

Consumer Electronics and Embedded Systems Engineering and Industrial Services



With advancing technology, consumer electronics industry has transformed from standalone, single function devices into converged, feature rich, complex, up gradable, network-connected devices. To retain competitive edge, consumer electronics companies like yours need to come out with innovative, compact, convergent products which are in sync with evolving standards at market beating pace. Tata Consultancy Services (TCS) with its rich domain experience and profit- impacting innovative solutions from concept to product, helps you design and provide high quality next- generation products for your customers.

Overview

With rapid evolution of consumer electronics market, to stay competitive manufacturers are under tremendous pressure to be first-to-market with unique and differentiated products leading to dramatic reduction in product development life cycle. Also, a successful product in the consumer market quickly attracts similar products from the competition, leading to rapid price erosion and hence manufacturers need to reduce cost of product development and manufacturing.

With emergence of technology, consumer electronics industry is driven by convergent products which can store, transfer and make use of the growing amount of multiple forms of digital data more efficiently. This convergence of technologies has resulted in integration challenges, as they pack more features while reducing the size.

All these imply the need for a greater understanding of evolving technology and the ability to rapidly incorporate developments into new products, offering consumers more utilitarian devices. At TCS, with our experience in consumer products development from concept to production, we ensure that designs are 'first-time-right' to minimize development and production cost and time, and provide better insights into product behavior. We enhance product quality through optimization and help you adapt quickly to market changes.

Global Network Delivery Model™, a collaborative, superior framework of people, processes and infrastructure, makes it possible for us to consistently ensure success of your initiatives - anytime, anywhere.

Why TCS

Our domain experts are well-versed in various technologies and are experienced in supporting customer engagements across the globe. We collaborate with ecosystem players such as industry standard platform providers, EDA tool vendors, prototype houses, standards bodies & academic institutes, to develop our competencies, in tune with the industry's demands. We derive strength from :

- **Concept to product solutions:** We can engage with you from the concept to production stage, as our capabilities include development of embedded software, design of embedded hardware systems with focus on micro-controllers and processors, FPGAs, ASICs, and DSPs, complex electromechanical products, sub-assemblies and box build. With the ability to undertake various hardware and software related activities, we are all set to be the single source of solutions for all your requirements.
- **Focus on innovation:** Our rich innovation network comprises innovation labs, with focus on finding novel solutions in different domains such as media processing, entertainment solutions and convergence in embedded systems.
- **Solution accelerators:** In-line with the latest technology trends, we invest significantly in developing consumer electronics industry specific assets and solution accelerators to enable our customers reduce time to market for their products. Some of our key solution accelerators include H.264, JPEG 2000, audio/ video/ speech Codecs
- **In-house electromechanical manufacturing facility:** TCS' 100% Export Oriented Unit (EOU) enables us to undertake activities such as prototype & box build, wire harness assembly, sub assembly, testing, visual inspection and pre-qualification. Backed by ISO9001 certified quality systems, products manufactured are certified by UL, TuV, CE and CSA.
- **Operational Excellence approach:** involves measuring customer satisfaction through metrics such as projects delivered on time, on budget and with zero defects.



What we offer

Our consumer electronics solutions bring you time-to-market advantage along with cost-effectiveness. Our scalability and a host of solution accelerators for this domain translate into viable solutions that can be delivered across continents, using our Global Network Delivery Model™. Our solutions across various domains include:

Home networking

Our state-of-the-art comprehensive solutions involve multimedia devices such as high-end audio and video systems and home networking gateways with secured access using smartcard and various other access devices. Our value added services include system integration, VoD, DAM and DRM.

Portable media devices

We provide specification to product solutions across the range of portable media devices. We offer solutions catering to the wide requirements of integrating functionalities of audio and video to a common platform. We understand and satisfy consumer needs of finding the right combinations of features to be integrated into convenient portable form factor devices such as media players, digital camera, game consoles, play stations and PMP.

Mobile computing

We provide integrated solutions that are suitable across networks and devices, which are architecturally appropriate for a fast go-to-market cycle. Some of our solutions are in the areas of PDA, tablet PC, laptop, mobile, navigation and video conferencing systems.

Our offerings for consumer electronics industry include,

- Standards based Codec/algorithm development, porting & optimization
- Protocol stack & device driver development
- Verification, validation and testing
- Application development and enhancement
- Baseband algorithms, MAC & PHY for wired and wireless applications
- Hardware design and development
- VLSI design and verification
- Styling and industrial design
- Mechanical design and packaging

How we helped our customers

Intelligent home entertainment solution for leading Asian service provider

A leading Asian home entertainment service provider was seeking for a partner to develop a digital Set-Top Box (STB) with integrated wireless connectivity and which can provide a reverse data path to viewers at lower cost. TCS developed digital STB, a TI-DaVinci platform based solution, has all common features of a digital home network system such as internet access, e-commerce and m-commerce on TV, music and video download, place shifting, time shifting, etc. We also provided value to the customer by helping in development of new features like electronic programming guide, pay-per-view, DLNA based home gateway support, MPEG4 Demux, MPEG4 audio/video decoders, graphic drivers for alpha blending, IS07816 compliant smart card driver, DVBN-SI parser, WMV, MP3, H.264 and AAC Codec. Our solution helped the customer in development of a system that can act as a control point for the entire DLNA compliant home network while reducing time-to-market and cost.

Engineering excellence for US based leading telecom vendor

A leading US based telecom vendor was looking for a partner for concept to product manufacturing of MPEG-4 based PVR, to be used along with high-end mobile devices. TCS developed a TI – OMAP platform based solution which can record multimedia content from various media such as TV/ camera/ mobile onto a SD/MMC card and playback when needed. The product supported a number of audio (AAC LC, M4A, AAC Plus, WAV, MP3, WMA) video (MPEG-4SP) and image (JPEG, BMP, TIFF, PNG & GIF) formats. It also offered various features for end-users such as recording, scheduled recording, file browsers, playback trick plays and album art. Our solution helped the customer to offer the end-user a next-generation product at lower costs.

About Tata Consultancy Services (TCS)

Tata Consultancy Services is an IT services, business solutions and outsourcing organization that delivers real results to global businesses, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT-enabled services delivered through its unique Global Network Delivery Model™ recognized as the benchmark of excellence in software development.

A part of the Tata Group, India's largest industrial conglomerate, TCS has over 100,000 of the world's best trained IT consultants in 50 countries. The company generated consolidated revenues of US \$5.7 billion for fiscal year ended 31 March 2008 and is listed on the National Stock Exchange and Bombay Stock Exchange in India. For more information, visit us at www.tcs.com

Contact us

To know more about our solutions in Consumer Electronics and Embedded Systems, contact corporate.engineering@tcs.com

All content / information present here is the exclusive property of Tata Consultancy Services Limited (TCS). The content / information contained here is correct at the time of publishing. No material from here may be copied, modified, reproduced, republished, uploaded, transmitted, posted or distributed in any form without prior written permission from TCS. Unauthorized use of the content / information appearing here may violate copyright, trademark and other applicable laws, and could result in criminal or civil penalties.

Copyright © 2008 Tata Consultancy Services Limited