20 Years of ongoing vision, innovation, evolution and revolution

Forward - by Joan Lyman, CAST’s Manager of Communications

The following article chronicles the last 20 years of innovation at CAST. While this is a review of technical achievement, we acknowledge that the inspiration and many of the ideas have emanated from you. We want to thank you, our Users, for your valuable input into every idea, development and revision. We take every bit of feedback seriously, whether it’s an email, phone call or conversation at a trade show. So keep those comments coming – you never know what the next 20 years may bring.

Imagine: 20 years ago a vision to deliver a planning solution sprouted from an innovation that triggered an evolution that triggered a revolution in our industry, and promises to do so again. Here is the story of wysiwyg’s origin. We think it’s about time this achievement is penned for prosperity.

Its Genesis

1991

For many years, veteran lighting designer Gilray Densham and assistant Steve Plotkin had been generating their designs using AutoCAD for the Canadian Broadcasting Company (CBC) in Toronto. In November that year, they produced a product concept document that became the first step in defining a 3D lighting design tool for professionals in the entertainment lighting production industry. The objective was simple enough – combine the Auto-CAD program as a design tool and the attributes of the lights to simulate the lighting could be done remotely using computer software.

The future sees a Lighting Designer and an assistant in an office, building the whole show from start to finish on a computer with plans lighting program, taking the show into the point and showing the whole show from start to finish.

The successful combination of these ideas proved pivotal. This breakthrough could now show how lights interacted with surfaces in 3D – a first of its kind.

Over the next years the Team continued refining this concept and in 1993, Gil said “If we can do it in a 2D static view, why not do it in a 3D virtual view as well? It sounded simple enough.

In addition to adapting the concept to 3D, the Team advanced their software module further by adding a DMX feed from an Animator, to be the first of many consoles. The successful combination of these ideas proved pivotal. This breakthrough could now show how lights interacted with surfaces in 3D – a first of its kind.

1992

Robert Bell came to work at the CBC with Steve. He used CBC’s 2D CAD program, combined lisp routines as a method to auto-number lighting fixtures, and eventually inserted 2D beam characteristics. The concept was delivered.

1994

Once CBC abandoned the project, in April 1994 Computer Animated Stage and Television Lighting Limited – CAST – was formed. Densham and Bell from CBC and Rick Szijarto, a newly hired software developer, joined forces and wrote the source code for wysiwyg. Version 1 using wireframe images which
was shown for the first time at PLASA 1994. Frankly, its reception was equivocal. Relateless, Densham, Bell and Szi-jarto continued to develop the technology further.

CAST teamed up with Flying Pig Systems who saw the enormous potential of wysiwyg, especially as it would work with their Whole Hog consoles. Flying Pig’s involvement led to the introduction of David Leggett and AC Lighting in London, which began to promote and distribute wysiwyg.

Two of wysiwyg’s major attributes were also initiated at this time. The first was the Library. It was clear that in order to have accurate representations onscreen, wysiwyg needed the exact measurements and photometrics of the lights being used. The Team knew that rigorous quality control over the information that wysiwyg would rely upon was essential for two reasons. Firstly, if the software’s previsualization would make it one of the first “green” products in the industry, 10 years later being green became fashionable.

During 1995, CAST won a Gemini Award (the Canadian equivalent of an Emmy) for technical achievement for wysiwyg.

As wysiwyg was becoming better and more widely known, CAST, the Users and other technology providers were unanimous in that wysiwyg needed to connect with more hardware and new technologies. This conclusion led to 3 results.

Firstly, until now wysiwyg’s growth relied on a limited number of 3rd party technologies – lights and lighting consoles. It was time to open the aperture. This reality imposed by the industry demanded that lighting designers produce designs for shows in various venues – not all venues used/had the same lights and certainly not the new light products; for that matter, not all board operators used the same consoles.

Accordingly, CAST adopted a tenant which underpins the business today; its technology/hardware would be exposed to more industry professionals leading to more sales, and wysiwyg’s market reach would drill down through the RWDs to reach even more potential customers.

Secondly, building on the first, CAST developed its Registered wysiwyg Developer (RWD) program. Once the software and interface parameters were defined, 3rd party manufacturers could write Dynamic Link Libraries (DLLs) that connected their technology to wysiwyg. However, to ensure that data was sent and delivered in a predictable and reliable manner, QA testing procedures were developed and imposed by CAST. It is relevant to highlight that while the decision to sign up and write the DLL is entirely up to 3rd party companies, by which they would

Thirdly, culminating from the foregoing, the input hard-ware as a package – a savvy move.

CAST and AC Lighting entered an exclusive distribution agreement whereby the technology would be exposed to more industry professionals leading to more sales, and wysiwyg’s market reach would drill down through the RWDs to reach even more potential customers.

CAST does not favour any particular manufacturer’s technology. Indeed, as it was (and is today) it was up to technology providers to sign up.

Secondly, building on the first, CAST developed its Registered wysiwyg Developer (RWD) program. Once the software and interface parameters were defined, 3rd party manufacturers could write Dynamic Link Libraries (DLLs) that connected their technology to wysiwyg. However, to ensure that data was sent and delivered in a predictable and reliable manner, QA testing procedures were developed and imposed by CAST. It is relevant to highlight that while the decision to sign up and write the DLL is entirely up to 3rd party companies, by which they would
That same year, CAST started building and selling its own interface device called the WYGIT one. (FYI - WYGITs are still around. They enable connectivity to the legacy DMX only consoles that did not have Ethernet capabilities.)

As well, CAST together with Joe Jeremy and Peter Sinkner from “Niscon” (a Canadian motion control console manufacturer) experimented with and introduced visualization of moving scenery. The addition was groundbreaking as it highlighted the potential for using wysiwyg in conjunction with other technologies for production elements. However, the idea of a much closer integration of moving sets and lighting would resurface the idea of a much closer integration of technologies for production elements. However, in conjunction with other technologies for production elements, the addition was groundbreaking as it highlighted the potential for using wysiwyg in conjunction with other technologies for production elements. However, the idea of a much closer integration of moving sets and lighting would resurface the idea of a much closer integration of technologies for production elements.

wysiwyg continues to grow – in popularity and in the number of Users

2000
CAST released Version 3.5 when it formed an exclusive distribution agreement with ETC. CAST commenced heavy development of wysiwyg Version 4 to coincide with the debut of the ETC Emphasis control console.

2001
CAST won a Prime Time “Technical Achievement” Emmy award for wysiwyg for having “Changed the industry and making it more efficient”.

2002
wysiwyg Version 4 and the ETC Emphasis debuted at PLASA 02. This was the most monumental ground-up rebuild of wysiwyg to date. Indeed, it was so substantial – its features, architecture, and innovation were built so well – that this architecture is still being used today.

Another major enhancement in Version 4 was the change from direct DX3 to Open GL technology. There were many other major architectural changes included as well. Since then CAST also extended motion control visualization and has added multimedia visualization (video) – all considered landmark innovations. Eventually CAST would describe its wysiwyg product as “Production Design Suite Software”. While officially still only PC-based, wysiwyg also ran on the new Mac Intel machines using Mac’s own Boot-Camp emulator. During the next few years, CAST was entirely focused on innovation for wysiwyg as well as providing proprietary development code of new console products. This innovation won product awards and also produced a substantial increase in the rigorously tested Library objects.

Separately, CAST also started to investigate new opportunities to use the core code from wysiwyg in similar uses for other industries.

wysiwyg’s growth continues and gets a baby sister (Vivien)

2005
CAST saw the potential to adopt the wysiwyg code beyond live entertainment into the meetings and special events industry, which was also serviced by a growing number of the same lighting designers. After 2 years of development, Vivien – the Virtual Event Designer was launched in April. Vivien is an intuitive, 2D / 3D event design and sales software, designed for the full spectrum of event professionals, who work in the special events and meetings industry. CAST took the original highly technical wysiwyg product and simplified it plus added wizards to make Vivien very easy to use for the events industry.

In 2005, CAST also brought home the total responsibility for marketing, selling and distributing. We changed it from a software-only development company into a full service one. By now, the 10-year old CAST had grown from 3 to 23 employees (Gil is the only one who has been around since it all began) and has all the key development, selling, and administration functions under one roof.

2006
wysiwyg had an aggressive year of feature development and some great strides in innovation. At the beginning of the year, R16 introduced more of the Moving Scenery features (simulating movement of all objects in a live show environment), improved DWG/DXF import/export, dramatically reduced file size for shows containing large numbers of polygons and Library objects, and increased Open GL performance for added speed in Shaded views. Then in December, R18 delivered a faster high speed Render Engine, giving Users the ability to create even more realistic images in less time and a more advanced way of treating smoke, resulting in more true to life lighting looks. CAST also introduced the Background Rendering Manager to queue render jobs and execute them in the background – without even requiring wysiwyg to run, or on a separate machine without the need for a dongle. R18 also delivered the creation of LED video walls, and other light emitting surfaces with new, multi-faceted wizards and tools.
Meeting Users’ demands for new 3D objects; going green

2007

In March, a mere three months after the previous wysiwyg release, R19 hit the market, introducing the ability to import SketchUp files direct from Google’s 3D warehouse, a vast and growing repository of 3D pre-built items. Users could now import realistic 3D models of many different types of objects from SketchUp, into wysiwyg and Vivien. Later R20 introduced CAD Mode Enhancements including tools for 2D or 3D Boolean operations (merging objects).

Many of the enhancements for wysiwyg were also introduced into Vivien, which is possible since both share the same core code.

As predicted at the time, this initiative has been mirrored around the world. It directly impacts the industry as today permit applications for special events and major productions require a calculation of environmental impact (carbon neutrality).

As an added benefit, it has been the catalyst for a new standard BS 8901: Specification for sustainable event management system with guidance for use, drawing worldwide attention to the growing concern of sustainability in the live event industry. The standard was enacted in anticipation of the 2012 Olympics in London and intended to manage the city’s carbon footprint. Venues would earn tax breaks, rebates, reduced rates and grants in most other jurisdictions by improving their carbon footprints to meet the new carbon standard.

Inventig, innovating and developing

2008

In May, wysiwyg began what would be considered the trilogy of improvements and enhancements to its visualization. R22 began with enhanced Shaded Views for added realism, including softer-edge beams, beam flare at certain angles, realistic beam colour-mixing and atmospheric smoke (still or animated). R23 was already at work in progress.

Meanwhile, the first Alpha version of BlackBox debuted at PLASA 08. As initially envisioned, BlackBox gives formerly autonomous hardware/software controllers the ability to interact and cue off each other, trigger pre-programmed commands (based on the dynamic positioning of moving or stationary objects), and deliver positional information for spatial audio (sound reinforcement) – live, and in realtime – a first in the industry. Whereas performers were originally committed to a script and recurring choreography in the past, BlackBox enables complete spontaneity (within the defined parameters of the space) while keeping lights and moving sets on track and providing added safety through its collision alert capabilities.

2009

wysiwyg R23 came out in February, delivering even further improved visualization in the Shaded Views and marking the second phase of the visualization upgrade project started in R22. This release included Improved Beam Footprints; Shadows; Hot Spots; Video in Beams; and an Improved Dongle Security System.

In August, wysiwyg R24 was released marking the crown of the trilogy. This release introduced the new LED Simulation Subsystem and Mesh Consolidation. It also added Colour Temperature and Footprint Intensity Fallout features for Enhanced Beams, as well as Smoothing of Library Objects (People, Mannequins) and 3D Primitives.

R24 was released at PLASA 09 and won a PLASA Innovation Award.

The new dongle security system, already released in wysiwyg, was released in Vivien 2010 meaning that Vivien Users share the same confidence in the security of their dongles and software.

The recession notwithstanding

2010

wysiwyg R25, released in April, enabled more advanced Video capabilities including Splicing Video into Sub-sources, displaying video sources and subsources on LED walls, and video could be projected and displayed on all CAD Primitive Objects. A few months later, in December 2010, R26 delivered a complete new ways to use the foundations that had made wysiwyg and Vivien unique, and extend them logically, ideally in the same market niche where they were already well known. Not that it was an epiphany, but the light grew brighter over time. The idea: Why not coordinate production design elements like 3D audio, motion control, lighting, video, media servers, performers, cameras, and other spontaneous elements? Is it possible to track, pinpoint the location of stationary and moving objects/people in 3D, and communicate that data in realtime to any technology connected to it? Thus the first seeds of the BlackBox high speed communications system were planted. Research and development on this project required an independent team for the sake of CAST’s Members. We would not divert resources and allow ongoing software engineering for wysiwyg and Vivien (and the BB development continued over the next years).

As wysiwyg and now Vivien continued to make major growth in their markets, CAST was again considering new innovations – perhaps at tangent to the past but not to depart from it. What had we learned from going green? Stick to your knitting – that is to say, continue to support your loyal customers and the mutual benefit of all industry professionals RWDs by developing new products for, into an industry that is already well understood.

The key therefore would be to conceive new ways to use the foundations that had made wysiwyg and Vivien unique, and extend them logically, ideally in the same market niche where they were already well known. Not that it was an epiphany, but the light grew brighter over time. The idea: Why not coordinate production design elements like 3D audio, motion control, lighting, video, media servers, performers, cameras, and other spontaneous elements? Is it possible to track, pinpoint the location of stationary and moving objects/people in 3D, and communicate that data in realtime to any technology connected to it? Thus the first seeds of the BlackBox high speed communications system were planted. Research and development on this project required an independent team for the sake of CAST’s Members. We would not divert resources and allow ongoing software engineering for wysiwyg and Vivien (and the BB development continued over the next years).

As wysiwyg and now Vivien continued to make major growth in their markets, CAST was again considering new innovations – perhaps at tangent to the past but not to depart from it. What had we learned from going green? Stick to your knitting – that is to say, continue to support your loyal customers and the mutual benefit of all industry professionals RWDs by developing new products for, into an industry that is already well understood.

The key therefore would be to conceive new ways to use the foundations that had made wysiwyg and Vivien unique, and extend them logically, ideally in the same market niche where they were already well known. Not that it was an epiphany, but the light grew brighter over time. The idea: Why not coordinate production design elements like 3D audio, motion control, lighting, video, media servers, performers, cameras, and other spontaneous elements? Is it possible to track, pinpoint the location of stationary and moving objects/people in 3D, and communicate that data in realtime to any technology connected to it? Thus the first seeds of the BlackBox high speed communications system were planted. Research and development on this project required an independent team for the sake of CAST’s Members. We would not divert resources and allow ongoing software engineering for wysiwyg and Vivien (and the BB development continued over the next years).
overhaul of spreadsheet functionality in the Reports and Worksheet tabs of PRES mode, plus New Reports with more functionality and even custom Reports.

Meanwhile, after many attempts over the past 2 years to find a third party live tracking system that was viable for the industry and that could work in real-time with BlackBox or a standalone, CAST decided to build its own and by PLASA 2010 in September, the first phase of the BlackTrax system was on display.

BlackTrax is a revolutionary real-time motion tracking system for people and objects, designed to work stand alone or with BlackBox. The BlackTrax system uses a proprietary sensor device that is placed on the moving object(s), giving tracking information in 3D (X, Y, Z) for the First Phase. Then the second Phase will deliver the option of the full 6 Degrees of Freedom – X, Y, and Z coordinates, plus roll, pitch, and yaw angles. BlackTrax monitors the dynamic position of the object(s) in motion as well as giving important spatial relationships between objects and people in a 3D space.

The judges were impressed and BlackTrax won a PLASA Innovation Award.

Poised for the next revolution

2011

This year promised to be just as exciting as the last 20. We will begin shipping BlackTrax, release wysiwyg R27 and continue to innovate and develop more groundbreaking technology.

And it all started with the vision that became an innovation, which led to evolution, that led to a revolution, which came to be known as wysiwyg. Today wysiwyg is indubitably the industry standard. Here are some stats:

- Four incredibly strong core products: wysiwyg, Vivien, BlackBox and BlackTrax
- A comprehensive website including a Members Only support area
- More than 130 distributors
- More than 50 RWDs
- More than 22,000 Library objects
- More than 350 schools, colleges and universities teach with it
- Oh, and we now have 30 employees...... and we still have Gil!

It began as a vision 20 years ago and has evolved into some of the most advanced innovations in the industry with plenty of directions to go in the future. Stay tuned!