

The Gadget Talk

Whether you are tech savvy or not, one can't imagine using any technology unless its user interface is easy to use. Read on to find out what goes into the making of a good user interface...

Using a smartphone, a tablet or a smart flat panel wouldn't have been enjoyable if they lacked ease of use. The easy usability comes from the user interface (UI), better known as Graphic User Interface (GUI). A GUI makes the user's life easy, but designing it is an entirely different ball game and we were curious to know how it is created. So we had our queries answered by Satish Patil, the chief designer of Tata Elxsi.

User Interface is the way a user communicates with the electronic gadget or system. Could you tell us how important this relation is and how important it is to make sure the user has a best possible experience while using the product?

With technology is getting more democratised, consumers across age-groups and diverse social backgrounds have access to multiple electronic devices like cell phones, ATMs, set-top boxes, BP measuring devices, check-in kiosks, vending machines etc in their homes and public places. Though technology is becoming accessible, it's still a challenge for people to effectively benefit from it, due to lack of adaptation/humanization. Therefore, it's imperative

for organisations to design devices with UIs which are simple, intuitive and user-friendly. A good user experiences is the single most important attribute that separates successful products from rest of the crowd.

Tata Elxsi's software has been incorporated into different set-top boxes, digital TV's, mobile phones, and automobile infotainment. So could you enlighten us as to how challenging and different each category is when it comes to designing the interface?

Designing embedded product user experience is very different from designing PC/web-based applications. In case of embedded products, consumers interact with the HMI in many different ways, as each device would have different type of controls, input mechanism and means to display information. For e.g., you can use your camera with the help of physical controls and touch-screen display but you will interact with your TV using remote control. So, let us take the example of TV in our drawing room. With the recent government policies put in place, within few years every Indian household will have set-top boxes instead of cable transmission. This calls for designing simple, easy to understand applications which everyone can access using their



Satish Patil
Chief Designer, Tata Elxsi

remote controls across the vast majority of bottom of pyramid.

At the other end smartTVs are finding their ways in middle and affluent class of homes alike. It's therefore important that smartTV apps are designed in such a way that they resonate with the Indian customers. Call it, localising apps for attracting more customers. For eg: In western countries, online dating apps are more popular whereas in India a matrimony application or a match-making app as a smart TV application turns out to be better proposition.

Similarly when we look at automotive world, convergence is the current trend. The ever-connected consumers of today increasingly seek to access phone, music, mails or get a Facebook update inside their cars effectively. Also, cars today are becoming very sophisticated electronic devices incorporating much digital functionality for driver assistance, comfort and better overall efficiency. It's a big challenge for design community to design exciting Automotive HMIs, keeping safety requirements in mind, and still succeeding to create a "Wow" effect that brands want to achieve.

Tata Elxsi's UX Design team is helping many Automotive OEMs and Tier I suppliers globally to do just that. Over the last three to four years, Tata Elxsi has designed many Concept Car HMIs showing futuristic visions and design solutions which were being displayed in Auto shows and consumer electronics shows globally. Also, our cross domain experience of communication, Media and App development helps us evolve better integrated automotive HMI Solutions for our clients.

How long does it take to design a UI for a particular product?

It's tough to define generic timeline for UI design across the board as it depends on the domain, complexity of the device and nature of design activities involved. Typical activities include consumer studies, information architecture, navigation and task flows, visual design and prototyping at various stages. It can take you anywhere from four to six months to do this. This would be followed by release of detailed design specifications, pixel guides and behaviour documents to assist the development team. Design team would interact with development engineers throughout the implementation process to make sure that original design intent is not diluted. Having said this, there is nothing more fatal than squeezing the conceptualisation time to meet the

launch deadline for the products, as you run a major risk of getting something in market with poor user experience.

What are the different elements that one must consider while designing a good UI?

Designing a good UI calls for deeper understanding of the user, the environment in which the systems are operating and underlying technology itself. These three aspects together are the key influencers while designing good user Interface.

At an emotional level, it is vital to understand the socio-cultural, educational backgrounds of users. Additionally from a functional perspective, it is important to evaluate aspects like anthropometric considerations, vision, etc to map their ability/ inability to access the interfaces. Many people are colour blind and cannot differentiate between certain colours, which needs to be critically looked at for certain applications. It is also important to study the environment and the gadgets that are being used. Whether it's indoor application/outdoor application, level of lighting or dust and other environmental conditions significantly influence the design of user interface. For instance, to design a mobile device for a courier services company to track deliveries, it's vital that UI should be of high contrast so that it can be used under direct sunlight as it might be the case many times.

Lastly, designers need to account for underlying hardware/software constraints itself, such as onboard computing power, overall form factor, display specifications ability to handle colours and graphics. Increasingly same applications are being used across multiple form factors/devices thus it's vital to design these applications to run smoothly on all of them.

How do you decide as to what colour scheme and other factors will work for a particular product? Like for

instance, with smartphones how do you shortlist a particular colour for the homescreen and other menus?

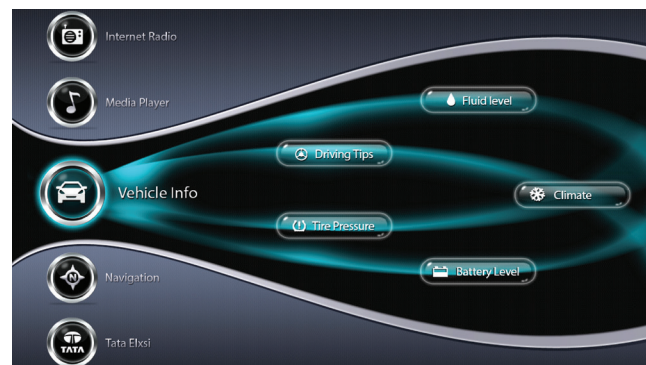
Visual design is one core part of user experience, which showcases the customers' brand to the world. Thus it's essential that style, colour, theme, iconography used reflects the brand essence. The user experience of the product is also the manifestation of the brand itself. With ever-increasing complexities in applications, it's vital to strike right balance between visual exuberance and functional aspects of graphics. Also, the visual design elements used must functionally contribute to overall user experience, by making sure it meets requirements of visual ergonomics, legibility, appropriate colour balances and contrasts etc. Throughout the application, appropriate use of colour is necessary to show various states, attributes, and elements defining consistent visual grammar. Similarly, effective iconography is the key to successfully communicate with users.

Multiscreen platforms like set-top boxes connected TVs, smartphones, tablets, media players, HTML5, Microsoft Silverlight and so on are constantly changing. How do you manage to keep trace of the changing times and demand?

Yes, it is challenging to keep pace with ever changing technologies. However, Tata Elxsi's UX and research team constantly study the trends and changing use-case scenarios brought about by the changing technology. It also helps to have close synergy of UX designers and engineering teams as they continue to build various technology demonstrators jointly. They constantly follow emerging trends in technology, be it explosion of possibilities in cloud computing or "Responsive Design", which enables application to be



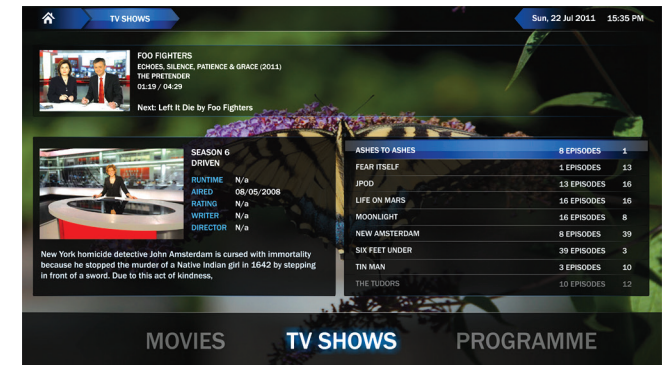
Design Of Digital Instrument Cluster



Car Infotainment Solution By Tata Elxsi at CES 2013



User Interface Design For Portable Media Player



Android-based STB Application

designed for multiple form factors.

When designing an interface for a product is there only one design that is worked out or different prototypes are created at the same time?

Most of the time the “Funnel Approach” is adopted, which means in early design cycle, designers explore multiple ideas for navigation and workflows. These ideas are typically tested with quick low fidelity prototypes with various stakeholders. Once the functional design is finalised, two to three visual design prototypes are created based on identified themes to showcase all aspects of user experience such as overall look and feel, transitions and animations etc. Based on these concepts, final design solutions are shortlisted..

Is there any real world testing done with the prototypes that are created by the company? If, yes, then how are they conducted and what is the general feedback?

Usability studies are integral part of overall UX design process. It is carried out in different context at different phases of design process. For instance, while redesigning existing applications, usability studies with actual users are conducted to get feedback about existing system, identify the pain points and area of improvements. Similarly, during the design process, once we have multiple design concepts, limited functionality mock ups are tested with multiple users to let them explore the overall UX. To conduct these tests, users are asked to perform certain specified tasks and researchers interact with them later to decipher the experience. In addition to this, eye tracking studies can be done to evaluate the layouts and workflows based on the analysis of eye movement during the test. Depending on the feedback of these user studies, final design solutions and refinements are identified and executed.

Tata Elxsi has developed products for many home-entertainment and consumer brands in the past. Are there more home-entertainment brands that have got in touch with you to design interfaces for their products?

We work with some of the top consumer electronics brands in India and across the globe. With India

Tata Elxsi’s design & engineering team has designed and developed several innovative solutions across categories.

becoming one of the most important markets globally, there is rush from global players to design products specific to India and other emerging markets. We have been assisting them with research and specific India Entry Strategies. More specifically, we are helping them to decipher typical Indian consumer mindset, identify and execute features specific to Indian Market. For example, in one instance we helped a global consumer electronics giant establish what defines entry level mass market television in India.

In the consumer electronics segment, HDD media players, flat panels and home-theatre projectors play an important role. What user interface innovations has Tata Elxsi brought about in these categories?

With increasing consumption of online media and streamed content, there is explosion of choices. To add to it the plethora of devices available in the market today like mobiles, TV, camera, recorder, STB, external Hard-drives make the consumers spoilt for choices. However, in many cases the very act of managing data across so many devices can be daunting tasks for consumers.

Tata Elxsi’s design and engineering team has designed and developed several innovative solutions across categories. Be it technology led solutions like incorporation of DLNA format or addressing a simple consumer need like designing simple, intuitive Photo viewer to view and manage thousands of photographs. In one instance, for Panasonic Viera Connect, we developed a smartTV application which can sync with an Arm-Band device using blue-tooth which shows daily calorie consumption and other body parameters on TV.

Could you name some challenging interface designs done in the recent years and highlight the reasons as to why the particular projects were

regarded as challenging?

Automotive instrument clusters are increasingly abandoning the analogue dials to adapt digital TFT screens as it allows showing contextual information to driver as and when required. Moreover efficient onboard hardware and increased memory, allows designers to take the overall user experience to next level.

Tata Elxsi’s UX design team has helped Renesas—the world’s leading suppliers of microcontrollers, to demonstrate Smart Instrument Cluster Interfaces for its reference boards capable of handling 3D graphics. While 3D HMI allowed us to take the overall experience to the next level, it was challenging to optimise the design for appropriate visual quality vis-a-vis the rendering performance for latency.

Mobile phones, PDAs, TVs, laptops and media players all rely on UI to a great extent. GUI solutions enable end-users to access products and technologies like never before. What improvements in the UI can be brought about in these product categories?

The key challenge for design community is to keep the user experience simple despite the ever-rising functions and features in most of the devices. Also, it’s vital to achieve the balance between the urge of marketers and product planners to pack the devices with features vis-à-vis what users really want.

Another opportunity is to harness the “always connected” scenario. With most of the indoor and outdoor devices being internet enabled, it’s important to identify right use case scenarios and opportunities to explore. For e.g. with GPS-enabled phones at disposal it’s important to identify and design location based apps to make positive difference in consumers’ lives. Multi-modal HMI which once was reserved for niche areas is fast seeping in mainstream consumer devices, albeit with few hiccups. While these technologies are maturing, it would take a while before they become easily available in the market. For instance, though various voice engines are already established, it would take time to build intelligence for all regional languages. I believe no single mode of interaction will dominate in the future. The future UX solutions would be truly multimodal comprising of touch, voice, gesture or simply eye tracking.

Lionel D'souza