Leveraging Data and Innovative Technologies to Achieve R&D Digital Transformation

**Regulatory Reimagined**

Many biopharmaceutical companies have increased their emphasis on innovative technologies and data science to enable a digital transformation across R&D. Underlying successful digital transformations, it is critical for R&D organizations to leverage innovative information and technology to enable a digital transformation of their R&D operations. This paper provides high level summarized learnings from multiple client engagements.

### Guiding Principles

**Vision**

Enable a digital transformation to unlock the full potential of data science and technology to achieve R&D innovation.

**Purpose**

To create a vision that sets a data science and technology strategy for achieving R&D innovation.

**Architecture**

To design a framework to enable a digital transformation across R&D operations.

**Data**

To drive insights and enable innovation within R&D operations.

**User Experience**

To enable a personalized user experience for R&D operations.

**Security**

To ensure data protection and privacy in R&D operations.

**Application & Visualization**

To enable applications and visualizations to support R&D operations.

**Optimization & Automation**

To optimize processes and enable automation in R&D operations.

**Modern Architectures & Infrastructure**

To enable modern architectures and infrastructure for R&D operations.

**Emerging Technologies**

To leverage emerging technologies to enable R&D operations.

**Strategic Business Drivers**

To define strategic business drivers for R&D operations.

### Emerging and Disruptive Technology

Develop digital transformation strategies to enable readiness to adopt emerging and disruptive technologies.

- **AI and Machine Learning**
- **Big Data & Analytics**
- **Cloud Computing**
- **Internet of Things**
- **Collaboration Tools**
- **Virtualization & Cloud Services**

### Future Technology Ecosystem

Technology Platform

- **Human interfaces**
- **Data Governance**
- **Data Quality & Security**
- **Data Management**
- **Data Integration & federation**
- **Integration**
- **Microservices**
- **API Gateway**
- **Data Services Pipelines**

Data Sciences & Compute Platform Details

- **Data Storage & Compute**
- **Data Analytics & Modeling**
- **Data Visualization**
- **Data Integration**
- **Data Governance**
- **Data Security**
- **Data Management**
- **Data Services Pipelines**

### Digital Transformation Goals At-A-Glance

- **Data Discovery**
- **Data Analysis**
- **Data Visualization**
- **Data Integration**
- **Data Security**
- **Data Management**

### Strategic Goals and Plans

- **Data Strategy**
- **Data Governance**
- **Data Quality & Security**
- **Data Management**
- **Data Integration & Federation**
- **Integration**
- **Microservices**
- **API Gateway**
- **Data Services Pipelines**

### Roadmap

- **Year 1**
- **Year 2**

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