

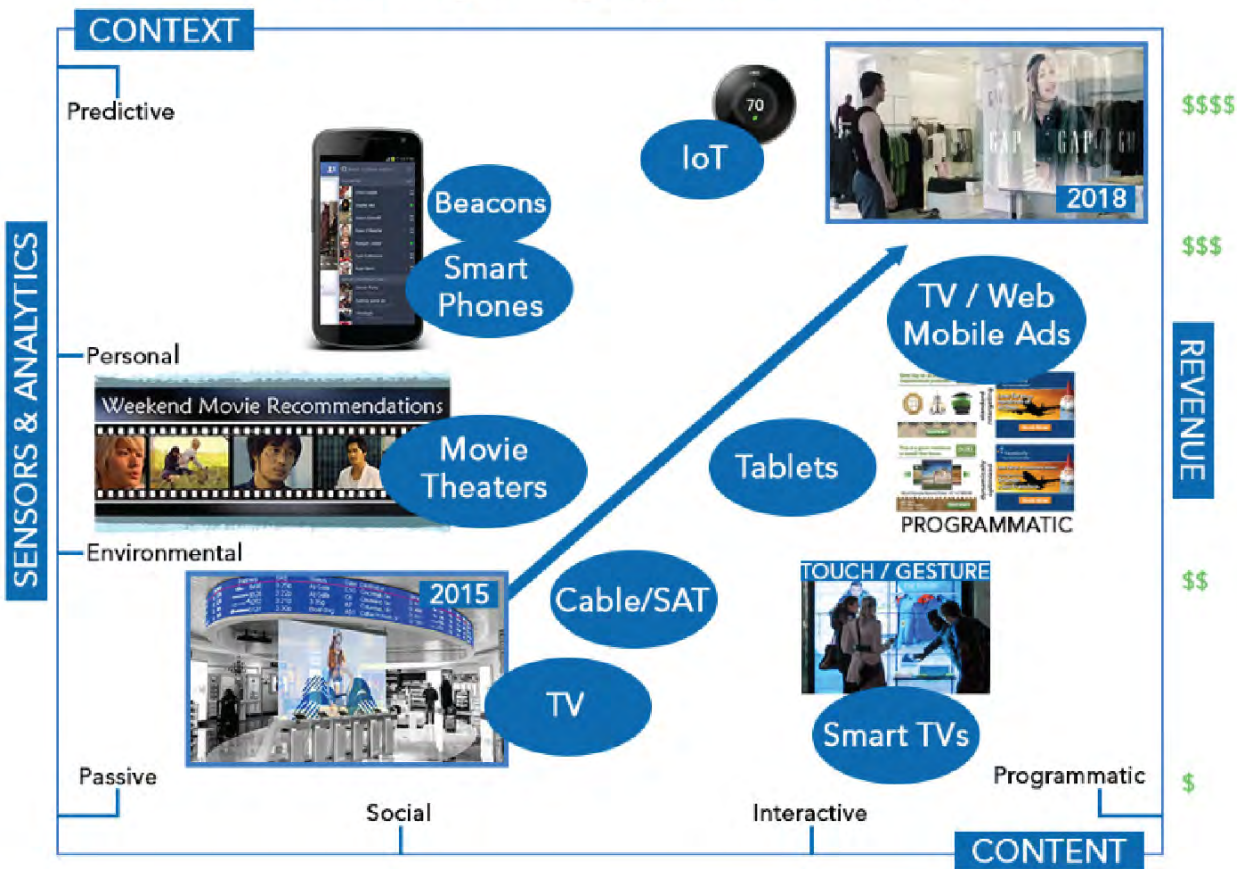


# TRANSFORMATION OF DIGITAL SIGNAGE AND VISUALIZATION

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## Growth of Digital Signage and Visualization



## Emerging Millennials, Behavior & Impact

It's no surprise that millennials comprise one-third of the U.S. population. As a result, millennials control over a trillion dollars in direct buying power and even influence the large older generation. Forty-six percent of them have 200+ friends on Facebook and they have posted content online. Millennials are equally influenced by social media. Fifty-six percent of them like to try new, cool technology & experiences! Top perceived brands are Amazon.com, Apple, Netflix, HBO and Google, showing their preference for digital experiences.

The growth of this generation has an impact on the overall advertisement industry with mobile ad spend expected to grow by 50% YOY in 2016 at \$40.5B. In addition, over half of U.S. companies are using digital signage for marketing / messaging, with 8 in 10 digital signage recipients "very satisfied" with the experience.

Transforming OOH signage to complement and extend the consumers digital touch points is key for our industry to reach the pinnacle of visualization, as shown in the illustration above.

## Key Concepts

### Programmatic

Algorithmic curation and display of content (media) in real time. Using real time feedback from sensors and consumer interaction, this process helps in buying and playback of content from outdoor media inventory.

### Predictive

By auto profiling customers and expected behaviors ahead of their actual presence, a signage solution can quickly change or personalize the theme, hence reducing lag between real time triggers and signage messaging catered to the customer.

### Personal

By knowing the customer better via mobile cookies, NFC, RF tags or beacon based solutions, the signage can make the content extremely personalized. By automatically speaking the "customer's mind" the information shown would be of greater value, as well as concise to the customer need, hence more likely to be engaged.

## Events, Triggers, Analytics & Signage

With the growth of connected devices, platforms and cloud based services, the digital world is generating billions of events and triggers each day. These events are an excellent source for creating enhanced visualization experiences based on human environment and intent.

Events and triggers, coupled with human presence, brings a level of personalization that delivers contextual content and interactivity in all vertical businesses, whether it is retail, transit, education, corporate, or casinos. A huge opportunity lies ahead of us, in providing targeted content (advertisement, media, entertainment) to customers individually or in targeted groups via digital signage displays. By recognizing and knowing the customer via face recognition, one can customize content based on gender, demographics, emotions, and interest. With audience impressions, IT can track performance of their assets on display screens at a given time, day, event as well as optimize the messaging and even the business - store layout.

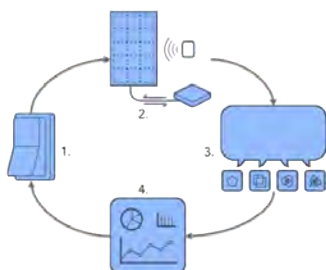
Recognition of customers' surrounding can bring another dimension to the same conversation. Using OpenCV-like technologies to capture objects within close proximity of the targeted customer (through a mounted camera), digital signage can bring continuity in customer experiences, example give additional coupons after recognizing customer is carrying a certain brand shopping bag.

Environmental data, whether it's the time of the day, changing weather or a crucial turnover in a game allows marketing to start a conversation with their customers. A marketing message that cues off a real world event brings higher engagement and piques the customer's curiosity.

Recognizing proximity and mobile devices when they approach a digital signage via Beacon, BT, NFC, GPS or RFID-like solution allows content to become personalized for the specific user. By knowing about users from the time they came into contact with a brand or location to when they leave a geo area, the backend system can auto curate and deliver relevant information at the right time in the customer journey.

By knowing that a mobile device is present in the environment (through beacons or proximity based services), signage can be used to deliver coupons, QR codes and SMS notifications building loyalty with a new customer.

Finally, with the inclusion of a fully integrated programmatic audience analytics as part of the connected backend platform, digital signage can know where the customer has been in the digital world before arriving to its location. Such a data event, can be fed in real time helping maximize the ad and media inventory and drive advertisers' KPIs higher.



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## Pillars For Enhancing Visualization

1. **Sensors:** Configure all your events and triggers from various sensors via necessary web services.
2. **Smart Installation:** Setup the signage display, companion smart delivery platform and sensors where the signage is intended to be delivered.
3. **Unified Scripting:** Create service built on media and input from the sensor's output. Based on the output, programmatic change content and user experience.
4. **Metrics:** Collect and stitch sensor outputs, audience analytics, player, proof of play and customer interactivity remotely. Analyze and calibrate the sensor and service in real time to further customize the campaign results.

### Environment

Any trigger from environment that can be used to start a conversation with the customer about something that is personal to them at the very moment. This helps digital linking the customer, their environment and potentially the message on the display signage.

### Interactive

A simple medium for the customer to show the signage of their interest with the message on the display. A way to delve deeper into the content or show consent for progressing the content to the next stage. This medium can also be used to enable customer take the content/message with them on their mobile device.

### Social

An approach to gain customer attention via social media sites. By showcasing customer generated content to wider audience, digital signage can highlight customer recommendations and comments that may resonate with other potential customers in the vicinity.

### Smart Platform

A hardware, software, cloud based system that stitches all the events, triggers, analytics, and content into a singular experience for the display signage manager.



## ABOUT NANOLUMENS

NanoLumens, headquartered in Atlanta, Georgia, creates display visualization solutions that deliver truly immersive customer experiences and great return on investment. We provide unique solutions to problems that haven't been thought of yet. Our fully custom display solutions provide engaging customer experiences and the ability to realize solid returns on investment. Our brilliant displays, designed and assembled in the USA, are so thin, lightweight and curvable, they fit almost anywhere. With quality backed by an industry leading, Six Year Warranty, NanoLumens is your collaboration partner for visualization solutions that live up to your imagination for more information, visit [www.nanolumens.com](http://www.nanolumens.com).