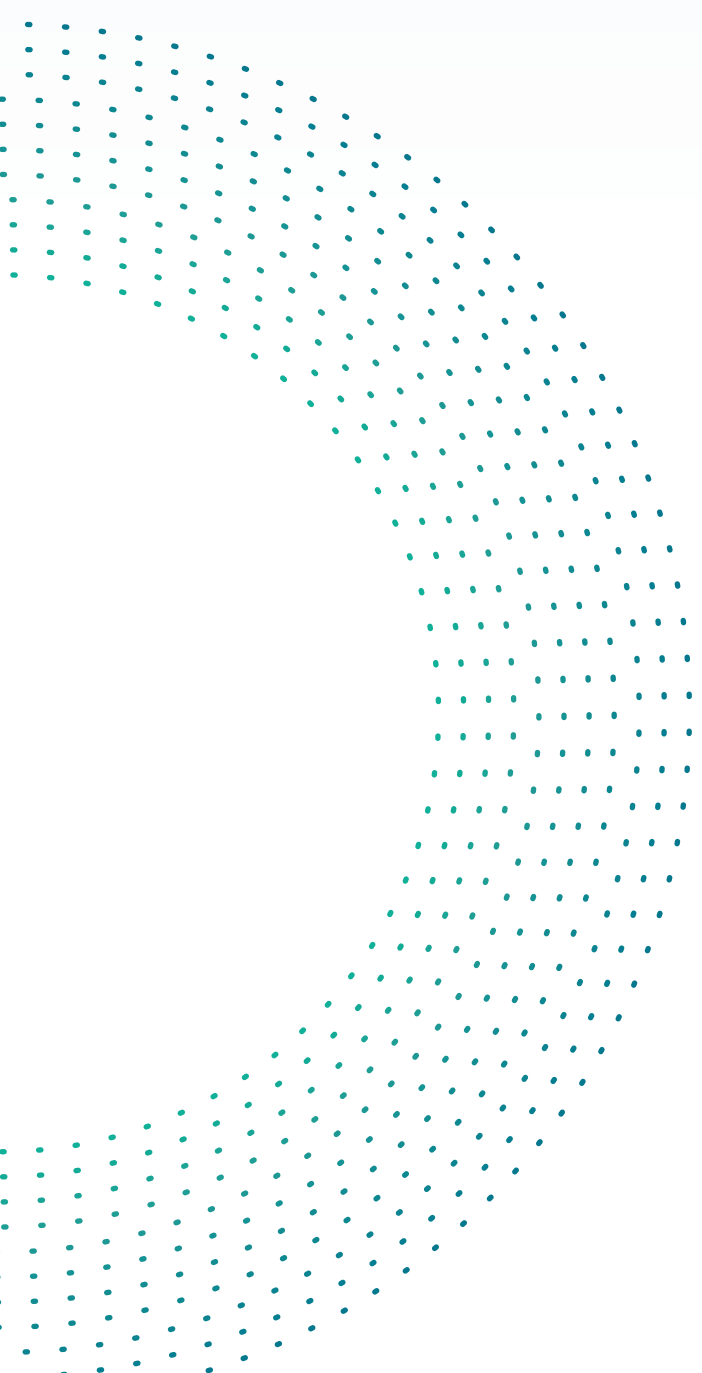




2021-2022  
**Graphical User Interface  
Global Trends Report**



# 2020

was an extraordinary year.

The world will feel the impact of the COVID-19 pandemic for years, probably decades, to come. Still, we continue to learn lessons from the coronavirus and beyond about how to address the needs of an ever-changing world—and we are implementing new innovations to our digital technologies to address those needs.

Wherever technology and people meet, there must be a control interface. Those interfaces are essentially where people meet products. Graphical User Interface (GUI) design is the most important and interesting facet of technology evolution. Keeping pace with this innovative field requires our constant attention.

Altia, the global leader in GUI design and development software and services, conducted a study of industry trends to measure the state of user interface development. The following report details the five top insights from this research that we collected from embedded GUI experts all around the world.

## Smarter equipment, smarter GUIs

Vehicles, appliances and devices are becoming exponentially smarter, which means GUI design is quickly evolving. People want to work less, yet understand more as they operate a product. Connectivity between devices is now the default and the expected. The era of constant, holistic and deep integration is here, not only to make the user experience easier, but also to make life easier all around.

People are interacting with dozens of GUIs every day, at home, at work and everywhere in between. Lines are blurring between devices. Data sharing is becoming commonplace among disparate platforms and equipment.

### Major Themes:

- > Autonomous driving technology will turn vehicles into “mobile phones that transport.” Augmented reality is also becoming a major feature in driver and passenger systems.
- > Colorful, feature-rich graphical displays will become part of most home appliances.
- > Smart technology will permeate agricultural and construction equipment through sensors, tracking devices, drones and Augmented Reality (AR) are all supporting precision excavation.
- > GUIs in smart home devices will soon evolve as well. “Holographic Alexa” interfaces may soon connect everything from entertainment systems to refrigerators and lighting.



TREND

# 2

## Deeply intuitive GUIs

With expectations defined by the latest smartphones, users have little patience for slow, confusing or even ugly interfaces. Market demand for intuitive, easy-to-use GUIs is on the rise. This demand will only increase with the integration of Google, Apple and even Amazon in the automobile industry—the bar for exceptional GUIs will rise to unprecedented levels.

The capability for consumers to choose how they interact with their devices is dictating the design for multiple interaction modes with modern embedded GUIs. While some people prefer voice control, others want haptic or visual interfaces. Most people will want to use the variety of modes simultaneously and interchangeably. Regardless of the mode or form, the expectation is the same: technology must meet user needs before the person even has to think.

### Major Themes:

- > Multimodal GUIs will allow users to improve their experience and increase productivity.
- > Users will operate products in different ways, under different contexts. Combinations of visual GUI, voice (Alexa/Siri/Google Assistant), touchscreen and air gesturing will provide maximum flexibility.
- > Safety and reliability are becoming essential requirements. Some GUIs or GUI elements, particularly in automobiles and medical devices, are mission-critical—they simply cannot fail.
- > Manufacturers must work with software that has functional safety capabilities. Process-specific software development plus software double-checks, like those in Altia Safety Monitor, will be mandatory.

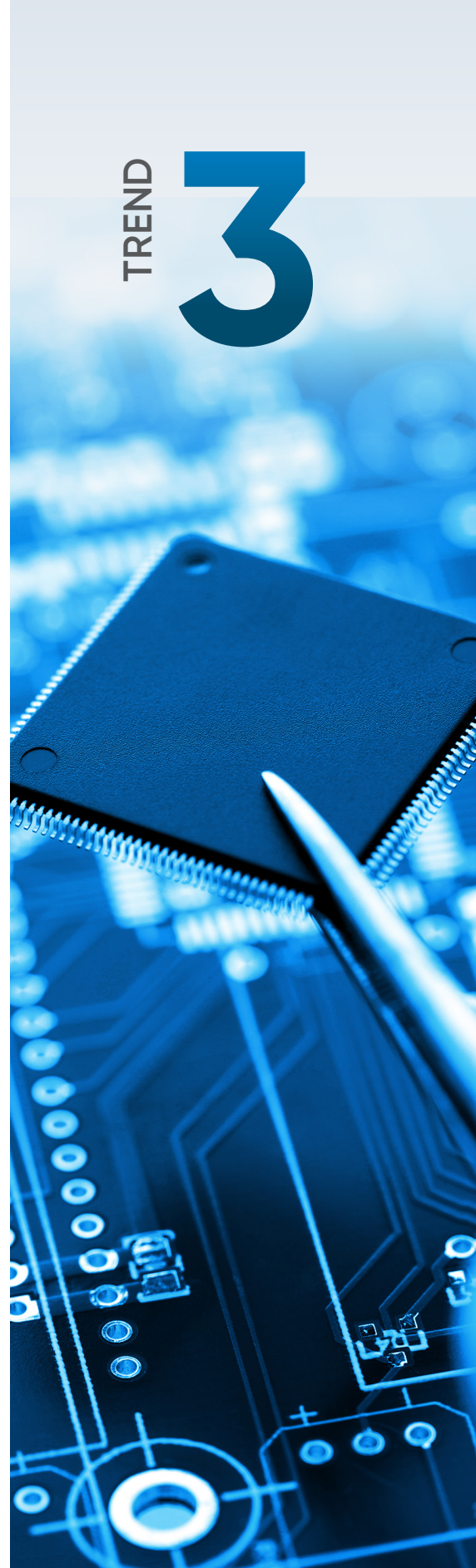
## Designed-in hardware flexibility and low power consumption

Among the untold number of ways COVID-19 has disrupted the world, the pandemic along with other global events, created a chip shortage that forced manufacturers to move to alternative microchips. Part of the shift is due to the need for chips with lower power consumption, which equals lower cost. The post-pandemic microprocessor shortage also disrupted supplies, forcing companies to look for greater hardware flexibility.

When a particular semiconductor is low in inventory or no longer available, manufacturers need to change up hardware quickly—sometimes in mid-production. As a result, GUI designs will need to be agile and adaptable to the environment beneath to reflect market and supply realities.

### Major Themes:

- > Power utilization is becoming a critical design consideration, especially for electric vehicles and medical devices.
- > Manufacturers are seeking greater flexibility in their microchip supply chains.
- > GUI designs will need to be not only hardware agnostic in the future, but also beautiful and functional.
- > GUI development software—like Altia Design GUI editor and DeepScreen code generator—will be needed to support quick changes from one chip to another.



TREND

# 4



## Broader design teams

Gone are the days when GUIs were designed at a couple of workstations by one or two people. Design teams are becoming larger, more diverse and more geographically dispersed.

GUI designs today involve User Interface/User Experience (UI/UX), graphic design, software engineering, marketing, quality/safety, automated testing and more. Teams are often assembled in multiple locations worldwide, with designs progressing 24/7. Collaboration among members is critical to ensure that milestones are met, and time-to-market is minimized.

GUI engineers are increasingly involved with writing Artificial Intelligence (AI) to assist renderers in generating smart code. Placed between design, software and hardware, they will be writing the interface layers to various new technologies to make functional design easier.

### Major Themes:

- > The focus in GUI design is quickly shifting from software to marketing, as user experience takes center stage as a product attribute.
- > Due to a mid to long-range shortage of coders and GUI experts, manufacturers are leveraging a low-code/no-code, model-based development approach.
- > Designers are increasingly looking for tools that quickly convert designs to production code before leaving the studio.
- > New roles are emerging: application engineers, user experience experts, process optimizer and others, with the intention to represent the end-user while enabling faster production cycles.

## Connected, agile design tools

The global nature of GUI design teams is driving a new generation of cloud-based, collaborative design tools. Solution agility is becoming more important as well, as manufacturers look for capabilities like more GUI on less chip, plus Over-The-Air (OTA) capabilities to support remote, on-demand GUI updates on products in the field.

Ultimately, future GUI design will be driven by both efficiency and cost—factors that favor low-footprint code and an agnostic target chip approach.

### Major Themes:

- > With more professionals contributing to designs than ever before, cloud-based platforms will allow teams to share ideas and designs seamlessly, anywhere in the world.
- > Tools will allow manufacturers to deploy more uniform GUIs across their products. OTA updates will enable GUIs to evolve, adapting to new features and innovations.
- > Following imperatives for chip flexibility, tools will allow manufacturers to quickly shift GUI designs from one hardware target to another.
- > Low-footprint code will be essential to meet demands for both agility and cost.





**Altia design tools address the full spectrum of GUI development, from concept to final product code.**

Used by many of the world's largest manufacturers in the automotive, consumer product, construction, agriculture and medical device categories, Altia tools lead the industry for innovation and productivity.

Contact Altia today to learn more about our full range of products and services at [www.altia.com](http://www.altia.com) or [info@altia.com](mailto:info@altia.com).



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