Been There, Done That, Bounced Back:

Lessons Learned
from Embedded GUI Disasters
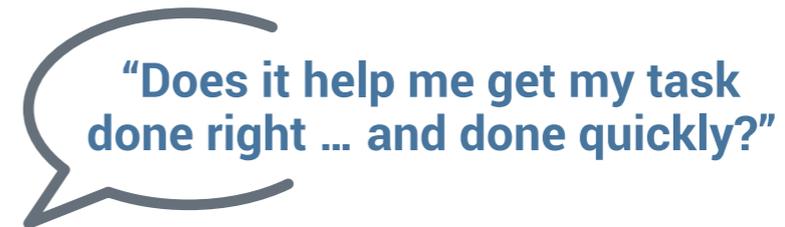
"Is it attractive?"

"Is it easy to use?"

"Does it help me get my task done right … and done quickly?"

These days, the graphical user interface is a crucial element of any electronic device. From coffee machines to washing machines, from automotive dashboards to state-of-the-art medical devices, the GUI is not only where the user meets your product for the first time, but it's also what forms the user's lasting impression about your product.

As important as the GUI is to a product, we all know that not all user interfaces are created equally...or well. There is much that can go wrong during concept and design development – and there are many examples out in the market today of great GUI concepts gone horribly wrong.

Perhaps you belong to one of those development teams who took the embedded GUI plunge, only to deliver a complete dud? Perhaps you're cringing at the thought of embedded GUI project 2.0?

The truth is that you MUST move forward. There's no going back to your old style interface because in today's competitive marketplace a 1990's style device just won't sell.

The good news? You're not alone – other companies have made the same mistakes with their own GUIs.

The best news? You've just found a resource to get you through to your next GUI, your GREAT GUI. **Check out these eight lessons learned by companies just like yours who bounced back from GUI failure to achieve GUI success.**

1 Keep It Simple

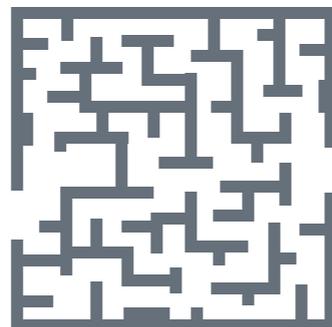Although it sounds obvious, a simple user interface is the key to success.

Before taking the plunge, ask yourself which GUI elements are truly necessary.

Sure, your product is full of great features and functionality. That's what makes your product stand out from the rest, right? So of course, it's tempting to give your customer access to everything on the first screen.

Don't do it! Avoid cluttering your GUI with excessive buttons, tabs, and extraneous elements. You'll only inspire user confusion or rejection.

If it isn't critical to the function of a specific screen, leave it out. Plan to present the simplest, most common options – but arrange for quick access to those features that make your product shine.

Besides being critical to user acceptance, **simplicity** is also required to handle the extreme memory and performance constraints of the typical embedded system. There's no space, bandwidth or money for extra screens, extraneous features and overblown UI concepts that rarely get used. Get rid of them! In addition to pleasing your users, you'll also earn the applause of your software, hardware and accounting teams.
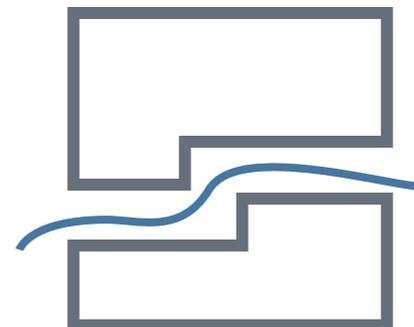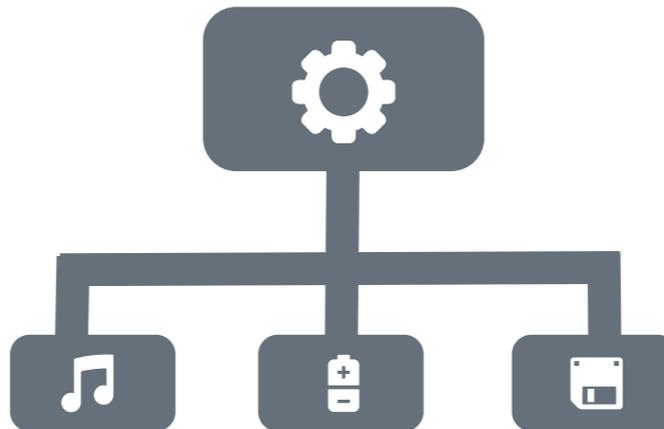
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Keep It Organized and Obvious

Creating an over-the-top GUI with dramatic design can be really tempting. BUT users do not like things they do not understand. Cool-looking buttons that offer no clear purpose are not good options.

Make things clear. Make things organized. **Clarity is massively important to the success of any GUI.** The GUI should allow users to complete their task quickly … period.

Organize the interface in a sensible, logical way. Make the preferred actions of each page abundantly clear. Maintain logical context to improve the UI experience. Users prefer to have elements in logical places. They do not want to hunt for them.

When attempting to keep an interface simple, some designers feel the need to explain everything via dialog boxes. Bad move. This increases data mass which slows down your UI and overwhelms the user.

It may be beneficial to explain some things to the user, but **keep it short.** The point of a user interface is to allow someone to easily interact with a device. They shouldn't have to spend time reading usability information. In the fast-paced digital age, people lack patience, and every second matters to them.

3 Make it Comfortable

Every GUI development team in the world harbors a secret desire to be the next groundbreaker. But there is such a thing as over-innovation – and over-innovation can spell disaster for your product.

Don't reinvent the familiar. People don't like surprises in their GUIs. They don't want to learn how to use your product's GUI, especially if there is another simpler model already out on the market.

Give users elements that they already understand, so that they know what to expect. We're not suggesting that you steal iconic images or features of well-known interfaces. **Be unique and give your interface its own voice and style, but incorporate familiar icons and functionality into your GUI so that your users can pick up your product and go.**

Remember, the GUI is a supporting player of the product. It's more effective when it is NOT noticed, versus trying to upstage the real reason people buy the product. In the end, they want their laundry done as fast as possible. They don't want to build a time-consuming relationship with their washing machine's GUI.
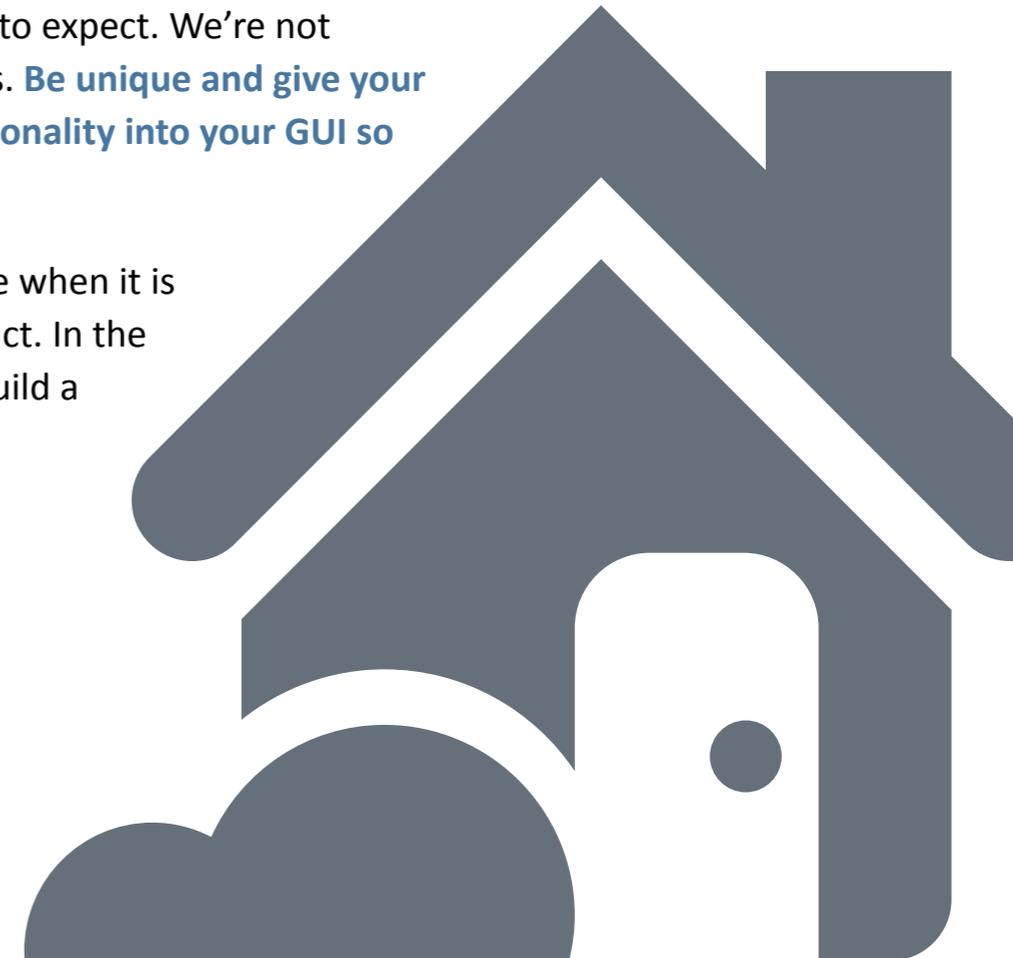
4 Be Consistent

Consistency is a crucial factor in successful GUI designs. Maintain the same visual language throughout so that you don't confuse the user – and you provide them with a cohesive, straightforward, effortless experience.

By visual language, we're talking about **layouts, format, typography, color, texture, imagery, sequencing, and sounds.** Sticking with a single representation of your menu item or function throughout your GUI screens is crucial for keeping your user informed, happy and on task.
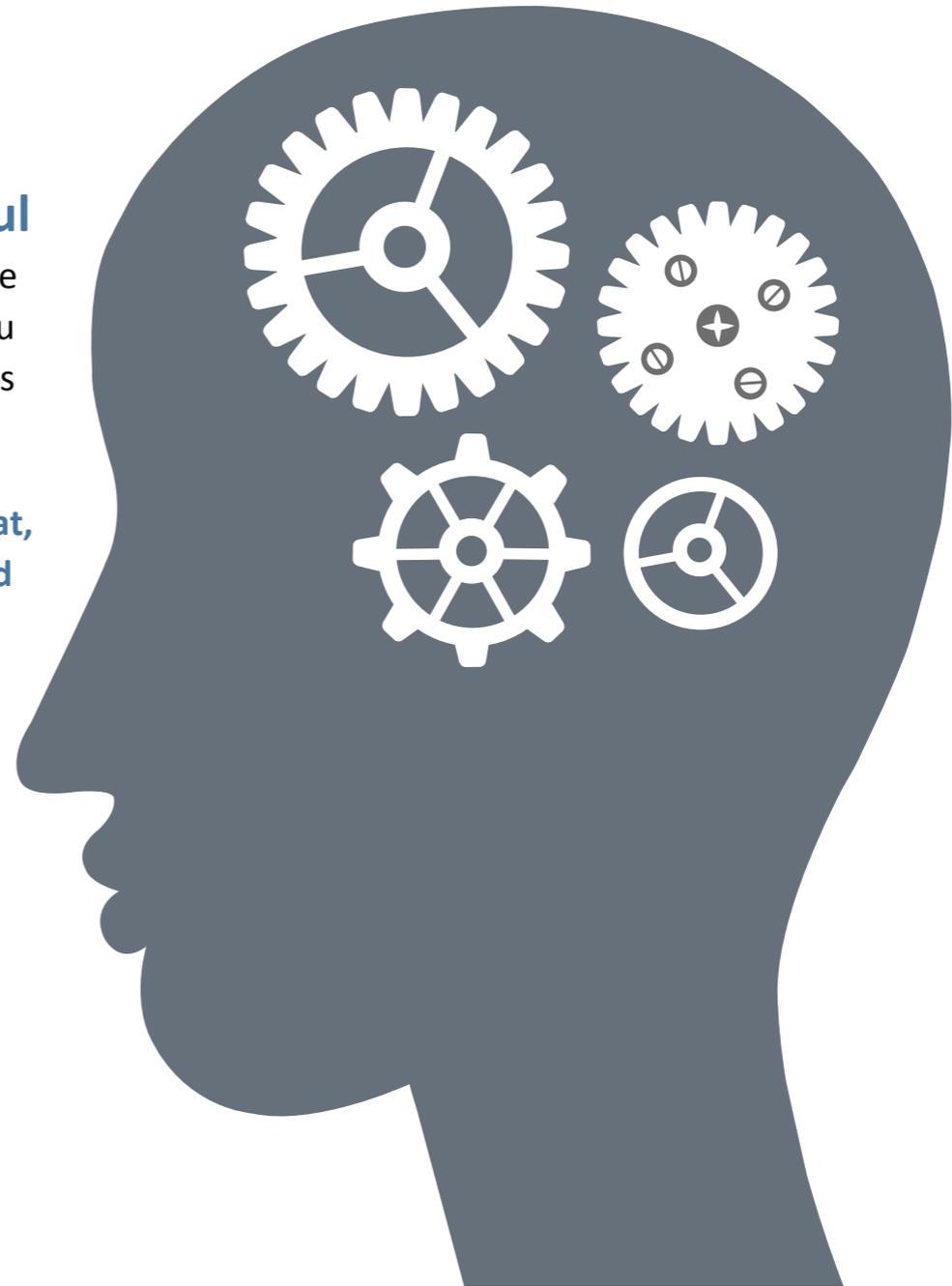
5 Consider Worldwide Users

We're designing for a global marketplace these days. With that in mind, it makes sense to be sensitive to how well your GUI will serve a user who doesn't speak your language.

Make sure to allow enough time for the development of icons.

Why? A picture can speak a thousand words – or the same word in a thousand different languages. Icons offers greater simplicity to your display, as well as savings on memory and translation requirements.

Coming up with symbols for your various concepts can be a challenge. But the time you put in for this purpose is well-rewarded with what you save on translations, space to hold text and memory to hold characters from multiple language font sets.

There will be cases where a symbol just cannot convey your meaning; text is your only viable option. It's wise to plan in advance for how you will handle these situations – especially your need for internationalization.

With proper planning and the right GUI development process, one device can have software to support internationalization. Simply architect your text labels so that they may be dynamically replaced...and prepare for world domination!

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6 Focus on the User's Goals, Not Your Company's Goals

The opportunity to reinvent your product (or create a new product from the ground up!) does not come around often – so a clear understanding about what features should go into your GUI is crucial. Marketing will have one set of demands; your Executive team will have another. But before you hit the drawing board, there's an even more important list of wants for your product that should take priority over any other – **the wants of your user.**

Consider your ideal user – whether it be a busy mom or dad doing laundry or a driver who wants to change the radio station while driving down the highway.

Spend some time with users in typical use cases for your product to help you map out the most common tasks they'll perform with your product. Walk through scenarios that separately consider tasks performed by new users, power users, everyday users and occasional users. Keep these as prioritized list and then create a weighted blend that best accommodates all of your target audiences.

Deciding how to address such disparate needs is not easy – and you most certainly can't do it all on one screen. Keep in mind that one of the strengths of a virtual screen is that you can let users customize the interface to their needs. They can tell you what type of user they are so that you can tailor their experience.
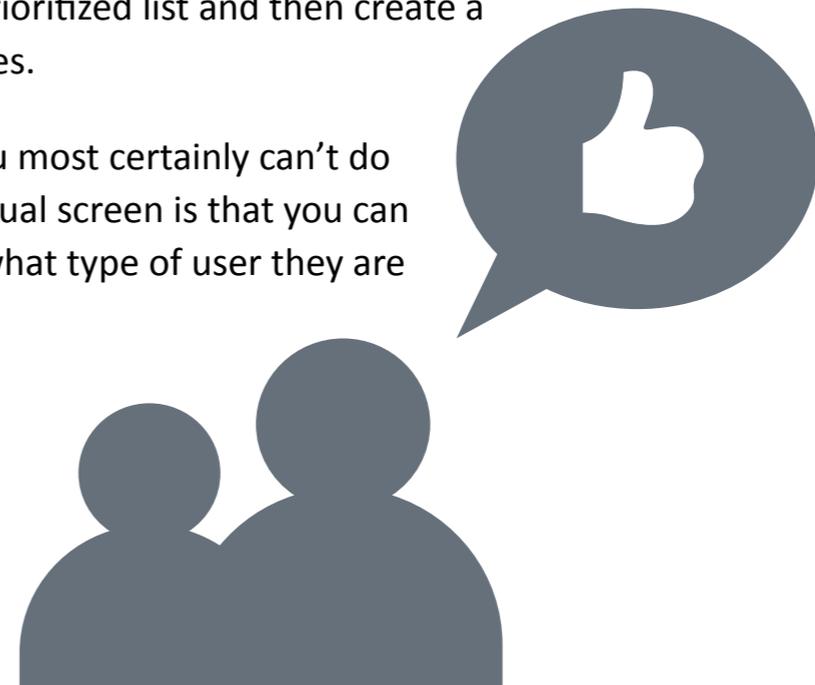
7   Test Users Often

How will you know if your customers will like your product unless you ask them? So let them try it out!

The best way to deliver a great GUI is to test it often – starting as early as possible. The best way to do this is to **simulate your GUI with a model-based development tool.**

In many cases the backend logic that controls your product functionality is already available – so use it! Connect your GUI to the logic; then let your customers and managers try it out...early and often.

This practice can be incredibly powerful. You're working with near-production code for graphics and behavior before the production hardware is even ready. **Taking that GUI for a test drive gives you the chance to get valuable, actionable feedback that you can implement back into your interface before it hits the market.** With this method, you are not locked into expensive hardware; you are just moving pixels around your simulation model until you get it right.

8 Require Instant Input Responsiveness

Whatever the purpose of your user interface, it must be as responsive as possible or your customers will get frustrated and your product will ultimately fail.

You know how frustrating it is to use a GUI that consistently lags and doesn't always respond to your touch or takes ages to load an app, page, or program. **A successful GUI is quick,** with a fast interface load time. That GUI must also reliably and predictably respond to the user every single time, without fail.

Modern GUIs – full of colorful animation and cool transitions – can be computationally expensive. Finding the hardware to support rich displays with the speed that is needed might just blow your engineering budget. It's easy to get management to agree to flashy graphics and animation. Getting them to agree to a BOM that includes a multi-GHz processor with gigabytes of memory is less so.

Strike a balance between display size, animation and color depth and the hardware that drives it. **Keep an eye on how your hardware responds to the demands of your GUI by generating graphics code early in development and testing on your target hardware.** By making adjustments to your GUI design based on your findings, you'll be able to strike a happy balance between your new GUI and your hardware.
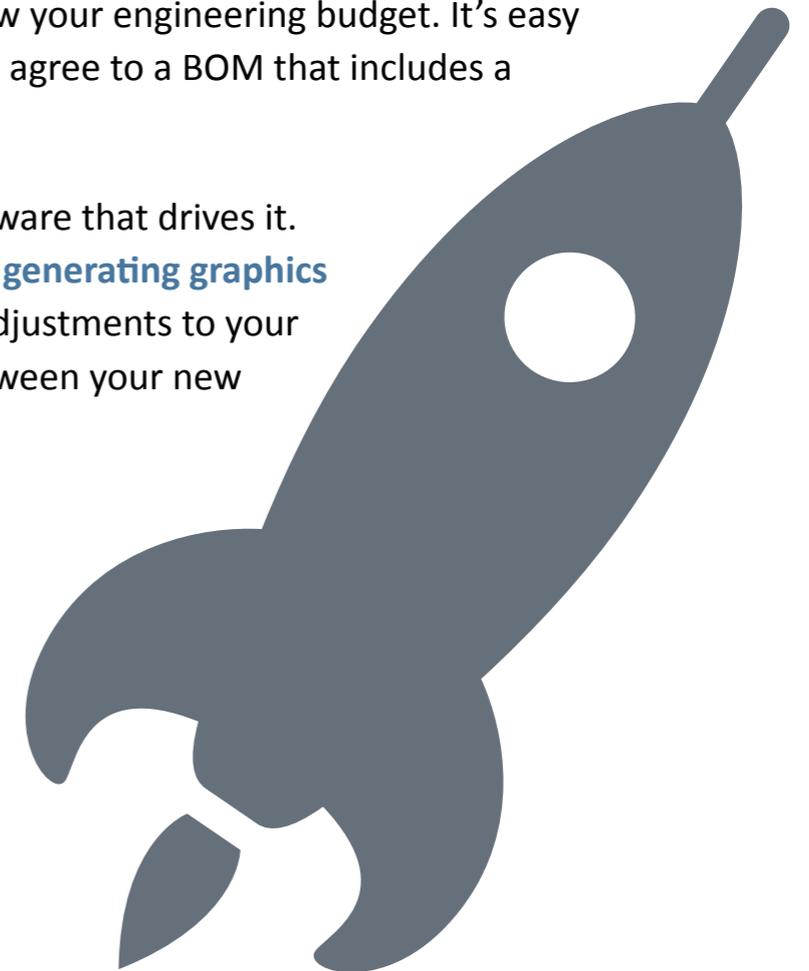
Need Help? We're Here.

A new GUI is an entirely new way to engage customers. A well-executed, intuitive GUI can deliver the kind of experience that converts customers for the long haul.

Designing a GUI isn't simple ... but with a clear focus on your user, great design and product performance, you and your team are on the right track.

How do you fast track your GUI – and your company – to market leadership? **Contact Altia.**

Companies in the automotive, medical, home appliance, consumer device and industrial industries all over the world have used Altia's GUI development tools and services to get first rate user interfaces into production embedded devices. Contact our team of user interface experts to discuss the goals for your next product user interface and learn how Altia can help.

Your next great GUI is waiting!

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