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Campus Dynamic Signage Networks
Communications Value and New Revenues

Higher education facilities including college and university campuses can enjoy significant benefits from the use of a Dynamic Digital Signage network. Beyond student, staff and visitor communications, new revenues are available through the signage network. Sponsored content and suitable, campus-approved advertising can offset display network costs, fund expansion or bring new revenues to individual departments of the campus as a whole. This paper outlines the broader value of dynamic signage on or near campus and the proven approaches to its effective planning, expansion and use, with a focus on revenue opportunities available through the medium.

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A. DYNAMIC CAMPUS SIGNAGE

A1. Dynamic Digital Signage overview.

The terms "*Digital* Signage[1]" and "*Dynamic* Signage" are often used interchangeably and are but two of the many descriptors of on-campus dynamic message display. In seeking its place in advertising plans and budgets, other descriptors have been used. "Dynamic Place-based Media" and "Dynamic Out-of-Home (DOOH)" for example, generally describe dynamic place-based media networks seeking out-of-home ads. "In-store TV" has sought a share of TV/broadcast ad spending and in being called "the Outernet," the medium has become part of Internet budgets.

1.4 million displays now operational across North America

The growing base of approximately 300 networks (outside campuses) that are entirely advertising-based have produced a critical mass of displays that advertisers are using. Nearly 1.4 million dynamic signage displays are now deployed across the North American economy and growing at 24% annually[2].

According to the 2010 Arbitron Digital Video Display Study[3], 70% of teen and adult U.S. residents have viewed digital video displays in the past month, an estimated 181 million people.

An October 2004 article[4] in University Business (Solutions for Higher Education Management) by Jean Marie Angelo titled "Digital Signage Delivers on Campus: Affordable wide-screen digital signs are finding multiple uses on campuses, and may even generate revenue" opened with "The millennial generation was raised on the moving image. HDTV, MTV, flat-screen PCs, PDAs and other electronics have created a generation with high expectations of media and its messages. No wonder digital signage - a new presentation technology - is making its way onto campus[5]".

James Velco, Chief Technology Officer, Information Technology Services of The John Marshall Law School says, "We have been using our digital signage for about three years and its use is growing exponentially. Initially, students were even skeptical about its possible value, but after about a year of use, they are now coming to us to asking for increased use of it. Our dynamic signage network is quickly becoming one of the first places that students go for information and based on the growing requests to display content and messages, we are having to develop standards and policies to help govern and better direct content".

[1] Digital Signage is referred to in many ways including Campus Media, Campus TV, Digital Signage, Retail Media, Displays, 27 inches (69 cm) larger of Digital Place-of Purchase (POP), the Scarper Display Service, audience DV, Narrowcasting Networks, Dynamic Display, Engagement Media,
[3] See http://www.arbitron.com/study/digital_video_display_study.asp
[4] See http://www.universitybusiness.com/viewarticle.aspx?articleid=330
[5] A June 2009 EduComm session presented by Ryan Cahoy of RiseVision is one of many events at conferences that have offered insights and project experiences.

Velco reflects, "Over time, different content has been posted to the signage, but the most effective content is timely, relevant and authoritative. We are trying to offer more value by integrating the digital signage with databases to provide students information they would not be able to easily access. We pull information from the school's databases, which contain information on room changes, class schedules and cancellations and other relevant databases such as the Chicago time updates on the expected arrivals of buses and trains. For the longer term we are considering how content might interface or integrate between the dynamic signage, interactive displays and mobile devices. That is the direction that we are heading".

James Velco, Chief Technology Officer, Information Technology Services of The John Marshall Law School said "The swiping of a student ID card at an interactive display helps us determine the effectiveness of information delivery through these devices".

Over the past several years, most large post-secondary campuses have installed dynamic signage networks motivated by the desire to:

- Provide mass notifications and alerts to improve campus safety
- Better inform students of campus activities, key dates, opportunities or services
- Present the campus "brand," values, culture, successes and achievements more effectively
- "Clean up" the campus environment
- Support campus sponsorship programs and generate new revenues
  Present messages targeted to students, staff or visitors at specific times or locations on campus

This paper outlines the broader value of dynamic signage on or near campus and the proven approaches to its effective planning, expansion and use, with a focus on revenue opportunities available through the medium.
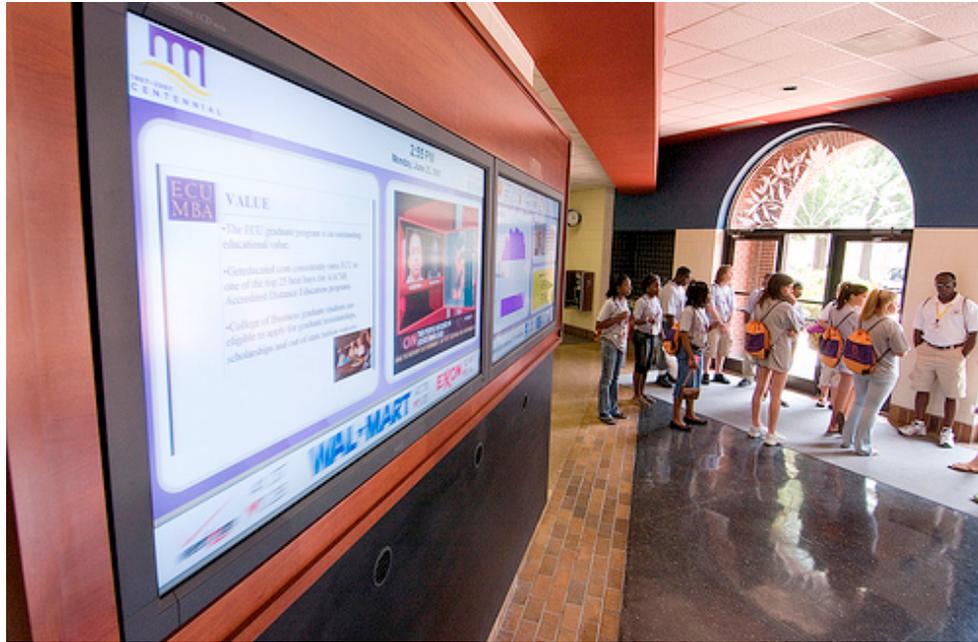
Photo of East Carolina University courtesy of Rise Vision

This centrally controlled video presentation medium has been on a compound annual double-digit growth trajectory for close to 10 years. The post secondary campus environment enjoys many of the benefits that this medium can deliver.

Dynamic media is typically installed at points of high traffic in areas such as *Point of Purchase* (i.e. retail and service locations), *Point of Transit* (walkways, elevators, bus, air, rail, train, boat stations), *Point of Waiting* (i.e. medical office, line ups, lobby areas), or *Points of Gathering* (i.e. student unions, stadiums, hotels, hospitality venues, museums, office and manufacturing workplaces, government facilities, military bases and other locations). The networks deliver messages that inform and can influence. Each of these points of display has relevance when the content message is important to a communicator *and* the viewer at the presentation time and place.

It is common that messages use the full display area, and equally in multi-zone screen layout whereby multiple types of messages are presented on the same display, such as:

- Campus-wide and localized (i.e. departmental, food court, stadium) messages
- Informational and promotional messages
- Wayfinding, venue and event information
- Campus or broadcast TV as well as pre-prepared messages

Communications on campus is a primary area of operations, and one in which greater efficiencies can and are being achieved through Dynamic Signage.

The use of visual display in campus sports venues and for broadcast uses some

technology elements that are similar to dynamic signage, and campus team content is often presented on campus signage. The ability to leverage and interface campus stadium content feeds and display to other points on campus in real-time, near real-time or as excerpts or pre-recorded programming can provide "info-tainment" while serving other campus communications goals.

The interface of stadium broadcast, CCTV, IPTV[6] and Dynamic Signage on campus can provide a campus media infrastructure that leverages on-campus content production and can serve other campus communications goals.

Another approach to proceeding with on-campus dynamic signage messaging is through providers of on-campus services. For example, the dynamic signage used to provide information on nutritional, health, menus and specials by food services providers[7] can also be used to provide campus information.

Digital Place-based Media has been rapidly growing and maturing during the challenging economy of this decade which has included 9/11, several economic downturns, recession, business uncertainties and a cautious investment climate. Dynamic communications provides "*speed to messaging*[8]" and *recency*[9], while many displays improve branding, staff and student communications, and the patron experience at a location.

## A2. Inherent Capabilities

A typical campus network of dynamic media includes central control Content Management Software, connectivity between the central control point and media players that drive media presentation on devises located at high pedestrian traffic and gathering areas on campus.

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[6] Closed Circuit Television (CCTV) and Internet Protocol Television (IPTV) are typically used as location-based TV content creation and streaming, which differs from file-based dynamic signage, though content can be presented using either approach. Harris Corporation provides technologies and infrastructure for stadium and dynamic signage applications.
[7] Aramark uses dynamic media provided by Cineplex Digital Solutions on several Canadian campuses.
[8] "Speed to messaging" is the ability to rapidly develop and present a message, preferably with minimal efforts.
[9] "Recency" is the term used to describe the capacity of a medium to deliver a message in close time proximity to a future action.

Typical Digital Signage Network Architecture
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Source: POPAI 2004[8]
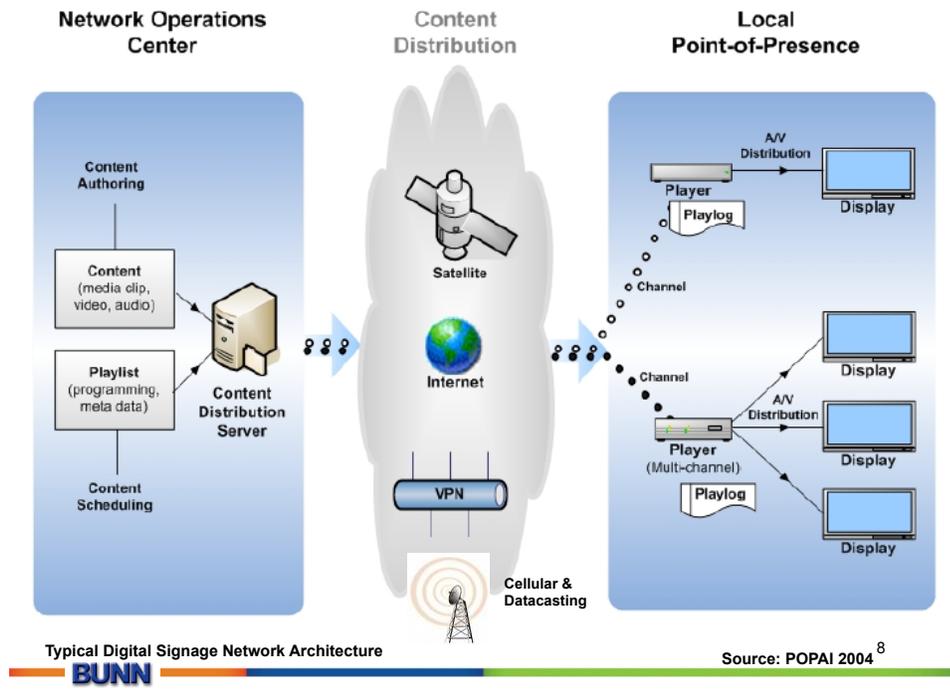
The inherent characteristics of the medium have not changed. "Digital Signage" reflects the inherent economies of a fully digital supply chain of media creation, management, connectivity and presentation. It is a highly target-able, viewer-addressable, "audience of many", location-based display media. Central control of message delivery to digital displays (i.e. LCD, plasma or LED) gives communications flexibility and assures 100% *compliance*[10] of message presentation to audiences at a time of day, in out-of-home locations where people shop, wait, work, commute and gather. Messages have high relevance when delivering content in the context of the location, time and viewer to achieve measurable business goals. It can provide a laser focus of message delivery to time and audience, wide demographic or geographic coverage, or anything in-between.

The Dynamic Media Platform is comprised of a connectivity infrastructure, display devices and media/data management capability.

Messages on modern flat panel commercial quality displays

Dynamic Signage describes digital display screens connected by a network and controlled from a single centralized point. Displays are typically 7 to 60-inch single or tiled Liquid Crystal display (LCD) or plasma panels, or larger Light Emitting Diode (LED) boards. Typically, content spots are integrated into a play-loop of 4 to 20 minutes in duration, coinciding with the length of time that a person would be in the viewing proximity of the display. Play-loops and content are configured to optimally reach viewers according to traffic pace, dwell time and viewer demographic.

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[10] "Compliance" is the term used to describe the fulfillment of message delivery.

An element of mobile commerce is the ability for information download to mobile devices through a text message ("short code"), a bar code or Quick Response (QR) code presented on dynamic signage or printed onto static signage. A user with a camera phone equipped with the correct reader software can take a photo of the QR Code causing the phone's browser to launch and redirect to the programmed website, from which video, text, graphics or animation could be downloaded, or Mobile Commerce could be launched.

Monitoring and Safety of patrons and property are high priorities for administrators, patrons and visitors to campuses and other environments that Dynamic Signage can serve. Permanently mounted displays offer a physical platform for cameras and atmosphere monitoring devices (i.e. sound, light, smoke, hazardous material/chemical detectors, etc.) to be mounted. They inherently offer visual information, alerts and direction, and can be configured to provide audio messaging or can emit close proximity messaging (i.e. blue-casting). The media platform provides an audience-of-one safety messaging, wayfinding and GPS/location detection capacity when the mobile phone is used to extend the display message.

Training and Video on Demand are increasingly delivered as part of a multi-use media platform. In retail, administration and consumer services organizations, a digital display may be customer-facing most of the time, but staff-facing for training or orientation at other times of the day. A dynamic media platform can provide the ability for campus "leaders" and spokespersons to distribute video messages that inform, educate and influence.

Wayfinding and Venue Signage are enhanced by dynamic signage. In presenting maps or directions pedestrian traffic can flow more smoothly and efficiently. Interactive flat panels can provide wayfinding and routing on campus in much the same way that it would be used in a shopping mall, hospital or other high traffic public facility.

Dynamic signage can display location information when classes, lectures and events are purposefully assigned to the most suitably available, sized and equipped rooms.

Students are media savvy people.

"Visual is our new language" explained Paco Underhill in a keynote address to delegates of Digital Signage Expo in 2009[11], noting "Our visual language is evolving faster than our spoken words. We process images faster, and it is a single language". This makes digital signage a powerful appliance to improve retailer

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[11] Paco Underhill, founder and Managing Director of Envirosell, whose books "Why We Buy" and "Call of The Mall" are published in 27 languages. He addressed delegates of Digital Signage Expo, February 26, 2009 in Las Vegas.

and brand success. "And," he added, "the value of digital signage does not decline, but increases over time when content messaging is refined".

Dr. Hugh Philips[12] of McGill University in Montreal has described that the human brain in particular notices motion. He further notes that humans "ingest" sensory information (i.e. sight in particular) and rapidly, unconsciously "de-select" items that are not related to their intended action, needs or interests.

The animations and motion inherent in Dynamic Place-based Media serves to get the "content" noticed, while its message subject or composition stimulate engagement and influence actions.

Dynamic Media is part of "transmedia" and the digital communication continuum

Digital signage is part of the Communications Continuum. Communicators use multiple devices such as internet, posters, TV, etc. to maximize the return on investment (ROI) and the economies of content production on this continuum have advanced significantly.

The "Communications Continuum"

<< *Engagement*   *Reach* >>

Cellular   Internet   **Digital Signage**   Billboard   Newspaper   Radio   TV

Mar-calm   Leveling Fields Daily   Plays Well With Others

Images by Azure Marketing

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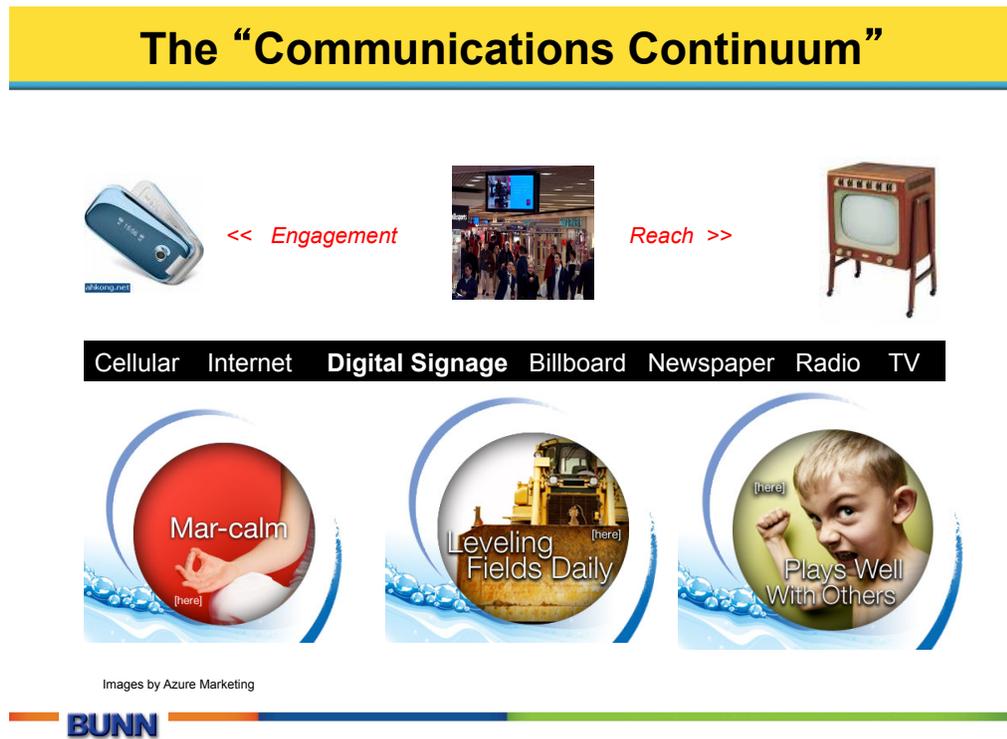
Message delivery to an "Audience of many" or an "Audience of One" with equal ease

Dynamic place-based media is a high-utility medium on the communications continuum. The medium can speak to an "audience of many" in serving as an out-of-home broadcast network, but also to a highly targeted audience (i.e.

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[12] Dr. Hugh Philips, cognitive psychologist at October 13, 2006 Toronto POPAI "University on the Road" event The Application of Shopper Psychology to Marketing at Retail.

geographic, activity-based or demographic) in a highly refine-able (i.e. granular) way. It can also speak to an "audience of one" at a point of decision.

Importantly, it can motivate a download, browse, mobile commerce session or opt-in by a user through a handheld or mobile phone, or direct a viewer to a website for additional information, registration, sign-up or purchase.

The medium provides additional value to brands, communicators and marketers.

- Messages need not be "shrill" to capture attention and motivate action. Active content presented at a prime location can calmly and confidently present features, points of value and a call for action.

- The medium "levels the playing field" of marketing communications by enabling low cost, highly targeted messaging. The ease of message placement and rapid placement/assessment cycle time allow communications campaigns to be modified quickly to maximize investment.

Content from websites and print can be re-purposed.

- Dynamic Place-based Media "plays nice" with other communications devices through the repurposing of brand assets and content. This has a twofold benefit.

  Content from other medium can be re-purposed for use on dynamic place-based media. This increases the overall return on content production investment, while reducing the cost of message production intended for use on each medium.

  Messages can be produced and presented on dynamic place-based rapidly and at low cost, providing the opportunity to test market and refine the message prior to more costly production and placement on other media, in particular TV and cable.

  Dynamic signage "plays nice with others" by helping to drive traffic and engagement by viewers with other devices.

A "Call to Action" helps generate desired results.

Digital Signage content spots typically include a "Call to Action" implicitly or explicitly directing a viewer to do something such as "buy", "try", "visit the site," "sign up," "remember", "take note," "attend", "download," "register", "visit", "call/dial", etc.

Out-of-home digital is a visually present and often captive medium and affords the chance to clearly articulate a value proposition and provide a call to action.

While many communicators, marketers, advertisers, brand managers and network operators want high returns on the dynamic media investment, specifically sales lift with growing brand awareness, the failure to include a call to action impedes the success of a content spot. By using content from other media such as TV,

print, static signage or other media, without adding a call to action, which dynamic place-based media is so capable of delivering, results are diminished.

A primary solution to the problem of under-performing Dynamic Media content is to clearly define the value proposition of the product or service, and then either display or request the desired action. Beyond the interest of art or branding, the dynamic media spots must be developed to "close the sale".

The call to action seeks to activate a viewer decision or close "the sale". This "ask" engages the viewer in motivating immediate or inspiring a future action. The call to action typically immediately follows presentation of strong value propositions presented in a direct way.

A3. Communications Benefits

A wide of benefits can be realized.

Dynamic Place-based Media responds directly to the growing needs for communications cost-effectiveness, innovation, efficient information provisioning, public safety, administrative efficiencies and social networking. [13].

Following are some of the benefits typically delivered through the use of dynamic digital signage.

Value Recipient	Benefit Realized
Campus Communicator	• Amplify key messages • Communications to Students, Staff and Visitors • Improved campus safety • Enhance campus branding and awareness of departmental activities. • Improve "wayfinding" • Enhance event information • Improve the signage for event locations • "Green" and "clean up" the environment • Improved campus communications such as values, events, services, offers, invitations, guests and visitors, wayfinding, observances, recognition/accolades, etc. • Trigger/motivate mobile communications such as downloads, mobile browsing, mobile commerce and messaging (including email, text, SMS, QR Codes) • Increase traffic to internet-based campus information

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[13] Many similar communications benefits are realized through the use of dynamic media in corporate "campus" environments. The Redmond, WA headquarters of Microsoft Corp. for example; uses a dynamic signage network provided by Broadcast International for staff, partner, visitor and customer communications in the Microsoft Partner Solutions Center.

	Campus Communicator - continued • Reduced costs of communications including printing, distribution, posting and disposal. • Improved compliance in delivering communications to the point of decision or need. • Align campus visuals and messaging with priorities • Sales lift of on-campus goods, services and events • Improved awareness of campus services • Provide a cleaner, less paper-cluttered messaging environment (i.e. green environment) • Improve communication of priorities • Reinforce campus "values" (i.e. aspiration, discipline, attainment, community, fun, diversity, cleanliness, respect, etc.) • Reach targeted audiences with key messages • Tie together geographically separate campus units with messaging that promotes the overall "college" • Improved awareness of policies and procedures by staff, students • Provide a "modern" look and feel • Solidify campus loyalty and affinity with students. • Amplify awareness of the successes of the institution • Leverage of connectivity infrastructure • Improve awareness of campus "attributes" (i.e. new faculty, team success, new patents filed, etc. • Improved recognition of funding sources/partners • Provide a cost-neutral or revenue generating visual messaging infrastructure • Increased use of other communications medium (website, briefing events, newsletters, etc. • Gain greater speed and flexibility in messaging.
Students	• Improved access to campus information • Access to offers and opportunities • Improved engagement with the campus experience • Improved knowledge of on or near campus services • Awareness of brands and employers offering student benefit
Campus Visitors (including part time students)	• Improved awareness of campus "life" and offerings • Improved visitor safety • Acknowledgement / welcome of the visitor

Student's Patrons (Parents, Sponsors).	• Peace of mind through campus safety • Affinity for campus life • Appreciation of non-tuition revenues.
Advertisers (including brands, events, services, teams, etc.) See following "Value to Advertisers" section	• Improve marketing communications reach • Improve awareness and recall • Put the promotional message in a lifestyle context • Cross-sell with other products in campus context • Cross-referral to other marketing medium • Pre-sell new releases • Issue electronic coupons • Profile special or limited time offers • Behavioral and Lifestyle Marketing • Increase brand presence in lifestyle ubiquity
Potential Employers and Research Partners	• Improved outreach and branding with students • Increase awareness of campus visits
Alumni	• "Pride of place" through environment modernization • Improved communications • Opportunity to visibly contribute[14]
Suppliers of Digital Signage Network elements (external and internal)	• Additional revenues, margins and economies of scale • Advancement of their standards of practice and capacities • Access to attractive markets at reduced cost of sales.

ROI and ROO are both served by dynamic media

The wide range of benefits that can be achieved through dynamic place-based media[15] allow communicators and marketers to enjoy numerous points of value to provide high Return on Investment (ROI) and Return on Objectives (ROO)[16]. Messaging should consider the primary, secondary and tertiary objectives.

Specific ROI can be measured through viewer response and awareness analytics. Interview and observation can be used to determine the return being realized from dynamic media on less measurable objectives. The initial creation and development, and subsequent refinement of content should continuously focus on clearly defined objectives and the way in which this achievement might be measured.

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[14] An innovative approach to alumni support and acknowledgement is to have a display "sponsored by" alumni with acknowledgement of the sponsorship labeled on the display.
[15] The business and communications benefits that can be achieved by dynamic media are included in a separate paper available at www.LyleBunn.com titled "The "Why" of Digital Signage.
[16] The term Return on Objectives (ROO) is used when benefits are difficult to quantify (i.e. reducing paper clutter, adding vitality, modernizing, etc.)

At Maryville College, Tennessee where Multi-Media Solutions[17] has designed and supplied the dynamic signage, Multi-Media Solutions CEO Mike White says "Maryville College has started by implementing Digital Signage in the Recruiting Department. The initial success of an initiative undertaken by the VP of College Recruitment was recognized by the Treasurer of the College, who suggested expanding this investment across the campus."

Dynamic signage speaks the language of students.

Dolphus E. Henry, Vice President of Maryville College says, "Maryville College has a story to tell that cannot be captured in mere words. It is an immersive experience providing a lifetime of memories that are rooted in a world-class education. We needed a tool, a platform, an experience to tell that story to prospective students and parents visiting our campus. It was important to Multi-Media Solutions that we first define what we wanted to achieve rather than just purchase a system. Our digital signage system has provided us the perfect tool to capture the attention of the prospective student while telling our rich story in a dynamic way that captures the imagination of every single student. It literally speaks the language of the young prospective student and has greatly added to our ability to engage more students.   We are currently expanding the number of screens on campus to promote the various activities that are available to all currently enrolled students".

Photo of Maryville College courtesy of Multi-Media Solutions

Mary Hood, CEO of Digital Roads that has assisted many campuses in Digital Signage planning says, "Dynamic signage is indeed good for achieving campus

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[17] Multi-Media Solutions has been recognized with a DIGI Award for their dynamic signage work on campus and regularly provides instruction at industry events on best practices related to the design and sourcing of display networks. At InfoComm2011, Multi-media Solutions will lead in providing a Digital Signage Innovation Pavilion, which will profile student-facing digital signage, among other applications. See http://www.InfoComm.org

communications goals. The search for meaningful and dynamic content naturally leads to enhanced interdepartmental collaboration and communications. In many instances the signage network is actually the catalyst that spurs the administrative discussions answering the question – what are our campus communication goals"?

Doug Chase, Project Manager, Higher Education at Four Winds Interactive, which has provided dynamic display to over 350 campuses says, "The benefits of digital signage and interactive panels in educational institutions are much different than those in hospitality or other industries. Recruiting is more competitive than ever, and making the institution stand out among its rivals is critical. Having great-looking and useful digital signs – especially interactive signs, which can provide multiple apps at each location – is a way that lots of first-class institutions are setting themselves apart"

He adds, "Dynamic signs can help save money, too. Many of the repetitive and predictable functions previously provided by an employee can be accomplished by a "virtual receptionist" or a kiosk designed to print forms or provide information".

"The governance structures and goals of each university are very individual. Therefore," says Chase, "each project is slightly different. The first step is to work with the stakeholders on campus to assess all of the campus goals and determine what applications the signs are intended to fulfill. Then, the technical questions need to be answered – we determine which architecture and installation approach makes the most sense for that institution. Normally, we can go from zero to a complete installation within 8 to 10 weeks".

Campuses are surprised at the speed of adoption

Chase adds, "Campuses are surprised by the speed at which the devices are adopted and understood by students. Today's students expect that these screens are touch-enabled and that they'll respond in much the same way as their smartphone or tablet computer, and they pick up complex interactive interfaces very rapidly. You can squeeze a lot of functionality into a single interactive sign. Ryan Cahoy of Rise Display, Inc. has identified a movement toward the use of more niche-focused display on sub areas within the schools including such areas as Business Schools. Athletic Halls of Fame and Donor Recognition. Cahoy says that Rise Vision expects deployments in the following areas of campus:

- Business School: 50 to 60 finance labs within universities this summer (2011) using combinations of LED tickers, world clocks, digital signs, video walls, and interactive video walls. These are being funded by alumni, donors and business partners to recreate "Wall Street" atmospheres on campus.

Photo of Temple University courtesy of Rise Vision

- Athletic Halls of Fame, which are often filled with etched glass and wooden plaques and are running out of space, are looking to use technology to better connect with students and visitors. Dynamic signage is helping to meet this need.

- Donor Recognition displays for alumni foundations seeking new ways to connect with younger generations are using technology. Dynamic signage operates well with web pages, mobile devices and social media to enable engagement and interaction.

Cahoy says, "I think the real future for dynamic signage use by schools is in their turning the display into a "sign post" that displays Quick Response (QR) codes that can be used to pull or transfer information to cell phones. This allows students or visitors to take the information with them, interact with it, and share it on social networking sites with their friends".

A4. Campus Advertising

The dynamic media industry has matured in three areas, which together offer substantial benefit to campuses.

a) Many of the displays installed on campus may not have ongoing financial support for effective operations.
b) Advertisers have recognized that the medium is an effective way to communicate to targeted audiences.
c) The infrastructure required to enable cost-effective media planning, ad placement and payment processing.

Advertisers seek to reach campus millennials

In particular, advertisers seek to reach a new generation of consumers, but are challenged in doing so given the out-of-home, mobile lifestyle of this younger demographic.

SeeSaw Networks Inc. reflects that students are very attractive to advertisers because:

- Not only do they spend money on themselves, their family and friends, but they also influence the purchases of the people around them. College students across the US account for about $170 billion in annual spending, and that includes their own as well as their parents' money.

- By 2010, this Gen Y population will account for about 32% of the total population; they will be the next dominant generation of purchasing Americans. If they become loyal to a brand, they present an enormous lifetime value in potential revenue for that brand.

- The majority of them grew up in dual-income families and that translates into more sophisticated tastes in clothing, dining and recreation. They also grew up in a media-saturated, brand-conscious world (i.e. they were raised as consumers). These attributes make them a great advertising opportunity for "entry level" luxury brands in particular.

18-24 year olds drive the adoption of new media

Research conducted by SeeSaw Networks Inc. and OTX Research indicates that awareness levels of digital signage are high for the 18 – 24 demographic and that it drives action for this audience, who are the early adopters of technology and new media.

- 70% of 18-24 year olds are aware of digital signage that they have seen in the past 12 months
- 27% of 18-24 year olds took an action based on the last time they saw advertising on digital signage

The objective of Dynamic Signage is to serve communicators' and marketers' goals. It can strongly influence the way that a consumer experiences and is stimulated by the identity of the product, service or information being presented, as well as by the environment in which it is being presented. While actual results vary by situation, the following are performance benchmarks representing measures of impact that have been achieved.[18]

Millennials

Post-secondary students comprise a population demographic called "Millennials."

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[18] Representative examples of digital signage impact are illustrative of network audit and brand results. Sales lift figures (i.e. the increase in sales revenues), vary, with virtually all uses of dynamic media experiencing 4 to 50% sales lift. Triple digit sales lift is not uncommon and up to 300% has been achieved. Impact figures are gained through the measured results of the medium and published examples of Dynamic media performance are increasingly provided through conference presentation and award programs.

Members of this demographic group are very hard to reach through other media. According to Edison Research, from 2000 to 2010 they cut their radio-listening time in half as they became infatuated with the internet, cellphones and video games. They typically time-shifted their TV watching, and listening to their iPod rather than radio.

Survey U presented "the characteristics of the Millennials demographic" at a conference in Toronto, Ontario in 2008, noting that:

- This demographic group was born between 1982 and 2002.
- Define themselves by seeking to correct for the recklessness of GenX including reinforcing community, bonding with parents/grandparents and making positive change.
- Protected, pampered & prodded to succeed by a generation of hyper-involved parents
- The first generation in American history to exceed 100 million members
- Multi-cultural / Multi-racial / Multi-lingual / Multi-media & Multi-tasking
- The first generation to, as children, be more technologically advanced than their parents.

Importantly, Millennials are at the beginning of a lifetime of major purchases (i.e. home, vehicle, vacations, recreation, etc.) and consumer brand selection and usage.

Of this total Millennials population:

- 20.5 million current college students in the U.S.
  - 17,063,732 are undergrads / 3,387,101 are grad students
  - 40%+ of those aged 18-24 attend college
  - 50%+ of high school grads attend college
  - 70%+ of high school students intend to attend college
  - 58% are female / 42% are male
  - 76% attend public / 24% attend private institutions

- College students are more numerous than residents of any single state, except California, Texas and New York states.

- The average cost of a year of college education is $14,000 for public institutions. $32,000 for private institutions.

- Post secondary tuition and Room/board accounts for $333 trillion in annual higher education spending

Financial Force (17-26 year olds)

- After rent & utilities are paid, non-college students have discretionary funds of 335.36 each or $7.45 billion[1] per month
- After school costs and accommodations, college students have a monthly discretionary budget of $327 each or $5.95 billion[1] per month
- Where does this $160.8 billion in annual spending go?

Expenditure	Non-College	College	Expenditure	Non-College	College
Dining out	$14.3	$11.3	Trips / Holidays	$4.0	$3.5
Groceries	$31.3	$11.1	Alcohol	$3.0	$3.4
Gas / Transit	$20.0	$9.4	DVDs / CDs	$3.5	$2.1
Clothing	$6.8	$7.1	Movie Tickets	$1.8	$1.8
Shoes / Acc.	$3.8	$4.0	Video Games	$2.4	$1.5
Cell Phone	$9.8	$4.1	Movie / Music Downloads	$0.5	$0.6
Books	$1.5	$3.8	Magazines / Comics	$0.8	$0.6

(in billions)

1. Source: SurveyU data collected Jan / Feb 2008

Millennials, in particular post secondary students are high consumers of technologies;

Technology Ownership Among 17-26 y.o.[1]

Technology	Non-College	College	Technology	Non-College	College
Mobile phone	86%	96%	LCD / Plasma TV	27%	29%
DVD Player	93%	89%	PVR / Tivo	32%	26%
High-Speed Internet	81%	87%	Digital Camcorder	31%	25%
iPod / Portable MP3	60%	87%	HDTV	16%	22%
Laptop Computer	54%	86%	PDA / Smartphone	16%	17%
Digital Camera	78%	78%	Satellite Cable	21%	16%
Video Game Console	74%	58%	Satellite Radio	12%	10%
Desktop Computer	85%	55%	VOIP	9%	7%
Digital Cable	47%	51%	E-Book Reader	3%	2%
Portable Video Game	43%	32%			

1. Source: SurveyU data collected Jan / Feb 2008

In summary, the Millennials demographic is a hard to reach population by brands and the post-secondary population, which are commencing adult lifestyles and

consumption represent an important population for marketers, recruiters, service agencies, institutions and government.

B. CAMPUS MESSAGING

B1. Improving Campus Safety

Dynamic signage brings the opportunity to present a wide range of messages in a wide variety of formats (i.e. video, still and animated content). It best serves campus interests (per previous section A2) when non-campus funding supports technology and operating costs.

Operating budget is commonly inadequate

It commonly occurs that the capital investment for the technology infrastructure including displays, media player, software and installation is inadequately supported by ongoing operating budgets for content creation, playlist administration and other functions needed to gain highest returns on the infrastructure investment. This can result in the decline of the use-ability and value of the dynamic campus signage network over time.

This lack of operating funding also means that the time/effort needed to generate possible revenue from the network are not realized.

A downward spiral of display system value, offset only by the providing of ongoing, internal operational funding is realized. This further impedes the addition of displays that could allow then system to better serve campus communications goals.

B2. Improving Campus Life

Campus communications and the quality of the campus experience are improved when fresh, relevant messages are presented related to campus safety, information, activities, values and services.

When technology infrastructure is not maintained, or messaging becomes "stale", the relevance and effectiveness of the dynamic media erodes.

The network must be available to serve communications goals

In a worst case scenario, the network is not available when required for critical uses such as mass notification and alerts, and the under-used dynamic media network has a de-branding influence on campus, even suggesting a broader level of poor maintenance and dis-repair of campus facilities.

B3. Supporting Campus Sponsors and Friends

Many enterprises contribute to the success of campus operations and student life. May of these would like, and would pay for the opportunity to provide campus messages. Some examples include:

- Public transit
- Food services providers
- On campus stores (books, ticket sales, technologies, apparel. etc.)
- Sponsors of campus teams
- Local and future career employers
- Nearby hotels, car rental, attractions, events, stores, restaurants, etc.
- Providers of financial, communications and technology products and services that can improve student success and campus life.

C. REVENUE POTENTIAL

Dynamic Digital Signage is built on the strong propositions that a) "content" can be displayed as suited to a specific demographic, location and time of day, b) digital signage offers high return on communications objectives and c) "digital" brand assets can be adapted to create messages that exploit the medium.

Spending on dynamic place-based media technologies in North America is reaching $2 billion annually and continues to grow year over year at 23% compounding annually. Further, $3.5 billion is spent on creating content for displays and this area of the industry is expected to see the highest growth of the industry at large. The industry is growing rapidly in size as well as sophistication, integration, best practices, standards, infrastructure and efficiencies, and is now continuously proven as a high value marketing and communications tool.

Advertising on dynamic signage is growing

According to PQ Media U.S. Digital Out-of-Home (DOOH) advertising spending is estimated to have grown 14.8% in 2010 to $2.07 billion[19]. The outlook for 2011 is also positive, with place-based networks expected to grow about 16%, digital billboards and signs to grow about 19% and overall DOOH predicted to experience almost 17% growth.

Advertising can be funded from multiple types of marketing budgets including local, regional and national as well as specific campus budgets in the case of sponsors or campus suppliers. A single advertising budget is typically applied to pay for an individual ad spot.

James Velco, Chief Technology Officer, Information Technology Services of The John Marshall Law School says, "When I introduced the idea of third party advertising to our Administration I expected push back, but there was acceptance of the idea, and we are now determining the kinds of paid ads that will add value to the student experience. As we clarify these policies we will definitely consider how VUKUNET can serve our needs".

Mary Hood, CEO of Digital Roads notes, "operating costs in particular can be supported by 3rd party (ad) revenues. Advertising is often seen as a dirty word on most College Campuses, although on any Campus you can easily find many

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[19] See http://www.digitalsignagetoday.com/article/178227/A-look-at-DOOH-by-the-numbers

examples of "sponsorships" and "partnerships". Oddly enough, advertising for free things like events or free download products, are not seen as advertising at all – these are just community service messages. Many college campuses use interdepartmental billing or charge back systems to pay for shared services such as IT and telephone services. Organizations that are accustomed to this type of internal billing find it easier to also pay for "air time" to reach their desired audience. Departments, such as athletics that regularly advertise for ticket sales quickly see the advantage and value of using the local signage network to reaching their target audience. We have seen these departments be instrumental in breaking down the barriers for other 3rd party "sponsors" to contribute successfully to the sustainability of the network".

Hood adds, "budget concerns are also serving as a catalyst, helping to bring clarity to the communication goals as well as greater analysis to the ongoing costs of ownership. In general, we find that administrators are far more likely to charge 3rd party contributors for their services if they know what it is costing them to support the network".

Mary Hood adds, "campuses can now more readily and efficiently enjoy new revenues as:

a) ad placement infrastructure (ad sales agencies, online exchanges) has advanced, and
b) brands and local advertisers are increasingly wanting to display their messages on campus signage.

This still tends to be highly relationship based. Outside company sponsorships have to include more than just money. They seem to do better when the advertising initiatives are grounded in a project or program that has a bigger picture message or community impact".

C1. Approach

The ways in which a campus can achieve new venues through paid messaging on its dynamic media network have advanced over the past several years. Several business models have evolved with varying costs and levels of service.

Ad sales agencies sell ads.

Ad Sales Agencies and Media Aggregators such as SeeSaw Networks, Adcentricity and others can be engaged by the campus to deliver ad revenues. They typically hire professional media sales professionals to actively market digital out-of-home advertising campaigns to advertisers and their agencies. These sales organizations will often include the campus along with other venues that meet a brand's messaging requirements in proposals presented to an advertising agency. Registration and provision of detailed network information is required, and often an extensive engagement agreement is necessary. Commissions paid to

these ad sales agencies and media aggregators are commonly 25% to 40% of the total ad revenue.

Adcentricity represents over 123,500 displays in over 53,000 locations[20] across the US economy. The campus locations it represents allow advertisers to present messages on specific areas of a campus including cafeteria, library/study hall, pub/bar, public spaces and student housing.

SeeSaw Networks which was recently acclaimed by the Wall Street Journal as "the next big thing" has announced that, with the addition of several new network partners, it has surpassed 200 million weekly impressions delivered across 40 different kinds of venues that people frequent daily[21].

"Our strong partnerships with over 45 networks provide us with unparalleled scale," said Peter Bowen, CEO of San Francisco-based SeeSaw Networks. "The combination of our scale and our precision targeting capability allow advertisers to very cost effectively reach their audience."

Ad sales agencies sell ads to agencies

Online advertising exchanges for digital out-of-home advertising are a new development in the marketplace, with the promise of delivering advertising revenue to dynamic media networks at a lower cost than ad sales agencies and media aggregators. These web-based exchanges have become increasingly popular in the efficient buying and selling of goods and services in many other areas, and allow ad agencies to use sophisticated modeling tools to develop an ad campaign plans to reach their prospective customers across many different dynamic digital media networks at the same time.

A concern of ad agencies and other purchasers of the DOOH advertising medium is that there has been very limited interoperability or standardization across the literally hundreds of solution providers and operating networks.

A newly announced strategic partnership between DOMedia, the leading DOOH ad exchange platform; and VUKUNET[22], the sophisticated DOOH ad serving and campaign management platform; has the promise of allowing ad agencies to finally plan, buy and effectively manage and measure the performance of large scale ad campaigns across dozens of dynamic digital media networks concurrently.

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[20] Adcentricity 2011 Digital Out-of-Home Outlook and Planning Guide – USA Edition. See www.Adcentricity.com

[21] SeeSaw Networks was the first Dynamic Signage ad sales agency to operate at large scale in North America. It has advanced the practice of "Life Pattern Marketing" through the medium, allowing advertisers and other communicators to gain efficiencies in targeted communications based on geography and demographic.

[22] VUKUNET, from NEC Display Solutions of America, is the engine that powers the digital out-of-home advertising business. VUKUNET is the only universal ad serving platform that drives ads to any digital out-of-home network, regardless of content management system. VUKUNET makes the buying, flighting and reporting of digital out-of-home ad campaigns easy. For additional information about VUKUNET, visit www.vukunet.com or call (877) 805-VUKU.

Using an online exchange, similar to the infrastructure now common through tools like DoubleClick for Internet advertising, the campus registers its available displays noting the locations, number of typical viewers and availability for advertising. As advertisers offer to pay for presentation of their messages, the opportunity to review and accept or decline offers are given to the campus network administrator. Accept advertising messages are then provided to the campus with the process administered (including billing and campus payment) by VUKUNET for a competitive fee.

Local ad sales partners including student union representatives can also be used to generate ad revenues. Such a partner can administer the ad review, fulfillment and financial processes, or can use the online ad exchange infrastructure to meet these requirements. Potential ad generation partners to the campus include ad sellers for nearby billboards, public transit, street furniture, transit shelter and other near campus advertising.

Since relationships already exist between campus administrators (or their agents) and brands currently involved or interested in on-campus advertising, events, promotions and sponsorship, the campus can leverage these relationships by entering revenue sharing or commission agreements. Advertising in stadiums, publications, websites and firms that conduct on-campus promotions or sponsorship are potential ad revenue generation partners.

Third party campus networks such as TUN, ZiloTV, MTVU or others typically provide the technology infrastructure, campus content (including music videos, movie trailers or other entertainment) and provide a rebate for a portion of the third party ad revenues that they are able to generate. While the campus may enjoy some revenues, these networks are typically limited in campus display locations and provide less campus messaging flexibility and capability.

Life Pattern Marketing: Campus advertising can fit into a messaging approach called "Life Pattern Marketing" being used by communicators and advertisers.

SeeSaw Networks has published several papers reflecting advertisers desire to shift their communications to correspond with the "life pattern" of consumers represented in their target market.
Life Pattern Marketing is the practice of placing companies' brand messages on digital screens and billboards that are located where busy people are "out and about," living their daily lives.

In Life Pattern Marketing, a physical mapping of the particular target audience's daily routine including work, play, study and social patterns is created. Then the display mediums are defined that could be used to reach people during their life pattern. The framework for Life Pattern Marketing as outlined by SeeSaw Networks is as follows:

1. Identify a target segment of the population you want to reach.
2. Map their life patterns. Find out where they go and what they do when they go there.
3. Find the venues along their life patterns that offer digital screen advertising.
4. Create a campaign 'flighting' strategy - a schedule that designates how much advertising is appropriate in each week.
5. Develop your creative assets so that the same basic creative and copy can be used across flights and across venues.
6. Customize the creative. Do this by slightly tweaking the creative across venues in a single flight and by tweaking the creative across flights.

SeeSaw Networks has released a whitepaper titled "Generational Shift in Media Consumption Habits" which describes the challenges faced by Marketers in reaching younger demographic groups.

Rocky Gunderson VP of SeeSaw Networks says, "The phenomenon we now know as the Internet is generating profound changes in the way advertisers and marketers communicate with existing and emerging customers. The Internet is the underlying catalyst for fundamental shifts in media consumption habits of the generations dubbed Gen X, Gen Y and Digital Kids (6-43 year-olds). This fundamental shift is reshaping the media landscape as well as product marketing and brand equity".

The shift to dynamic signage is permanent and growing

Gunderson continues, "The shift is a permanent alteration of the media topography that must be understood, embraced, measured and acted upon by advertisers and marketers. Failing to attract these new decision makers will find formerly savvy advertisers and marketers facing persistent detachment from emerging customers and relentless degradation of hard-won brand equity".

Internet adoption has expanded distribution and creation of information and product awareness beyond the trinity of traditional media - television, newspapers/magazines and commercial radio. Against this backdrop, a level of information anarchy was created in the early 1990's that are now coalescing. Currently, anyone with access online can be a journalist/publisher (Blogging), producer/director (YouTube), social advisor (MySpace), or self-proclaimed expert (message boards, podcasting, advice sites).

The advertiser and marketer is now confronted with frightening possibilities that are startling new realities of media consumption. Gen X and GenY patrons are rapidly reducing consumption of traditional media. They are instead spending their time in less controlled, homogenized and predictable environments. These environments include:

- Being in physical spaces outside of a home, office or school
- Online entertainment viewing, chatting, IMing and VoIPing
- On/offline gaming

- Satellite (non-commercial) radio and digital music listening including iPods and MP3 devices

On-campus and near-campus dynamic display offers marketers the opportunity to reach this target demographic group.

Gunderson notes, "It's a world of social networking, downloads, digital communities and heightened mobility. Advertisers and marketers must begin to accept that Gen X and Gen Y customers are where they want to be, not where advertisers and marketers hope they will be".

A November 2005 Harvard Business Review article co-authored by the CEO of SeeSaw Networks describes how technology trends are moving toward the delivery of a message suitable to achieving communications objectives can be delivered through emerging technology applications.

C2. New Revenues

A $10 CPM per spot can deliver substantial new revenues to the campus.

A campus can expect to third party advertising/display revenues based on the number of people (students, staff or visitors) who will see the ad and the number of individuals ads that are displayed.

It would not be uncommon for an advertiser to pay $10 for each 1000 viewers of a 15 second message that would be displayed over a period (which could vary from 1 week to a month).

This display cost per 1000 viewers is a typical media buying unit known as Cost per Thousand abbreviated as "CPM" ("M" being the roman numeral for "1000"). On a campus of 10,000 students where virtually all would naturally see a message being displayed, the revenue from that message at $10 CPM would be $100. Presenting 10 different messages at $10 CPM would generate $1000.

A higher CPM rate or larger number of advertising or promotional messages displayed would result in increased revenues for the campus.

C3. Simple Actions

The actions to achieve new revenues are simple and straight-forward.

The "road to revenues" for campuses is straight forward and an easily travelled one. The steps are as follows:

1. Select an advertising sales approach, the most viable options of which are outlined in Section C1 – Approach. While several approaches might be used concurrently, the time and effort required on the part of the campus is reduced when one approach is used. This reduces the conflicts of multiple points of representation to a potential advertiser and the distribution of success fees/commissions. Given the higher dependence on local advertisers (or local

budgets) an approach that assures easy access by local advertisers is suggested. VUKUNET offers easy access, full service and minimal commissions.

2. Describe the campus displays on which advertiser messages can be placed along with the typical viewer volume and profile. This can be done while registering the campus to receive advertising, during which other information such as key contact person, Playloop information and "exceptions" are provided.

3. Direct possible advertisers as may be interested to use the ad revenue generation approach. Ad sales agents and exchanges will do this, however local advertisers can be advantaged and accommodated more easily by indicating to them how they should go about advertising. Information notices can be placed on the displays themselves, on the campus website, in the campus newspaper.

4. Review possible advertising that is put forward for review, in order to be responsive and plan for updating. This review/acceptance or decline process is handled online from the campus content administrators desktop and consumes only a few minutes per advertising spot. Playlist updating by the campus content administrator based on an "insert order" provided by the advertiser or ad sales agency is not required when the VUKUNET ad exchange is used. Based on approval, VUKUNET will automatically place the approved ads onto the system for play out (regardless of the brand of dynamic signage software, media players or displays used.)

The campus will be required to validate the number of viewers of the display on which the ad or sponsored message appears. While the total traffic in an area of the display(s) may be adequate to satisfy advertisers, on the basis that everyone in the area would be a display viewer, at times other metrics are required.

More detailed statistics of the number of possible viewers in an area (i.e. presence), the number who actually looked at the display (i.e. notice) and how long each looked at the display (i.e. dwell) are useful to communicators to determine the effectiveness of their content message in "resonating" with the target audience.

Anonymous Video Analytics (AVA) provides an excellent, low cost way of gaining awareness measures. AVA uses an inexpensive webcam and proprietary algorithms to detect facial patterns. No infringement of privacy occurs since no photos of faces are taken, no records of the webcam view are maintained and no image of the person looking at the facial pattern is ever captured. The capture, analysis and reporting of facial patterns are all automatic and completed in real time at the point of viewer interaction with the sign.

AVA is increasingly used to measure the audience or viewership of dynamic signage, and to report the level of interest in a message as an input to refining the message. This "actionable intelligence" helps maximize the effectiveness of the message being presented.

The most popular AVA tool is the Intel® Audience Impression Metric (AIM) Suite. Its core technologies were recognized with a 2009 DIGI Award as "The Most Effective Measurement System".

As the Intel AIM Suite anonymously monitors viewer metrics such as age, gender and length of attention, this enables the advertiser, retailer or electronic signage network operator to automatically present digital messages on the electronic display that are most relevant to the demographic of the person(s) looking at the display. This "Dynamic Content Provisioning" is a growing area of interest and use by advertisers and communicators seeking to better target their messaging and maximize their communications investment.

D. ADVERTISING CONTENT

Revenues are derived from fees charged for the display of messages including advertising messages by brands, goods and services providers and Sponsorship of information (i.e. "this message brought to you by…").

D1. Messages

Advertising messages are typically 5 to 30 seconds in duration and are often created specifically to take advantage of dynamic display network capabilities and the viewer environment. Many do not include audio but depend successfully on the visual messaging, composition and animations to attract and hold attention, and ultimately to influence attitudes and behaviors.

D2. Sponsored Messages

Sponsored messages are often informational, providing instruction or advice on subjects such as health awareness, nutrition, financial management, etc. A recent campaign for example, aimed to increase awareness of the negative environmental impact of the use of single-use plastic water bottles and urged the use of re-fillable containers.

Sponsored messages could provide instruction and counsel on financial management, nutrition, health, enabling technologies and other areas that can contribute to the success of students during and after the post-secondary experience.

D3. Respecting "Exceptions"

Campuses have the inherent right to decline to carry any messages on their dynamic media network. While advertising that promotes the use of tobacco, alcohol and firearms are often unwelcome, exclusive relationships with providers of services to students such as telecommunications or banking, as well as campus suppliers (i.e. a soft drink bottler), may result in some advertising not being acceptable to any given campus.

These exceptions can be easily managed in the ad sales and review process to assure compliance of ads with campus policies. The following Standards of content suggest a further framework related to acceptable advertising.

D4. Standards of Content

Content standards protect network operators

Content and Advertising Standards offer a framework to help assure that the dynamic spot is not perceived in a negative light or tests legality. The American Association of Advertising Agencies (AAAA) has published advertising standards of practice (www.AAAA.org) which direct that no advertising should contain:

- False or misleading statements or exaggerations, visual or verbal.
- Testimonials, which do not reflect the real choice of a competent witness.
- Price claims which are misleading.
- Comparisons that unfairly disparage a competitive product or service.
- Claims insufficiently supported, or which distort the true meaning of practicable application of statements made by professional or scientific authority.
- Statements, suggestions or pictures offensive to public decency.

Standards of practice on digital signage content in the style guide for a network operator, content producer, communicator or advertiser should reflect that content presented on Digital Signage should not;

- Infringe the legal rights (including copyrights, rights of privacy and publicity) of other.
- Cause any damage or disadvantage to others.
- Disturb public order.
- Reflect a criminal act.
- Present or distribute any third parties' private information without obtaining approval from such third parties.
- Disgrace others
- Defame or libel others.
- Offer digital files for access or download that contain viruses, corrupted files that may damage the operation of others' computers.

- Present unlawful or prohibited information.
- Reflect any other activities that the location provider of the digital display deems inappropriate.

A Code of Advertising Standards published in Canada offers a comprehensive framework for marketing and other communications. See http://www.adstandards.com/en/Standards/canCodeOfAdStandards.aspx

All content offer lessons

A good way to improve dynamic signage content design and composition skills is to look at content spots and gauge the ways that you are affected. Be the judge by asking yourself the following while considering the viewing environment;

a) What would make the intended message clearer or easier to ingest or "take in"?
b) What was good about it?
c) Was the value proposition clear?
d) Was the requested action clearly presented and compelling?
e) What was a distraction or not essential to the message?
f) What would you change to simplify or empower the message?

E. OUTLOOK AND CONCLUSION

"The future isn't what it used to be" could aptly apply to the area of dynamic media network operations. Advances in technologies, standards of practice, best practice and innovations are advancing as communicators and marketers seek to gain best advantage from this very powerful medium.

Advances in the use of the medium by communicators willing to pay for message display and the infrastructure available to support this commerce efficiently can bring significant new value to campuses.

E1. New Value – New Revenues

Operating efficiencies are gained through a structured approach in which communications objectives are defined, followed by a definition of the "content" that will achieve these objectives, followed by the design and deployment of the technology system required to manage and present the content.

The primary role of the technology infrastructure of a dynamic media display or network is to present the required media needed to achieve communications goals at minimal cost.

Content ROI is strongly linked to technology choices

The way in which this ecosystem of integrated technologies content management, distribution, play out, presentation and analytics handle "content" is key to the

return on investment (ROI), high functionality, ease of use and lowest costs of ownership and ongoing operations that the network operator and users can enjoy. It is common that through the use of the system, the demands of content management and presentation on the technology are increased. The problems of inadequate functionality are negated by carefully planning content approaches toward suitable hardware and software selection and deployment. A similar process is used related to the upgrade of the technology infrastructure to optimize content opportunities and operations.

Operating costs are increasing while technology prices decline.

The 4 to 9 year term of use that is expected from most dynamic media installations includes initial capital costs (which can often be financed and amortization), followed by ongoing operating costs.

While technology prices have been declining and performance increasing (i.e. the declining price/performance equation), operating costs, which are human resource intensive have been increasing for design, network installation, hot line support, repair, training and content and playlist administration. These trends are expected to continue.

Operating costs can be minimized and the effectiveness of the media maximized toward the achievement of business goals through the use of functionally rich, robust technology infrastructure.

Infrastructure that impedes the use of content, requires reformatting or significant efforts to plan and manage play out deters from system success.

Minimal operating costs and greater content effectiveness are realized when the technology infrastructure, including the critically important Content Management System, includes as the following key features.

E2. Other Useful Materials

EDUCATION AND DIGITAL SIGNAGE – A Guide from Digital Signage Today. Published by NetWorld Alliance © 2008 www.networldalliance.com Written and edited by James Bickers, editor, Digital Signage Today

NEC DISPLAY SOLUTIONS FOR HIGHER EDUCATION - Benefits, Concerns, approaches and questions to be asked. See http://necdisplay.com/solution/education

DIGITAL SIGNAGE AND EMERGENCY MESSAGING ON CAMPUS by Richard Slawsky Contributing editor, DigitalSignageToday.com 2010. Sponsored by Capital Networks. http://www.DigitalSignageToday.com

Rise Vision offers several education sector case studies and many photographs at the following websites. http://www.risedisplay.com/wp/examples/case-studies

http://www.flickr.com/photos/risedisplay/sets/72157607676096739/

"FAIL TO PLAN - PLAN TO FAIL". As published in the Digital Signage Best Practices" Guide, this articles outlines how to address how to proceed in planning dynamic media networks. www.LyleBunn.com - Resources for download of this and other dynamic media papers.

THE CONTENT FOR DYNAMIC PLACE-BASED SIGNAGE. March 2011. This comprehensive, 44-page whitepaper provides direction on how to maximize the value of Dynamic Media. Free download at http://lylebunn.com/aboutus.aspx

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Lyle Bunn (Ph.D Hon.)

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BUNN Co.

Lyle Bunn has been recognized with an Honorary Doctorate for his significant contributions to education and the development of the Dynamic Place-based Media industry by The Digital Signage Expert Group in January 2011. Lyle is one of North America's most highly regarded independent consultant, advisor, commentator and educators to end users, integrators, suppliers, operators and investors of Digital Signage, Digital Place-based and Enterprise Media.

Lyle Bunn is broadly recognized as a leading figure in the high growth Dynamic Media industry. Lyle was the only individual named to the Digital Signage Forum's 2005 Digital Signage Top Ten List, among such corporations as Thomson, 3M, Clear Channel, Focus Media and others.

Through his advisory and education services, he has contributed to the development of hundreds of networks in retail, consumer services, hospitality and corporate environments for consumer, patron, staff and student communications.

His eBook titled the "Digital Signage Planning Guide," was released in its 5th edition in June 2010 and is used around the world.

The "SPEED" Digital Signage Training Program, which was launched in late 2008, has been presented to over 2000 end users, advertising, integrator and supply professionals to accelerate projects and supply capability. In addition to private corporate programs, SPEED is provided at major industry events such as Digital Signage Expo.

He Chairs or presents at every major North American digital signage event. He is also among the first to carry Digital Signage, Digital Out-of-home and Enterprise Media perspectives into the broadcasting, consumer electronics, audio-visual industries and Silicon Valley technology sector with presentations at the National Association of Broadcasters (NAB), Consumer Electronics Show (CES), InfoComm and others.

In over 200 published articles and whitepapers, and serving as principal writer and editor of industry supplements included in USA Today, The Wall Street Journal and The National Post, Lyle has advanced the understanding and application of dynamic place-based media and digital signage. Numerous articles and other whitepapers are available at www.LyleBunn.com - Resources including:

The CONTENT for Dynamic Place-based Signage. March 2011. This comprehensive, 44-page whitepaper provides direction on how to maximize the value of Dynamic Media. Free download at http://lylebunn.com/aboutus.aspx

Lyle serves as Academy Faculty of InfoComm International, on the Digital Signage Expo Advisory Board Industry Consultant's Council and on the Board of Advisors of Customer Engagement Technology World (formerly KioskCom/Self Serve Expo – Digital Signage Show).

He serves on the judging panels of the DIGI, POPAI, Digital Screenmedia and the NEC Best of InfoComm awards.

Lyle is often referred to as an "industry expert" in articles, presentations, whitepapers and the corporate plans and press releases of companies. In the National Association of Broadcasters (NAB) Executive briefing series he is referenced almost a dozen times including in the initial pages of the book as "one of the better known and better versed champions of the recent digital signage movement."

Lyle travels extensively and enjoys small craft sailing, golf, classic movies and trail biking.

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