Service Portfolio



Tuhin Chattopadhyay, Ph.D.

Founder & CEO, Tuhin AI Advisory

An ISO 27001:2013 Certified Company













India's Top 10

Analytics and Insight Data Scientists - 2016 Leader of the Year - 2017

Artificial Intelligence Leader of the Year - 2018

Digital Transformation Leader of the Year - 2019

CTO of the Year - 2020

https://www.linkedin.com/in/tuhinai/

International Experience

- •20 years of experience in academia & industry delivers analytics solutions to organizations across USA, Europe, Australia, Africa & South-East Asia
- Keynote speaker at international conferences like Next Big Tech Asia 17 in 2017 at Kuala Lumpur and Sports Analytics Africa in 2018 at Johannesburg
- Jury Member of data science competitions across Europe & USA

Thought Leadership

- Authored books & more than 30 publications in international journals & conferences
- Editor-in-Chief of International Journal of Business Analytics and Intelligence (IJBAI)
- Interview to DZone, USA https://dzone.com/articles/coffee-with-adata-scientist-tuhin

Senior Leadership



Kunal Kanti Mondol
Chief Technology Officer
Digital Transformation



Sujay Bhattacherjee

Advisor, Data Engineering

Enterprise Architecture,
Big Data Analytics,

Cloud Platform and Services



Chandan Mukherjee

Head, Business & Social Research

Economics & Finance

Professional



Head, Automation

Robotic Process Automation,

Business Process Reengineering,

Intelligent Automation

Sudhakar Nammi



Diptesh Saha

Head, Cybersecurity

Cybersecurity, ISO

Certification, Cloud,

Managed Services

Client Portfolio











Dr. Tuhin was able to combine academic rigour with pragmatic excellence and demonstrated stellar client skills. He developed a Marketing Mix Model with an accuracy/ predictive performance of more than 90% after more than hundred iterations, and still managed to deliver it well before the scheduled time.

Besides his thorough subject matter expertise in AI and Analytics, Dr. Tuhin is also adroit in making Data Science relatable to real world environments. **He has a vast repository of solutions** which are highly effective and easy to deploy. I would highly recommend him for any

Industry 4.0 technology led industry agnostic digital interventions.



Head
Auto Retail Practice at Nomura

Service Portfolio

Artificial Intelligence

Blockchain

Business Analytics

Business & Social Research

CaaS - CTO/ CDO/ CAO/ CISO as a Service

Cloud Computing

Cybersecurity

Data Engineering

<u>Digital</u> <u>Transformation</u> Intelligent
Automation

Managed Services

Management
Consultancy (IA)

Artificial Intelligence

Video Analytics & Surveillance

- 1. Vehicular Monitoring System
 - a. Traffic Monitoring
 - b. Automatic Number Plate Recognition
 - 2. Automated Warehouse Operations
 - a. Automated Loading & Unloading
 - 3. Workplace Safety
 - a. Human & PPE Detection
 - b. Human Pose Estimation & Analysis
 - c. Gait Analysis for Injury Prevention
 - 4. Image based fashion recommender

Augmented Reality (AR)

Drone Image Identification & Classification

Smart Farming

Audio Mining

Natural Language Generation





Blockchain

InsurTech

• Distributed smart contract system to create a transparent, secure, immutable, and reliable ledger to document contracts, incidences, and records

Supply Chain

• Tracking Product Information - State of the product, shelf life, time, and location

Internet of Things - Machine-to-Machine (M2M) Transactions

• Immutable and transparent ledger of IoT devices, the data they collect, and the interactions between one another

Financial Services – Banking

• Money Transfer, Financial Settlement, Trade Finance

Travel

• Token assigned to each traveler allows TAs & airlines to identify customers and track their belongings simpler and faster

Automotive

• Preventing intentional undesirable Interference In vehicle data and enabling the tracking of parts of the supply-chain



Business Analytics – Horizontal

Marketing Analytics

Marketing Mix Model

Marketing Budget Optimization

Price Elasticity & Optimization

Distribution Analytics

Sales Analytics

Lead Scoring

Digital Analytics

Attribution Modelling

Recommendation Engine

> Clickstream Clustering

Content Analysis

Web Analytics

Social Media Analytics

Financial Analytics

Credit Risk Modelling

Fraud Analytics

Merger & Acquisition
Analytics

Collection & Recovery
Analytics

Portfolio Stress Testing

Financial Crime Analytics

Supply Chain Analytics

Demand Forecasting

Inventory Optimization

Replenishment Analytics

Network Planning & Optimization

Transportation Analytics

Warehouse Optimization

Customer Analytics

Customer Segmentation

Propensity Modelling

Churn Prediction

Customer Lifetime Value

Sentiment Analysis

Customer Service Analytics



Business Analytics – Verticals

Retail Analytics

Assortment Planning

Merchandizing Mathematics

Planogram Optimization

Market Basket Analysis

Price & Promotion (PnP) Analytics

Loyalty Analytics

Healthcare Analytics

Disease Prediction

Predict ICU Mortality & Inpatient Health

Risk Stratification

Health Monitoring

Digital Consultation

Hospital Performance Dashboard Actuarial & Banking Analytics

Claim & Renewal Analytics

Underwriting Analytics

Portfolio Growth & Profitability Analysis

Credit Risk Management

Customer Journey Optimization

Risk Prediction (EaR, VaR)

Student Analytics for Academia

Admission Analytics

Performance Analytics

Placement Analytics

Retention Analytics

Course Recommendation

Student Segmentation

Manufacturing Analytics

Predictive Asset Maintenance

Parts Pricing Optimization

Predictive Quality
Analytics

Process Risk Analytics

Operational Planning Optimization

Inventory & Distribution Optimization



Business Analytics – Verticals (Contd.)

Art Analytics

Valuation Prediction

Portfolio Optimization

Price Forecasting in Auctions

Generative Art

Collector Analytics

Gallery Analytics

Auto Analytics

Connected Cars

Telematics

Subscription Analysis

Preowned Car Price Prediction

Showroom Space Optimization

Prescriptive Analytics for Manufacturing Cost

Wine Analytics

Quality Prediction

Chemical Analysis

Wine Classification

Pricing Analytics

Brand Positioning

Cultivar Analysis

Sports Analytics

Team Selection

Player Pricing

Result Prediction

Performance Analytics

Live Video Analytics

Ticketing Analytics

Maritime Analytics

Voyage Operations

Container Space Optimization

Trade Lane Performance

Port Operations
Analytics

Yard Capacity Optimization

End-to-end Pricing Strategy



Business Research



- A. Conjoint Analysis
- B. Choice Modelling
- C. Brand Equity & Positioning



- A. Competition Analysis
- B. Market Potential
- C. Innovation & Technology



- A. Strategy Testing
- B. Strategy Monitoring
- C. Strategy Implications



- A. Interest Rate Prediction
- B. Currency Prediction
- C. Risk Analysis



Social Research & Advocacy

Vision

- Emerge as a leading global think-tank and an advisor to Government and non-Government institutions
- As a change agent, improve the livelihood and sustainability of the small and marginalised segments by understanding the ground-level reality through research and advocate actionable insights
- Make this world a better place to live in through our research and intellectual inputs



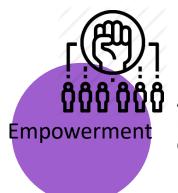
- A. Poverty
- B. Education
- C. Health



- A. Requirement Analysis
- B. Policy Formulation
- . Policy Evaluation



- A. Export/Import Research
- B. Economic Policies
- C. PPP



- A. Digital/ AI-ML Empowerment
- 3. SME Empowerment
- C. Buyer/ Seller Empowerment



CaaS – CTO/ CDO/ CAO/ CISO as a Service

Hire Your Virtual C-Suite

Chief Analytics Officer as a Service (CAOaaS)

- 1.Tri-headed coalition with business & IT to generate business value for the company
- 2.Lead organization's data analytics strategy to determine how analysis gets done, tools/resources used, outsourcing required
- 3. Deploy and scale AI/ analytics across the organization and improve business processes
- 4.Leverage analytics for capitalizing on the data for making sound decisions and achieving better outcomes for the business
- 5. Provide thought-leadership for raising the analytics quotient of prospects and customers

Chief Technology Officer as a Service (CTOaaS)

- 1. Develop strategies to increase revenue by RoI analysis to ensure technologies are used efficiently, profitably, securely
- 2. Envision how tech will be used while setting, evaluating & implementing the tech strategy to fuel tech infrastructure
- 3. Develop policies/ uses tech for products/ services that focus on customers, analyse target markets & create business models
- 4. Oversee company's data, security, network and take analytics powered preventive maintenance
- 5. Liaison b/n customer & business by getting a grasp on the target market and helping deliver IT projects to market



CaaS - CTO/ CDO/ CAO/ CISO as a Service (Contd.)

Chief Data Officer as a Service (CDOaaS)

- 1. Visionary to monetize your existing data by devising data strategy to drive revenue
- 2.Use big data analytics to spot new business opportunities and enable data-based innovation
- 3. Creating a data-driven organization by embracing data culture
- 4. Strategize data governance
- 5. Reskilling employees to help them use data more effectively

Chief Digital Officer as a Service (CDOaaS)

- 1. Transformer in Chief: Lead the digital transformation in a company
- 2.Lead the company to take advantage of digital technologies for improvement
- 3. Make digital integral to the strategy
- 4. Aligning customer technology with the go-to-market strategy
- 5. Developing new digital business models

Chief Information Security Officer as a Service (CISOaaS)

- 1. Visionary to deploy proactive measures anticipating potential security threats
- 2.Real-time analysis of immediate threats, and triage to mitigate any exigency
- 3. Roll out security policies customized for departments and hierarchies
- 4. Governance for seamless implementation of the policies
- 5. Developing robust security architecture to combat both external threats and any internal sabotage



Cloud Computing



Business model features

On-demand self service access to infrastructure, platforms and applications

Broad access through mobile phones, tablets, laptops and workstations

Resource pooling and automation to combine resources into managed services

Rapid elasticity that scales automatically and quickly with demand

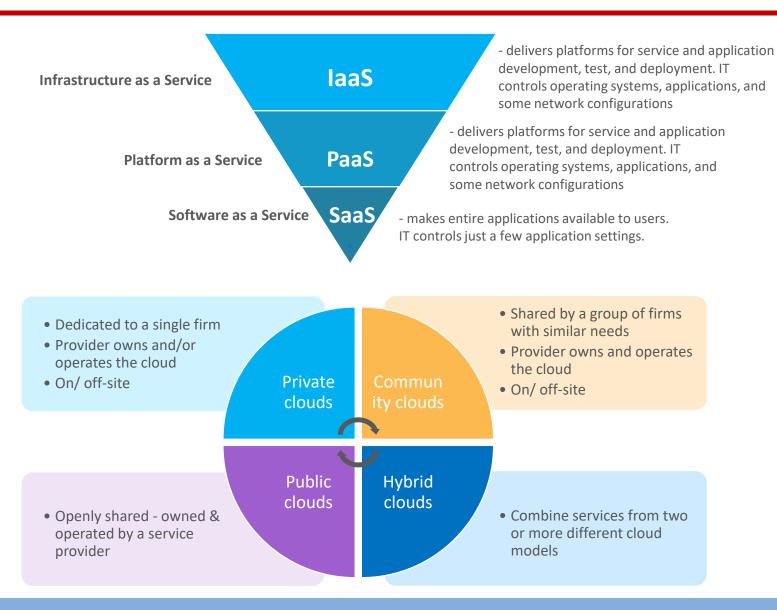
Measured service with usage monitored, controlled and reported



Cloud Service Models

Decreasing level of controls over IT

Ownership & Usage





Cloud Strategy & Services

Re-hosting (Lift & Shift)

• On-premise to cloud

Re-platforming

• Move to platform of choices

Re-purchasing

• CICD, Analytics, Database, etc.

Consulting Services – Design

- Architecture Design
- Security Policy & checks
- Hosting Services

Refactoring

• Micro service, containerization, orchestration

Retaining

• Complex and sensitive services/applications

Retiring

• Less used functions might be retired

Support Services

- 24/7 Infrastructure Monitoring & Management
- User Administration
- 24/7 Performance Monitoring & Enhancement



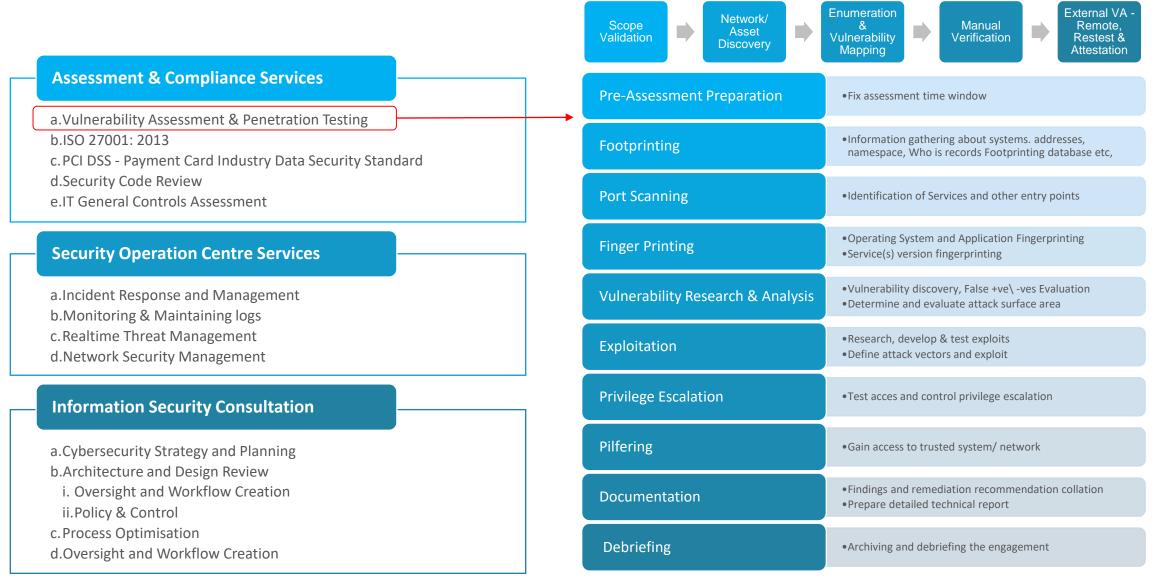
Professional Services – Implementation, Integration & Migration

- 1. Creating Virtual Machine, Site-2-Site VPN
- 2. Azure SQL Backup Configuration
- 3. DR Setup Configuration
- 4. Office 365 Domain Verification and Configuration
 - ✓ Verify the domain
 - ✓ DNS configuration
- 5. Active Directory Federation services
 - ✓ Prepare the Base Servers
 - ✓ Prepare Active Directory
 - ✓ Clean up Active Directory
 - ✓ Create the SSL Certificate Request (CSR)
 - ✓ Complete the Certificate Request (CSR)
 - ✓ Assign the Completed SSL Certificate
- ✓ Configure Local AD FS Federation Server
- ✓ Configure Federation Trust with Office 365/ any Application

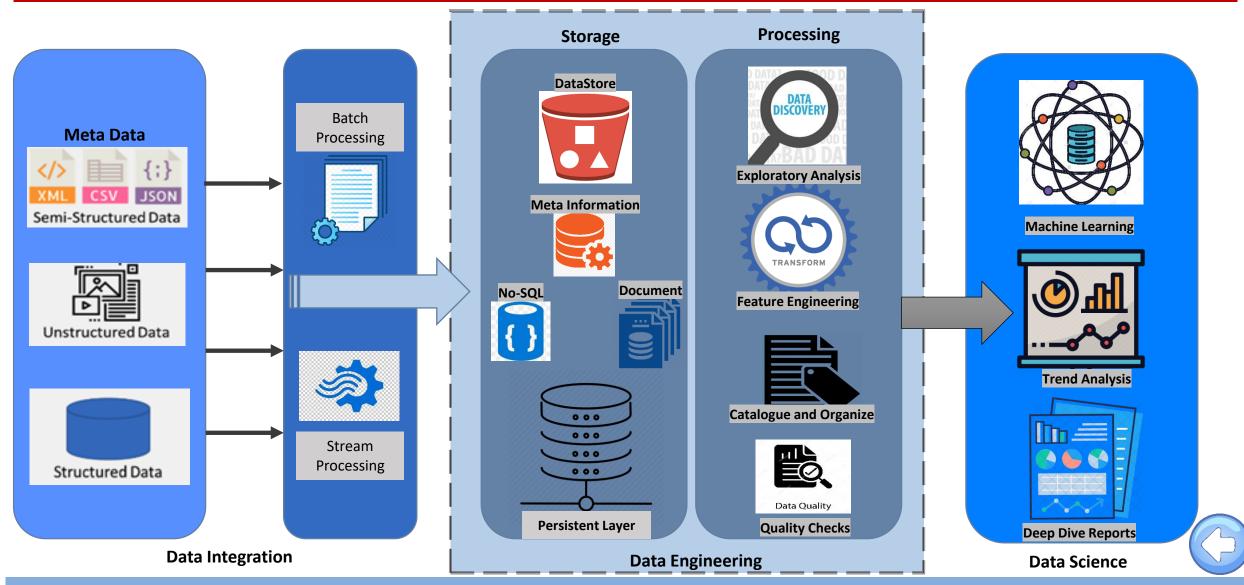
- 6. Integration & Collaboration Services
- 7. Platform migration Services
- 8. O365 Migration, User Creation & Monitoring
- 9. System Migration & Cloud System Revamp
- 10. Database Migration
- 11. CRM Customization
- 12. SFB Configuration and Implementation
- 13. Integrating Dynamic CRM with Exchange, SFB, Outlook, and SharePoint
- 14. Azure VM Creation
- 15. Site-Site VPN
- 16. Point to Site VPN
- 17. Disaster Recovery Services
- 18. Backup Creation
- 19. Website Migration from any platform to Azure
- 20. Infrastructure to cloud serverless migration



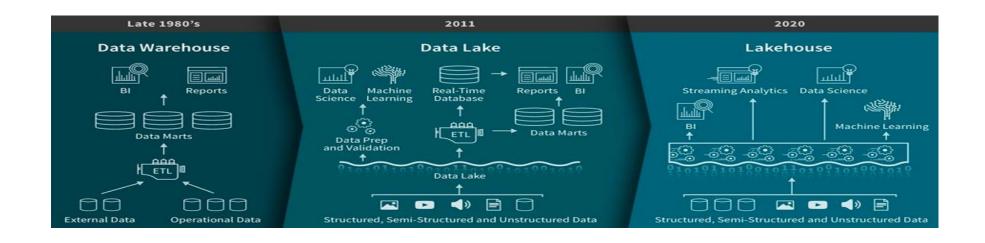
Cybersecurity

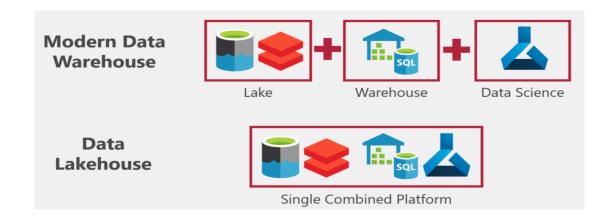


Data Engineering Framework



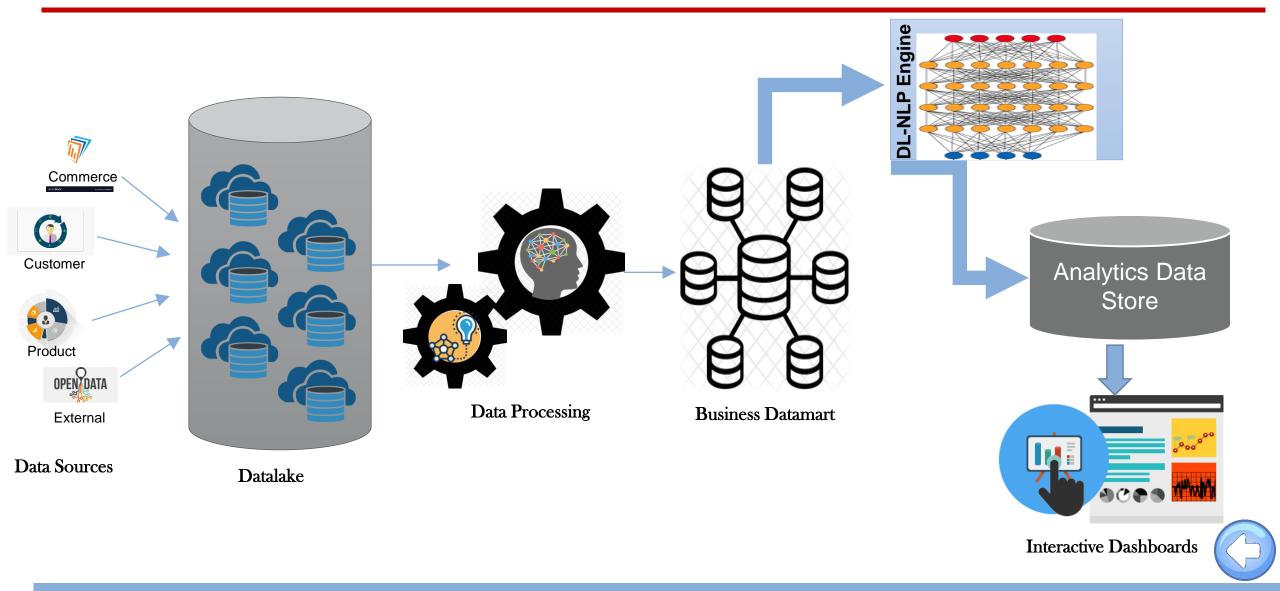
Big Data Evolution to Lakehouse



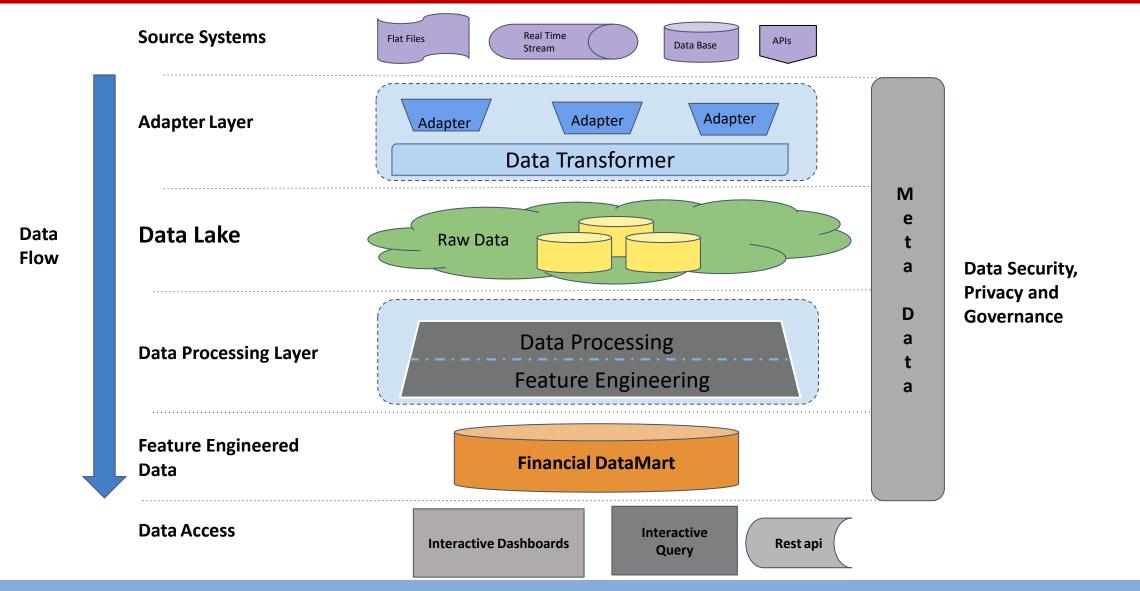




Data Architecture



Data Platform Architecture



Digital Transformation

Long-term digital transformation

Short-term business value

Process
Transformation

Business Model
Transformation

Cultural /
Organizational
Transformation

Capture

Capture
information, in
physical and
digital media, for
business
processing

Digitize

Capability to digitize physical media

Intelligence

Ability of technology to replicate human judgement

Automation

Ability to replace human interaction in low-value tasks

Integration

Achieve flexible and rapid system integration capability

Data

Access, clean, manage and store business data

Analytics

Advanced analytics capability to drive optimization and uncover opportunities

Self improvement

The ability to drive selfimprovement in processing models to further decrease human interaction over time

Technology enablers



Digital Transformation Infrastructure

Web based

- User data capture
- Dash boarding / Visualization / Reporting
- Reporting

Mobile/Tab

- User data capture
- Dash boarding / Visualization / Reporting
- Reporting

Batch process

- Automatic upload documents and information from physical copy
- Complex computing

Middleware

 Integration between several technical components for data and computing Traditional infrastructure

- On-premise server hosting for applications
- Web hosting, API hosting
- Middleware hosting

Cloud based infrastructure

- Hosting moved to cloud
- Licensing of software, operating systems and other related technologies can be managed separately

Cloud Server less model

- Use cloud's server less model for pay-per-use payment.
- Minimal investment in the beginning as cost is proportional to usage



Digital Transformation Technologies

Front end

- Web -
- Angular 10 Major front-end technology
- React
- Bootstrap 4
- HTML 5
- LESS and CSS3
- Mobile
- Ionic 5 Framework for mobile
- Bootstrap 4 For styling
- Angular 9
- Capacitor/Cordova For accessing device features
- React native
- LESS and CSS3

Back end

- Amazon EC2 server Deployment server for Web client
- Rest API exposed via AWS API Gateway – Front end connects with backend
- AWS Lambda Business logic implementation layer
- Node JS/Python For implementing business logic in AWS Lambda
- Java, spring, ORM (Hibernate)
- Laravel

Storage

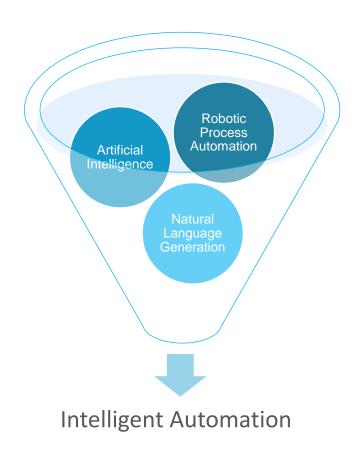
- MongoDB For storing metadata and resources
- AWS S3 For file storage
- MySQL, SQL server, Oracle

Third party integration

- Messaging service
- Email Service
- Payment Gateway
- AWS IAM User and session management
- AWS CloudWatch For logs and audits
- AWS Cloudflare For static content delivery
- AWS Elemental For video, chat and any other media service



Intelligent Automation: Automation Bots & Chat Bots







Automation Process

Automation Management

Re Design

A high-level approach of scoping processes at organizational level for Automation journey with the help of industry heat maps, Organizational charts, understanding of business units with automatable processes. Projects are prioritized based on business needs & overall strategy

Assessment

Discovery

Business analyst in discussion with the process owners & SME creates a document which has

- SIPOC
- IT Environment
- Applications used



Transformation

Lean Six Sigma

Lean Six Sigma Expert understands the process & conducts a value stream mapping exercise to identify & eliminate waster



Design Thinking

Solution Architect redesigns the process by discovering latent sources of value for key process stakeholders and enables fast, iterative testing of intermediate solutions



ROI Report

ROI

Redesigned process is evaluated for Cost, benefits are calculated We create a ROI report and share that with the client Post approval this moves to deployment



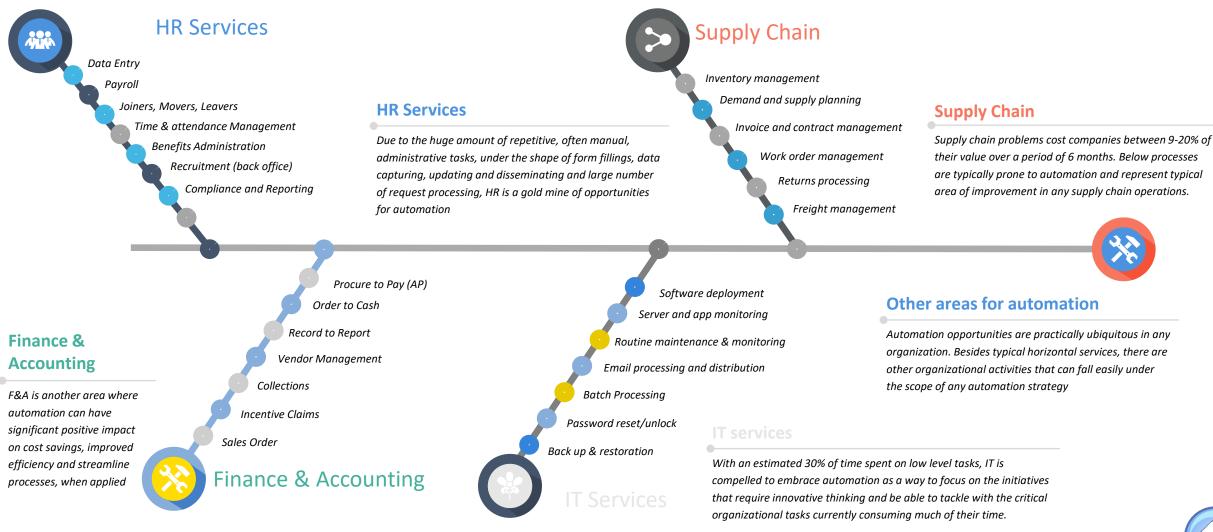


AGILE Scrum

Project is broken down into SPRINT's with each sprint delivering MVP Project is tracked to closure & realized ROI reported



Intelligent Automation Applications



Managed Services – Datacentre

Objective

- To manage and monitor data center infrastructure elements
- Includes server, storage, OS, network, database, backup and other DC operations
- Use automation tools to deliver efficient services
- Ensure continuous delivery without disruption.

Scope

- Data center management
- Server management
- Platforms support
- Database management

- Backup and restore management
- Network management
- Physical and logical security management
- Process compliance

Business Value

- Continuous delivery with improved business SLAs
- Higher customer satisfaction
- Predictable IT operations cost

- Agility and robustness for continuous delivery
- Flexible support and pricing model 9x5, 9x9, 24x7 etc.
- End to end SLA management

 Productivity improvement year-onyear - with automation and left shift

Endpoint Computing Support Server Solution, Management & Monitoring Storage Solution, Management & Monitoring Virtualization Solution, Management & Monitoring Domain Controller solution, Management & Monitoring Data Backup & Recovery Solution, Management & Monitoring End user & Server Endpoint solution, Management & Monitoring

Cloud Solutions – O 365 & Microsoft Azure Solution, Management & Monitoring

Database Management Wireless On-prem & Cloud Solutions, Management & Monitoring

Enterprise Mobility Solution – BYOD & MDM Network Solution, Management & Monitoring Network Security Solution, Management & Monitoring



Portfolio of Datacentre Services

Server Management

Performance Monitoring & Optimization

System Administration & Troubleshooting

Install, Update, Upgrade & Patching

O/S Hardening & Policy Enforcement

Backup Recovery & Job Scheduling

Virtualization
Consolidation Migration

Network Management

Performance Monitoring & Optimization

Administration & Troubleshooting

Install, Update, Upgrade & Patching

Policy Enforcement & Security Hardening

Configuration & Backup
Management

Planning & Design

Storage Management

Performance Optimization & Capacity Planning

Administration & Troubleshooting

Install, Update, Upgrade & Patching

Security & Hardening

Configuration Management & Synchronization

Virtualization Consolidation Migration

Application Management

Performance Monitoring & Reporting

Availability Management & Troubleshooting

Install, Update, Upgrade & Patching

User Provisioning & Access
Management

Backup Recovery & Job Scheduling

Platform Standardization

Database Management

Performance Monitoring & Fine Tuning

Administration & Troubleshooting

Install, Update, Upgrade & Patching

Access & Security Management

Backup, Restore, Archival & Job Scheduling

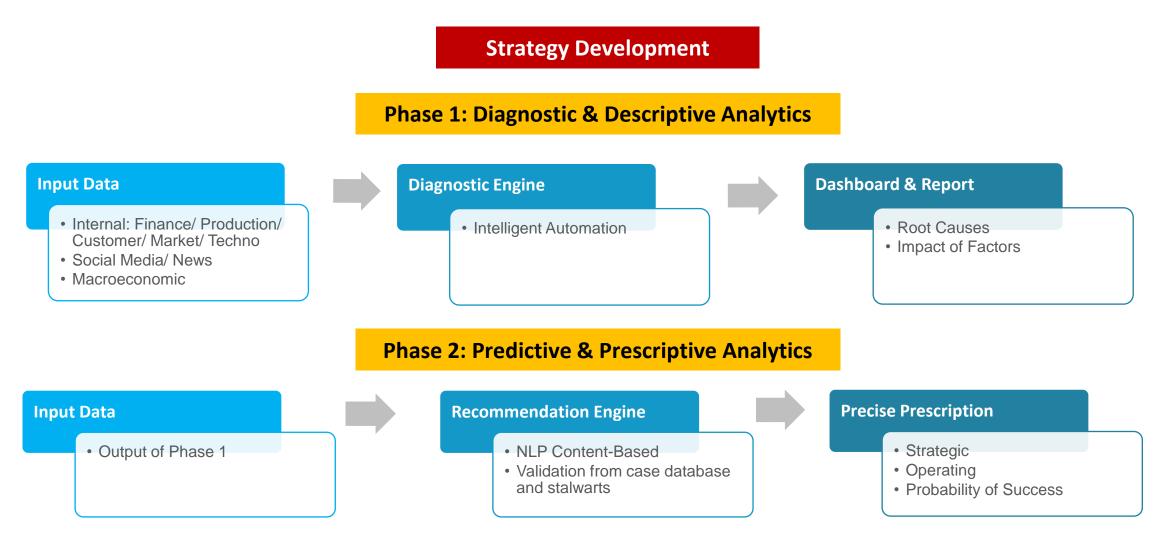
Virtualization Consolidation & Migration

Service Level Management

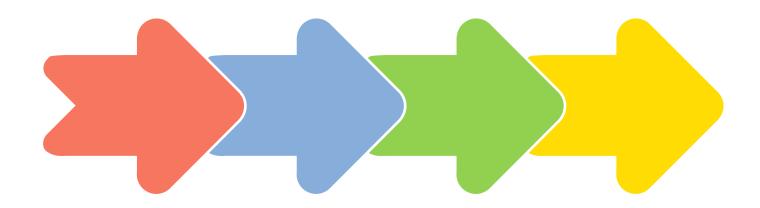
IT Service Management



Management Consultancy – Intelligence Amplification (IA)



The Process



Business Problem Identification
Use-Case & Relevant Data

Commencement of the Project
On acceptance of the proposal

02

Proposal Submission

Solution with technical & commercial details

04

Realize the Benefits

ROI 5X-10X





Why Tuhin Al Advisory



Real Time Solution

Automated models will keep generating real time solutions



ROI Driven

At least 5X-10X; Think Big & Start Small, Unmatched value





Robust Framework

Multiple approaches to assess a problem driven by research questions from different perspective



Multiple Advanced Algorithms

Multiple algorithms applied to solve each business problem to gain a holistic perspective





Thanks