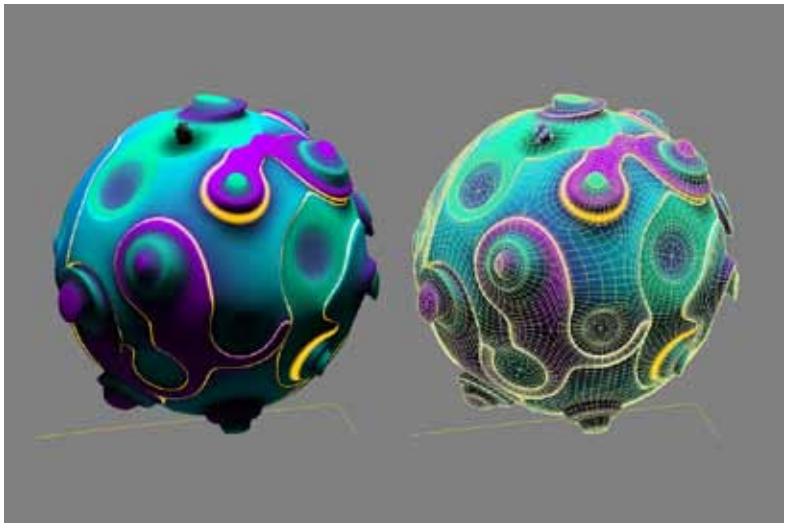
Security issues

One of the biggest concerns for a virtual world, especially for one that caters to children under 13, is safety. At present New Zealand has no specific laws on child safety on the internet (though guidelines are available on the Netsafe website LINK) so foreign legal standards such as The Children's Online Privacy Protection Act (COPPA) from the United States set a benchmark followed by many websites looking for a global audience.

COPPA is of particular relevance to BigLittleBang, as the US has been identified as its largest potential market. COPPA has guidelines for websites dealing with under 13s, and includes information on when and how to

The birth of a planet





< GO BACK TO PAGE 1

Going global

maintain parental permission, the verification of email addresses, and how to ethically market products to children as well as providing guidance for protecting the safety of children online.

Chris made online safety one of the pillars of BigLittleBang's offering from the start, and invested heavily in integrating software tools to assist live moderators keep the community safe and friendly for all users.

"We have to consider where our audience is and adhere to their legal guidelines, but more than that we as a company want to provide the best service we can, so we are using the best tools in the market to keep our community safe."

Because of the dangers of cyber bullying or more disturbingly, predatory adults, BigLittleBang has live moderators who can monitor the interactions between users, looking for inappropriate language or unsocial behaviour.

"This means there is always somebody within the game that can help."

This live service is also backed up by UK internet security company who specialise in providing online community management software for a range of online games, social networks and virtual worlds, with several years of experience in this area helping to inform the service they provide to BigLittleBang.

"With their help we can identify the negative behavior as it happens, anywhere in the game. And as most parents will know responding to negative behavior swiftly and clearly is the best strategy to avoid the same thing happening again."

The key advantage of using a specialised service is the vast amount of knowledge and experience at their disposal that helps them to identify threats that may be difficult to recognise.

"There are always workarounds that kids find to be able to say things that they know they shouldn't. For example most games won't let you write a swear word, but they will let you spell out an abbreviation. Working with third party consultants that specialise in this area means that we can fix problems before they occur," Chris explains.

In August 2011, BigLittleBang the site opened its membership to international users, bringing in a far larger user base and creating new challenges for Chris and his team.

Previously BigLittleBang was restricted to New Zealand users who access the site after school, enabling the staff to take advantage of off peak periods for updates and changes, but this has now changed with users in multiple time zones, using the site for 24 hours a day. "This means we need to be offering moderation over different time zones and have systems in place so that we can police the game in the middle of the night, and a big part of that is adding community managers to the time zones in overseas countries."

To continue the expansion of the company, Chris is also looking into the various methods of marketing to its key audiences.

"Part of our expansion will be trying to get awareness outside of New Zealand and that will mean looking at everything from magazines, radio and online advertising," Chris says. "We also have to inform parents that we are a safe, credible place for their children to play online, which requires a different approach again."

Using virtual money earned playing, an avatar can purchase items such as physical features, accessories or furniture for their spaceship home space.

BigLittleBang won the 2011 Deloitte Fast 50 Rising Star award, judged by Deloitte and New Zealand Trade & Enterprise, which recognises early-stage, innovative, high-potential New Zealand companies.

As parents play a key role in determining the internet activity of under 13s, it's important for BigLittleBang to consider the needs of the parent, as well as the child.

"Explaining what makes us special to kids is a no-brainer because they know what else is out there and they see right off the bat how we are different. The harder task is educating the parents because for them it's a whole new world and they don't have time to experience it for themselves."

What next…

By late 2011, the site had 17,000 members and was growing at the phenomenal rate of 50% a month.

In September of that year, Chris travelled to the US as part of the company's expansion into new and bigger markets.

"The way forward for us is to start up a satellite office in America and grow our audience over there. So this last trip was about finding advisors in the market that can help transition the company. Also as we shift it makes sense to be financing ourselves out of America rather than New Zealand because the needs of the company expand when you go into a bigger market," Chris says.

"So we are executing on our plan ,and while you never know what's around the corner, we are confident we are heading in the right direction, which is always good."

< GO BACK TO PAGE 1