Creating a Virtual Reality Safety Experience
**Bit Space Development (BSD)** is a Winnipeg-based interactive digital media studio that specializes in creating innovative learning experiences for the classroom and workplace using cutting edge technologies such as virtual and augmented reality.

BSD builds training simulators that are used as a complementary technology to augment course work when training people for trades-related tasks. We work with many of the organizations that help build a **safer workplace here in Manitoba** to build **interactive learning tools** for their employees.
About the Speaker

Daniel Blair is a technology entrepreneur based in Winnipeg Manitoba. In 2015 he founded Bit Space Development Ltd, an industry leader in interactive digital media focused on developing augmented and virtual reality experiences for serious purposes. Dan is a technology advisor for North Forge Technology Exchange where he founded the Advanced ICT Lab which brings interactive technology to the prairies through partnerships with industry-leading hardware manufacturers. In addition to his work in Innovation Alley, Dan sits on the board of directors for New Media Manitoba where he works to grow the IDM industry in Manitoba. In 2016 Daniel received the future leaders of Manitoba award as well as the CICAN award for his efforts in building the startup and entrepreneurship ecosystem as well as his efforts working alongside Red River College to develop the ACE Project Space. Daniel enjoys working with emerging technologies and will tell you he is almost addicted to new tech.
Immersive Technology

Immersive technology, also known as extended reality (XR) technology, is a blanket term that covers a variety of mediums that combine the real world with the virtual world in varying degrees.

These technologies can either bring you into the virtual world (ie: virtual reality) or bring the virtual into the real world (ie: augmented reality).
What is the difference between AR and VR?

Virtual reality puts you inside the digital world

Augmented reality brings digital objects into the real world.
What Does The XR Device Landscape Look Like?

- Smartphone-based VR
- PC-Based VR
- Standalone VR
Smartphone VR Options

Smartphone-based VR headsets were among the first virtual reality systems to be available to consumers and businesses.

**Advantages**
- Affordable
- Accessible
- 360-visuals

**Disadvantages**
- No Spatial Awareness
- Drains Smartphone Battery
- Limited Input Options
PC-Connected VR Systems

PC-connected VR systems are the most feature rich options available on the market, but they are also the most expensive and complex. They also require a powerful gaming PC to operate.

**Advantages**
- Higher Resolution
- Complex Experiences
- Support for Peripheral Accessories

**Disadvantages**
- Expensive
- Requires Powerful PC
- Tether limits freedom of movement
PC-Connected VR Systems

Currently, there are three major headset platforms in the consumer PC VR space from Oculus, HTC and Microsoft, and each one of those offers commercial support options. There are also a few niche brands that tailor to the high-end of the commercial market, including Vrgineers Xtal and Varjo VR-1.
Standalone VR Options

Standalone VR headsets use technology derived from the smartphone industry and they include all the processing technology built-in, which the need for a host device such as a smartphone or a PC.

Advantages
- Self-contained
- Portable
- Lower Cost than PC VR

Disadvantages
- Limited Battery Capacity
- Less powerful than PC VR
- Built-in components increase weight
Standalone VR Options

These devices often support room-scale tracking which gives you the best of both worlds. You don’t have to worry about tether cables, but you can still have fully interactive experiences with a standalone device.
Why Should You Care About VR Technology?

Technology news pundits like to claim that virtual reality is dead, but that couldn’t be further from the truth. VR adoption is on the rise in both the consumer and commercial markets, and industry analysts are predicting rapid growth over the next several years.

VR facilitates:

- Making Workplaces Safer
- Improving Onboarding Procedures
- Making international collaboration easier and cheaper
- Helping product designers iterate faster
- And much more!
FORECAST: Global VR Headset Shipments

By category, in millions

Stand-alone  Smartphone-powered  PC-powered  Game console-powered


Source: BI Intelligence estimates

BI INTELLIGENCE

SAFETY SERVICES MANITOBA
Preventing loss, protecting people since 1964
What are you making?

- **Training Experience / Learning experience**
  - Simulator
  - Classroom activity

**Tool**
- Data visualization
- Workflow augmentation
- Internal applications
Can users interact with the world?

- Can the users use their hands to interact with objects or the world?
  - Pick up tools
  - Press buttons
  - Walk in the virtual world

- Are the users stationary?
  - Looking around only
  - No walking
How will you distribute it?

- Pre-installed on devices in a classroom?
- Pre-installed on devices taken to locations
- For download on a specific platform?
  - Apple app store / Google play store
  - Steam / Viveport / Oculus
- Downloadable from your own website?
Do you have a preference?

- Ultimately at the end of the day the technology that is best for your project is the application that makes the most sense for your organization.
  - The thought process only guides us to common solutions
  - The world of VR is a lot more flexible than you may imagine
The Process
Planning Phase

1. Identify the goals of the application
   a. What will the learners be getting out of this

2. Identify where the application will be used
   a. Will this be used at home for general awareness?
   b. Will this be used in a classroom with 20 other learners

3. Plan for the technology we will deploy to
   a. PC based hardware or mobile?

4. Will we need access to job sites?
Content Shooting – If 360

1. Identify where we will be shooting
   a. Training facility or job site?
   b. Identify required PPE

2. Meet with safety supervisor to walk through site with content expert

3. Capture photo and video content of the job site
   a. 360 Camera
   b. Mounted Camera

4. Record audio if required
Development Phase

1. Create the 3D art for the experience – If room scale
2. Select best photos from the shoot – If 360
3. Design the flow of the application
   a. Decide on a linear or dynamic path
   b. Identify desired hotspot types
4. Insert interactive hotspots into the images
5. Build for desired platforms
Pilot & Deployment

1. Identify how we want to pilot the application
   a. Classroom setting or open beta?

2. Gather feedback
   a. Iterate on items that need addressing

3. Prepare for deployment
   a. Will this be a downloaded application?
   b. Will this be installed on devices owned by your organization?
What Does Success Look Like?

1. Every organization has different ideas of what success looks like:
   1. Sales
   2. Engagement
   3. Knowledge transfer
Performance Indicators

1. Every organization has different ideas of what success looks like:
   1. Sales
   2. Engagement
   3. Knowledge transfer
Try On The Trades Northern Performance

1. Every organization has different ideas of what success looks like:
   1. Sales
   2. Engagement
   3. Knowledge transfer
Kids loved it

Did you like the trades presentation?

292 responses

98.6% Yes

0.4% No
Try On The Trades Performance

1. We asked kids and teachers about the experience

2. We also asked them anonymously if they are interested in a career in the trades after

3. We also took looked at their grade, community, and age (but no names or personal information)

   1. This let us break down engagement to see if what we had developed to promote our partner and their industry was performing as expected.
Recommendations for Success
Decide on your KPIs now

1. What indicators are important for your organization?
2. What are your goals with this medium and what does success look like to you?
   1. Increased sales?
   2. Cool factor?
   3. Savings from Operating expenses?
Real Examples
The construction industry is using VR to improve safety on the worksite. Bit Space works closely with local construction safety bodies to create relevant training materials with our VR Safety 360-degree image and video training platform.

The Manitoba Construction Sector Council, TradeUp Manitoba, Manitoba Home Builder’s Association, and Manitoba Heavy Construction Association have all adopted virtual reality for training purposes.
Learn How to Safely Operate Dangerous Tools

Bit Space Development worked with MITT to create a welding simulator, and we worked with the Manitoba Home Builders Association to create Power Tools VR, which simulates the operation of eight different power tools.

These products are used in training courses to give students an understanding of how to operate these tools without the hazards involved with using real tools.
Simulators For Operator Licensing

Virtual reality simulations can be incredibly accurate to the real-world procedure, which makes it possible to do proper operating licensing training with this technology.

You can create simulations that mimic almost any machine, and advanced VR platforms can work with custom peripherals such as the lift platform in the image to the left that mimic the real control panel of the machine.

By the end of 2019, United Rentals expects to be certified to offer aerial lift platform operator license testing completely in VR.
Fostering a Culture of Safety in Today’s Youth

**Bit Space Development** worked with Safe Workers of Tomorrow to create **Level Up VR**, which is used to introduce youth and young adults (ages 14 through 24) to the concept of **being mindful of hazards at work**.

**Safe Workers of Tomorrow** takes Safe Work VR to **schools, career fairs, and industry events** around the province. The game was released in **September 2018**, and so far, more than **700 students** have tried the experience.

Level Up recently **won the Innovation Award** from the International Summit Awards.
Play some games

Seriously, visit a VR arcade, play games on your phone, explore content and find out what you like and what you don’t.
Try the hardware first

1. Try different types of VR before deciding on what you want to use
   1. You can book time at our office to explore this technology if you choose

2. Having an understanding of the limitations of each option is important when planning your application.
Take risks

VR is early, you’re an industry pioneer for exploring this technology, it is highly likely that everybody involved will learn from your project.

I have been doing this for 5 years and I still learn every project.

Don’t get caught up on technology moving forward, there is a lot of support in the industry for making things as future proof as possible but unforeseen changes always pop up.
Fin.
Connect with Bit Space

For more information about virtual reality, augmented reality, or to discuss how you can use these technologies at your workplace, please don’t hesitate to contact us.

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