Platforms & Solutions

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β € I N G #1
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LTTS innovation led engineering practices enabled us...

**CUSTOMER NEEDS**
- Faster Product Development
- Product Differentiation
- Optimize Development Cost
- Automate Redundant Activities

**LTTS PROFICIENCY**
- **80+YRS** Engineering Heritage
- **43 Labs** Investments
- **5 Verticals** Comprehensive Domain Expertise

**OUTCOME**
- 51 customer of Top 100 R&D spenders
- 337 Patents
- 50+ Solutions, Reusable components & Frameworks
...to create a lot of assets.

OUR JOURNEY SO FAR

2014
- UBIQWeise
- i-BEMS
- VLSI-IPs
- Imaging

2016
- UBIQWeise 1.0
- i-BEMS
- VLSI-IPs
- Imaging
- MCare

2018
- i-BEMS 5.0
- UBIQWeise 2.0
- VLSI-IPs
- NB-IoT
- Compute Vision
- MCare
- AiKno
- DT Robo
- VANGEN
Emergence of the Era of Digital Engineering Enabled Platforms (DEEP)

DEEP are not Greenfield but evolutionary with Revolutionary Tendencies

VERY LARGE SCALE

INTELLIGENT

PARTICIPATIVE

7 Billion People
7 Trillion Things

PERVASIVE

ENABLED BY DIGITAL TECHNOLOGIES

Autonomy
Additive Manufacturing
Blockchain
Cobots
Cognitive Computing
Compute Vision

5G
3D Printing & Scanning
Sensors
Nanotechnology
IoT Platforms
Optical Computing
5G Accelerating Disruption

5G - ENABLED INDUSTRIES /USECASES

- Smarthome
- Wearables
- Retail
- Media and Entertainment
- AR, VR & Games

- Telco Infrastructure
- Industrial IoT
- Public Safety
- Enterprise connectivity
- Cloud and Data Center

- 5G Modem (NB-IoT, eMTC, 5G - NR)
- Enhanced power Management
- AI chipset

- 5G – RAN & 5G Core Network
- Edge Computing
- NFV Infrastructure
- Test Equipments
- Analytics and AI Tools
- OTN

- IaaS, PaaS
- Telco VNFs
- Orchestration
- Dimensioning & Benchmarking
- Service Automation

APPLICATIONS & TECHNOLOGIES

CONSUMER APPLICATIONS

ENTERPRISE APPLICATIONS

DEVICE

NETWORK

CLOUD ENGINEERING
Compute Vision Platform

- Face Detection
- Gender Detection
- Object Motion tracking Estimator
- Gesture Detection
- Person detector with Depth
- Depth Cloud Fuser
- Depth data calibration
- Sensor Fusion
- Behaviour Recognizer
- Motion alignment
- Face Emotion/Expression Detection
- Pose Estimation Descriptor
- Context descriptor & Learner
- Activity Learner
- Action Sequencer
- Eye gaze & drowsiness detection
- Eye ball/ brow tracking
- Surround View Modules
- Eye gaze & drowsiness detection
- Imagery Aligner
- Perception monitor
CTO Org – Enabling LTTS to go up the value chain

Preferred innovation partner for the customer

Development of Current Assets

Building New Assets

Monetization of Assets

- 35% Workforce
- 65% Workforce

Innovation, Platforms and Solutions

CTO Org

- Plant Engineering
- Transportation
- Hitex
- Medical
- Industrial Products

Horizontals

- Embedded
- Application Engineering
- Mechanical
- Digital Manufacturing Services

Client Servicing

Innovation, Platforms and Solutions
...by optimizing old infrastructure and building new infrastructure...

Cybersecurity – CoE Isreal

1. AUTOMOTIVE SECURITY
2. HOME NETWORK SECURITY
3. CYBER SECURITY SOLUTIONS
4. IOT PLATFORMS SECURITY

- 10+ Centre of Excellence
- 17 Nationalities
- 10 + Avg. Years of Experience
...building multi-vertical frameworks and solutions.
CTO Group Focus – Monetizing our Platforms

**LTTS 2021 Revenue:**

*USD 1 Billion*

**IP Revenues 2021:**

*1%*

**IP Influenced Revenue:**

*4 - 5x*
...and maturing next-gen platforms....

Intelligent Building Experience Management System
- System of Systems | Advanced Analytics

Artificial Intelligence Framework
- ML | NLP | Image Processing

NB-IoT Protocol
- Asset Tracking | Smart Metering | Smart Agriculture

IoT Platform
- Device Health Monitoring | Data Aggregation | Analytics

APPLICATION
- LWM2M
- One M2M
Layer 3 Protocol Stack
Layer 2 protocol Stack
- L1-L2 Abstraction
- L1 Baseband SW
Radio Interface
Target HW
RF Transceiver

UBIQWeise™

AiKno™

L&T Technology Services Partner 3rd Party

RTOS
Interfaces USB, Serial
LTTS AI Framework - AiKno™

Successful Cases

1. AI based Cognitive system for Metadata Extraction - for Oil and Gas Drilling Major
2. AI based system for better content retrieval and improvement - for Oil and Gas Drilling Major
3. AI based auto tagging system for restricted Semantic Search - for Oil and Gas Drilling Major
4. AI based Supplier Analysis and Comparison - for Transportation Major
5. AI based Information Retrieval System - for Automotive Manufacturer Major
6. Predicting and monitoring Efficiency of Plant – For Construction major
MARKET

- Smart Building Market Size: $32Bn by 2021
- 1.4 Billion Sensor deployments by 2021 for Commercial Real Estate Buildings

OUR FOCUS

- Office Spaces
- Commercial Buildings
- Residential Buildings

Roadmap

- Features to Enhance Quality of Life inside the building
- AI /ML based Enhanced Analytics

Technology Partners

- Azure
- Intel
...aided by Ideation through a Robust Innovation Engine

**Ideation Process**

- Opportunity Identification
- Innovation Ecosystem
- Front End
- Collaborative Shaping
- Ideation
- SWOT Analysis
- Feasibility Study
- Identifying Need

**Patents Filed**

- 337 Patents filed*
- *Patents filed include co-authored patents with customers

**University R&D Institute**

- Participate in Events
- Develop
- Roadshows

**Institutes Internship**

- Partnership
- Incubation
- Publish Paper

**Growth Plan**

- Reward
- Hire PhD

**Customer**

- L&T Technology Services
We are gaining initial traction

**IP Monetization Plan**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>PATENTS MONETIZATION IN PROGRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hydraulic</td>
</tr>
<tr>
<td>2</td>
<td>Lamp and Flicker testing</td>
</tr>
<tr>
<td>3</td>
<td>Camera based CO2 estimation in building</td>
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</tbody>
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**PHASE 1**

- Patent Monetization Opportunity Exploration
- Patent Shortlisting
- Potential Buyer Identification & Negotiation, Signing & Closure

**PHASE 2**

**PHASE 3**

- SINGAPORE BASED DATA CENTRE
- MIDDLE EAST TELECOM OPERATOR
- AUSTRALIAN MAJOR BANK
- OIL & GAS MAJOR AEROSPACE MRO
- US OEM
- INDIA DTH OPERATOR
- US OFF-HIGHWAY OEM
- Global Auto TIER 1 – ECU Security
- Security