



WHAT THE NO-CODE MOVEMENT HAS MISSED

Why in-venue application development is the next no-code domain

Executive Summary

The no-code movement is represented by a landscape of software solutions enabling "citizen developers" - business & creative professionals without coding skills - to quickly and easily create applications for in-house use or distribution to select audiences via web or mobile apps. The output could be customer-facing websites and consumer apps or could address in-house needs like workflow automation and payment processing. It has received so much interest and adoption that its market size was an impressive \$13.8B in 2021, growing annually at 23%.

The 140+ vendors of no-code software offer solutions characterized by features like templated, building-block construction, broad platform support, and streamlined onboarding. Use of such software has resulted in 5x productivity gains vs. custom software development, enabling businesses to increase their agility despite a professional developer shortage and an accelerated pace of change spurred by the COVID-19 pandemic. It has proven so popular that analysts predict 65% of app development in 2024 will be created using no-code platforms.

All of this makes it even more surprising to find a no-code blindspot: in-venue applications. These are the out-of-home solutions ranging from digital signage and in-store kiosks to curated exhibits and employee training. Here too is a transition from mere information broadcasting to a self-service model where target audiences can interact with digital content in real-time. Unfortunately, unique characteristics of the in-venue app market - such as support for touch alternatives like computer vision and sensors, hyper-local context dependence, and resilience in network-poor environments - exclude existing no-code solutions and exceed the ability of traditional digital signage platforms to deliver.

Intuiface stands out as the only true no-code solution addressing the unique needs of in-venue app development and deployment. Accessible to the same citizen developer as other no-code solutions, Intuiface is optimized for the creation of modern, compelling digital experiences that engage audiences. Expensive, time-consuming custom development is not the only option for what has been a broadly overlooked app creation marketplace.

Introduction

More than 65% of app development in 2024 will be performed using a no-code platform. That's business and creative professionals with zero software development experience, creating software applications for personal, company-wide, and customer use. It's a market so explosive and pervasive that its [estimated size in 2021 was \\$13.8B, growing 23% annually](#).¹

Regardless of their domain, companies can be more agile and responsive to employee and customer demand by adopting a no-code approach. You see it in everything from enhanced spreadsheets and business process automation to mobile app development for a remote workforce or retail shopper.

No-code is everywhere, but one domain has remained off the radar: in-venue digital communication. In this world of digital signage, information kiosks, retail self-service, curated exhibits, and more – broadly known as "*in-venue digital audience engagement*" – custom software development remains the dominant approach. This oversight is notable considering the associated market size, encompassing the entirety of screens outside of personal devices (phones, tablets, etc.), PCs, and home TV, is valued at a significant [\\$8B in software sales](#).²

This paper explores the oversight, detailing characteristics of the no-code movement and how its democratizing approach to app creation is equally suited to in-venue digital deployments. We'll conclude with an introduction to Intuiface, the only true no-code option for in-venue digital audience engagement currently in the market.

¹ <https://userguiding.com/blog/no-code-low-code-statistics/>

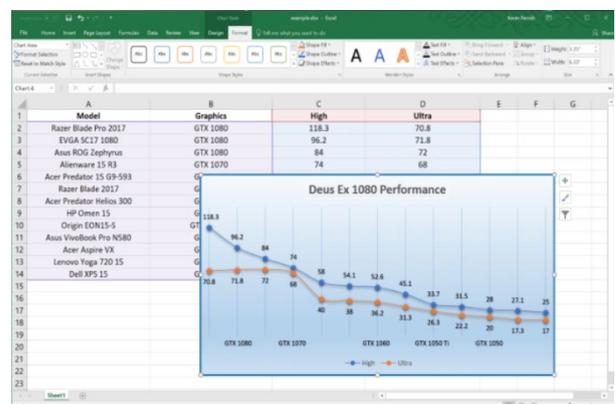
² <https://www.marketwatch.com/press-release/digital-signage-software-market-size-2022-industry-share-latest-trends-global-business-strategies-covid-19-impact-analysis-development-challenges-top-countries-data-and-forecast-2028-2022-02-14#:~:text=According%20to%20our%20most%20recent,14.7%25%20over%20the%20analysis%20period.>

What is No-Code?

Birth of No-Code

The idea of enabling non-developers to create applications isn't new. Even for developers, there has been a decades-long movement towards "visual" development vs. pure coding, creating representations of complexity that can be manipulated as black boxes and combined in novel ways. What's changed then isn't the idea of representational application creation but the idea of who is the intended creator.

Providing no-code options to the "citizen developer" rather than the professional developer can be traced as far back as the 1980s with apps like *HyperCard* on the Mac. But the first broadly adopted example was macro development for spreadsheet programs like Microsoft Excel, powerful but narrow in use case and requiring a good technical foundation.



Then came three significant trends that pushed no-code application development into the limelight.

- The demand for software developers far outstripped supply, leading to a [global developer shortage](#).³
- Digitalization went mainstream – *from smart thermostats to wifi-connected ovens* – creating a generation of workers comfortable with "programming"
- COVID-19 [accelerated the pace of digital transformation](#)⁴, increasing the growth and adoption of technology to facilitate customer and supply chain interactions

A no-code approach to creating apps helped companies address all three trends by letting more people in on the process of building software. This transition has become a game-changer for companies of all sizes and in every industry. Notable no-code players focused on user experience (UX) include *Webflow* for website creation, *Bubble* for web-hosted apps, and *Adalo* for mobile-hosted apps. Many other domains are also serviced, such as workflow automation (with players like *Zapier*) and smart spreadsheets (with players like *Airtable*).

Common Characteristics

So how do you know no-code when you see it? The simple (and obvious) definition is application creation without having to write code. The creation process still requires use of a software platform, but that platform provides **pre-created building blocks that can be drag-and-dropped into a visual representation of the app**, exposing easily adopted approaches to customization and integration with external data sources, plus the ability to deploy the resulting solution to target users.

³ <https://www.daxx.com/blog/development-trends/software-developer-shortage-us>

⁴ <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever>

The promise of an excellent no-code offering is "*low barrier, high ceiling*". The barriers of complexity, speed, and cost are minimized, the capacity to offer endless possibilities limited only by one's creativity is maximized. Velocity is high without sacrificing quality; budgets are kept low without sacrificing scope.

Here are examples of what one can expect from a no-code platform:

- ***Streamlined onboarding***

Discovery, education, purchase, and roll-out of a no-code platform are structured to accommodate non-technical users.

- ***Templated / building block approach***

Provides access to libraries of pre-created modules delivering well-understood functionality. The user's responsibility is to pick the right components and connect them in meaningful ways.

- ***Broad platform support***

No-code platforms hide the underlying differences between, for example, an Android phone and an iPhone. Users can be safely ignorant of how the hardware differs. You build it once, and it can run anywhere.

- ***Native performance***

The end user shouldn't be able to distinguish a no-code app from a similar custom-coded app based on performance. No-code apps should act as if native.

- ***Integrated analytics***

Self-assessment is accomplished by collecting and analyzing data for critical scenarios, providing content creators a feedback loop for learning how to improve the appeal and effectiveness of their apps.

- **Enterprise-grade security**

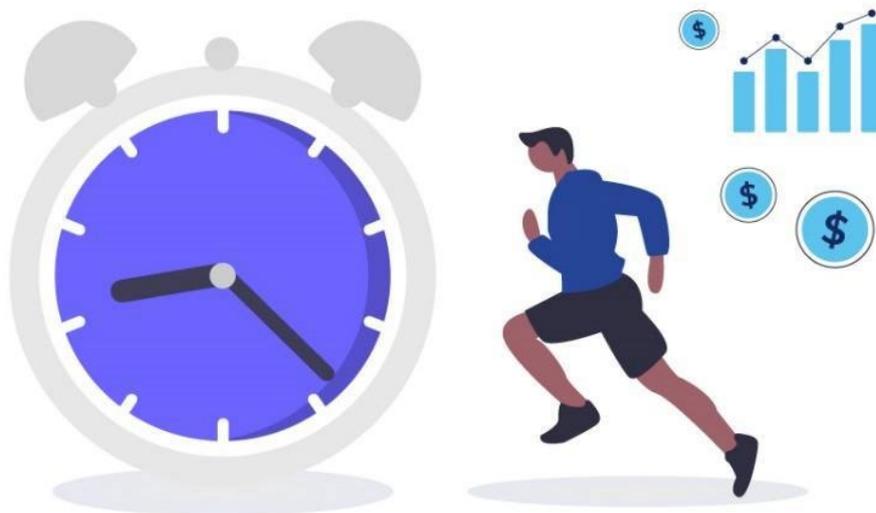
No-code platforms and their output are held to the same Enterprise IT standards as all other corporate software. These standards include (but are not limited to) information security (like ISO 27001 and SOC 2) and data privacy (like GDPR) standards.

Benefits of No-Code

Enabling subject matter experts with no coding experience – *on both the business and creative sides of the house* – to create apps that benefit the company delivers significant advantages. The use of no-code approaches has produced [5x productivity gains](#)⁵ since their adoption. And teams switching to a no-code approach claim it's [4.6x faster and 4.6x more affordable](#)⁶ than traditional programming.

The results have been so positive that analysts predict up to [65% of app development in 2024 will be created using no-code platforms](#)⁷.

A notable side-effect is the elevation of professional software developers, freeing them to address more complex and transformative projects. By removing no-code apps from a professional developer's scope of concern, the impact of the developer shortage on companies is minimized.



⁵ <https://nocodecensus.com/>

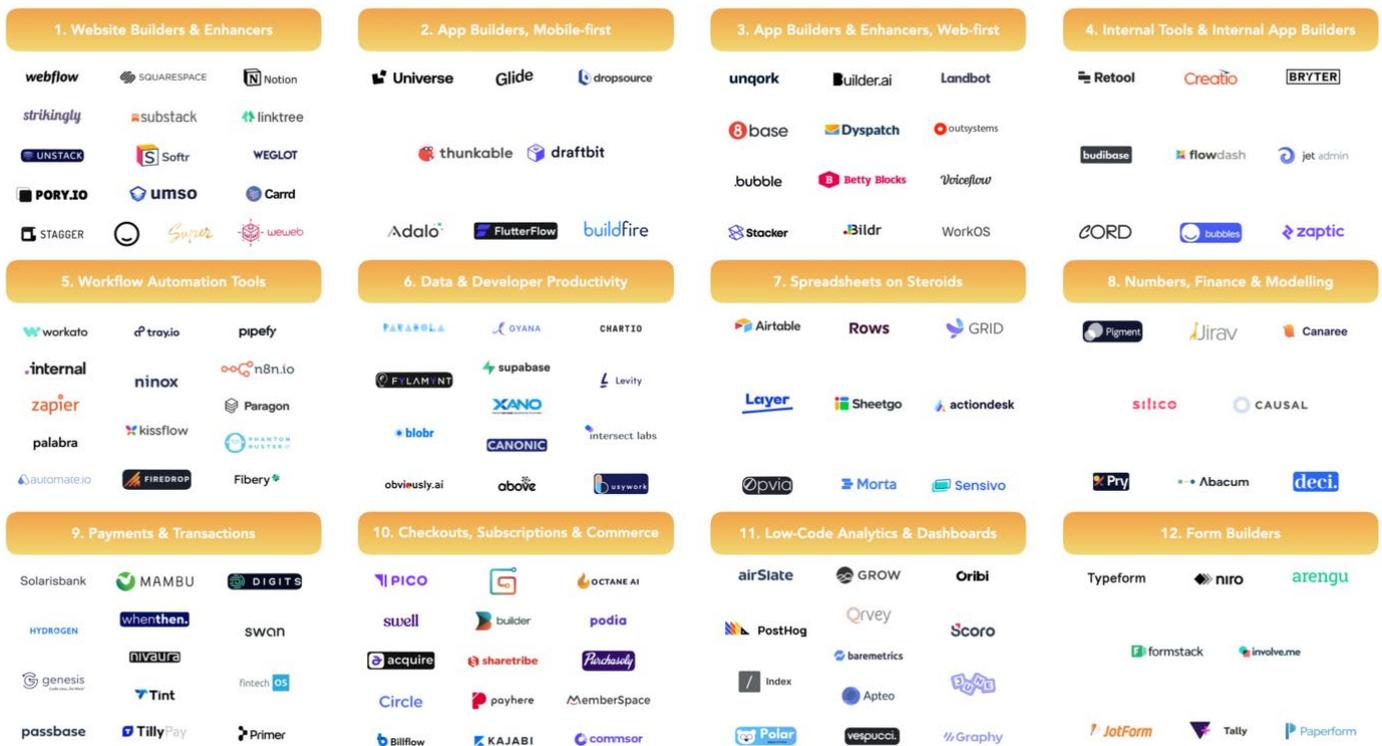
⁶ <https://nocodecensus.com/>

⁷ <https://userguiding.com/blog/no-code-low-code-statistics/>

No-Code Landscape

Here is [one organization's take](https://pinver.medium.com/decoding-the-no-code-low-code-startup-universe-and-its-players-4b5e0221d58b)⁸ on the landscape of no-code offerings on the market today, categorized by the problem(s) these vendors solve.

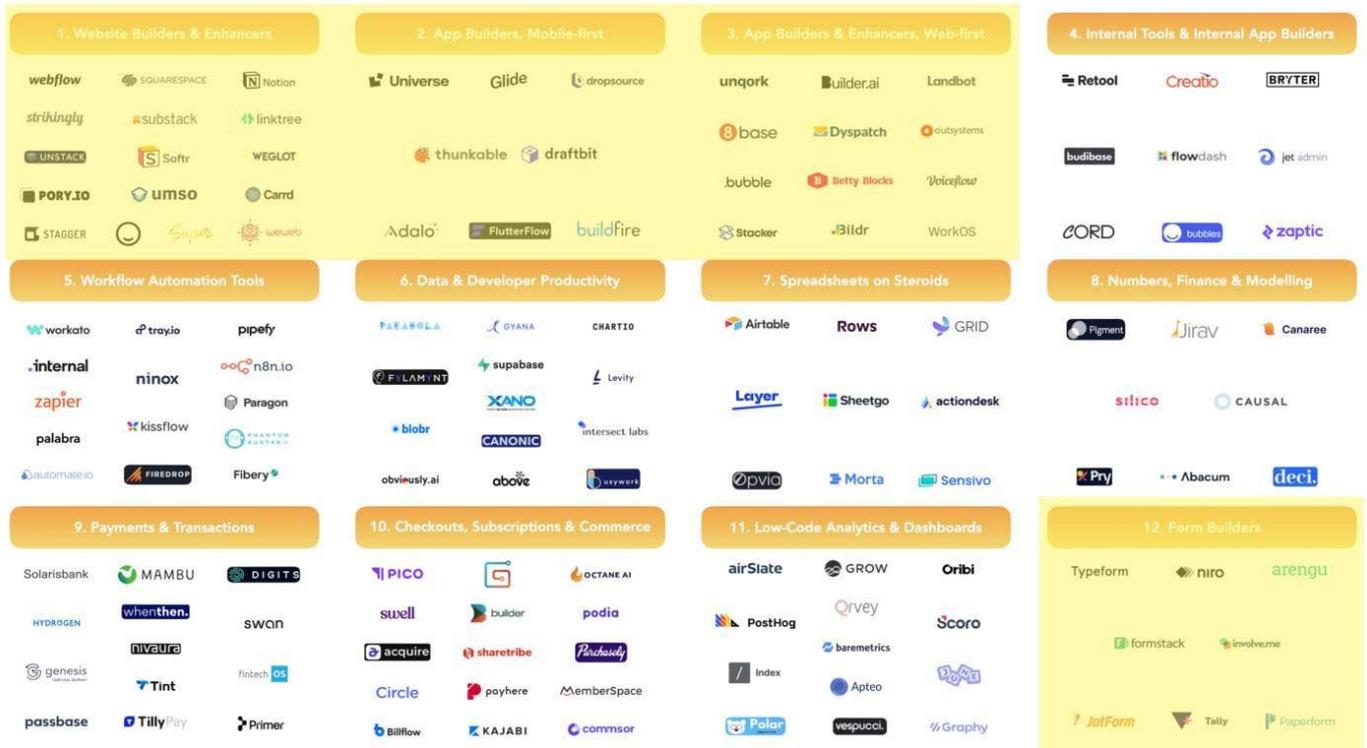
NO-CODE & LOW-CODE STARTUPS, by @pinverrr & @bentossell



⁸ <https://pinver.medium.com/decoding-the-no-code-low-code-startup-universe-and-its-players-4b5e0221d58b>

Let's focus on the user experience (UX) portion of the landscape as this is where an external audience (vs. workplace employees) will likely be the intended target:

NO-CODE & LOW-CODE STARTUPS, by @pinverrr & @bentossell



Something is missing. Nowhere can one find in-venue apps, apps intended for audience engagement in physical spaces.

Is this an oversight, or is in-venue just a subset of the categories already identified? We'll show you shortly that in-venue has unique characteristics and constraints requiring special consideration.

Let's understand why it's missing before discussing why no-code plays a considerable role here.

A man in a dark jacket and light-colored pants is standing in a public space, interacting with a kiosk. The background shows other kiosks and a bright, modern interior. The image is overlaid with a blue tint.

Understanding "In-Venue" Applications

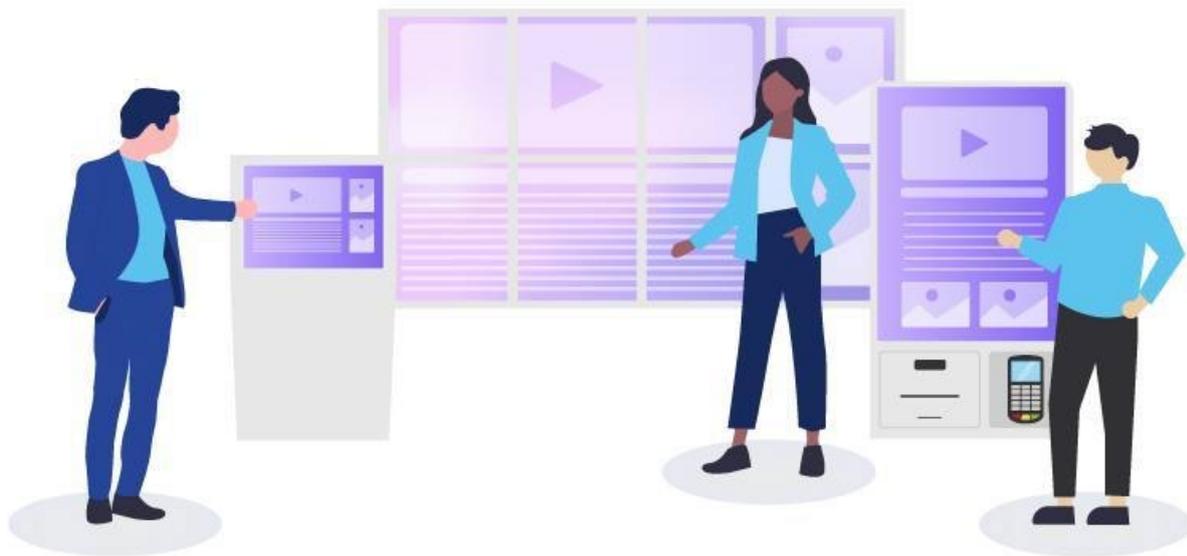
What Is An In-Venue Application?

In-venue applications encompass digital content displayed on a public out-of-home screen (vs. personal mobile devices), represented by [\\$8B in software sales](#). By "out-of-home," we mean it could be in the workplace, museum, library, or any other venue outside the home.

In-venue apps can be purely broadcast in nature – like traditional digital signage – or interactive. "Digital signage" connotes a dumb terminal, a screen broadcasting information with minimal environmental context and no real-time input from the audience. On the other hand, interactive content encompasses any scenario that dynamically reacts to the user or environmental input. This input could be intentional – like touch, voice, gesture – or passive, such as via computer vision or sensors. Kiosks are the oldest and most prominent example of how interactive in-venue applications are delivered, but multiple alternative approaches exist – e.g., lift-and-learn scenarios where lifting an item triggers the display of onscreen content.

In-venue interactive scenarios include:

- *Information kiosks*, like a wayfinder or tourist guidance
- *Retail self-service*, such as endless aisle kiosks or QSR food ordering
- *Curated museum exhibits*, potentially featuring integrations with digitized archives
- *Digital mirrors*, enabling shoppers to request alternative sizes and colors for an article of clothing
- *New hire training*, providing workplaces with a consistent onboarding experience
- *Line busters*, giving customers multiple means for completing a transaction
- *Promotion gamification*, encouraging interaction to reveal discounts
- *Product or solution pitch*, used at a tradeshow or during an in-person event



What Makes In-Venue Unique?

How are the needs of an in-venue application different from the web and mobile domains already targeted by the no-code marketplace?

- *Support for "beyond touch" interactivity*

The app must be engineered to work with various means of interactivity, not limited to fingers on a screen. Audience demands stemming from hygiene sensitivity or accessibility requirements for the lesser-abled benefit from multiple approaches to interaction – such as voice, gesture, use of personal mobile devices – in the same in-venue application.

- *Support for a broad range of execution platforms*

A variety of operating systems can host in-venue content. Some are general-purpose, like Windows and Android. Others are signage-specific, like BrightSign and Samsung Tizen. In-venue deployments need to support the unique execution and deployment requirements of each OS while still enabling their creators to build once and have their output run everywhere.

- *Hyper-local context dependence*

In-venue apps can be very context-dependent, reactive to hyper-local factors like physical location, sensors, weather, shopper gender, store hours, etc., that can vary from one screen to the next.

- *Support for peripherals*

Interactive isn't just about the screen. Deployments may involve card readers for payment, barcode scanners for data lookup, printers for information sharing, and much more. Web/mobile apps are all about the screen.

- *High-availability*

Place-based deployments must perform reliably throughout the workday, potentially even 24 hours each day. This requires a rugged software infrastructure resilient to high volume, long-term use without the assumption that users will be able to refresh or restart the content.

- *User privacy/confidentiality*

As publicly accessible devices will serve multiple, independent people, there is an even greater responsibility to respect privacy and confidentiality requirements. Public installations must assume an opt-in posture vs. the more typical opt-out approach on the web and mobile.

- *Resilience in the face of network unreliability*

In-venue deployments typically require cloud connectivity to facilitate real-time updates but must also be resilient in the face of unreliable or infrequent network connections. As a result, the content and logic must be functional even while offline.

In-Venue Needs a No-Code Approach

As all aspects of our lives become digitized, modern audiences are increasingly empowered to control and configure those experiences. Everything from our thermostats to our vacuums have become "**app-ified**". In-venue digital content is no different, increasingly dependent upon user input to generate unique, contextual responses, not generic content pushed without regard for personal needs.

If an app-like approach is required for successful in-venue engagement, it too is ripe for attention from the no-code community. Unfortunately, the current no-code landscape cannot address the unique needs listed above. Meanwhile, traditional digital signage platforms (CMS) fall short as they were never intended to accommodate such a paradigm.

For example, consider how in-context responses depend on the notion of an event (the trigger) and reactions to that event (the actions). Some deployment needs are simple - e.g., when this button is pressed, play a video. Other scenarios can be deeply complex and interdependent with external services and data sources (think a QSR ordering app). **This programming-like approach far exceeds the ability of a traditional signage CMS.**

Another example is creative freedom. The starting point for a traditional signage CMS is almost always the selection of a prebuilt template, followed by building block selection. Unavoidably, the result is a cookie-cutter, good-enough user interface. **Successful audience engagement depends upon enabling creatives to break free from utilitarian layouts and create UIs with style and appeal.**

Currently, there is just one solution on the market that both claims to be a no-code platform while, at the same time, addresses all of the unique needs of in-venue deployment.

That solution is Intuiface.

Intuiface: The Ideal In-Venue No-Code Solution

We've reviewed the characteristics of a true no-code platform and have shown how in-venue deployments require their own fit-for-purpose no-code solution. **Is Intuiface the answer?**

Intuiface is a "no-code platform dedicated to the delivery of rich interactive digital experiences that connect audiences to place" (Here, a place-based "experience" represents the notion of an "app" that emphasizes engagement). Embedded within that value proposition is an embrace of the "*low barrier, high ceiling*" description shared earlier about top-end no-code options. **Let's take a look.**

Low Barrier

How does Intuiface lower the barrier to adoption, enabling even those with zero development experience to quickly create in-venue interactive digital content?

✓ *Drag and drop authoring*

Intuiface brings a Lego-like approach to UI creation. A wide array of visual and logical components can be combined in an infinite number of ways – using any storyboard or layout – ensuring the realization of every creative idea without compromise. There are no template restrictions or confinement to a prebuilt plug-in library.

✓ ***Broad media support***

Users control every single pixel of their design, including the ability to incorporate any image, video, document, 3D model, website, and more. Every output reflects the brand's unique characteristics and uniquely appeals to any audience.

✓ ***Platform-independent content creation***

Users can be ignorant of OS nuances, simply building their interactive digital content however they wish and then deploying it to the platform of their choice. Users can choose to run experiences either online or offline using operating systems like Windows, Android, iOS, BrightSign, and Samsung Tizen, or deploy those experiences as a website or as a mobile app.

✓ ***Simple deployment w/ scheduling***

Intuiface natively supports remote deployment, meaning users only need a web browser to push new or updated experiences to screens anywhere in the world. With flexible capabilities like scheduling and remote restart, Intuiface embeds the entirety of the traditional Dev/Ops domain, putting it entirely in the hands of the content creator.

✓ ***High performance***

Experiences run as if created using native-code languages and techniques. Responses will be in real-time, regardless of the chosen deployment option.

✓ ***Extensive support/educational resources***

Users can choose from a 12 course Academy, 400+ article online library, 70+ prebuilt sample experiences, 10+ webinars, and more, plus free access to a global-spanning Technical Support team.

High Ceiling

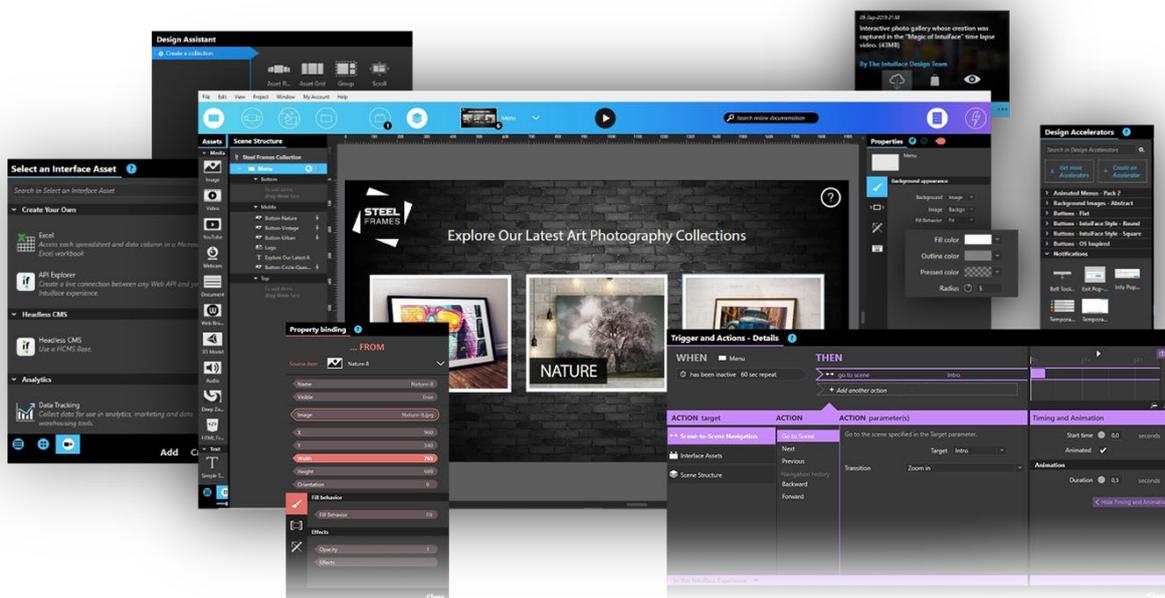
Enabling hour-one productivity is great, but the platform will be limited in its appeal if the output is limited in functionality.

Intuiface - Version 7 at the time this paper was published - combines 7+ years of R&D and feedback from a 1400+ customer base. It is a mature platform reflecting the needs of its (often non-technical) users while pushing the boundaries of what is possible and exploring new territories.

Everything listed below requires no programming knowledge or development background.

Visual programming

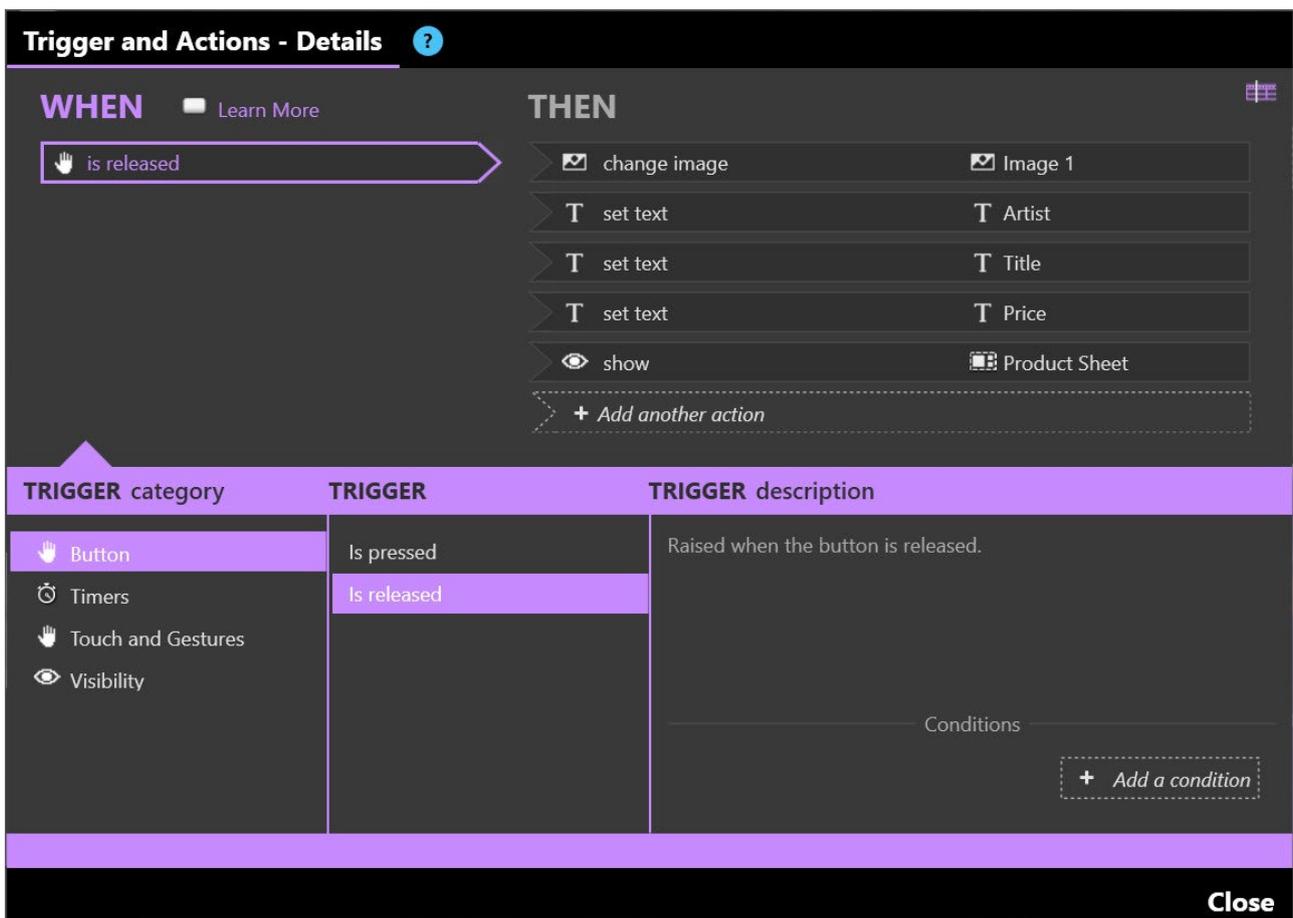
Critical for real-time human-machine interaction and real-time data processing is the ability to identify and react to events and store and process *information*. Intuiface has taken traditional developer-centric programming paradigms (plus [seven patents](#)) and made them available to the creative professional at an abstraction level that makes sense even to them.



Intuiface Composer, no-coding authoring of in-venue interactive digital experiences.

• **Triggers and Actions**

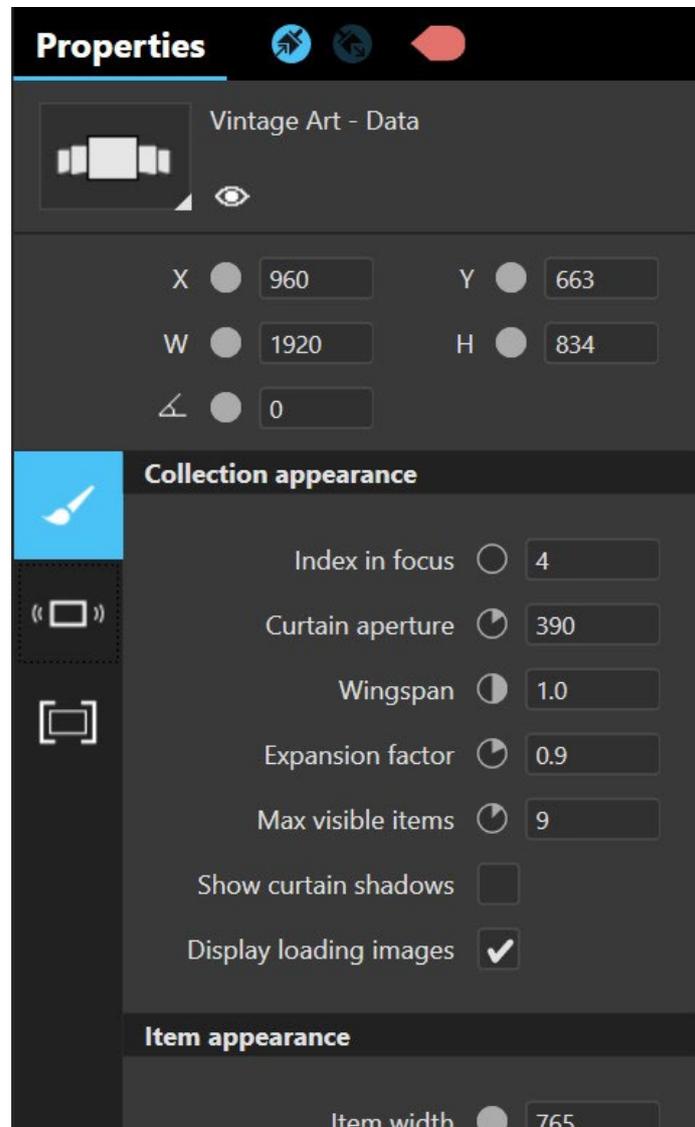
Events and responses to those events. Intuiface has built-in recognition of more than 200 triggers (e.g., when the button is pressed, when the video is stopped, when the webpage is loaded) and more than 200 actions (e.g., play the video, navigate to a new scene, rotate the 3D model). It can also be expanded to incorporate 3rd party triggers and actions through no-code integrations, plus the ability to sequence actions for complex responses. All of this is possible using an innovative UI that requires zero coding knowledge.



WHEN the "Learn More" button is pressed and released (the trigger), THEN change an image and some text in a product sheet, then show the product sheet (the action).

- **Properties**

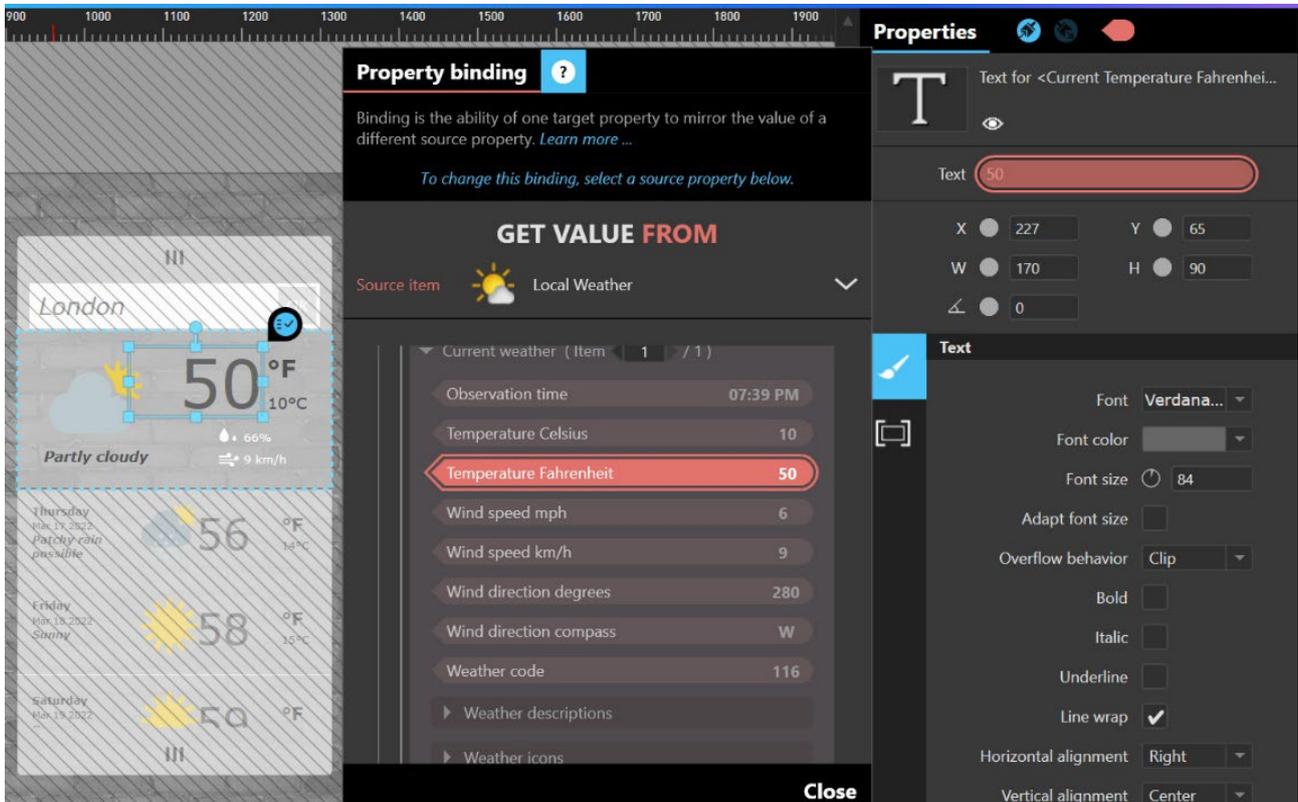
Value storage for everything from computation and animation to processing data entered by users via the app itself or an external process.



Configure and constrain every aspect of visual and functional elements within your design.

- **Binding**

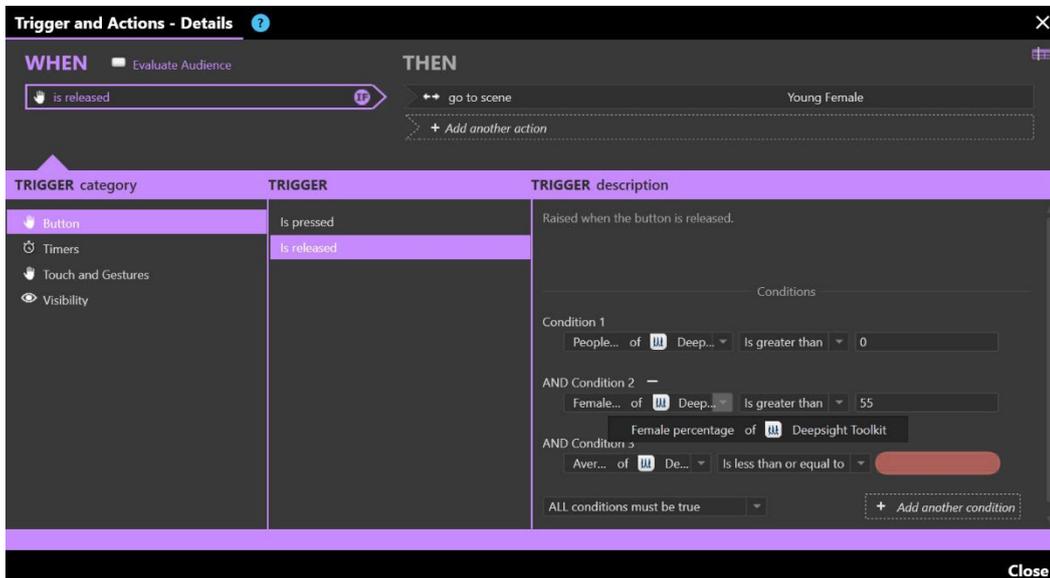
Mirroring of values between two or more properties, critical for (but not limited to) the real-time display of information stored outside of Intuiface. Includes the ability to manipulate the source value (e.g., add/subtract numbers, format text) before assignment to the target.



The temperature value in the design (on the left), stored in the property named "Text" (on the right) is coming from the "Temperature Fahrenheit" property of a third party weather API (middle).

- **Conditionals**

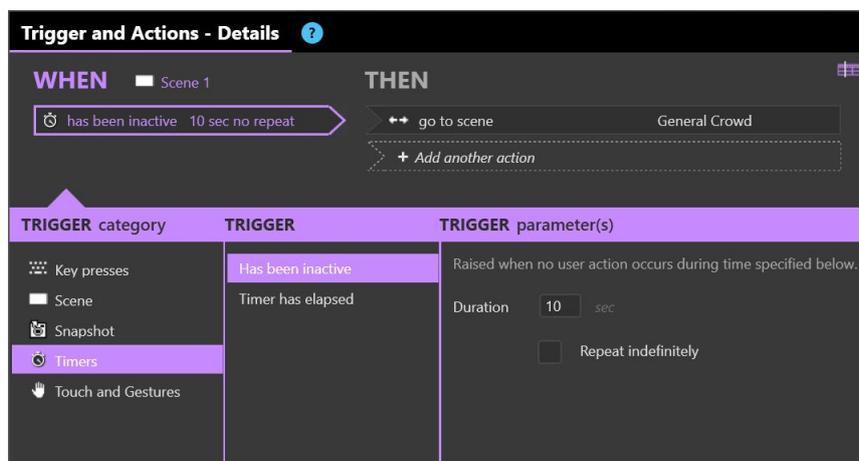
Familiar to developers as an IF statement, conditionals enable the construction of workflow logic with branches. Triggers are often conditionally based on contextual parameters – *e.g., if a woman is detected by the camera, if the value is greater than 500, if the time is after 5pm, etc.*



WHEN a button is pressed, evaluate the age and gender of the person in front of the camera. If that person is female and below a certain age, THEN navigate to the "Young Female" scene.

- **Timers**

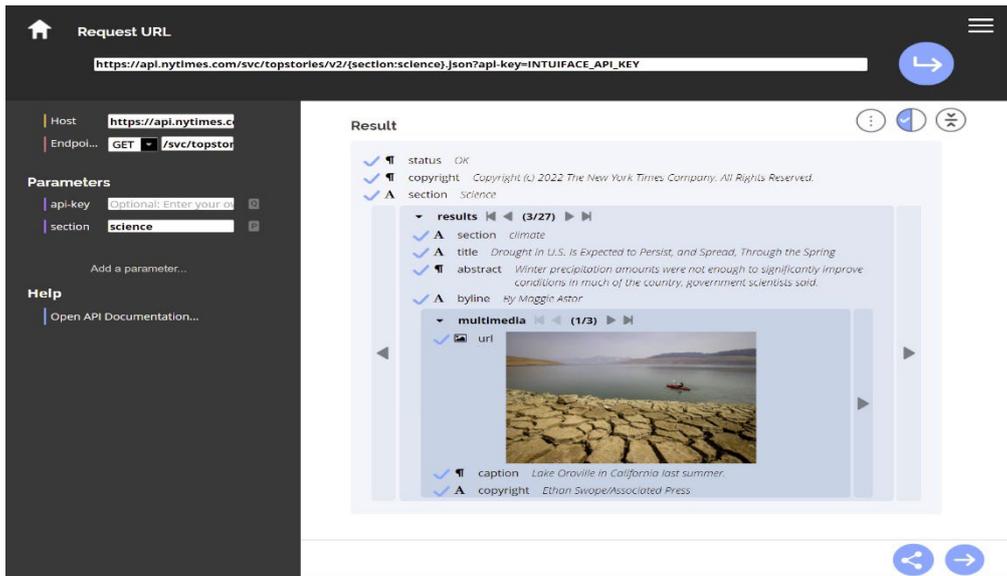
Using time limits as another trigger input. For example, if nothing has happened after 10 seconds, then navigate the experience back to the attract loop scene.



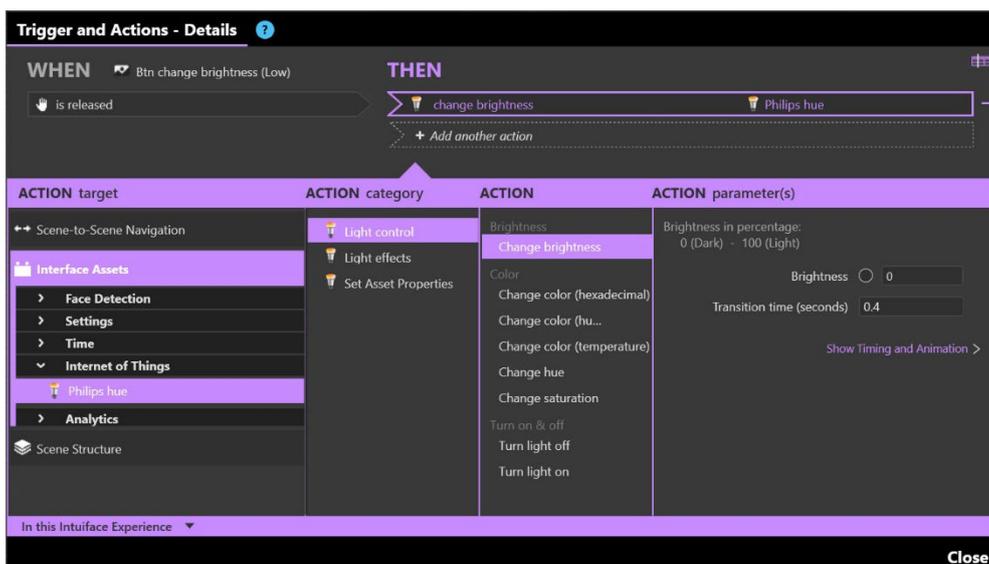
WHEN nothing has happened for 10 seconds, THEN navigate to the "General Crowd" scene, which exists to attract attention to the onscreen content.

Platform extensions

- Intuiface has a built-in utility - **API Explorer** - that can create real-time integrations with any Web API without having to write a line of code (for developers: it's like Postman for the creative). These integrations can apply to any data source, business logic, or device accessible in the cloud. It could be databases, back-office ERP applications, or objects among the internet-of-things. All can be incorporated in Intuiface experiences without any software development experience required.



Get the Request URL from a developer, enter it into API Explorer, and select the values in Results you'd like to display onscreen. No understanding of web services is required.



Control brightness and color of the Philips hue lightbulb. Philips hue uses a Web API so it's just as accessible to Intuiface as a back-office system wrapped in a Web API.

- This ability to work with external services isn't just limited to data. The same integrations make it possible to recognize external triggers or trigger external actions. Intuiface experiences are not black boxes and thus not limited to predefined in-product integrations.

" Beyond Touch" support

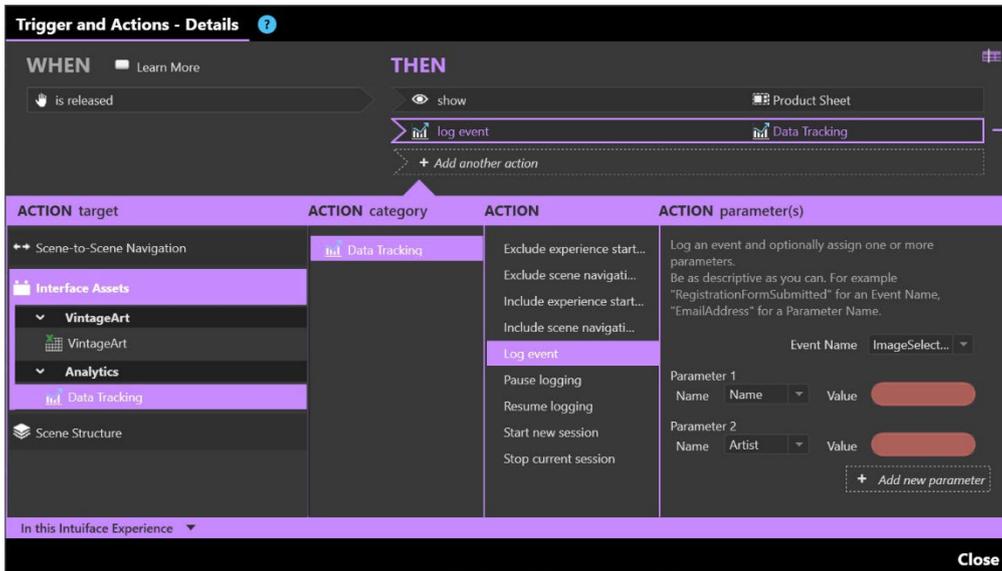
- In addition to touch, Intuiface also contains built-in support for audience-initiated communication like voice and gestures, plus support for computer vision, sensors, RFID/NFC, QR codes, and more. Apps can incorporate multiple modalities to satisfy the needs of any audience.

Additional Capability

Intuiface incorporates additional capability that brings additional value to the process of creating and assessing in-venue digital content.

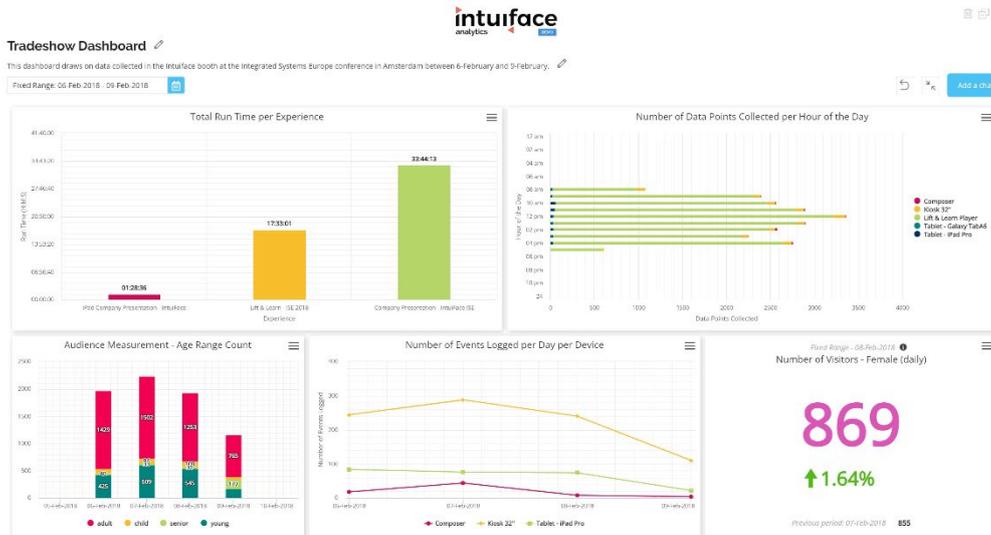
Analytics

- Intuiface supports both data collection at the endpoint and data visualization via a cloud-hosted, web-accessible chart creation and dashboard publishing capability.
- Data collection is passive, like fishing with a net. Data collection can be tied to specific events, ensuring collection of both the data you want and the context you need. And the specification of a data collection event is easy as it's just another action that any trigger can initiate.



WHEN the "Learn More" button is pressed, log the Name and Artist of the selected artwork. Later, we can chart the popularity of each work and artist over time.

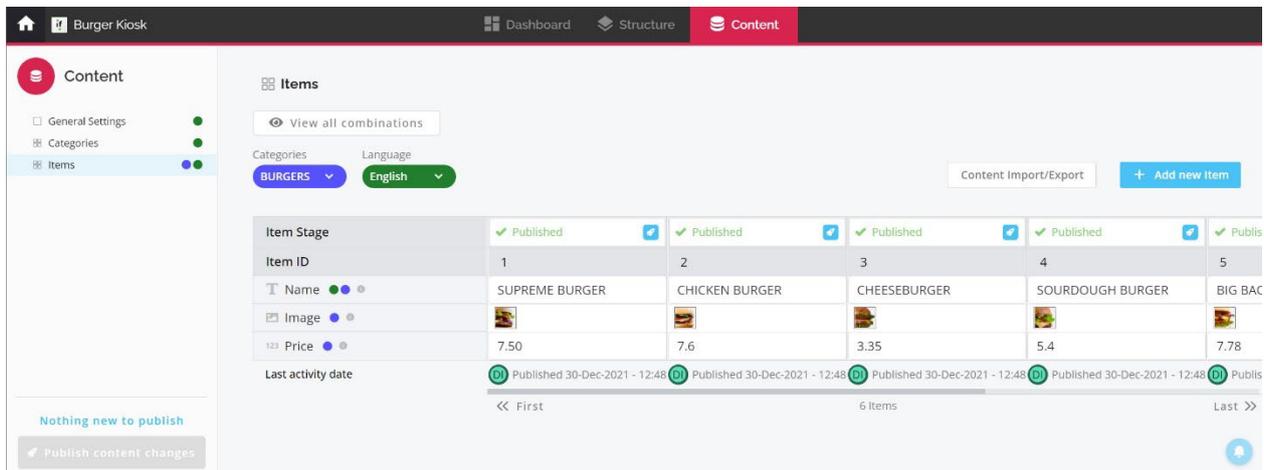
- More than 30 chart types with a built-in chart editor are easily created (without code) and then combined and published to web-hosted dashboards that update in real-time.



Dashboards are updated in real-time and can be accessed in any browser.

Content Management System

- Intuiface has a Headless CMS, meaning its content management system is design-independent, permitting even those with zero knowledge of the target user interface or even of Intuiface can manage the content consumed and displayed by a running experience.



No knowledge of the targeted UI is required. Content managers can just focus on what they know best.

- Intuiface is not limited to its own CMS – see the Platform Extension capability mentioned in the previous section – but the Headless CMS has advantages such as the creation of an automatically synchronized on-device data copy to speed performance and ensure resilience in the face of an unreliable network connection.

Integrations with other no-code solutions

- Intuiface has built-in support for process automation platforms like Zapier and IFTTT and information management solutions like Airtable.

Optional low-code extensions:

The inclusion of low-code options enables an already high ceiling to be pushed even higher. It may require some minor developer skills or contribution, but the coding effort is trivial and thus easily accomplished.

- With Intuiface's support for JavaScript and .NET, it is possible to interface with local peripherals or applications that are not accessible via Web APIs.
- JavaScript support is also available for manipulation of content accessed through binding (see the High Barrier section above).
- Intuiface permits HTML5/CSS/JavaScript to be embedded when the targeted functionality is not achievable with existing Intuiface components.

Conclusion

As noted previously, the no-code market is expected to grow at 23% year-over-year, and that is without any attention paid to the in-venue market. As we've seen, the in-venue opportunity is sufficiently unique to require dedicated platforms embracing a no-code approach.

Intuiface was conceived to provide non-developers with a means for creating sophisticated interactive digital content for audience engagement. Patented expertise in both interactivity and no-code techniques has fed a platform now used in 70+ countries and among 1400+ agencies, integrators, and enterprises.

In-venue targets typically inspire experiences created with Intuiface, but the content can also be freed from the venue and pushed to the web or installed as a mobile app. Thus, harking back to the Vendor Landscape presented above, Intuiface should be considered "App builders, in-venue-first", but it can also accommodate web-first and mobile-first needs. This means building it once then deploying everywhere as needed. For example, repurposing a curated exhibit onto a museum's website.



Intuiface is a unique – and uniquely powerful – no-code solution that brings the venue to business professionals who know their audience and just need the tools to serve them.