

# Tata Elxsi



## Driving into an exciting future

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Investors are advised to refer through disclosures made at the end of the Research Report.

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## Tata Elxsi

BSE Sensex  
27,177S&P CNX  
8,214

CMP: INR1,003

TP: INR1,300 (+30%)

Buy



## Stock Info

	TELX IN
Bloomberg	TELX IN
Equity Shares (m)	31.1
52-Week Range (INR)	1,488/472
1, 6, 12 Rel. Per (%)	-10/64/63
M.Cap. (INR b)	36.6
M.Cap. (USD b)	0.6
Avg Val (INRm)/Vol	631/856
Free float (%)	55.0

## Financial Snapshot (INR Billion)

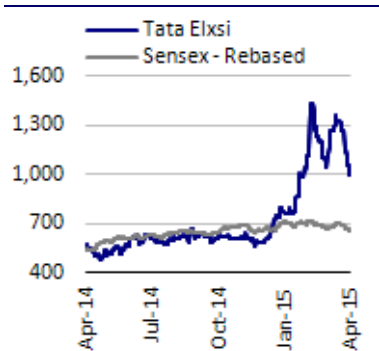
Y/E Mar	2015E	2016E	2017E
Sales	8.5	9.9	11.5
EBITDA	1.8	2.2	2.7
PAT	1.0	1.3	1.6
EPS (INR)	32.4	40.8	51.3
EPS Gr. (%)	39.5	26.0	25.6
BV/Sh. (INR)	91.7	112.6	138.1
RoE (%)	38.7	39.9	40.9
RoCE (%)	58.6	60.5	61.9
P/E (x)	31.0	24.6	19.6
P/BV (x)	10.9	8.9	7.3

## Shareholding pattern (%)

As on	Dec-14	Sep-14	Dec-13
Promoter	45.0	45.0	45.1
DII	3.5	3.8	5.1
FII	7.0	7.2	2.3
Others	44.5	44.0	47.5

FII includes depository receipts

## Stock Performance (1-year)



Incorporated in 1989, Tata Elxsi (TELX) operates in two core segments – software, which contributes 88% to revenues, and systems integration, which contributes 12% to revenues. In the software vertical, 77% of revenues are derived from embedded product development (EPD), followed by industrial design, which contributes 9% to revenues, and the balance 2% is derived from visual computing labs (VCL). Within EPD, TELX caters to three core industries – automotive (40% of EPD revenues), broadcast (35% of EPD revenues) and communications (25% of EPD revenues). TELX employs 4,000 people and derives approximately equal revenues from US, Europe and Asia.

## Driving into an exciting future

## Opportunity huge; re-rating in the offing

- Global R&D spends by auto companies' stand at USD120b annually, of which the outsourcing proportion is just 10% and offshoring to India is just ~0.4%, providing immense growth potential.
- Software, which comprised 2% of total value of a vehicle in 2000, now comprises 15% of the total value and is expected to reach 20% by 2020. With 40-50% cost savings and just 0.4% penetration, offshoring to India is a multi-year growth story.
- By 2020, there will be a quarter billion connected vehicles on the road, enabling new in-vehicle services and automated driving capabilities, according to Gartner.
- We expect TELX to post secular growth led by automotive, broadcast and consumer electronics divisions which together contribute ~75% to its revenues.
- TELX has restructured its loss-making VCL business and has evolved into a high quality business focused on niche software services, with minimal capital needs.
- We expect PAT CAGR of 26% over FY15-17 with strong capital efficiency (RoCE of 62% and RoE of 41% for FY17). Initiate with Buy and a price target of INR1,300.

## Low off-shoring penetration sets the stage for multi-year secular growth

Global R&D spend by auto companies stands at USD120b annually, and is expected to grow at a CAGR of 6.4% over 2014-16 (Source: Thomson Financials, Roland Berger Analysis). Of the total R&D spend, 90% is undertaken captively by auto OEMs, with outsourcing proportion being just 10% and offshoring to India being just ~0.4%, providing immense growth potential for players like TELX. Since new-age electronics and software development involving multimedia, connectivity, and consumer technologies have traditionally not been a focus area for car OEMs, they are increasingly finding it favorable to outsource to specialized players. Global paucity of engineering and software talent for embedded systems, along with cost advantages (40-50% cost savings adjusted for productivity differences), strongly favors offshoring. Additionally, given the small ticket nature of deals (sub-million dollar deals) associated with embedded product development, the market is relatively niche and hence is not a major focus area for large Indian players like TCS and Infosys. Thus, high growth potential, minimal 0.4% penetration, and niche nature of this segment, sets the stage for multi-year secular growth for focused players like TELX.

**Automotive and broadcast segments set for exponential growth**

Software, which comprised 2% of total value of a vehicle in 2000, now comprises 15% of the total value and is expected to reach 20% by 2020. By 2020, there will be a quarter billion connected vehicles on the road, enabling new in-vehicle services and automated driving capabilities, according to Gartner. Key areas for growth in the automotive vertical include Infotainment (40% of revenues), Powertrain and Hybrids (40% of revenues), and Safety and Security (20% of revenues). Similarly, we expect strong growth in broadcast segment led by investments by operators in developing newer services and features. Automotive and broadcast together account for ~75% of TELX's EPD revenues and have been key growth drivers (CAGR of 49% and 41%, respectively over FY12-14). We expect high growth in both these key segments to continue (CAGR of 25% and 15%, respectively over FY15-17).

**Restructuring of VCL done; focus on pure software service business**

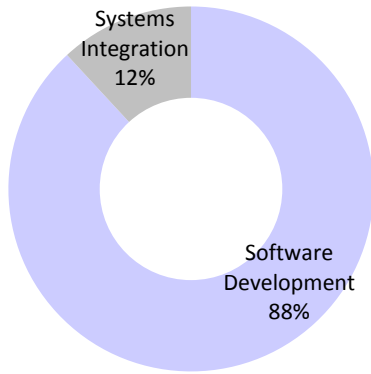
TELX management took corrective action, exiting the loss making Visual Computing Labs (VCL) businesses of overseas studio as well as JV with A2E Entertainment. Similarly, the management is not looking to grow the lower margin hardware related systems integration (SI) business, instead focusing on higher margin software business in SI. The SI business, which was once significant, now forms a minimal proportion of TELX's consolidated revenue (SI revenue proportion down from 39% in FY04 to 12% in FY14). Further, unlike peers that engage in aggressive capex to develop a non-linear profitability profile, TELX is focused on a pure service business model (Auto and Broadcast being key growth drivers), requiring minimal capital investments. We expect TELX to derive significant operating and free cash flows from operations, which should total INR3.6b and INR3.2b, respectively over FY15-17. Similarly, the business model delivers superior return ratios – 62% RoCE and 41% RoE for FY17E along with ~50% dividend payout.

**Poised for re-rating; initiate coverage with Buy**

We expect revenue to grow at a CAGR of 16% over FY15-17, led by 18% CAGR in EPD business. We estimate 22% EBITDA CAGR and 26% PAT CAGR. We believe TELX has significant margin levers, which provide further upsides to our estimates – (a) increase in off-shoring proportion from the current 55% to 60-65%, (b) increase in proportion of fixed price contracts from the current 25% to 30-35%, (c) increase in utilization rates from the current 70% to 80%. The stock trades at 24.6x FY16E and 19.6x FY17E EPS. Given high growth prospects and robust cash generation, we value the stock at 25x FY17E EPS. We initiate coverage with a **Buy** rating and a target price of INR1,300.

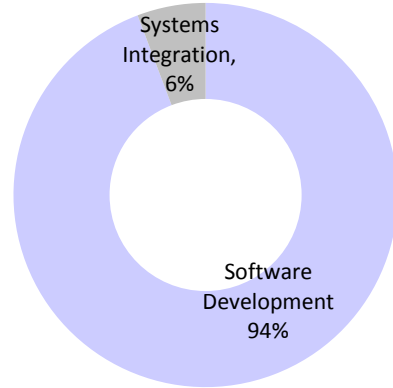
## Story in charts: Massive opportunity

**Exhibit 1: High revenue contribution from software business**



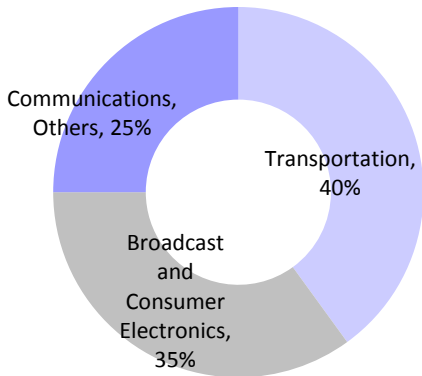
Source: Company, MOSL

**Exhibit 2: EBIT contribution from software business higher**



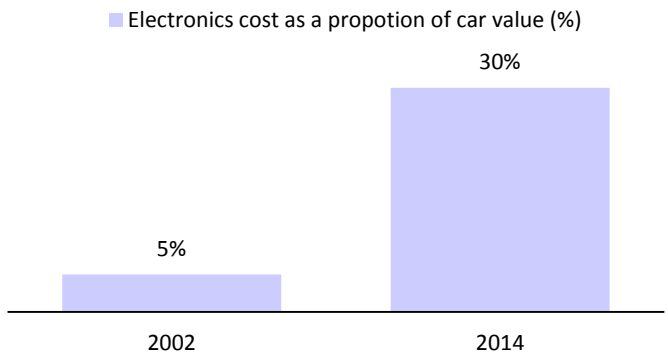
Source: Company, MOSL

**Exhibit 3: Transport and Broadcast – Key growth drivers**



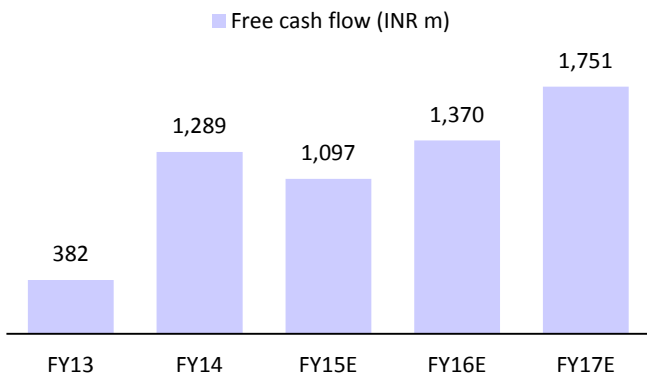
Source: Company, MOSL

**Exhibit 4: Greater demand for electronics – A secular trend**



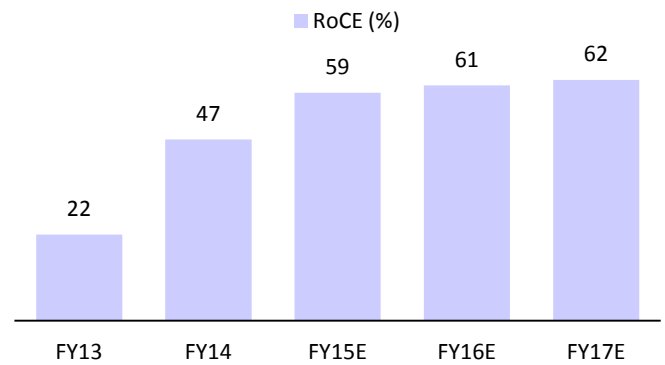
Source: Company, MOSL

**Exhibit 5: Robust cash generation**



Source: Company, MOSL

**Exhibit 6: Strong return ratios**



Source: Company, MOSL



## Embedded Product Development – massive opportunity

### Autos and broadcast to drive growth, communications in slow lane

- Increasing spend on electronics/car is a secular trend. Given that auto makers have traditionally not been focused on the electronics segment, and possibility of 40-50% cost savings, offshoring is set to grow exponentially.
- Similarly, proliferation of new technologies is causing broadcast service providers to continuously innovate their products, driving strong growth.
- We expect the communications division to report flat growth due to challenges faced by the end-customer – the telecom industry.

### #1 Autos (40% of EPD revenues) – Largest growth driver

#### The connected car – infotainment in cars growing exponentially

The global passenger car market is witnessing significant changes. With influx of new technologies, the car is increasingly becoming a connected device, with a host of new features. For instance, infotainment systems within cars have progressed significantly in richness of features, support for various types of multimedia and graphic content, as well as in integrating consumer devices into the car. This is further enhanced by connectivity of 3G or 4G into the car, allowing for content and information to be delivered real time into the vehicle on the move. From simple radios and in-built cassette and CD players in the 90s, today's infotainment systems provide playing of content from in-built storage, external storage devices such as USB sticks or via Bluetooth from a tablet or mobile phone.

Entertainment is now even classified by occupants, with rear-seat systems that can play videos and movies, while the front head units display maps, etc. The integration of consumer devices with the infotainment system allows routing of phone calls to the car speakers, playing of content or even live maps, etc, from the phone to the car display unit.

Exhibit 7: The connected car



Source: Company, MOSL

### Human machine interface (HMI) – also witnessing sea change

The HMI or human machine interface is also undergoing significant change, with physical knobs being supplemented by touch screens, steering wheel controls, audio commands and upcoming gesture-based commands. Latest features include heads-up display that projects key parameters onto the windscreen in front of the driver, and personalization of the vehicle and infotainment settings based on the car recognizing the driver and his/her preferences.

#### Exhibit 8: Human machine interface – moving to next level

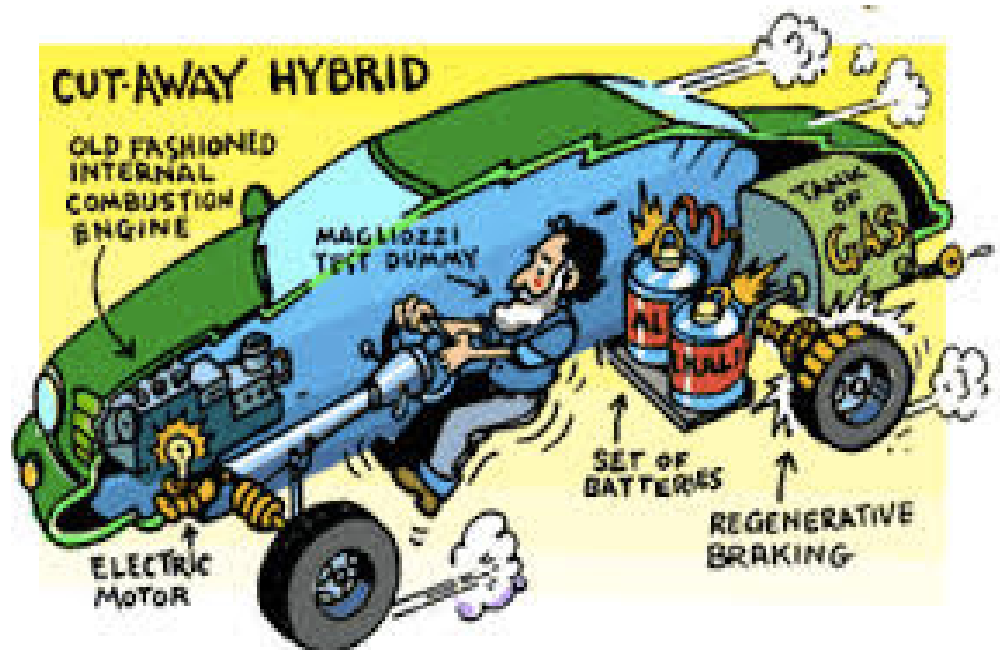


Source: Company, MOSL

### Powertrains and hybrids – emission norms driving hybrid engines

Due to the regulatory pressure for stringent emission and safer transport from governments across the world, demand for intelligent electronics is expected to increase substantially. Leading OEMs and system suppliers are thus working on the development of next-generation hybrid vehicles driving higher growth.

#### Exhibit 9: Migrating from old fashioned combustion engines to new generation hybrids



Source: Company, MOSL

### Advanced driver assistance systems (ADAS) – making driving safer

Today's cars are increasingly getting equipped with advanced driver assistance systems (ADAS). Governments in developed countries are mandating their use to make driving easier and safer. The first ADAS or active safety feature mandated by government regulation was tire pressure monitors, which continuously monitor and warn of low pressure in any tire. The next to follow was rear view cameras for reversing ease; most developed countries are now considering this. ADAS features are diverse – from lane departure warning and collision detection to adaptive cruise control and automatic park assist. These features are now percolating to mid-range cars.

As technology develops and vehicles are capable of interacting in machine-to-machine (M2M) mode with other vehicles (V2V) and infrastructure on the road or in buildings and parking lots (V2X), ADAS systems will become more sophisticated, ultimately leading to fully autonomous driving or driverless cars. Google already has fully automated cars under trial in the US, while Mercedes, BMW and other leading brands have announced significant programs towards driverless car technology. These are mega-changes expected in the automotive world, which will drive huge demand for auto-electronics.

#### Exhibit 10: Advanced driver assistance systems (ADAS) – making driving safer



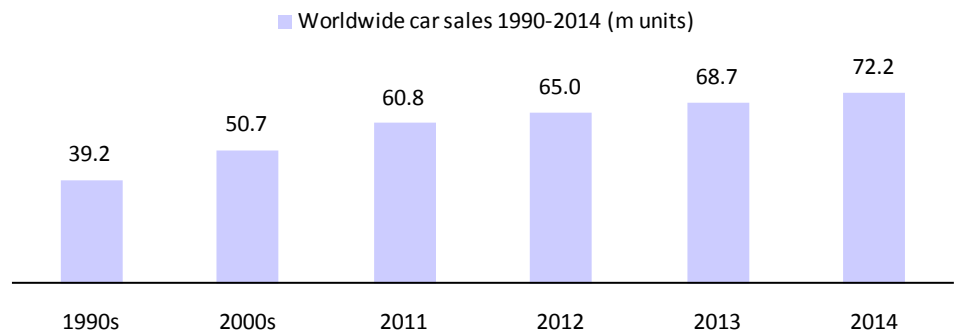
Source: Company, MOSL



**All-round investments in R&D and new products – to drive growth for TELX**

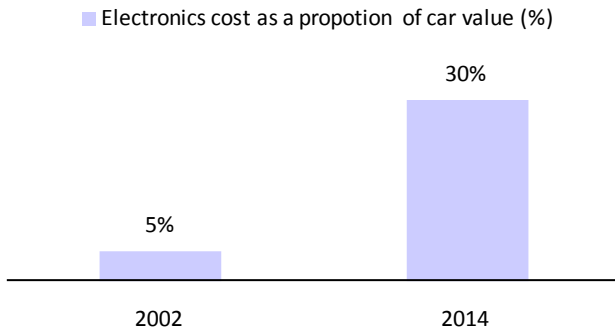
The size of the global passenger car market is estimated at ~USD1,300b. Given the strong demand for auto electronics, electronics cost (hardware plus software) now comprises 30% of the total vehicle value, up from 12% in 2000 and expected to reach 40% of total vehicle value by 2020. Further, cost of software now comprises 15% of the total vehicle value, up from 2% in 2000 and expected to reach 20% of total vehicle value by 2020. Increased spend on electronics/car is a secular trend, which will shape up a massive opportunity for niche and dedicated players like TELX. Luxury car market (28% of passenger car market) is the key innovation driver.

**Exhibit 11: Worldwide car sales on a continuous growth path**



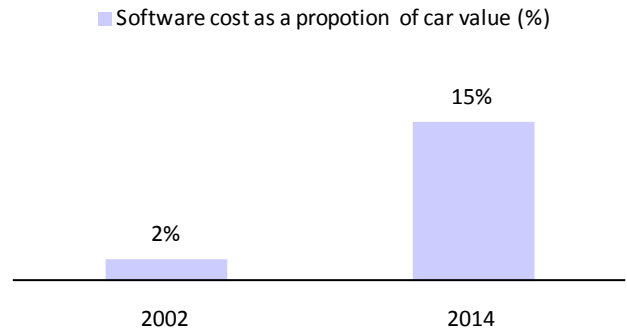
Source: Industry, MOSL

**Exhibit 12: Increasing proportion of electronics in cars**



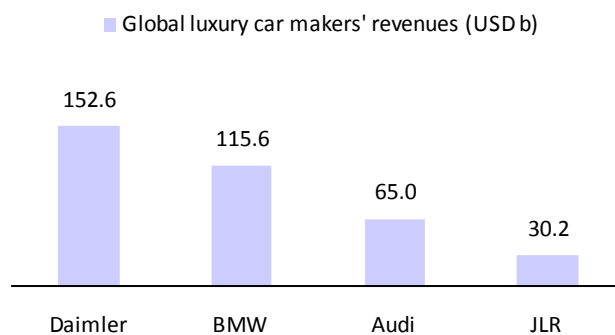
Source: Company, MOSL

**Exhibit 13: Increasing proportion of software in cars**



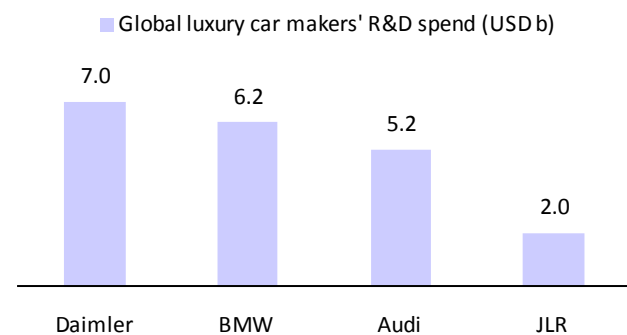
Source: Company, MOSL

**Exhibit 14: Global luxury car makers' revenues (USD b)**



Source: Company, MOSL

**Exhibit 15: Global luxury car makers' R&D spend (USD b)**

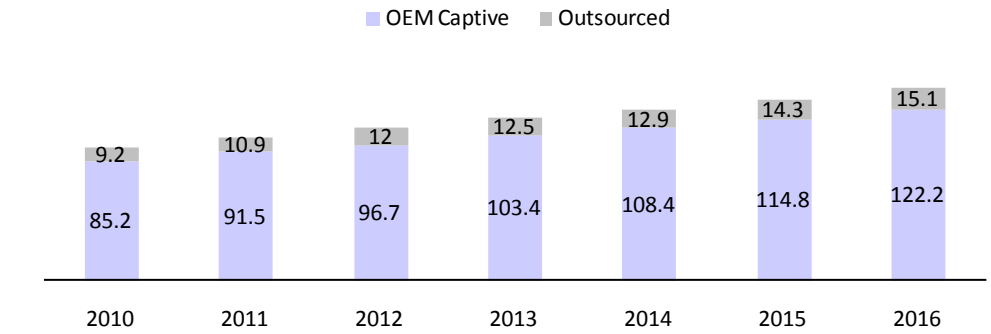


Source: Company, MOSL

**Auto R&D spend stands at USD120b annually**

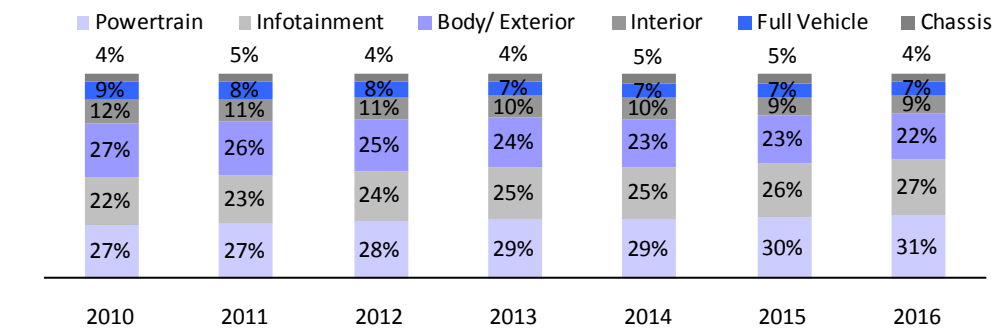
Global R&D spend by auto companies' stand at USD120b annually, and is expected to grow at a CAGR of 6.4% over 2014-16 (Source: Thomson Financials, Roland Berger Analysis). Of the total R&D spend, 90% is undertaken captively by auto OEMs with outsourcing proportion being just 10%.

**Exhibit 16: Global R&D spend by auto companies stands at USD120b annually**



Source: Thomson Financials, Roland Berger Analysis, MOSL

**Exhibit 17: Powertrain, Infotainment and Body together form ~80% of R&D spend**

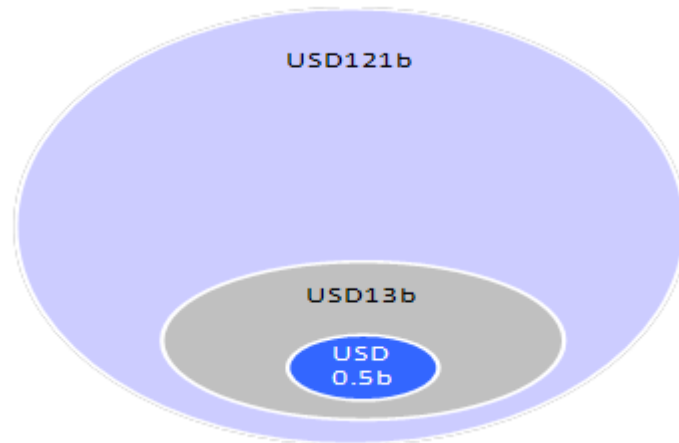


Source: Thomson Financials, Roland Berger Analysis, MOSL

**Low off-shoring penetration sets the stage for multi-year secular growth**

Of the USD121b auto R&D spends, 10% is the outsourced proportion aggregating to USD12.9b, while off-shoring to India currently stands at just ~0.4%, thus providing immense growth potential for players like TELX.

**Exhibit 18: Outsourced R&D spend is 10% of total, with offshoring to India being 0.4%**

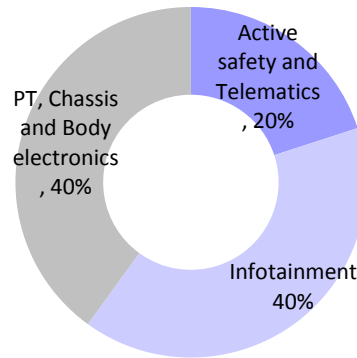


Source: Company, MOSL

**How TELX is placed to capture this massive opportunity**

Automotive has been the highest growth segment for TELX, with revenue from this segment growing at a CAGR of 49% over the last two years. TELX’s revenue mix within autos is (1) infotainment: 40%, (2) power train (PT), chassis and body electronics: 40%, and (3) active safety and telematics: 20%. Given hyper-growth in this segment, and huge untapped opportunity, we expect 25% CAGR over FY15-17.

**Exhibit 19: Autos – Revenue mix by type of product for TELX**



Source: Company, MOSL

**Exhibit 20: Automotive – key segments**



**Telematics & Infotainment**

- In-car connectivity
- Front & Rear Seat Entertainment
- Driver Information
- Navigation & Location Based Services
- Remote Vehicle Interactions
- Vehicle Telemetry

**Powertrain & Hybrids**

- Engine Management
- Transmission
- Start Stop
- Hybrid Controllers
- Battery Management
- DC-DC Converters

**Safety & Security Electronics**

- Airbag & Occupant classification
- Immobilisers
- PEPS & CLSS
- Blind spot warning
- Night Vision
- Driver drowsiness
- Park Assistance
- Lane Departure Warning

**Body & Chassis Electronics**

- Automotive Lighting
- Instrument Cluster
- Steering
- HVAC Controllers
- Seating systems
- Door Systems
- Roof Systems
- Braking System
- Suspension System
- Rear Spoiler

Source: Company, MOSL

**Exhibit 21: Strong credentials built in the automotive segment**

**15+**

Years of Competence in Automotive E/E solutions

**400+**

Man years of Competence in AUTOSAR, BSW & MCAL

**1000+**

Man years of Competence in Automated HILS validation solutions

**2500+**

Man years of Competence in Modeling & Simulation solutions

**350+**

Man years of Competence in Electrical systems build & launch for OEMs

**100+**

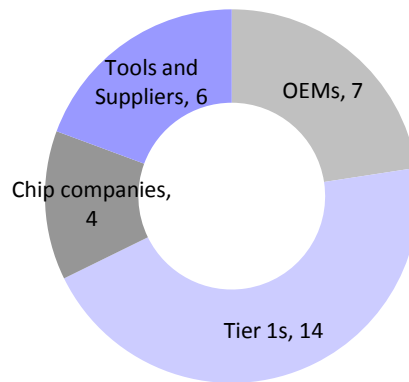
Man years of Competence in ISO26262 compliant solutions

Source: Company, MOSL

**Product differentiation – key driver for higher spend on auto EPD**

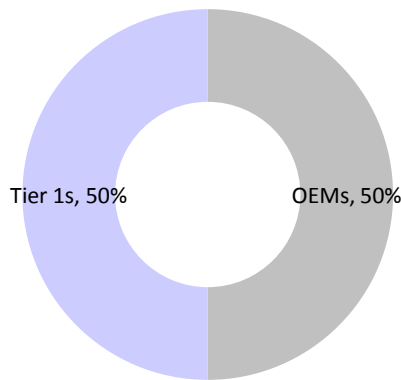
A major driver for higher spend on auto EPD is OEMs’ need to differentiate their product features. OEMs invest themselves and develop patents to protect their R&D and differentiation. TELX has over 30 clients in the auto division, of which 7 are OEMs, 14 are tier-1 suppliers, 6 are tools suppliers, and 4 are chip companies. It derives 40% of its revenue from OEMs and the balance from suppliers. Tier-1 suppliers have been the higher growth segment for TELX, with revenue contribution from this segment increasing from 50% to 60% over FY11-14. TELX derives 50% of its auto division revenue from Europe, 30% from US, 15% from Japan, 5% from APAC including India, China and Korea.

**Exhibit 22: Autos – client mix**



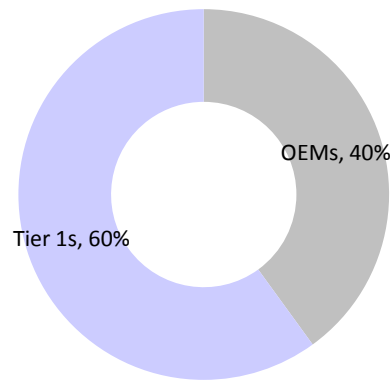
Source: Company, MOSL

**Exhibit 23: Autos – FY11 revenue mix by type of client**



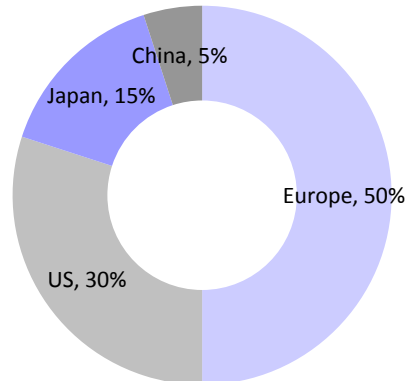
Source: Company, MOSL

**Exhibit 24: Autos – FY14 revenue mix by type of client**



Source: Company, MOSL

**Exhibit 25: Autos – revenue mix by geography**



Source: Company, MOSL

### **Key drivers for growth in auto segment**

The car has undergone very little innovation over the last 100 years. Engines – both diesel and petrol – have remained largely unchanged. However, the industry is now entering a phase of massive innovation in engine as well as in accessories. The electronics versus electro-mechanics mix is shifting in favor of electronics. The biggest change is happening in the hybrid vehicles space. Electric motors, which are electronically controlled, are increasingly shaping the future of the industry. Players like Apple and Google are writing mathematical models to control the entire working of the car. As this is not the domain of the traditional car manufacturers, new technology companies are taking this forward. The changes would be dynamic and require continual investments. The net implication of this will be increasing use of electric-controlled systems, where players like TELX come to the fore.

TELX works with OEMs and tier-1 suppliers in the auto segment. Backing the right suppliers is the key, given their dependability on the OEMs to win new business. If they don't win new business, growth for TELX could be impacted. Needs of OEMs tend to be more stringent than the suppliers, as the suppliers are really looking here and now, while the OEMs are largely looking to develop futuristic products and solutions. OEMs typically look for developing differentiation from a 5-year / 10-year / 20-year timeframe. For TELX, the OEM-supplier mix has changed from 50:50 three years ago to 40:60. Business from tier-1 suppliers has grown at a faster pace compared to OEMs over the last three years.

#### **a) Infotainment**

In-vehicle infotainment is rapidly extending to multiple applications such as navigation and location services, telephony, and Internet services. This demands experience with integration of multiple technologies, along with enhanced user interfaces to allow drivers to use these features easily and without distraction. TELX has built a unique value proposition for this market owing to its combined knowledge of user experience design, multimedia and connectivity technologies, and experience of the automotive-specific processes and systems. It is also working with leading aerospace OEMs and suppliers for avionics and electronics design.

TELX's work in infotainment requires hardware to support computing and real-time processing, along with multimedia format support. This is supplemented by various connectivity-related chips and antennae for Bluetooth, Wifi and 3G/4G. The actual functionality and features are realized via custom software that has to be developed, optimized and integrated onto the selected hardware. For example, it may be possible to select a common hardware platform for a range of models and realize various features to distinguish between the top and the base model via software. However, as one progresses from one model of a brand to another, hardware 'commonization' becomes difficult to justify against pricing pressures, necessitating continuous rounds of investments in EPD and product testing. With rapid progression of features and functionality in infotainment, hardware design needs to be refreshed once in a while, based on limitations of performance and supported functionality as well as upgraded technology for connectivity, etc. Software change is more continuous, and will undergo significant change even from one model year and minor model refresh to the next.



**b) Powertrains and hybrids**

TELX is engaging with leading OEMs and systems suppliers for the development of next-generation hybrid vehicles. TELX recently worked with a leading Japanese automotive OEM to design and develop a complete electronic control unit (ECU) for a hybrid electric vehicle, including software and hardware. The hybrid vehicle was successfully released in the market in June 2013. The division also supported India's Mars Orbiter mission – Mangalyaan, by designing its data control hardware. The Mars Orbiter was launched into space on November 05, 2013.

**c) Advanced driver assistance systems (ADAS)**

Due to the regulatory pressure for stringent emission and safer transport from governments across the world, demand for intelligent electronics is expected to increase substantially. It is leveraging its extensive experience in imaging and video technologies, digital signal processing, imaging and video technologies to help automotive customers develop advanced driver assistance systems that can help make driving safer and less tiring.

ADAS is complex, involves significant hardware and software development, and requires high levels of safety validation and testing. The primary drivers for ADAS will be safety regulations by governments and need for differentiation by car brands to provide consumers with sophisticated features that ensure higher levels of ease and safety in driving. Similarly, on the infotainment, active safety and telematics front, systems are evolving rapidly. For instance, high-end cars now come with electronics that (1) display directions directly from Google maps on the screen, and (2) enable driver assistance in the form of assisted parking, automated parking, reversing cameras, etc. TELX helps build such systems for OEMs and suppliers.

**d) Body & chassis electronics – increased innovation on ground**

In the body & chassis segment, innovation has picked up significantly in key areas like designing front & rear lighting systems, instrument cluster, steering & suspension systems, door systems, etc.

**Ability to cross-sell provides operating leverage**

TELX does not work on any exclusivity arrangements on work done or capabilities built with tier-1 suppliers. It can largely plug-and-play the capabilities built with one client, with other clients. Our interaction with management suggests work done with one client tends to build up as a portfolio for other clients. However, it is important to note that there are not many tier-1s operating in the world. Of the 20-25 tier-1s that operate globally, TELX already has relationships with 14. Ability to cross-sell products and solutions across customers lends operating leverage to TELX.

**Project-based relationships have 12-month lifecycle**

TELX has a project lifecycle spanning 12 months. Typically, a team for a project starts to build over 3-4 months from project award, delivers for the next 7-8 months, and then slowly starts to ramp down as the project approaches completion. Post 12-15 months, only a small team, aggregating 4-5 people is left working on the project. A typical code name for a project would be 'Ford – Infotainment – Program – Model Year 2016'.

**Focus on EPD, partnerships with industry bodies makes TELX well placed**

TELX offers customized R&D services, spanning across the product lifecycle to automobile manufacturers and component suppliers. Its industry experience in working with leading OEMs, tier-1 suppliers, tool and chip vendors, makes it the preferred partner for system and sub-system design for the entire product lifecycle. Its partnerships with industry bodies such as AUTOSAR, Artop, and Genivi enable it to provide expertise in the design and development of next-generation automotive electronics, pertaining to powertrain and hybrids, body & chassis, safety & security, and infotainment & telematics. TELX is certified for ISO 27001:2005 and ISO 9001:2008 standards and compliant with Automotive SPICE® Organization Maturity Level 5 and SEI CMMi Level 5 requirements. This experience reflects in high quality deliverables and services to its customers.

**Offshoring an attractive opportunity for OEMs**

Car OEMs and suppliers have traditionally not been equipped for new-age electronics development, which involves multimedia, connectivity, and consumer technologies. The difficulty and costs associated with developing and owning all of this capability in the face of ever-changing technologies and functionality favors outsourcing. The nature of software development is also highly specialized and involves domain and technology knowledge apart from language and platform skills. Global paucity of engineering and software talent for embedded systems, along with cost advantages (40-50% cost savings adjusted for productivity differences), strongly favors off-shoring (currently, penetration is 0.4%).

TELX benefits from fragmented competition, which works on a high cost base. Most of the competitors are local players in each client country (usually ex-employees of auto companies), working in teams of 10-15 people, who serve the auto company 100% onsite. These local players (30-40 such outfits around each OEM) are not corporatized; hence it is difficult to get the exact quantum of work done by such firms. Additionally, TELX competes with vendors like KPIT, specialized in this niche.

As most of TELX's customers are well sophisticated to understand the pricing differences between offshore and onsite, TELX places its value proposition purely on delivering superior capabilities and domain knowledge. Given the huge size of the market, India's cost and skill-led competitiveness and minimal offshoring penetration (0.4%), we believe TELX is well placed to post strong 25% growth in the auto business, going forward.

## #2 Broadcast (35% of EPD revenues) – innovation driving growth

TV broadcast can be via cable, terrestrial signals, satellite or IP-based via wired / wireless networks. Broadcast service providers or MSOs have to continuously innovate and offer richer services and features to drive market and wallet share, and reduce customer churn. Conventionally, the cost of the set-top-box or gateway device in the house is funded by the service provider with the aim of locking the subscriber and recovering through subscription fees over a period of time. As subscription fees are driven lower through static or even diminishing subscriber base in mature markets, service providers are under pressure to innovate and offer richer features and packaged services. This implies constant upgradation and replacement of the hardware. Further, to avoid such costly replacement, MSOs are migrating to a cloud based delivery model whereby most features can be delivered through the cloud, and the box in the home is a thin or dumb device.

### Key drivers for growth in this segment

- **Migration in content type:** Migration in all developed and many developing nations from analog signals to digital broadcast.
- **Migration in content quality:** Progression of video quality from standard definition to HD and now ultra HD.
- **Significant expansion in content choice:** Expansion in broadcast packages to include hundreds of channels, video-on-demand, recording of content, and over-the-top or OTT content from the internet.
- **Packaged/bundled services:** IP and cable providers are increasingly bundling landline, broadband, TV through triple or even quad-play packages.
- **Device proliferation:** Latest broadcast services now enable viewing of content and interaction through a second-screen (such as a tablet or phone), and multi-screen distribution within the home through a single connection.

### Outsourcing and offshoring drivers

Given significant innovation across the broadcast value chain, there is a requirement for continuous software development and testing, and all development is typically customized to the service provider. Also, the permutations and combinations of features and packages imply significant amount of testing and validation at the device, network and service level, before it is deployed.

Aspects such as testing are usual candidates for outsourcing and offshoring to reduce costs and enable 24x7 development and testing cycles. Continuously changing skills and domain experience, and cost savings favor offshoring to countries like India, benefiting players like TELX.

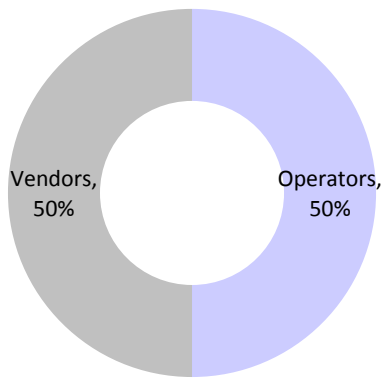
### Growth to be driven by operators in the broadcast segment

TELX's broadcast and consumer division caters to ecosystem players like – operators (50% of revenue; 12 clients), vendors (50% of revenue; 8 clients) like CISCO, Motorola, etc, silicon companies (Broadcom, Qualcomm, Intel, ST), and conditional access (software aspects). Like auto OEMs, operators in the cable TV market are looking to develop a host of new and differentiating features to help them stay ahead of competition. Operators like Comcast, Time Warner Cable, Sky, BT, etc, are

TELX’s key customers. Operators look for products/features that help them drive up ARPU (average revenue per user). TELX has developed a product for an operator that helps users to chat online in groups on TV while watching sports telecast.

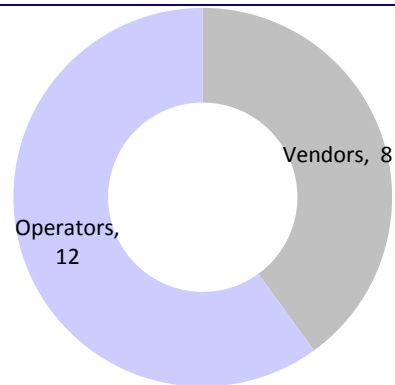
Operators have been a high growth segment for TELX. Revenue from operators, which was non-existent, increased to 50% of TELX’s broadcast revenue in five years. On the vendors (device companies) front, TELX’s key clients include ST Micro, Entropic, etc. Like vendors, device companies are looking to build differentiators on their platforms. However, unlike operators, the device business is now increasingly commoditized. For TELX, device revenues have been virtually constant over the last 3-4 years. Devices contributed 100% of broadcast revenue five years ago. The operator business, which was virtually non-existent five years ago, has now grown to a size equal to that of the device business. We believe mega changes like migration from 3G to 4G can drive device revenue growth, but in the absence of this, operators will continue to drive growth.

**Exhibit 26: Broadcast – Revenue mix by type of client**



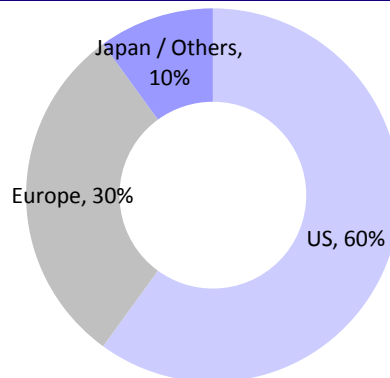
Source: Company, MOSL

**Exhibit 27: Broadcast – Number of clients**



Source: Company, MOSL

**Exhibit 28: Broadcast – Revenue mix by geography**



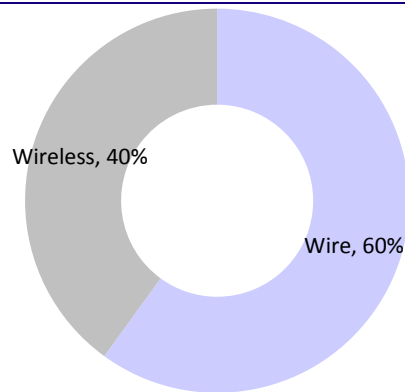
Source: Company, MOSL

**#3 Communications (25% of EPD revenues) – in a slow lane currently**

In the communications division, TELX works with networking & wireless communications product companies for product development, testing, maintenance and support services. Both the enterprise and service provider markets are experiencing increased adoption of IP (Internet Protocol) based voice and video communications, as well as cloud-based applications that can be enabled on any connected device. TELX is working with leading product companies to build next generation voice and video solutions, based on the latest cloud technology. Traditionally, wire was the key technology. Over time, Wimax, LTE, and combination (wire+wireless) technologies have been increasingly adopted. Combination – a mix of both wire and wireless – is the future.

TELX caters to major divisions in the communications vertical – wire (60% of revenues) and wireless (40% of revenues). Communications has been witnessing weak growth, and has been the slowest growing sub-segment within the software services vertical. This is due to growth challenges faced by the end customer, the telecom industry, especially key players like Nortel and Nokia-Siemens. Going forward, with no dramatic changes, we expect this segment to witness low growth.

**Exhibit 29: Communications – revenue mix by segment**



Source: Company, MOSL

**Exhibit 30: Device and network management software**



Source: Company, MOSL

**Exhibit 31: Broadband (3G & 4G) wireless software system development**



Source: Company, MOSL



**#4 Medical electronics, Cloud based communication devices and Internet of Things (IoT) – segments with hyper-growth potential**

TELX entered the medical electronics segment around 2008 through tie-ups with Japanese companies but did not scale up due to lack of focus initially and risks associated with liability clauses. Till 2010, the business segments at TELX were horizontally structured. Post 2010, segments were defined vertically, with individual P&L responsibilities for division heads.

Further, due to restructuring in 2010, the management decided to focus on core transportation, broadcast, and communications, and dropped focus on a number of other smaller divisions like medical, storage, computer peripherals, etc. The management wanted to make sure that the company is not present as a niche player in niche segments, as this would limit growth and critical mass.

The management is now focused on developing the medical electronics segment through introduction of futuristic products and solutions. TELX has appointed Mr Vasant Shah as the division head, with individual P&L responsibility. The segment is in incubation currently, and is yet to achieve critical mass. However, given renewed interest in developing this segment along with necessary scale, capacity, capability and revenues, we believe medical electronics could be the fourth core segment for TELX in the software solutions business.

**Exhibit 32: TELX is targeting medical devices in point of care and diagnostic segments**



Source: Company, MOSL

**Cloud and Internet of Things (IoT)**

**Exhibit 33: TELX helping customers in unified communications segment transition to cloud based applications and solutions**      **Exhibit 34: TELX working with customers across industries (retail, energy, smart home, healthcare) for IoT developments**



Source: Company, MOSL



Source: Company, MOSL

## Industrial Design – making the right moves

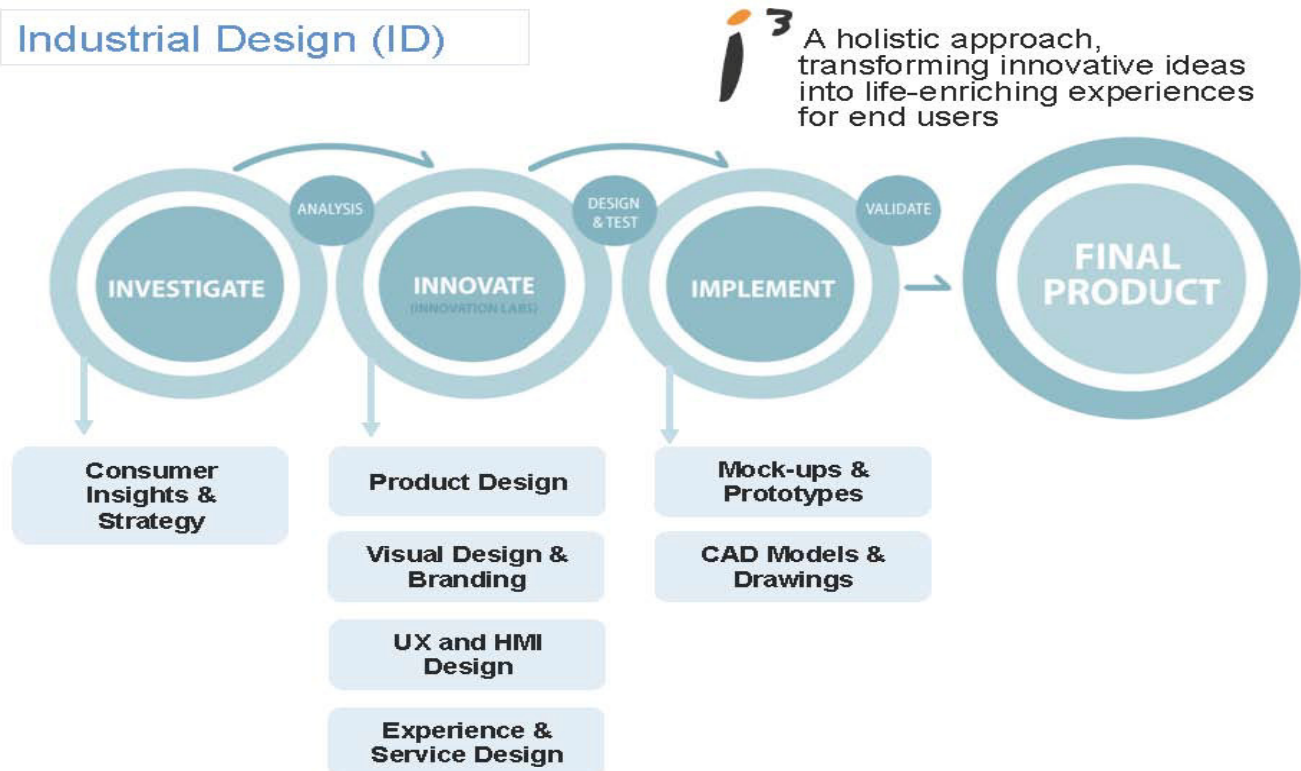
### Niche services to ensure strong growth ahead

- Industrial Design (ID) includes services like mechanical design of products and user experience design. This business contributes 10% to TELX’s software revenues.
- There is huge potential to scale up non-India revenues from the current levels of 50% to 80-90% in line with high international revenue contribution from the EPD division.
- As ID requires significant local presence, TELX has set up a new satellite studio in Europe in FY14. It plans to open satellite studios in the US and other markets like Japan. These will drive higher international contribution.

### Delivering niche design services, enhancing user experience

TELX’s Industrial Design (ID) division helps customers develop endearing brands and products by using design and technology as a strategic tool for business success. In the case of products, this includes form, color, branding and texture, as well as the way the product interfaces with the user. The division also helps customers improve their service delivery by studying, analyzing, and providing design interventions that improve end-user experience at every touch point. It services a spectrum of industries, including automotive, consumer electronics, retail, consumer goods, communications, and healthcare. With increasing competition in the services sector, many companies may need to take a fresh look at their existing services and to redesign the workflow and every aspect of their services to create better user experience. Service design is an emerging opportunity for the ID division, across multiple segments such as retail, travel, hospitality, and banking. TELX’s ID division has grown at a CAGR of 18% over FY12-14, we expect 15% CAGR over FY15-17.

Exhibit 35: TELX’s life-cycle for a Industrial Design Project



**Key growth drivers**

As products get more digital, user interface is the most important element. It is no longer about buttons on products. Key growth drivers:

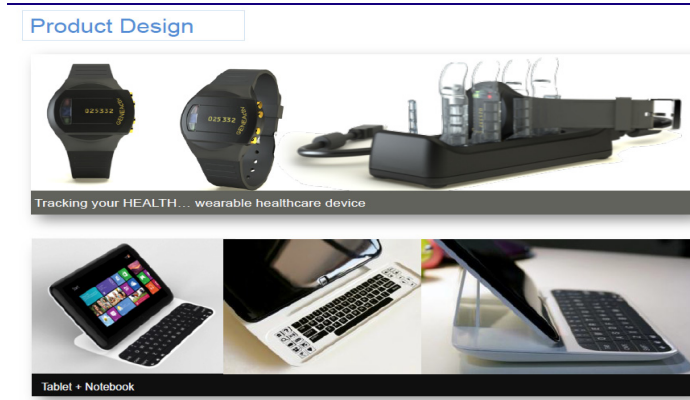
- 1) Need to enhance user interface for products across industries
- 2) Service design – T2, Taj Hotels, Bangalore metro, Mumbai monorail, hotels, infrastructure, banking, real estate, etc.
- 3) Enhancing closeness to the customer through satellite studios.

**Major projects executed by TELX in the ID division**

TELX’s ID division executed multiple projects in FY14. It worked with GVK to create enhanced experience for travelers at Mumbai International Airport’s new integrated terminal-2, while increasing efficiency and productivity for the airport staff. As part of this project, the ID team designed entertainment zones, customer service zones, general and lifestyle seating areas in the main terminal area, payphones, charging stations, ATM vending machines and Internet workstations/kiosks.

It worked with (1) St James’ Court, and (2) Taj 51 Buckingham Gate, Suites and Residences in London to redefine the visual identity of the two hotels. The design team executed over one hundred design interventions as part of this re-branding project that encompassed amenities, services, communication, and promotional collateral and stationery. TELX was also declared winner of the first Automotive Grade Linux (AGL) User Experience Contest in the “Best User Experience” category for its concept of a next-generation user interface for cars.

**Exhibit 36: Product design for wearables**



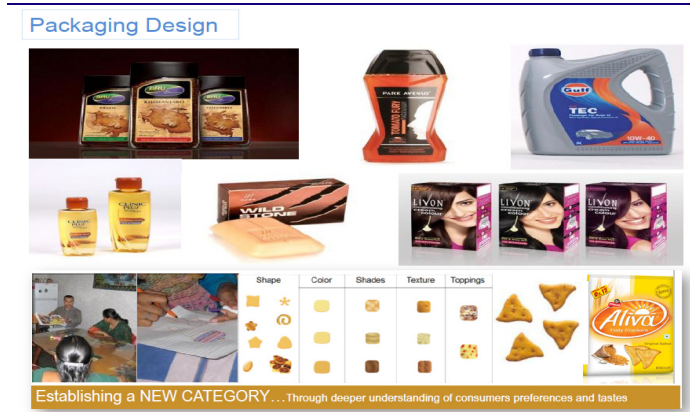
Source: Company, MOSL

**Exhibit 37: Product conceptualization for HUL’s Pure it**



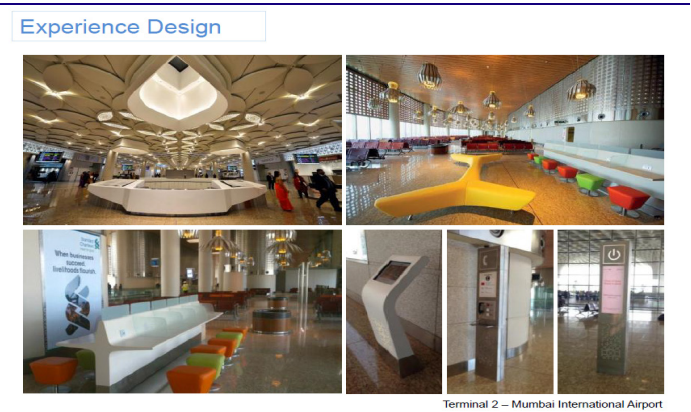
Source: Company, MOSL

**Exhibit 38: Packaging design for FMCG**



Source: Company, MOSL

**Exhibit 39: Experience design for Mumbai Airport, T - 2**

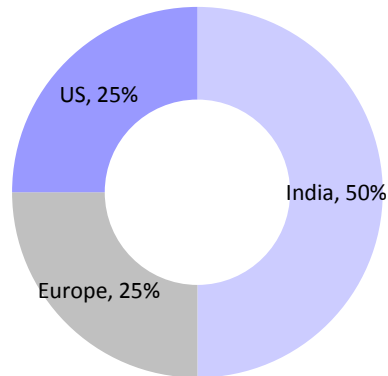


Source: Company, MOSL

### Focus on expanding region-centric model to Europe and US

The ID division is a business that requires high degree of local presence. India accounts for 50% of the division's revenue. TELX has a 300-member team in the ID division. To be better equipped to meet local needs, TELX has set up a new satellite studio in Europe. It is planning to open satellite studios in the US and in other key global markets like Japan. The management believes there is huge potential to scale up non-India revenues from the current 50% to as high as 80-90%, in line with high international revenue contribution from the EPD division.

#### Exhibit 40: Industrial Design – revenue mix by geography

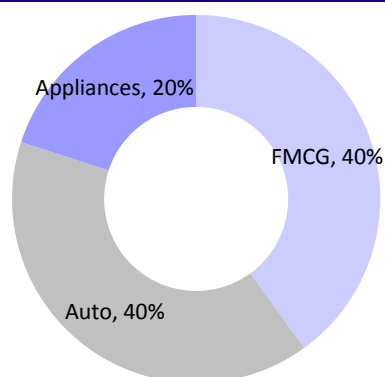


Source: Company, MOSL

### FMCG, autos key revenue contributors to ID division

The ID division caters to three large addressable markets – FMCG, autos and appliances. The division's key responsibilities include understanding consumer needs, converting them into designs, and delivering the final product to the customer. FMCG, for example, does not have anything to do with electronics. Here, orders mean delivering on product designs, branding, and shelf-spacing for clients like P&G, Unilever, Emami, Dabur, etc, in categories like personal care, healthcare, foods, etc. Similarly, in autos, cross-selling to global customers from the EPD division helps drive ID revenues. In appliances, there are more opportunities to work with category players like Phillips, LG, etc, as against large and deep-pocket players like Apple and Samsung. The management believes retail could be another major sub-sector, contributing meaningfully to ID revenue, going forward.

#### Exhibit 41: Industrial Design – revenue mix by client type



Source: Company, MOSL



## Visual Computing Labs – restructuring done

### Focus now on profitable projects

- TELX has significantly ramped down its VCL business, with closure of the loss-making Los Angeles studio and termination of the A2E JV with Andrew Heyward.
- Having learnt lessons from losses in the overseas studio and the JV, TELX is now focused on domestic business and short-contract overseas business.
- Going forward, VCL is expected to be a small business segment for TELX, contributing just 5% to software business and 0% to profitability.

### Restructuring done; focus now on lean, profitable sub-segments

VCL provides high-end animation and visual effects (VFX) services. It caters to the entertainment industry by providing these services for feature films, television serials and high-end gaming. It also caters to the marketing and advertising industry by providing these services for TV ad commercials and corporate videos for visualization and new product launches. VCL is focused on winning and executing projects that ensure financial sustainability while maintaining its proposition for world-class creative services. TELX won the 2013 Filmfare award for the Best Visual Effects for 'Dhoom 3', strengthening its position as the leading creative services company in India. It was also recognized for its stellar work in delivering visual effects for 'Bhaag Milkha Bhaag'.

### Developed unique capabilities over the years

Very few studios in the world do both animation as well as special effects. TELX's VCL division is one of these. The division is largely focused on post-production work, with no exposure to live shoots. The array of work it covers includes movies, TV, custom content in gaming, corporate AVs, etc. TELX has a 125-member team that supports the VCL business.

### What went wrong with Los Angeles studio

TELX was doing well in the India market, but was not making major breakthrough in the US due to lack of a front-facing team. There were two key sub-segments – visual effects and 3D animation. To gain US business, TELX opened a studio in Los Angeles (LA). In the first year, the LA studio worked on Hollywood movies and did a lot of 2D to 3D conversion work, to which the entire skill base in that studio was oriented. However, the 2D to 3D conversion work dried up pretty quickly. In the absence of revenues, TELX found it extremely expensive to run the LA studio and had to downsize.

The 3D animation sub-segment got a handful of projects. They were long-duration projects and all of them ended up costing much more than the revenue agreed upon because of changes in the quality of animation (number of characters, background, etc). TELX went back to most customers seeking price revision but was unsuccessful. It wound down contracts relating to 3D animation engagements and started to focus more on the VFX for films - Indian or international, completely doing away with long form animation contracts. Focus was re-oriented to doing short-form animations like those for TV commercials, 7-10 minute visualization films, etc, which are not loss-making.



**A2E@ JV – another VCL sub-business which went wrong**

TELX formed a JV with A Squared Entertainment (A2E), an international kids' entertainment company, to create, develop and distribute original brands, including animated entertainment, digital gaming and originally-designed consumer products. A2E was owned by Andrew Heyward, a Hollywood veteran who has created over 500 animation characters in his career. Led by Andrew Heyward, the JV intended to combine A2's creative development, brand management and multimedia distribution expertise with Tata's animation capabilities and technological innovation. The JV gained licenses for a powerful stable of brands involving personalities ranging from Warren Buffett to Martha Stewart, Gisele Bündchen and Stan Lee. TELX invested USD4m (INR220m) in the venture. Success of content could provide a non-linear revenue and profitability stream, which had attracted TELX to enter the JV.

**Problems began to surface as the JV progressed:** Within a year's time TELX exited the JV, as it was not progressing as per its original business expectations. The initial focus of the JV was to create animated characters of renowned personalities, targeting children in the age group of 10-14. Heyward had obtained the rights to produce shows featuring animated characters of personalities like Warren Buffet, Martha Stewart, Gisele Bündchen and Arnold Schwarzenegger. As the JV partner, TELX's role was to fund these projects apart from providing animation services. However, during the life of the JV, TELX did not see significant uptake in this content. Though it saw some interest among broadcasters for its animation shows like Secret Millionaires Club, pictured on Warren Buffet, those did not translate into enough business. To compound problems, it was also hamstrung by the fact that it had to abandon the show featuring the animation character of Arnold Schwarzenegger because of the scandal that came out about him. Broadcasters did not want to touch anything about him since it was meant for the children.

**Investments required in the JV were higher than initial commitment:** As per the JV contract, TELX was expected to invest USD3m every year from the second year. However, realizing that the actual investment would be much more, TELX decided to part ways in order to contain further risk of losses. In terms of the JV, TELX provided for full loss of equity as well as the financing that it had made available to the JV. Consequently, it also explored taking legal action to see if it could recover some of the money that it had lent to the JV.

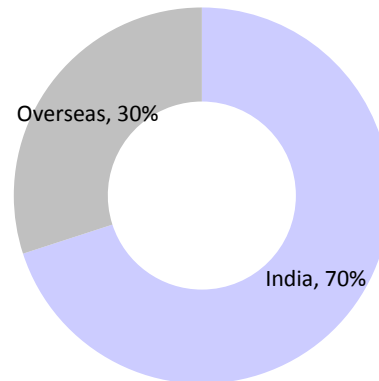
**Exit from overseas business, a decision in time**

Though TELX made the right investments in developing its overseas business, the results were not as per expectations. The management finally exit from its overseas loss-making businesses. It has decided to continue this business in areas where TELX has strengths, that is, strong offshore execution capability, while not engaging in any own property development or co-production opportunities, where it cannot exercise complete control on cost or revenue generation.

### Past tense; future promising for VCL division

Having learnt lessons from losses in the overseas studio as well as the JV, TELX is now focused on domestic business and short-contract overseas business. It derives 70% of the overall revenues of this division from India, with the balance 30% coming from overseas markets. In its worst times, the division reported a loss of INR500m (INR300m studio loss + INR200m JV loss), with a negative EBITDA margin of 20%. It has now broken even and we expect further improvement, going forward. However, profitability is likely to remain low. The management aims at 20% EBITDA margin in this business in the long term.

#### Exhibit 42: Revenue mix for VCL division by geography



Source: Company, MOSL

### Pipeline management key to achieving maximum productivity

The VCL business is lumpy and the management has to dynamically allocate resources to various projects. It is difficult to allocate people. Sometimes there is a need to allocate 100% of the workforce to a single project. Sometimes it becomes challenging to accept new projects, as the people working on old projects cannot be suddenly ramped down. Pipeline management is a fundamental challenge that the industry faces globally. In the US, as there are well-defined models of hire and fire, it is easier to ramp up and ramp down. However, in India, as it is difficult to fire employees, the management has to hire conservatively. The management is currently not considering hiring new employees. The division has only one location – Mumbai, with a 125-member team.

### VCL projects implemented by TELX



Source: Company, MOSL

## Systems Integration – not a major focus area

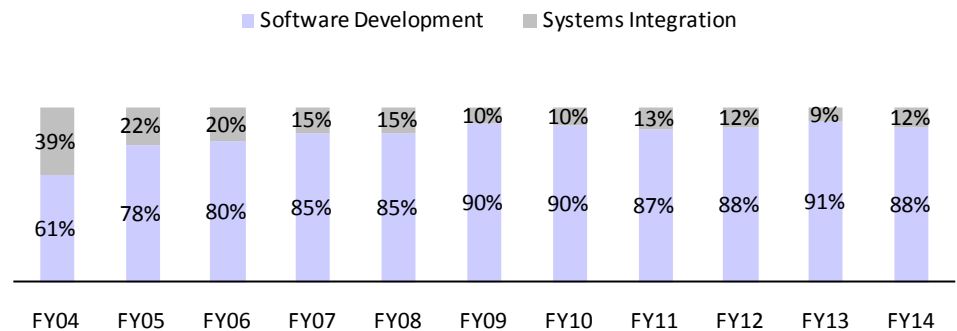
### Expect this business to remain largely stable

- Revenue contribution from the Systems Integration (SI) division has declined substantially over the last 10 years – from 39% of TELX’s revenue to 12%.
- The management prefers to focus on increasing the share of software sales and support services against hardware. This helps to improve margins; hardware is a low margin business.
- Increasing share of software and support services in the business mix should improve revenue composition and margins, going forward.

### Systems Integration not a major focus area

The proportion of revenue from Systems Integration (SI) has been declining over the years. In FY14, SI contributed over 39% of TELX’s revenue; this has now declined to just 12%. This business segment implements and integrates complete systems and solutions for high-performance computing, CAD/CAM/CAE/PLM, broadcast, virtual reality, storage, and disaster recovery. It also provides professional services for maintenance and support of IT infrastructure in India and overseas.

#### Exhibit 43: Revenue composition from Systems Integration has been declining



Source: Company, MOSL

### Driving higher software sales in Systems Integration

In SI, the management is focused on increasing the share of software sales and support services to improve margins. Though hardware contributes heavily to revenues, it does not contribute significantly to EBITDA. Further, there is considerable unpredictability and cyclicity associated with the hardware business, both in annual terms as well as on a quarterly basis. The SI segment reported revenue of INR920m in FY14, as against INR687m during FY13, registering an increase of 34%. Profit was INR84m in FY14 as against INR17m in FY13. This business delivered improved results through focus on a solution-centric approach that drives higher composition of software and support services in the business mix to improve revenues and margins.

## Earnings to post 26% CAGR over FY15-17

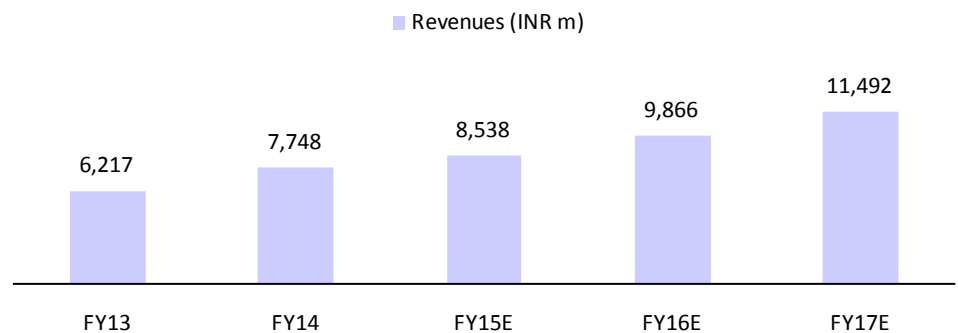
### Drivers: Transport and Broadcast

- We expect revenue to grow at a CAGR of 16% over FY15-17, led by 18% CAGR in EPD business. EBITDA would grow at 22% CAGR, with margins expanding 210bp to 23.4% led by mix improvement. Adjusted PAT would grow at a CAGR of 26%.
- Return ratios are expected to remain robust with RoCE expected at 62% and RoE expected at 41% for FY17. We expect strong cash generation to continue, with free cash reaching INR2.0b in FY17. We expect ~50% payout. Cash on books should rise to INR2.8b (~9% of market capitalization) in FY17.

### Expect revenue CAGR of 16% over FY15-17

We expect revenue to grow at a CAGR of 16% over FY15-17, led by 17% CAGR in software business, while we expect 5% CAGR for the SI business. Within software, we expect 25% CAGR for transportation, 15% CAGR for broadcast business, while we expect 5% CAGR for communications over FY15-17. Revenue mix for the software and SI business would be 95:5.

### Exhibit 44: Revenue to post 16% CAGR over FY15-17

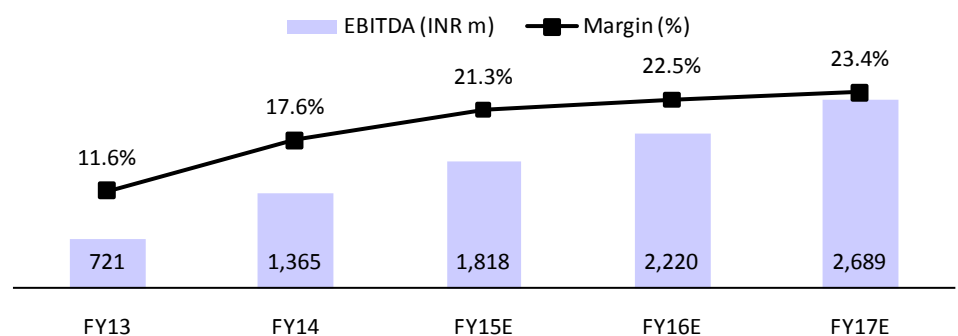


Source: Company, MOSL

### EBITDA to post 22% CAGR over FY15-17

We expect EBITDA to post 22% CAGR over FY15-17. Margins should expand 200bp to 23.4%, driven by higher contribution from software business. We expect software margins to expand by 200bp from to 25% led by higher margin auto and broadcast businesses. We expect 200bp improvement in SI margins due to higher focus on software sales. EBITDA mix for software and SI business would stand at 97:3.

### Exhibit 45: EBITDA to clock 22% CAGR over FY15-17

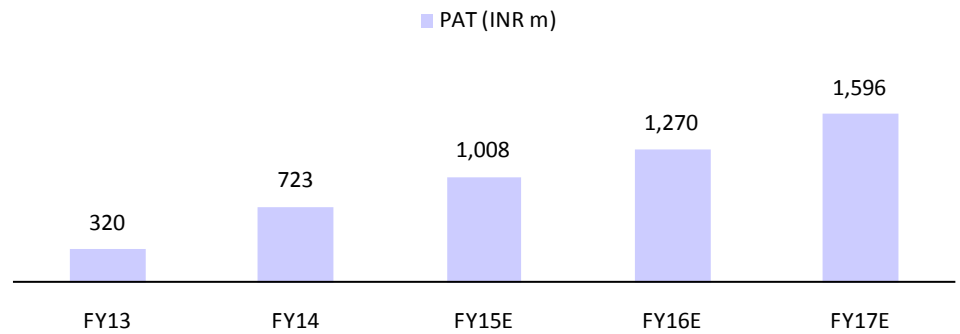


Source: Company, MOSL

**PAT to post 26% CAGR over FY15-17**

We expect PAT to grow at a CAGR of 26% over FY15-17, from INR1b to INR1.6b.

**Exhibit 46: PAT (INR m)**

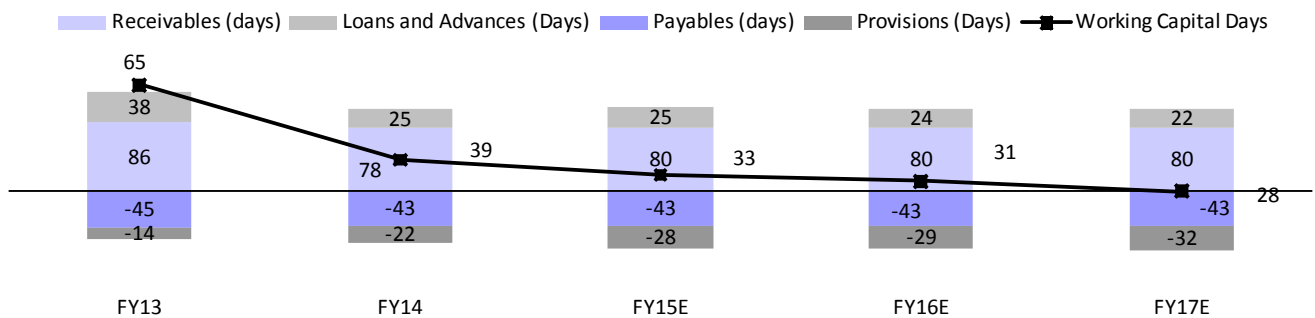


Source: MOSL

**Working capital cycle to remain strong**

We expect working capital days to remain strong, with improvement to 28 days.

**Exhibit 47: Cash conversion cycle (days)**

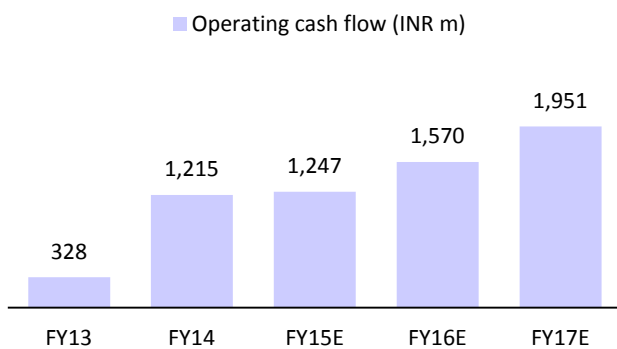


Source: MOSL

**Operating cash flows to remain strong; free cash flows robust**

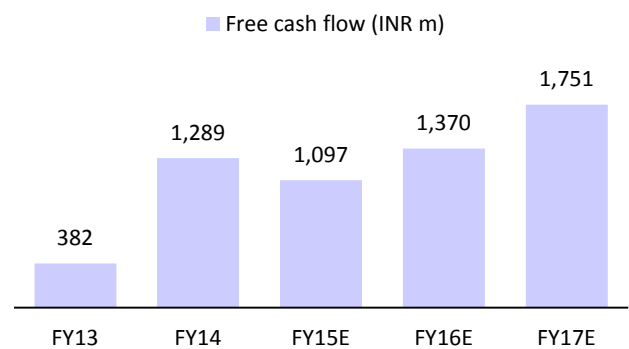
We expect operating cash flow to remain strong. Given minimal reinvestment needs, free cash flow should improve to INR1.8b over FY15-17. Capex during the period would only be minimal at INR200m per annum.

**Exhibit 48: Operating cash flow to remain strong**



Source: Company, MOSL

**Exhibit 49: Robust free cash generation**



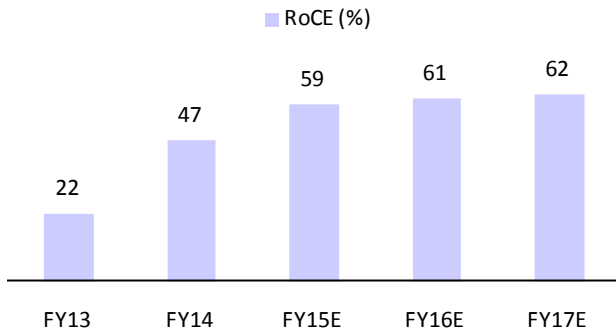
Source: Company, MOSL



**Return ratios to remain strong**

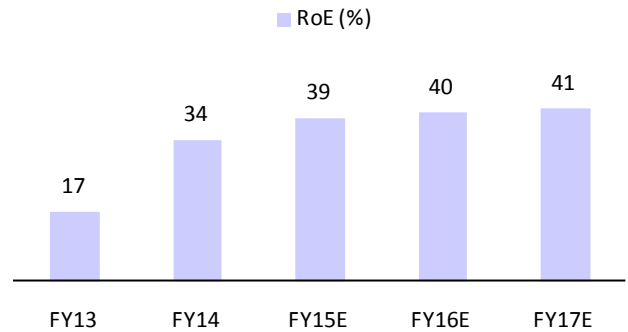
We expect strong return ratios with RoCEs and RoEs expected at 62% to 41%, respectively for FY17.

**Exhibit 50: RoCE (%)**



Source: Company, MOSL

**Exhibit 51: RoE (%)**

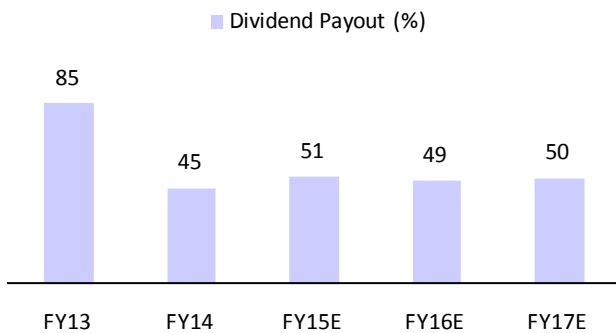


Source: Company, MOSL

**Dividend payout at 50%; strong cash accretion on books**

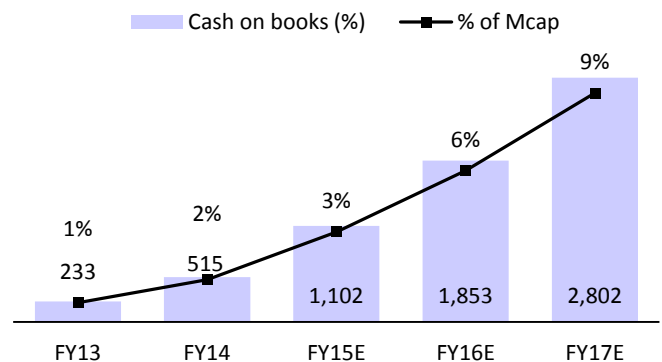
We expect TELX to continue its strong dividend track record, with ~50% payout. Despite high payout, we expect cash on books to rise from INR1.2b in FY15 due to INR2.8b in FY17, approximating 9% of the current market capitalization.

**Exhibit 52: Dividend payout (%)**



Source: Company, MOSL

**Exhibit 53: Cash on books (%)**



Source: Company, MOSL

## Initiating coverage with a Buy rating

### Target price of INR1,300 implies 30% upside

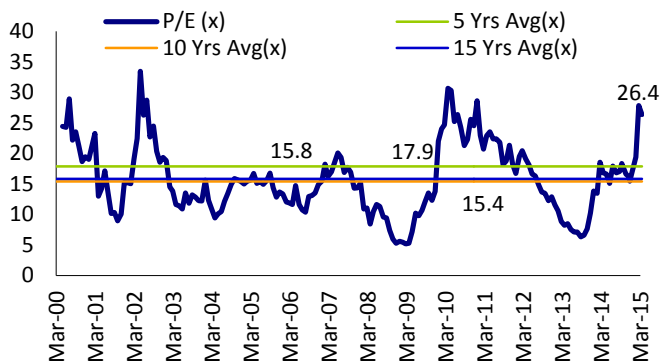
- We like TELX's niche presence in the high growth embedded product development market. It has undergone significant restructuring in the last two years, and has evolved into a more focused player with presence in the most promising business segments.
- Along with secular growth prospects, we believe TELX has significant margin levers, which provide further upsides to our estimates – (a) increase in offshoring proportion from the current 55% to 60-65%, (b) increase in proportion of fixed price contracts from the current 25% to 30-35%, (c) increase in utilization rates from the current 70% to 80%.
- We expect revenue to grow at a CAGR of 16% over FY15-17, led by 18% CAGR in the EPD business. Consequently, we expect 22% EBITDA CAGR and 26% PAT CAGR.
- The stock trades at 24.6x FY16E and 19.6x FY17E EPS. Given its high growth prospects and robust cash generation, we value the stock at 25x FY17E EPS. We initiate coverage with a Buy rating. Our target price is INR1,300, implying 30% upside.

Exhibit 54: Comparison with peers on key operating metrics (%)

Key matrices	TELX	KPIT	Infosys	TCS	MTCL
Offshore mix	55	43	49	51	54
Onsite mix	45	57	51	49	46
Utilization	70	72	75	81	74
Employee base (Nos)	3,000	9,933	165,411	313,757	13,018
Attrition rate	~15	~20	20	13	16
Fixed price contracts	25	30	43	51	44
Time and material contracts	75	70	57	49	56

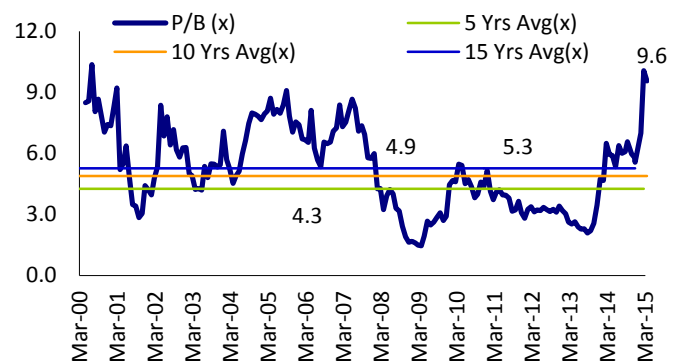
Source: Company, MOSL

Exhibit 55: PE (x)



Source: Company, MOSL

Exhibit 56: PB (x)



Source: Company, MOSL

**Exhibit 57: Assumption Sheet**

<b>Assumptions</b>	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>	<b>FY15E</b>	<b>FY16E</b>	<b>FY17E</b>
Software Development	4,543	5,530	6,827	7,893	9,189	10,781
Systems Integration	845	687	921	645	677	711
<b>Total Revenues (INR m)</b>	<b>5,387</b>	<b>6,217</b>	<b>7,748</b>	<b>8,538</b>	<b>9,866</b>	<b>11,492</b>
Software Development (%)	27	22	23	16	16	17
Systems Integration (%)	46	-19	34	-30	5	5
<b>Total Revenue Growth (%)</b>	<b>30</b>	<b>15</b>	<b>25</b>	<b>10</b>	<b>16</b>	<b>16</b>
Software Development (%)	84	89	88	92	93	94
Systems Integration (%)	16	11	12	8	7	6
<b>Total Revenue Mix (%)</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Software Development	598	624	1,379	1,815	2,205	2,695
Systems Integration	84	17	84	52	61	71
<b>Total EBITDA (INR m)</b>	<b>740</b>	<b>721</b>	<b>1,364</b>	<b>1,818</b>	<b>2,220</b>	<b>2,689</b>
Software Development (%)	13	11	20	23	24	25
Systems Integration (%)	10	2	9	8	9	10
<b>Total EBITDA Margin (%)</b>	<b>14</b>	<b>12</b>	<b>18</b>	<b>21</b>	<b>22</b>	<b>23</b>
Software Development (%)	88	97	94	97	97	97
Systems Integration (%)	12	3	6	3	3	3
<b>Total EBIT Mix (%)</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Company, MOSL

**Risks and concerns**

**Changes in US immigration policy:** The Indian IT industry is facing some challenges due to the changes in immigration policies in countries such as the US and UK, which increase the cost of deploying resources in those regions.

**INR appreciation:** INR appreciation can impact margins and profitability due to >70% export dependence. The recent appreciation of INR against the Euro can impact margins for TELX as it derives ~1/3<sup>rd</sup> of revenues from European geography.

## Annexure 1: Management

### Exhibit 58: Composition of the Board



**Mr. N Ganapathy Subramaniam**  
Chairman



**Mr. P McGoldrick**  
Independent Director



**Dr. R Natarajan**  
Independent Director



**Mrs. Shyamala Gopinath**  
Independent Director



**Mr. P G Mankad**  
Independent Director



**Mr. Madhukar Dev**  
CEO and Managing Director

Source: Company, MOSL

### Exhibit 59: Corporate Structure

	<b>Managing Director &amp; Chief Executive Officer</b> Madhukar Dev	
<b>Embedded Product Design (EPD)</b> Manoj Raghavan	<b>Chief Financial Officer</b> Ramaseshan	<b>Human Resources</b> Philip Mammen
<b>Industrial Design (ID)</b> Anil Sondur	<b>Strategic Initiatives &amp; BPR</b> Rajesh Kumar	<b>IT &amp; Systems</b> Arunava Mukhopadhyay
<b>Visual Computing Labs (VCL)</b> Nagarajan S	<b>Marketing</b> Nitin Pai	<b>Administration</b> Lokeshwaran
<b>Systems Integration &amp; Support (SIS)</b> Mannmohan Prasad P Shivakumar		<b>Company Secretary &amp; Legal Head</b> G Vaidyanathan

Source: Company, MOSL

### Mr. Madhukar Dev, Managing Director

Mr. Madhukar Dev is the Managing Director of Tata Elxsi. He has over 30 years of industry experience, including 20 years in Sales & Marketing. He joined Tata Elxsi in 1991, and since then has held various positions in Sales & Marketing. He has been instrumental in nurturing the company's economic, professional and, most importantly, intellectual growth. Prior to joining Tata Elxsi, Madhukar has worked in industries spanning Information Technology, Power Electronics and Publishing where his work experience included roles in Field Sales, Product Management and Market Development. Madhukar is a qualified MBA from IIM Bangalore and has also completed his M.Sc. in Physics.

**Mr. P McGoldrick, Independent Director**

Mr. P McGoldrick is the Independent Non-Executive Director on the board of Tata Elxsi. He began his career with the Lawrence Livermore National Laboratory, where he worked primarily on defense-related projects including the Mirror Fusion Test Facility for which he was the chief computer architect. In 1981, McGoldrick joined the Tata group and honed his vision of applying technology to help manufacturers create better products, which led to the establishment of Tata Technologies. He is also the Chief Executive Officer and Managing Director of Tata Technologies Ltd.

**Mr B V R Mohan Reddy, Independent Director**

Mr Reddy holds a Graduate degree in Mechanical Engineering from the College of Engineering, Kakinada and Postgraduate degrees from IIT, Kanpur, and University of Michigan, Ann Arbor. He has received an honorary Doctorate from JNTU, Hyderabad. Mr Reddy is a member of the NASSCOM Executive Council. He is also a member on the National Council of CII and is the Co-Chairperson of CII's National Committee on Design. He is the Chairman of the Board of Governors of IIT, Hyderabad. He is the Founder Chairman and Managing Director of Infotech Enterprises Limited. He is also on the Boards of Vizag IT Park Limited, Ocimum Bio Solutions Limited, and Tele Atlas (India) P Limited.

**Mrs. Shyamala Gopinath, Independent Director**

Mrs. Shyamala Gopinath is the Independent Non-Executive Director on the board of Tata Elxsi. She has vast experience in guiding and influencing the national policies in the diverse areas of financial sector regulation and supervision, development and regulation of financial markets, capital account management, management of government borrowings, forex reserves management, RBI accounts, and payment and settlement systems. Mrs. Gopinath holds a Master of Commerce degree and is a Certified Associate of Indian Institute of Bankers. Mrs. Gopinath retired as Deputy Governor of Reserve Bank of India. She is also on the Board of Indian Oil Corporation Ltd., Gas Authority of (India) Ltd., and National Stock Exchange Ltd.

**Dr. R Natarajan, Independent Director**

Dr. R Natarajan is an Independent Non-Executive Director on the Board of Tata Elxsi. Natarajan is currently the Vice President of The Indian National Academy of Engineering, and the Chairman of the Research Council of the Central Fuel Research Institute, Dhanbad. He received his Ph.D. and MASc degrees from the University of Waterloo, Canada. He was awarded Distinction in the M.E. Degree Program of the Indian Institute of Science, Bangalore.

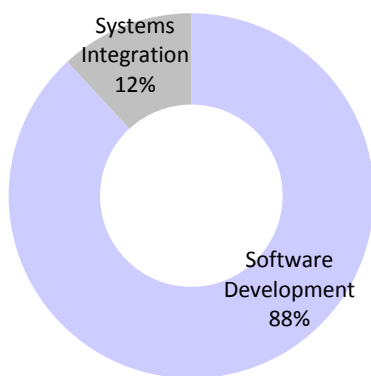
**Mr. P G Mankad, Independent Director**

Mr. Mankad is an Independent Non-Executive Director on the board of Tata Elxsi. He is a retired civil servant with a distinguished career of over 40 years in the prestigious Indian Administration Service, which he joined in 1964, topping his batch. Mankad was educated at Delhi University and later at Cambridge, UK, where he obtained a Post Graduate Diploma in Development Studies, with distinction.

## Annexure 2: About Tata Elxsi

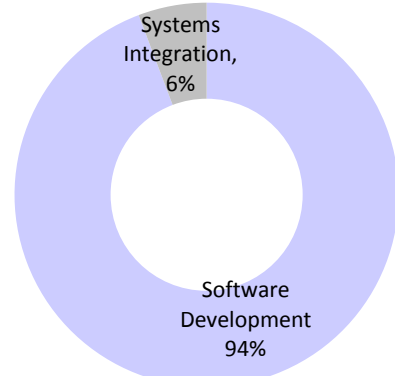
Tata Elxsi is a design company that blends technology, creativity and engineering to help customers transform ideas into world-class products and solutions. Tata Elxsi addresses the communications, consumer products, defence, healthcare, media & entertainment, semiconductor and transportation sectors. This is supported by a network of design studios, development centers and offices worldwide. Key services include embedded product design, industrial design, animation & visual effects and systems integration. Headquartered in Bangalore, India, its global network of offices includes Dubai, France, Germany, Japan, Malaysia, Singapore, South Africa, UAE, UK, and USA. Key Divisions:-

**Exhibit 60: Revenue Mix**



Source: Company, MOSL

**Exhibit 61: EBIT mix**



Source: Company, MOSL

**Exhibit 62: About Tata Elxsi**

### Technology-led Services Company

- Established in 1989
- Headquartered in Bangalore
- Public Limited company – 44% TATA owned



### Global Delivery capability

- International presence - US, Europe, APAC and Japan
- 3500+ team of designers, engineers & creative talent
- World-class Labs, Design Studios & Centers of Excellence

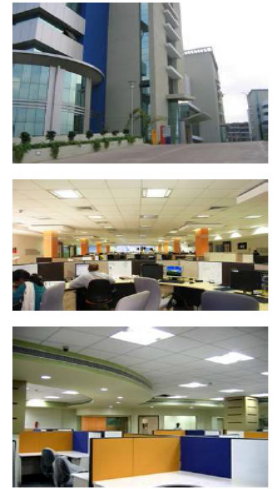
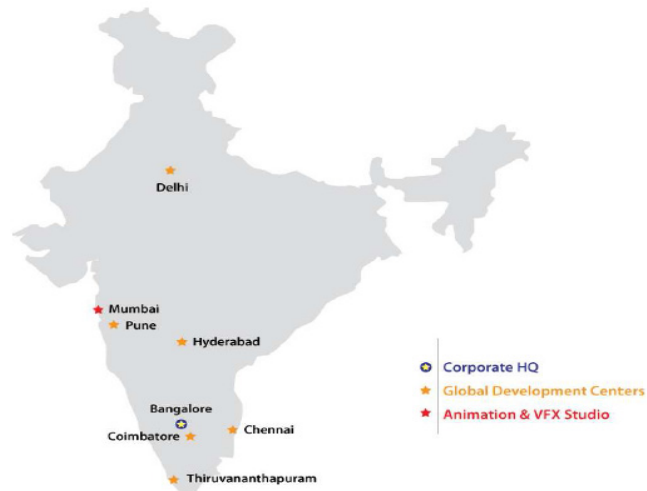
### World Class Systems & Processes

- Mature Quality Processes and Custom methodologies
- Certified for SEI CMMI Level 5 and ISO 9001:2000
- Assessed for Auto SPICE Level 5
- Assessed for ISO 13485:2003 for Medical Product design
- BS 7799 certified Information Management Processes



Source: Company, MOSL

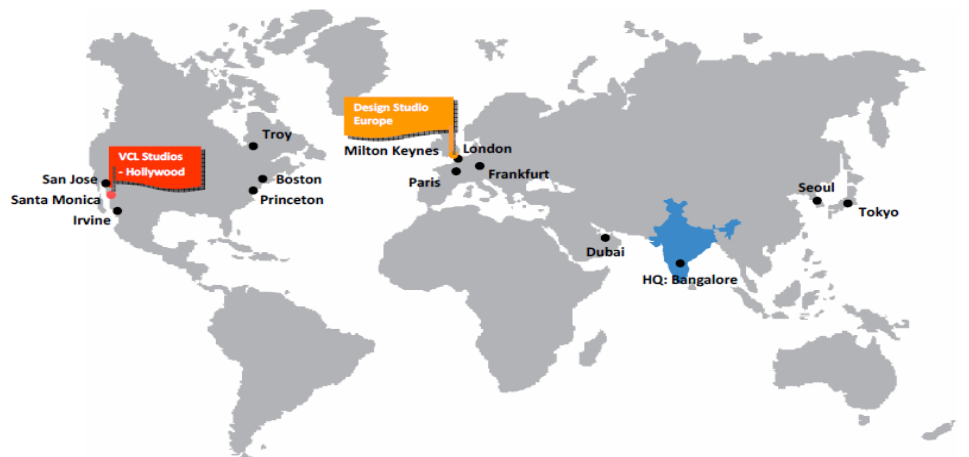
**Exhibit 63: Tata Elxsi – India Locations**



Source: Company, MOSL

**Exhibit 64: Tata Elxsi – Global Locations**

Offices and Centers across US, Europe and Asia



Source: Company, MOSL

**Exhibit 65: Tata Elxsi – Key segments**



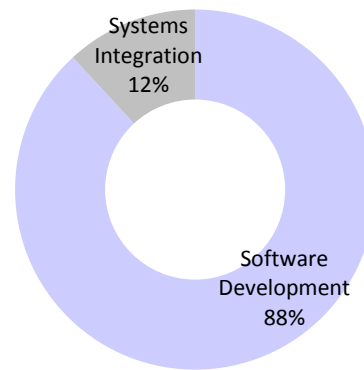
Source: Company, MOSL



**Software development is the core business for TELX**

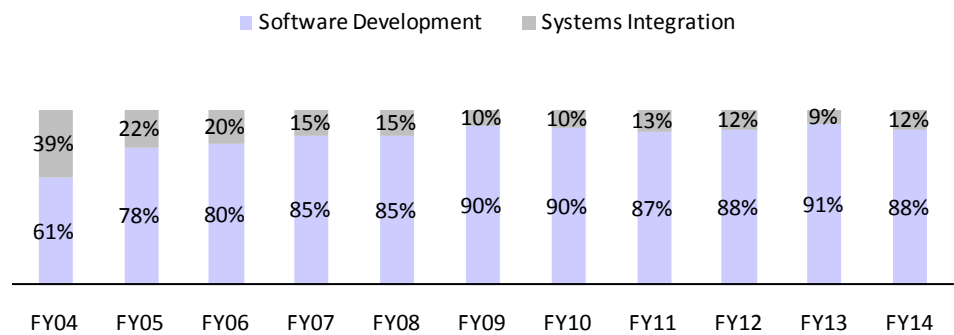
TELX has two major reporting divisions – Software development and Systems integration. Software development is the core revenue earner for the company and also the key focus area for the company. Revenues for the software division have posted a 22% CAGR over the last 10 years, while the Systems Integration division revenues grew by a mere 4% CAGR during the same period. Thus, revenue contribution from the Software division has increased from 61% in FY04 to 88% in FY14. Going forward, given management’s focus on growing the software division, we believe the revenue contribution from the software division will further increase. In terms of EBIT, Software development contributes 95% to total EBIT and is a higher margin business as compared to SI (SD has a 20% margin against SI margins of 8%).

**Exhibit 66: Software development contributes 88% to TELX’s revenues**



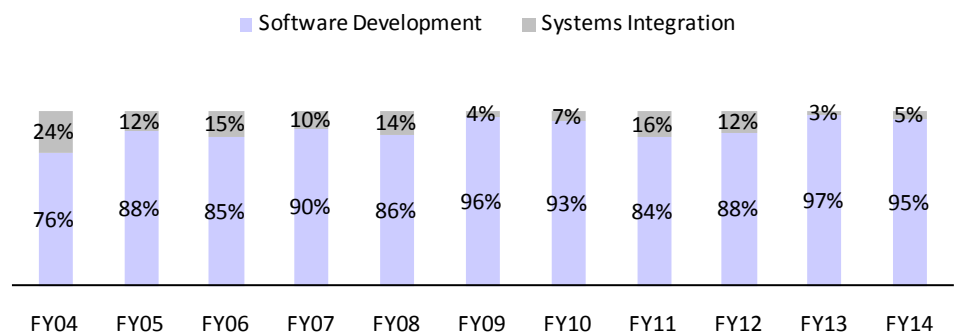
Source: Company, MOSL

**Exhibit 67: Software development division’s revenue contribution up from 61% to 88%**



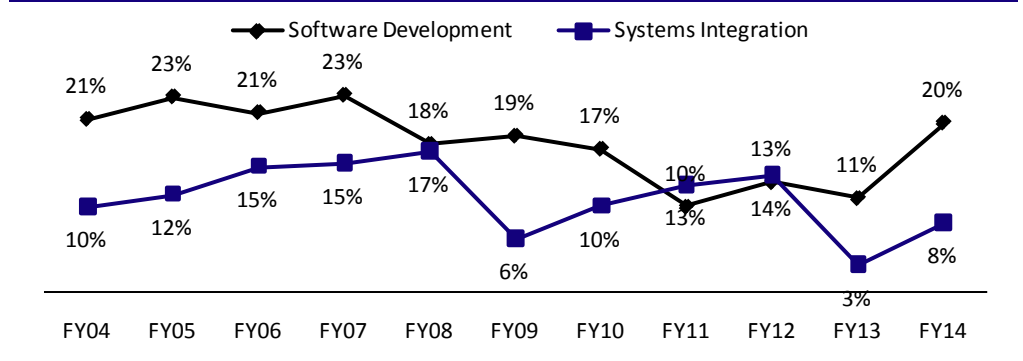
Source: Company, MOSL

**Exhibit 68: Software development division’s EBIT contribution up from 24% to 95%**



Source: Company, MOSL

**Exhibit 69: Software development is a higher margin business as compared to Systems Integration**

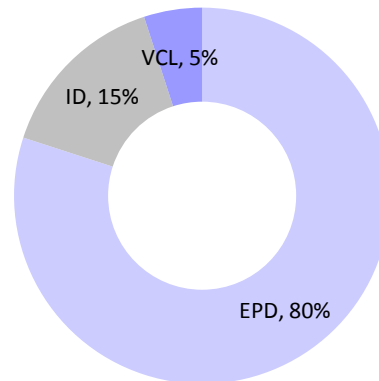


Source: Company, MOSL

**Software Development and Services is dominated by the EPD segment**

TELX has three major divisions under the software development and services business segment. Embedded Product Design (EPD), Industrial Design (ID) and Visual Computing Labs (VCL). EPD is the dominant contributor to software development revenues and contributes 80% to the division’s revenues, followed by ID and VCL which contribute 15% and 5% respectively.

**Exhibit 70: Revenue contribution of the software development division**

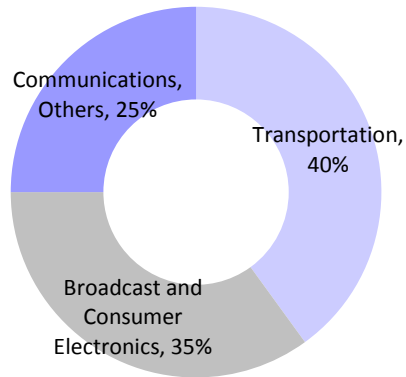


Source: Company, MOSL

**Embedded Product Design (EPD)**

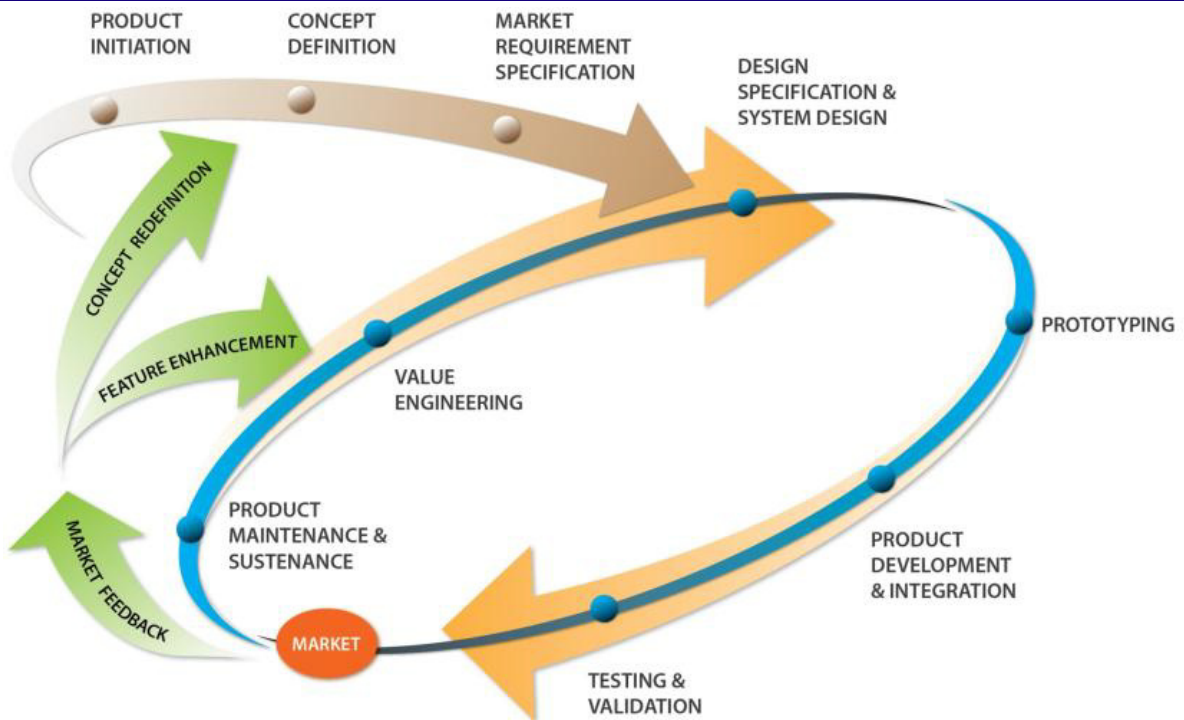
The Embedded Product Design division provides technology consulting, new product design, development, and testing services for transportation (40% of revenues), broadcast (35% of revenues) and communication (25% of revenues) industries. The segment helps customers develop electronic products by providing design of hardware, implementation of technologies such as audio, video, imaging and connectivity onto the hardware, and developing software applications and user interface that enable users to use the product and its functionality with ease.

**Exhibit 71: Revenue mix of the EPD division (%)**



Source: Company, MOSL

**Exhibit 72: EPD - Integrating hardware, software and system development services across the product development lifecycle**



Source: Company, MOSL

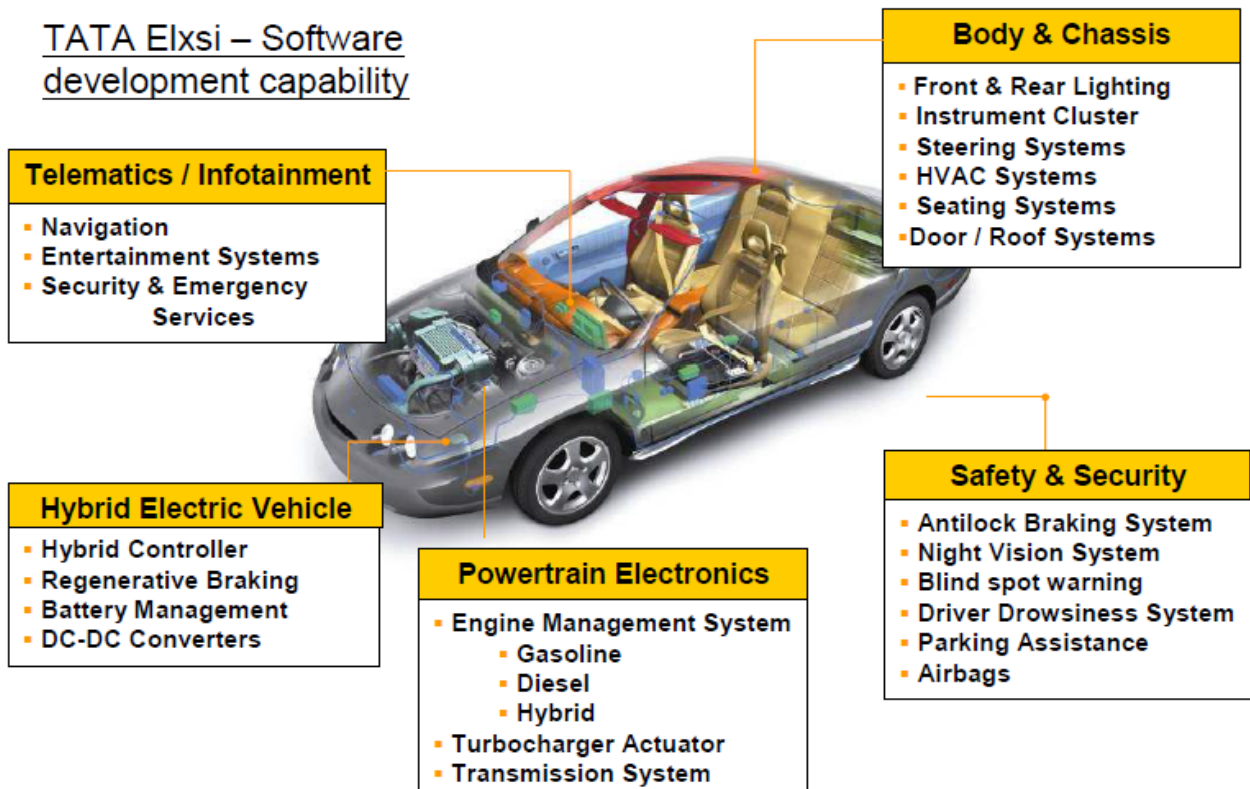
**Exhibit 73: EPD is structured into self-contained business units aligned to key industry verticals**

Broadcast & CE	Communications	Medical Electronics	Transportation
<p>Smart TVs &amp; Gateways, Smart Phones, Tablets, Consumer AV, Wearable devices</p>	<p>Unified Communications Equipment, 3G and 4G wireless devices, Routers &amp; Switches</p>	<p>Diagnostic equipment, Point-of-care equipment, Regulatory compliance</p>	<p>Infotainment, Safety &amp; Security, Powertrain, Chassis, Telematics, Avionics</p>
<b>Systems Custom hardware, Operating System, Drivers and Firmware</b>			

Source: Company, MOSL

## Transportation (40% of EPD revenues)

Exhibit 74: Scope of services provided by TELX in transportation division



Source: Company, MOSL

### Key focus areas include:

- **Body & Chassis Electronics:** Designing Front & Rear Lighting Systems, Instrument Cluster, Steering & Suspension Systems, Door Systems etc.
- **Telematics & Infotainment:** Connectivity, Navigation and location-based applications, Front and Rear Seat Entertainment, Multimedia, Human Machine Interface system etc.
- **Powertrain Electronics:** Designing an engine management system (Gasoline, Diesel & Hybrid), Transmission systems etc.
- **Hybrid Electronics:** Battery Management system, DC-DC Converter, Motor Control etc.
- **Safety & Security:** Designing central locking system, passive entry system, night vision system, blind spot warning, parking assistance system etc.
- **AUTOSAR:** AUTOSAR migration services, AUTOSAR component & tool development, AUTOSAR stack support & maintenance, AUTOSAR training etc.

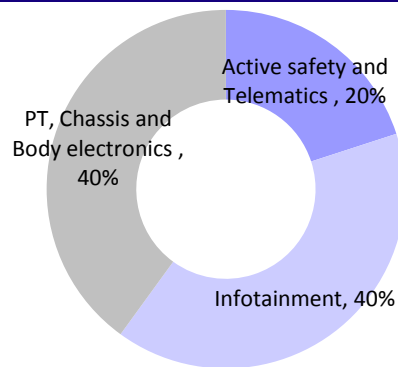
### Key offerings include:

- Verification and validation
- Rapid prototyping
- Hardware design
- Model-based design
- Development of control systems
- Embedded coding
- Process and domain consultancy

**Infotainment and Power train – Key segments driving auto EPD growth**

TELX transportation division offers electronics, software development and system design services for the automotive, rail and aerospace industry. Leading automotive manufacturers and system suppliers have collaborated towards an initiative called Automotive Open System Architecture (AUTOSAR) to better manage the increasing complexity of automotive electronics and heightened passenger and legal requirements. TELX has been associated with the AUTOSAR consortium from its early stages and is helping the automotive ecosystem adopt and implement AUTOSAR compliant systems in next-generation vehicles. Current mix between infotainment, power train (PT), chassis and body electronics for TELX stands at 40:40, with the balance coming from Active safety and Telematics.

**Exhibit 75: Auto’s – Revenue mix by type of product**

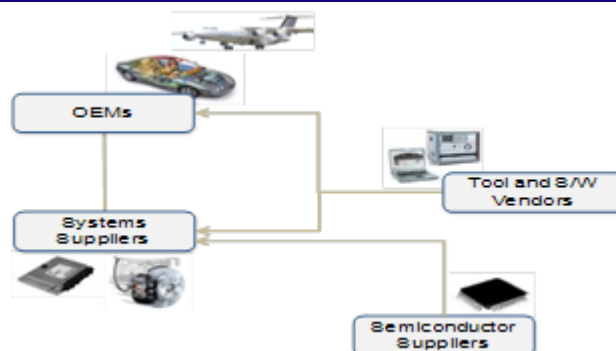


Source: Company, MOSL

**TELX caters to the entire value chain leading up to the OEMs**

TELX caters to the entire value chain leading up to the in the auto OEMs. Proportion of electronics cost as a proportion of car cost is only increasing, suggesting increasing penetration of high-end electronics in high-end as well as mass-oriented cars. For instance, high-end cars now come with electronics that display directions from Google maps directly on your screen, electronics that enable driver assistance either in the form of assisted parking, automated parking, reversing cameras, land departure, etc. As OEMs traditionally did not focus or build all required capabilities around these areas, it is beneficial for players like TELX to build products for OEMs and win new business. Presence in the fast evolving electronics business presents a huge opportunity for niche, and focused players like Tata Elxsi.

**Exhibit 76: Automotive segment ecosystem**

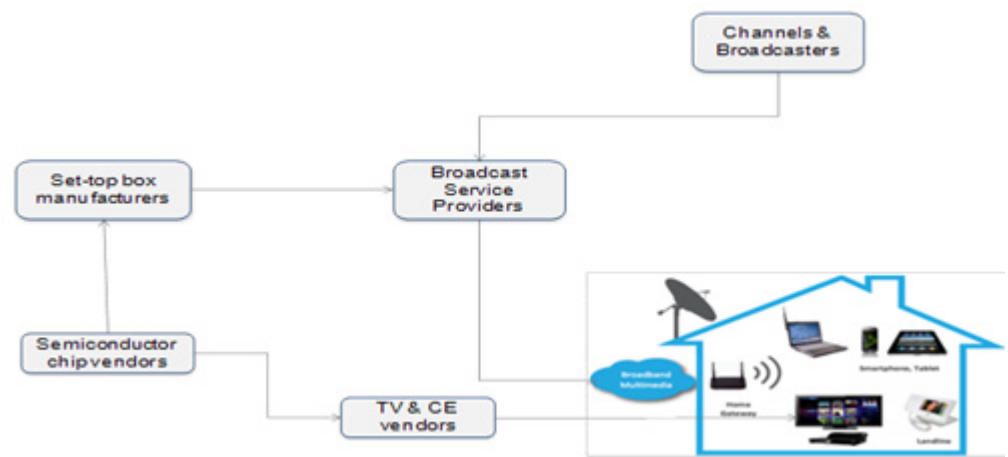


Source: Company, MOSL

### Broadcast and Consumer Electronics (35% of EPD revenues)

Tata Elxsi addresses the complete product development lifecycle from R&D, new product development (STB, Smart TVs, encoders, decoders, head-end, Value added services – Pay TV market, Cameras, video cameras, tablets, mobiles, etc ) and testing to maintenance engineering for Broadcast and Consumer Electronics. It also engages with Broadcast service providers across the world for the development of value-added applications that enhance the experience of their services and helps them reduce engineering costs associated with service deployment. Next generation cloud computing technologies and Internet bandwidth efficiency are driving the availability and consumption of content anywhere and everywhere. The Internet of Things (IoT) is allowing additional services on the same medium to enable services such as home automation, home surveillance and collaboration for the connected home. TELX is targeting engagements with service providers and product manufacturers to address these emerging opportunities.

#### Exhibit 77: Broadcast segment ecosystem



Source: Company, MOSL

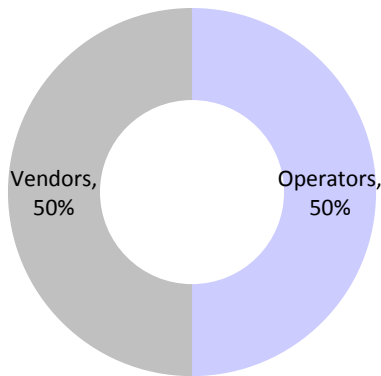
### Broadcast and Consumer Electronics

TELX in the broadcast and consumer division caters to 4 large ecosystem players – Operators (50% of revenues – 12 clients), Vendors (50% of revenues – 8 clients) like CISCO, Motorola, etc, Silicon companies (Broadcom, Qualcomm, Intel, ST), Conditional Access (Software aspects – work more as partners with them). Like in the automotive OEMs sector, operators in the cable TV market globally are looking to develop a host of new and differentiating features to help them stay ahead of competition. This is what entails new investments in technologies where players like TELX come to the fore.

Operators like Comcast, Time Warner Cable, Sky, BT, etc are key customers for TELX on the operator's front. Operators build products that help them drive their user ARPU (Average Revenue Per User) higher. Examples of products developed by TELX for operators – TELX developed a product for an operator which helped users to chat online in groups on TV while watching a sports telecast. Operators have been a high growth segment for TELX, revenue from operators which was non-existent rose to 50% of broadcast revenues in 5 years. Similarly on the vendors (device companies) front, TELX's key clients include ST Micro, Entropic, etc. Device companies like vendors are looking to build differentiators on their platform.

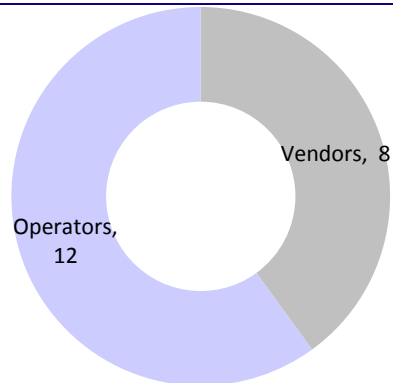
However, unlike operators, device business is now increasingly commoditized. Hence, device revenues for TELX have been virtually constant over the last 3-4 years. Devices infact contributed 100% to broadcast revenues 5 years back, and operator business which was virtually non-existent 5 years back has now grown to equal of the device business. Going forward, we believe mega changes like migration from 3G to 4G can drive device revenue growth; but in the absence of which operators will continue to drive growth.

**Exhibit 78: Broadcast – Revenue mix by type of client**



Source: Company, MOSL

**Exhibit 79: Broadcast – Number of clients**

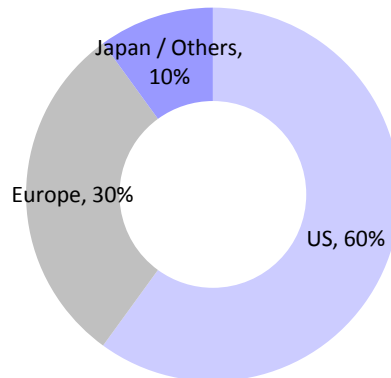


Source: Company, MOSL

**Broadcast and Consumer Electronics**

TELX in the broadcast and consumer electronic business derives 60% of revenues from the US, 30% from Europe and balance 10% from Japan and other markets. With emerging segments like cloud based TV Video Recording (TVR), Video on Demand (VoD), enabling operators for cloud for Pay TV, etc management is confident of strong growth across geographies.

**Exhibit 80: Broadcast – Revenue mix by geography**

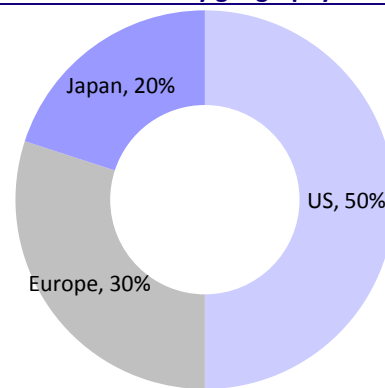


Source: Company, MOSL

**Communications (25% of EPD revenues)**

TELX in the communications business division derives 50% of revenues from the US, 30% from Europe and balance 20% from Japan. It has 15 to 20 clients in this division.



**Exhibit 81: Communications – Revenue mix by geography**

Source: Company, MOSL

**TELX participates in leading industry events**

TELX participates in leading industry events such as the Consumer Electronics Show (CES) - Las Vegas and SAE Convergence Show in Detroit, to showcase its capability and innovations to the global market. It also presented technical papers on topics such as next-generation vehicle security at the VDI conference in Germany.

**Exhibit 82: Key events TELX participates in auto segment****Events Participated in 2014:**

- FISITA 2014 World Automotive Congress
- R-Car Consortium 2014 Meet
- TMSC Forum 2014–Presentation
- Euroforum 6th International Annual Conference on ISO 26262
- International CES 2015

**TBU IPs:**

- AUTOSAR Software stack
- **Infotainment related components and codecs such as**
  - **Audio Codecs such as** MP3, Windows Media Audio, DTS
  - **Speech codecs such as** G.711, G.722, G.722.1, AMR
  - **Video:** MPEG-2, MPEG-4, H.264, H.263, Windows Media Video, etc

Source: Company, MOSL

**Exhibit 83: Key events TELX participates in broadcast segment****Events Participated in 2014:**

- CES
- RDK Users Conference – Denver
- Euro RDK Conference
- ASP RDK Program – Atlanta
- IBC - Amsterdam

**BBU IPs:**

- RDK Prime - RDK Deployment Framework
- FalconEye - Test Automation Solution
- RDK Emulator - Desktop RDK Emulator
- Cloud based Autonomic Healing
- Proactive Diagnostics Solution
- Media Asset Manager (MAM ) - Asset management Solution

Source: Company, MOSL

**Exhibit 84: Key events TELX participates in semiconductor segment**

**Events Participated in 2014:**

- ARM tech Symposia
- Design Automation Conference

**SBU IPs:**

- H.264 - Ultra low latency CODEC
- H.265/ HEVC
- CPRI
- JESD 204 (High speed interface)

Source: Company, MOSL

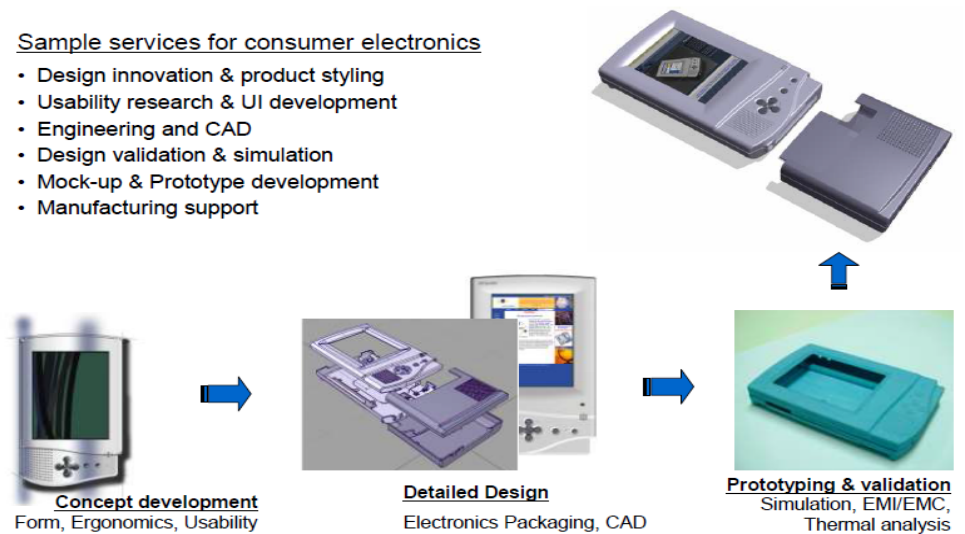
**2) Industrial Design**

Tata Elxsi helps customers develop successful brands and products by using design as a strategic tool for business success. It caters to a broad spectrum of industries like Automotive, Communications, Consumer products, Healthcare and Retail. Its services include research & strategy, branding & graphic design, product design, packaging design, UI design, retail design & signage, transportation design, design engineering and prototype development. It has supported the launch of multiple brands and products across the world and won several international awards and patents for design and innovation.

**Exhibit 85: Software components and products**

Sample services for consumer electronics

- Design innovation & product styling
- Usability research & UI development
- Engineering and CAD
- Design validation & simulation
- Mock-up & Prototype development
- Manufacturing support



Source: Company, MOSL

**Exhibit 86: Software components and products**

Internationally recognized for innovation & design...

★  
World star award  
Innovative packaging



**Horlicks Junior  
for GlaxoSmithKline**



★  
iawards  
Product innovation which has  
positively impacted society  
**PureIT water purifier  
for Unilever**

★ House Beautiful award,  
UK  
Best gardening product



**Deck Applicator  
for Cuprinol**



★ Asia star award  
Innovative  
packaging  
**Ponds Dreamflower Talc  
for Unilever**

Source: Company, MOSL

**Exhibit 87: Software components and products**



**Simputer, for Encore**  
Styling and product design of a  
Low-cost handheld computer for the  
rural market – enabling connectivity,  
education, mobile banking and more

**Ooria, for BP**  
Low-cost biomass stove  
that is environment  
friendly, easy-to-use and  
safe



**Pure-it, for Unilever**  
Low-cost water purifier that does not  
require electricity or running water;  
filters and purifies water to drinking  
quality

**Star solar lantern, for Tata BP**  
Low-cost solar lantern to replace  
kerosene lamps and enable high-  
quality lighting in rural areas and poor  
households



Source: Company, MOSL

**3) Visual Computing Labs**

Tata Elxsi provides Animation and Visual Effects (VFX) services for feature films and episodic television. It also supports advertising and marketing by providing these services for TV Ad Commercials and corporate videos for visualization and new product launches. It has a world-class studio in India and a creative team that includes national and international award winning professionals. It has won the coveted 59th Filmfare Award and the Star Guild Award 2014 for “Best Visual Effects for a Feature Film” for its work in Dhoom 3 and has been acclaimed for the stellar work in delivering visual effects for Bhaag Milkha Bhaag.

**Exhibit 88: Software components and products**

Leading Production Studio for Visual Effects, Animation and Digital Content Creation



Source: Company, MOSL

**Exhibit 89: Software components and products**

- Creative work spanning from Hollywood to Bollywood...
- Production Studios in Santa Monica, USA and Mumbai, India
- Staffed by world-class creative talent including Joel Hynek, double *Academy Award* winner and leading Hollywood visual effects supervisor



Feature Films  
Animation  
Special Effects

**3D Animation  
Digital Visual Effects  
Pre-Visualization**



Television  
TV Commercials  
Episodic Television



Custom Content  
Visualization  
Training / Simulation



Games  
Game Art  
Cinematics

Source: Company, MOSL

**Exhibit 90: Software components and products**

Internationally recognized for digital media content

**Recent International projects**

- Spiderman 3
- Iron man
- Clash of the Titans
- Ghost rider



**Recent Awards**

- ★ India's first ever nomination to the **VES awards** for "**Outstanding animation in a animation feature film**" for "Roadside Romeo", co-produced by Disney Pictures
- ★ Winner of the "**Best Special Effects**" award at the 53<sup>rd</sup> Indian National Films Awards - 2010



Source: Company, MOSL

**4) Systems Integration**

Tata Elxsi implements and integrates complete systems and solutions for Broadcast, CAD/CAM/CAE/PLM, Disaster Recovery, High-Performance Computing, Storage and Virtual Reality. It addresses the Broadcast, Defence, Education, Government and Manufacturing sectors with an expert team of integration specialists and support engineers located across a wide network of offices. This is backed by strategic partnerships with best-in-class software and technology providers. It also provides Professional Services, extending maintenance and support services for data mining, storage, IT facilities and network management in India and overseas.

**Exhibit 91: Software components and products**

Complete Solution Integrators for Select Verticals

- CAD / CAM / CAE
- Film, Video & Broadcast Solutions
- Media Asset Management Solutions
- Play out Servers
- Storage & Disaster Recovery Solutions
- Intelligent Digital Disk Recorder (iDDR)

**KEY PARTNERS**

- HP
- SGI
- EMC
- Thomson
- Autodesk
- Siemens PLM



Source: Company, MOSL



## Annexure 3: Technology Partners

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### 1) ADC

As a Premier Apple Developer Connection Member, Tata Elxsi has access to the latest tools and technical support needed to deliver in time. Its competence on Mac & iOS has resulted in many repeat design solution for healthcare, media & entertainment, and consumer electronics segment.



### 2) Altera Design Services Network

Tata Elxsi's partnership with Altera Design Services Network gives it Access to Altera's DSN Resource Center. This is a gateway for accessing technical training and certification, free tools/IP licenses, among others. It also serves as a platform to connect FPGA deigns engineers, business development, marketing, and sales team, and other interested engineers from Tata Elxsi and Altera.



### 3) Cadence

Tata Elxsi's partnership with Cadence provides it with verification tools/software (Specman simulators) for its internal training. This enables its engineers to effectively use the latest changes in tools, thereby reducing the verification time for the customers.



### 4) Comcast RDK

Comcast RDK is a pre-integrated software bundle that powers tru2way® IP or hybrid set-top boxes, and includes the CableLabs OCAP Reference Implementation software along with other open source components. Owing to this partnership, Tata Elxsi provides a framework that enables MSOs, SOC, and other box manufacturers/OEMs to rapidly optimize and deploy new broadcast and IP-based solutions for a richer consumer TV experience.



### 5) CommAgility

Tata Elxsi uses AMC form factor cards from CommAgility for solution development. CommAgility is a leading manufacturer of signal processing AMC modules for wireless baseband applications, combining flexible CPRI/OBSAI antenna interfaces, the latest TI DSPs and Xilinx FPGAs, and high bandwidth on and off-card communications using Serial RapidIO, PCI Express and Ethernet.



### 6) Polaris Networks

Polaris Networks provides EPC solution, which enables Tata Elxsi to offer an integrated solution to its customers.



### 7) Kontron

Tata Elxsi utilizes hardware platforms from Kontron for development. Kontron offers industry leading embedded computing platforms, which helps us provide accelerated embedded solution development for OEMs and system integrators.



### 8) DTS

Tata Elxsi is an implementation partner for DTS, and enables DTS algorithms to be ported on multiple semiconductor platforms for variety of applications. It brings together the multi-year DTS algorithm expertise in the pre and post processing components to ensure quick and efficient porting of DTS audio codecs onto various semiconductor platforms.



### 9) Interphase

Tata Elxsi uses AMC cards from Interphase for developing broadband wireless software solutions. Interphase delivers customers best in class solutions for connectivity, interworking, packet processing, electronic manufacturing services, and electronic engineering design services.



### 10) Freescale

Tata Elxsi, an authorized codec partner and supplier on QorIQ platform, delivers high quality and optimized codecs. Its clients have competitive advantage of test lab set up equipped with the latest hardware and software tools to verify and validate complete solution on the Freescale's communication processor.



### 11) Intel

Tata Elxsi's membership with Intel Embedded Alliance membership provides its engineering teams with access to the latest technology, devices and SDK from Intel. Tata Elxsi enables customers with a world-class professional engineering team across technologies and industries, trained on the latest Intel platforms and technologies. This allows its customers reduce development effort and time-to-market for their products and solutions.



### 12) Mentor Graphics

Tata Elxsi's partnership with Mentor Graphics entitles it with free access to Mentor Graphics' simulator tools/ Software like Model sim/ Questa prime for its internal training. This enables it to ramp up the team for any new projects within a short period of time and upgrade its engineers for effective usage of latest changes in tools thereby reducing the verification time for the customer.



### 13) Signalion

Tata Elxsi utilizes compact radios from Signalion for integration with its COTS based reference/custom solutions. Signalion offers test and measurement products and services for wireless communications along with highly specialized consulting services in mobile communications.



### 14) Qualcomm

Tata Elxsi has tied up with Qualcomm to help the users of QDSP - Hexagon platform get optimal software porting services on the Hexagon DSP's. Being the only service company to have entered into the Hexagon partnership with Qualcomm, Tata Elxsi provides software optimization, porting, customization, and integration services on the Hexagon platform DSPs.



### 15) R-Car

With a strong focus on the automotive and infotainment segment Tata Elxsi has joined R-Car consortium to bridge the gap in the infotainment value chain. With its expertise on the media codecs, connectivity protocols, applications, RTOS and hardware, Tata Elxsi has been able to provide right combination of technology and services to its automotive customers. This alliance gives its customers the desired expertise for complete solution and integration services on infotainment system.



### 16) Texas Instruments

Texas Instruments Tata Elxsi in partnership with Texas Instruments has access to the latest chipsets, software libraries, tools and technical support. Its competence in LTE L1 has resulted in many design solutions for public safety.



## Financials and valuations

Income statement				(INR Million)		
Y/E Mar	2012	2013	2014	2015E	2016E	2017E
<b>Net Sales</b>	<b>5,387</b>	<b>6,217</b>	<b>7,748</b>	<b>8,538</b>	<b>9,866</b>	<b>11,492</b>
Change (%)	29.5	15.4	24.6	10.2	15.6	16.5
<b>EBITDA</b>	<b>740</b>	<b>721</b>	<b>1,365</b>	<b>1,818</b>	<b>2,220</b>	<b>2,689</b>
EBITDA Margin (%)	13.7	11.6	17.6	21.3	22.5	23.4
Depreciation	205	237	350	353	395	431
<b>EBIT</b>	<b>535</b>	<b>483</b>	<b>1,015</b>	<b>1,465</b>	<b>1,824</b>	<b>2,258</b>
Interest	23	39	18	0	0	0
Other Income	42	48	126	63	100	161
Extraordinary items	0	-159	0	0	0	0
<b>PBT</b>	<b>554</b>	<b>652</b>	<b>1,122</b>	<b>1,528</b>	<b>1,925</b>	<b>2,418</b>
Tax	167	110	399	519	654	822
Tax Rate (%)	30.1	16.9	35.6	34.0	34.0	34.0
<b>Reported PAT</b>	<b>387</b>	<b>542</b>	<b>723</b>	<b>1,008</b>	<b>1,270</b>	<b>1,596</b>
<b>Adjusted PAT</b>	<b>346</b>	<b>320</b>	<b>723</b>	<b>1,008</b>	<b>1,270</b>	<b>1,596</b>
Change (%)	6.4	-7.6	126.1	39.5	26.0	25.6

Balance sheet				(INR Million)		
Y/E Mar	2012	2013	2014	2015E	2016E	2017E
Share Capital	311	311	311	311	311	311
Reserves	1,608	1,640	2,046	2,544	3,195	3,990
<b>Net Worth</b>	<b>1,920</b>	<b>1,952</b>	<b>2,357</b>	<b>2,855</b>	<b>3,506</b>	<b>4,301</b>
Debt	342	585	0	0	0	0
Deferred Tax	131	192	128	128	128	128
<b>Total Capital Employed</b>	<b>2,392</b>	<b>2,729</b>	<b>2,485</b>	<b>2,983</b>	<b>3,634</b>	<b>4,429</b>
Gross Fixed Assets	1,963	2,190	1,821	2,097	2,297	2,497
Less: Acc Depreciation	964	1,198	853	1,205	1,601	2,032
<b>Net Fixed Assets</b>	<b>999</b>	<b>992</b>	<b>968</b>	<b>892</b>	<b>696</b>	<b>465</b>
Capital WIP	105	213	126	0	0	0
Investments	0	0	0	0	0	0
<b>Current Assets</b>	<b>2,243</b>	<b>2,449</b>	<b>2,789</b>	<b>3,552</b>	<b>4,651</b>	<b>6,021</b>
Inventory	0	3	0	0	0	0
Debtors	1,369	1,567	1,748	1,871	2,162	2,519
Cash & Bank	267	233	515	1,102	1,853	2,802
Loans & Adv, Others	606	645	526	579	636	700
<b>Curr Liabs &amp; Provns</b>	<b>1,048</b>	<b>1,071</b>	<b>1,458</b>	<b>1,520</b>	<b>1,773</b>	<b>2,116</b>
Curr. Liabilities	719	830	994	1,006	1,162	1,354
Provisions	329	241	463	514	611	763
<b>Net Current Assets</b>	<b>1,195</b>	<b>1,378</b>	<b>1,331</b>	<b>2,032</b>	<b>2,878</b>	<b>3,904</b>
<b>Total Assets</b>	<b>2,392</b>	<b>2,729</b>	<b>2,485</b>	<b>2,983</b>	<b>3,634</b>	<b>4,429</b>

E: MOSL Estimates

## Financials and valuations

### Ratios

Y/E Mar	2012	2013	2014	2015E	2016E	2017E
<b>Basic (INR)</b>						
EPS	11.1	10.3	23.2	32.4	40.8	51.3
Cash EPS	17.7	17.9	34.5	43.7	53.5	65.1
Book Value	61.7	62.7	75.7	91.7	112.6	138.1
DPS	7.0	5.0	9.0	14.0	17.0	22.0
Payout (incl. Div. Tax.)	73.2	85.5	45.3	50.6	48.8	50.2
<b>Valuation(x)</b>						
P/E			43.2	31.0	24.6	19.6
Cash P/E			29.1	23.0	18.7	15.4
P/BV			13.3	10.9	8.9	7.3
EV/Sales			4.0	3.5	3.0	2.5
EV/EBITDA			22.5	16.6	13.2	10.6
Dividend Yield (%)	0.7	0.5	0.9	1.4	1.7	2.2
<b>Profitability Ratios (%)</b>						
RoE	18.5	16.5	33.6	38.7	39.9	40.9
RoCE	26.6	22.2	46.6	58.6	60.5	61.9
<b>Turnover Ratios (%)</b>						
Asset Turnover (x)	2.3	2.3	3.1	2.9	2.7	2.6
Debtors (No. of Days)	92.8	92.0	82.3	80.0	80.0	80.0
Inventory (No. of Days)	0.0	0.2	0.0	0.0	0.0	0.0
Creditors (No. of Days)	56.4	55.1	56.9	54.6	55.5	56.1
<b>Leverage Ratios (%)</b>						
Net Debt/Equity (x)	0.2	0.3	0.0	0.0	0.0	0.0

### Cash flow statement

(INR Million)

Y/E Mar	2012	2013	2014	2015E	2016E	2017E
OP/(Loss) before Tax	554	334	1,122	1,528	1,925	2,418
Depreciation	205	237	350	353	395	431
Others	0	0	0	0	0	0
Interest	23	23	16	0	0	0
Direct Taxes Paid	-138	-177	-174	-519	-654	-822
(Inc)/Dec in Wkg Cap	-86	-89	-99	-114	-96	-77
<b>CF from Op. Activity</b>	<b>624</b>	<b>379</b>	<b>1,288</b>	<b>1,247</b>	<b>1,570</b>	<b>1,951</b>
(Inc)/Dec in FA & CWIP	-282	3	1	-150	-200	-200
(Pur)/Sale of Invt	0	0	0	0	0	0
Others	-51	-307	-221	0	0	0
<b>CF from Inv. Activity</b>	<b>-332</b>	<b>-304</b>	<b>-221</b>	<b>-150</b>	<b>-200</b>	<b>-200</b>
Inc/(Dec) in Net Worth	0	0	0	0	0	0
Inc / (Dec) in Debt	44	183	-585	0	0	0
Interest Paid	-23	-39	-18	0	0	0
Divd Paid (incl Tax)	-218	-218	-156	-510	-619	-801
<b>CF from Fin. Activity</b>	<b>-232</b>	<b>-109</b>	<b>-786</b>	<b>-510</b>	<b>-619</b>	<b>-801</b>
<b>Inc/(Dec) in Cash</b>	<b>59</b>	<b>-34</b>	<b>282</b>	<b>587</b>	<b>751</b>	<b>949</b>
Add: Opening Balance	208	267	233	515	1,102	1,853
<b>Closing Balance</b>	<b>267</b>	<b>233</b>	<b>515</b>	<b>1,102</b>	<b>1,853</b>	<b>2,802</b>

E: MOSL Estimates

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