Healthcare IT in Europe

These are the snippets from our report on Healthcare IT Trends & Opportunities in Europe for Technology Service Providers (TSP)

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AGENDA

01 Healthcare IT Framework

02 Technology Footprint of Europe

03 Outsourcing Vendor Analysis

04 Healthcare IT Future Market Drivers

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  ▪ Connected Health Technologies
  ▪ Themes of Healthcare IT
  ▪ IT Application Segments
  ▪ Infrastructure

➢ Major Themes of Healthcare IT
  ▪ Smart Care
  ▪ Patient Information Management
  ▪ Intelligent Enterprise Systems
  ▪ Remote Care

➢ Major Use cases of Healthcare IT

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Medical device companies in Europe are proactive in offering solutions to address the demands of diagnostic equipment and wound care products.

European Medical Device Market Size

- The healthcare IT infrastructure also includes computerized physician order entry systems, electronic health management and medical record keeping.

Future Trends in Medical IT

Major Job Roles in Medical Devices

- Quality Engineer
- Senior Equipment Engineer
- Mechanical Design Engineer - Senior
- Senior Packaging Compliance Engineer
- Senior IT Architect
- Senior Project Portfolio Manager
- Graduate Automation Engineer
- Solution Engineer - Med Device
- R&D Design Engineer
- System validation Engineer
- Process Engineer
- Field Engineer

Future Trends in Medical IT

Top 7 countries with highest employment in the medical technology industry

- Germany had the highest absolute number of people employed in the medical technology sector.
- Most of the technology companies are based in Germany, followed by the UK, Italy, Switzerland, France and Spain. Small and medium-sized companies (SMEs*) make up almost 95% of the medical technology industry.

Medical IT Ecosystem in Europe

- Germany is the leading country in Europe in terms of medical technology employment.

Talent Split By Experience

- 52% 0 - 5 years
- 24% 6-10 years
- 24% 10+ years

Europe Healthcare Market Size

- The above-mentioned job roles are very high demanded roles in Medical devices across the Europe region.
- The talents across were analyzed based on the experience and represented.

Companies represented are considered as the top players that are grown more in 2018 across Europe in Medical Devices.

Notes:
(1) The Europe Medical Device Market Size is curated from news articles, journals and other similar sources are represented based on the cost estimation module of DRAUP's internal data team.
(2) The above-mentioned job roles are very high demanded roles in Medical devices across the Europe region.
(3) The talents across were analyzed based on the experience and represented.
(4) The companies represented are considered as the top players that are grown more in 2018 across Europe in Medical Devices.
Healthcare IT Framework: Healthcare industry is driving technology advancement by creating an IT framework for seamless integration of all aspects of patient care and administration.

Connected Health Technologies
- Bio sensing wearables
- Mobile Applications (apps)
- Personal Health Records (PHRs)
- Electronic Patient Records (EPR)
- Electronic Health Records (HER)
- Mobile Health (mHealth)
- Participatory Medicine
- Patient Portal
- Online Patient Communities
- Technology Enabled Care (TEC)
- Telehealth & eHealth
- Telemedicine

Themes of Healthcare IT
- Smart Care
- Patient Information Management
- Remote Care
- Intelligent Enterprise Systems

IT Application Segments
- Clinical Solutions
  - Fitness and Compliance
  - Medical Condition Management
  - Wellness and Nutrition
  - Medical Reference
  - Electronic Health Records
  - Reminders and Alerts
  - Diagnosis
  - Continuing Medical Education
  - Remote Consultation and Monitoring
- Non-Clinical Solutions
  - Insulin & medication recording
  - Weight Management
  - Data export & Communication
  - Urgent & emergency care
  - Diet Recording
  - Hospital acute elective
  - GP practice
  - Community Care

Infrastructure
- Communications (gateways, connectivity Protocols, networks)
- Software Defined Infrastructure
  - Storage: cloud Infrastructure, data Lakes
  - Compute: high Performance Compute
- IoT Devices
- Cyber Security

Note: Analysis is based on the DRAUP’s proprietary engineering database, updated in December 2019.
Note: Primary and secondary research sources have been used to align the Digital themes and use-cases.
Healthcare IT Themes: DRAUP has identified 4 digital themes that play a crucial role in the technological advancement of a healthcare IT

**Major Themes of Healthcare IT**

**Smart Care**

- Hospitals are looking for technology solutions that use patient data to help the doctors fine-tune their administrative processes.
  - Early detection & diagnosis: Prevent clinical risk using algorithms on patient data
  - Clinical support decision: Using CDSS to increase accuracy & speed of decision making
  - Wellness & protection: Wellness apps and wearables for well being
  - Therapeutics/Chronic Disease management

**Patient Information Management**

ICT solutions that enable availability of patient information in all stages - from entry to exit – and the optimization of admission, scheduling and other processes around it that can result in seamless patient flow.

- EMR/EHR: Electronic patient data collection & storage
- CRM/Billing Systems: Financial accounting systems for hospitals
- Practice Management: Manage appointments, claims and statements, prescriptions and reporting

**Intelligent Enterprise Systems**

Includes end-to-end smart systems that control various functions critical for the operation of hospitals.

- Safety & Security: Safety and security of hospital and patients
- Automation: Automating various processes to increase efficiency & performance
- Communication: Integrated devices which communicate for information
- Infotainment: Interactive infotainment systems & IPTV for patients
- Energy Management: Solutions to improve operational efficiency of a hospital
- Connectivity: Solutions that enable internal and external connectivity in hospitals

**Remote Care**

Introducing IoT devices with the patients’ to extend the hospital borders and provide remote medical care.

- Virtual Care: Usage of digital platforms for interaction between physicians and patients
- Connected Home Health: Constant home monitoring and tracking patient’s progress

Note: Analysis is based on the DRAUP’s proprietary engineering database, updated in December 2019
Note: Primary and secondary research sources have been used to align the Digital themes and use-cases
Case study: Nordic collaboration

NCSH has together with Upgraded and DTU Executive School of Education entered a Nordic partnership to strengthen Nordic collaboration for sustainable and digitally smart solutions in the healthcare sector.

- The future of healthcare with sustainable and smart future is funded by Nordic Innovation for the coming one and a half year.
- Sustainable and smart healthcare in the Nordic region is well developed and advanced global interest specifically for Nordic solutions in Smart care.
- To establish the relevant connections in Denmark, the Netherlands, Canada and the USA for Upgraded technologies and a general focus on social responsibility for DTU.

Segments of Smart Care

**Patient Privacy**
Ensure data security, regulatory compliance and protect customer privacy with Protected Health Information (PHI) masking solutions. We employ the latest data management techniques to mask and scramble sensitive information in order to ensure data integrity and optimal system performance.

**Smart Health**
- Healthcare Accessibility & Affordability
- Appropriate treatments are delivered at the appropriate time, in the appropriate place, for the appropriate patient
- Clinicians use technology to more accurately diagnose and treat illness and deliver care
- The correct individuals do the correct work (e.g., nurses handle patient care, not administrative tasks)
- Patients are informed and actively involved in their treatment plan
- Efficiency improves; waste declines

**Accountable Care Organization**
Accountable Care Organizations (ACO) measure and track the entire healthcare value chain, including the cost and quality of care. Solutions include:
- Electronic health record (EHR) and electronic medical record (EMR) data integration
- Data aggregation
- Clinical analytics and business intelligence
- Performance and financial reporting framework
- Performance-based reward/incentive program for providers
- ACO contract management and claim processing KPO services
- End-to-end testing

**Digital foundation solutions**
- Integration of core and care data for mobile and other digital platforms
- Consumer centric solutions (KYC 360º / EYC 360º)
- Smart care providing wellness and remote healthcare solutions

**Vendor Landscape**

**Data Management**
- Patient Health Data
- Financial, organisational and other hospital data

**Interconnected Clinical Information Systems**
- Hospital Information Systems
- PACS

**Networking Equipment**
- IOT Equipment

**Digitization Assets**

**Patient Privacy**
- Patient Health Data
- Hospital Information Systems
- PACS

**Accountable Care Organization**
- Hospital Information Systems
- PACS

**Smart Health**
- Hospital Information Systems
- PACS

**Note:** Analysis is based on the DRAUP's proprietary engineering database, updated in December 2019.
Remote Care: Remote care initiatives will enable capacity-constrained healthcare systems to steer patients away from hospitals and deliver medical treatment at home

Segments of Remote Care

Virtual care
Virtual care is a term that encompasses all the ways hospitals/physicians interact with their patients using digital platforms like live video, audio, or instant messaging etc. Telemedicine is one major virtual care segment, but it specifically refers to the medicinal aspect of healthcare. Offering medical advice and prescriptions, physiotherapy, at-home exercises and continuous monitoring of chronic patients through smart phones, web or hospital-based platforms are key aspects of telemedicine.

- Driving real-time communication between providers, specialists, and patients.
- Enabling smaller and/or rural hospitals to leverage specialists from other facilities.
- Reducing ambulance time spent by providers, specialists and patients.
- Allowing patients to participate in their healthcare from any device, anywhere, and at any time.
- Enhancing patient engagement, overall satisfaction and outcomes.

Teledigmicine
How Accenture and Microsoft helped Spain’s Basque Country Health centre build a remote elderly patient monitoring system known as TEKI.

- The TEKI system in Spain’s Basque Country keeps patients connected to their care team via an internet-linked Microsoft Kinect unit.
- Patients communicate regularly with their physician using video, voice or text messages via an interface on their TV screen.
- They can also complete symptom-related questionnaires by gesture control, perform prescribed rehabilitative exercises and check vitals.

Connected Home Health

- Connected health monitoring in the home involves individual ‘piecemeal’ smart health gadgets that provide an ongoing wellbeing assessment to the user.
- Developing everyday appliances to specifically help the patient and therefore fit into the connected home is the next immediate step for the medical industry.
- Electronics and mobile companies are launching independent devices and smartphone applications, to track heart rate, activity and even sleep patterns.
- The connected home will be a major enabler in helping the NHS to replace certain healthcare services, freeing up beds for just the most serious cases and easing the pressure on GP surgeries and A&E departments.
- Home health technology will continuously check for vital signs and everyday non-invasive health checks will be possible without the need for a doctor.

Vendor Landscape

Remote Care

Digitization Assets

Data Management
- Patient Health Data

Remote Care Systems
- Implanted devices such as pacemakers
- Wearable external devices-insulin pumps

Networked Medical devices
- Devices for tele-diagnosis & tele-monitoring
- Automated dosing equipment

Networking Systems
- IoT Gateways
**Segments of Patient Information Management**

**EMR/EHR**
Electronic Health Records (EHR) and Electronic Medical Record (EMR) deliver advantages to healthcare providers and patients by enabling better collection, storage and sharing of health information for the purpose of coordinated care delivery. Electronic data storage and retrieval reduces the risk of lost patient records and test results and offers more secure access over their paper predecessors. Key functions of EHR/EMR that help physicians offer better care include:
- Identify and maintain a patient record
- Manage patient demographics
- Manage problem lists
- Manage medication lists
- Manage patient history
- Manage clinical documents and notes
- Capture external clinical documents
- Present care plans, guidelines, and protocols

**Practice Management**
Practice Management manages different administrative and clinical aspects such as Patient Portal, Scheduling and e-Prescribing using desktop software, client-server software and Internet-based software.
- Preventive Care
- Value-Based Care & Innovation
- Silver Economy & Seamless Care

**CRM/Billing Systems**
Financial systems is aided by accounting software for healthcare organizations, healthcare billing systems, healthcare policy and contract management software and interactive and intuitive inventory control systems.

**Case study: One voice in Europe on FH**

**Collaboration between Familial Hypercholesterolaemia (FH) patient representative network, FH Europe, and the FH investigators from all over the world who work together as part of the EAS FH Studies Collaboration (FHSC).**

FH Europe and the FHSC will speak with one voice on FH, and by linking FH patient groups with expert clinicians from all over the world
- FH continues to be a major global health problem, very common — worldwide, one in every 200-500 people
- The partnerships goal is to identify people who have inherited high cholesterol, and are at risk for premature atherosclerosis and early cardiovascular events that are often fatal. But if FH is identified early, and effective treatment begun, individuals with FH can live long and healthy lives

**Digitization Assets**
- Data Management
  - Patient Health Data
  - Inventory Data
- Interconnected Connected Communication Systems
  - Hospital Information Systems
  - Laboratory Information Systems
  - Pharmacy Information System
  - Blood Bank System
- Networking Systems
  - IoT Gateways

Note: Analysis is based on the DRAUP’s proprietary engineering database, updated in December 2019
Intelligent Enterprise Systems: Ability to enhance patient safety and automate redundant manual systems allows physicians and nurses to focus on diagnosis and care

Segments of Intelligent Enterprise Systems

Safety
Technologies such as sensor-based video in corridors and at entry and exit, video management suite and network-based systems offers safety via video imaging surveillance. Such technologies help in monitoring patient, employee and visitor traffic and improve hospital security and prevent crimes and fraud medical insurance claims.

Infotainment
Interactive infotainment systems allow patients to place an order, adjust bed position and offers access to music, games, and movies. IPTV includes TV programming, health information videos, hospital messaging notifications, automates patients requests, and patient education videos.

Automation
Automating several tasks such as admission processes, medication processes, documentation, and drug supply increases efficiency and performance of the hospital staff. It saves costs, reduces the workload of hospital staff, streamlines medical billing, etc.

Energy Management
Energy management solutions improve financial health and operational efficiency of a hospital by adopting energy efficient infrastructure, automating and integrating systems, and real-time metering.

Communication
Connected and integrated devices communicate with each other thereby increasing the efficiency and reducing time loss. Information is stored centrally at one place which links pharmacy to labs and EHRs to images and reduces manual tasks and manual error.

Connectivity
Connected hospital infrastructure allows internal and external connectivity with the help of fast networking solutions. This allows seamless data transmission between different facilities.

Case study: Next-generation cloud solution

SAP and Cerner are two companies on the forefront of digital innovation and are co-developing a next-generation cloud-based EHR and patient management solution.

Healthcare industry is dealing with a Big Data explosion: Electronic health records (EHR) contain an unprecedented amount of structured and unstructured information.

- For example: As part of the pre-admission process, an online pre-registration and patient self-check-in component will digitize the capture of health information, helping to reduce administrative burden and shorten patient waiting times and to leverage artificial intelligence (AI) to simplify and streamline patient billing.
- The partnership goal is to digitally transform core hospital processes, improve care collaboration, facilitate smart medicine, and personalize care.

Note: Analysis is based on the DRAUP’s proprietary engineering database, updated in December 2019.
**IT Use cases:** DRAUP has identified 10 Major Use Cases that play a crucial role in the technological advancement of a Healthcare IT

### Major Use cases of Healthcare IT

<table>
<thead>
<tr>
<th>Use Case</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Biosensing Wearables</strong></td>
<td>Biosensing wearables can monitor changes in physiology and environment. They are easy to use and provide useful, real-time information by allowing continuous physiological monitoring in a wide range of wearables forms. Smart technology is certainly something that will be the key to the optimal operation of our future society, especially when it comes to health care.</td>
</tr>
<tr>
<td><strong>eHealth</strong></td>
<td>The Transfer of Health Resources and Healthcare by electronic means, encompassing three main areas - The Delivery of Health Information, Power of IT &amp; eCommerce, Use of e-commerce &amp; e-Business.</td>
</tr>
<tr>
<td><strong>Electronic Patient Health Records (EPR)</strong></td>
<td>A set of records that the patient controls and which allows the patient to work with their clinical team across institutional boundaries - Providing accurate, up-to-date, and complete information about patients at the point of care.</td>
</tr>
<tr>
<td><strong>Mobile Health (mHealth)</strong></td>
<td>Medical and Public health practice supported by mobile devices, smart phones and tablets, patient monitoring devices personal digital assistants (PDAs) and other wireless devices. Core utility of voice and short messaging service (SMS), general packet radio service (GPRS), third and fourth generation mobile telecommunications (3G and 4G systems), global positioning system (GPS), and Bluetooth technology.</td>
</tr>
<tr>
<td><strong>Mobile Applications</strong></td>
<td>A software application that can run on a mobile platform (i.e. a handheld commercial of the shelf computing platform, with or without wireless connectivity) or a web-based software application that is tailored to a mobile platform but is executed on a server. Mobile applications for healthcare organizations help deliver services with quality care, improved workflow and increased patient interaction while minimizing complexity and cost to achieve the desired goals.</td>
</tr>
<tr>
<td><strong>Participatory medicine</strong></td>
<td>• Patients and clinicians work together to improve the patient’s health. Patients have equal access to all data, are case managers of their own illness and co-producers of their own health. • Current technology trend that is helping to mainstream participatory medicine is the “Internet of things”.</td>
</tr>
<tr>
<td><strong>Online Patient Communities</strong></td>
<td>• Ability to connect with people online a daily part of life. In healthcare, it has become the place that patients turn to for information and peer-to-peer support. • Patients are going online to discuss personal experiences with medication and to seek advice on how to talk to their doctors and beyond.</td>
</tr>
<tr>
<td><strong>Personal Health Records (PHRs)</strong></td>
<td>PHR includes health information managed by the individual. (Often the term patient is used when referring to stakeholders of PHRs, but we prefer to use the term individual to emphasize that the PHR is a tool that can be helpful in maintaining health and wellness as well as a tool to help with illness that the term patient implies.</td>
</tr>
<tr>
<td><strong>Technology Enabled Care (TEC)</strong></td>
<td>Technology Enabled Care Services (TECS) programme is to create the right commissioning environment that supports and encourages the innovative use of technology to improve health outcomes for patients with long term conditions and deliver more cost-effective services.</td>
</tr>
<tr>
<td><strong>Telemedicine</strong></td>
<td>Biosensing wearables can monitor changes in physiology and environment. They are easy to use and provide useful, real-time information by allowing continuous physiological monitoring in a wide range of wearables forms. Smart technology is certainly something that will be the key to the optimal operation of our future society, especially when it comes to health care.</td>
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Healthcare IT in Europe

- The Healthcare & Medical Technologies Sector of Europe covers a broad range of technologies, products, equipment and devices. Recent trends underline the principles of Circular Economy – reducing material inputs and resource intensity, greater durability or reusability of healthcare and medical devices.

**Role of HealthTech**

HealthTech refers to any technology, device or digital solutions designed to improve health patients:

- **Medical devices**, i.e. products intended to perform a therapeutic or diagnostic action on human beings by physical means.
- **In vitro diagnostic systems**, non-invasive assays analysing biomarkers of pathologies in biological samples.
- **Digital health solutions**

**Health Tech Products**

- Glasses
- Pacemakers
- Magnetic Resonance
- Automated in vitro diagnosis
- Nano carriers for smart drug
- Syringes or latex drugs
- 3D Scanners
- Neurostimulators

**Emerging Technologies in Healthcare IT**

- Nanomedicine
- Photonics
- Robotics
- Bio - materials
- Digital Health

**New Horizons in Healthcare IT**

- **Organ-on-Chip**
  - To study the physiopathology of various disease in the genomic context of each patient for personalized medicine, predict drugs, safety & efficacy by Hdmt(Institute for Human organ and disease model technologies).

- **Robotic - Exoskeleton**
  - An Implantable device can record brain signal and decrypt it so the patient can pilot the robotic arms and legs of an ambulatory exoskeleton to allow paralyzed people to walk again developed by Clintatec. Only the convergence of expertise in robotics, biomaterials and digital health allow to develop this system.

Note: The above insights are curated through various strategic and tactical signals triggered in Draup Platform from news articles, journals and other similar sources.
We have covered the analysis of Northern European region. Other regions are covered in the Full Report.

Send your requests to info@Draup.com to receive the Full Report.
North Region Technology Center Overview – Helsinki Area, Finland Area is the major MSA for North region contributes to 22% of total technology workforce

Technology Footprint of North Region

Key Workloads of North Region

**Helsinki Area, Finland**
- Development of HUS R&I activities and secure external (EU-) funding to strengthen EU-level strategic networks
- Implementation of Process re-engineering, RPA, AI, new financial systems and partners

**Stockholm, Sweden**
- Renewal and replacement planning, design of layouts and assessments of functionality needs.
- Implementing the visual of Patient Health Information (PHI) in electronic health records (EHRs) have been applied to improve efficiency.

**Denmark**
- Integrated existing Copenhagen and Szczecin software departments with new Warsaw site.
- Establishment of agile organization, creating transparency and predictability in software delivery plans.

**Norway**
- Development of approximately 80 psychoactive drugs with UPLC-MS/MS (Qaqa) and UPLC-HRAMS (Orbitrap)
- Automated sample preparation with Hamilton Star pipetting robot.

**London, United Kingdom**
- Development of Human Centre Design to understand customer needs, and rapid prototyping/lean start up techniques to develop proof of concepts

Note: Global Footprint Data curated by DRAUP and updated in December, 2019
Note: Key workloads of major MSAs related to healthcare IT engagements in North Region of Europe are mentioned
AGENDA

01 Healthcare IT Framework

02 Technology Footprint of Europe

03 Outsourcing Vendor Analysis

04 Healthcare IT Future Market Drivers

➤ Outsourcing vendor analysis of Europe
   - Major Technology service providers
   - Total deals and split by engagement
   - Outsourcing market size in healthcare and major clients

These sections are covered in the Full Report

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DRAUP Capabilities & Data Assets

- **240,000+** companies analysed
- **3,000+** data sources
- **300,000+** daily signals analysed
- **1.2 M+** curated global executives
- **2,400+** unique attributes analyzed
- **2,500+** global locations
- **3,000+** technology service providers’ partnerships analysed
- **1,300+** Braindesk reports

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Source: Draup
## Application Development & Maintenance (ADM)

<table>
<thead>
<tr>
<th>Service</th>
<th>Description</th>
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<tbody>
<tr>
<td>Application Development</td>
<td>Involves defining, designing, and building applications tailored to meet client business requirements. Services include Solution development, application whitelisting, application control, application security, risk mitigation.</td>
</tr>
<tr>
<td>Testing Services</td>
<td>Software testing involves the execution of a software component or system component and evaluate it against one or more properties of interest to ensure its smooth functioning and capability of seamless integration across various technologies. Services include Software testing, Mobile testing, Cloud based testing, functional testing, engineering testing, user acceptance testing (UAT), non-functional testing, Model testing.</td>
</tr>
<tr>
<td>Application Modernization</td>
<td>Modernization services help modernize legacy systems to enhance flexibility, mitigate risk, minimize disruption, and lower costs. Application Rationalization, Re-hosting, application re-engineering, Field Remediation, Data migration, Re-structuring of applications.</td>
</tr>
<tr>
<td>Application Maintenance</td>
<td>Application Maintenance helps clients with proper maintenance of the existing applications across areas of application operations management, support, updation and availability. Services include Pro-active maintenance, TCO Reduction, Alignment with industry standards, corrective maintenance, SLA Management, Knowledge management.</td>
</tr>
<tr>
<td>Custom Application Development</td>
<td>Custom build application development services for an end client.</td>
</tr>
<tr>
<td>Mobile Services</td>
<td>Use of Mobile medium by enterprises through building innovation mobile solutions to target customers by offering bundled services. End-to-end solutions and services to help companies capture insight from mobile devices to fuel innovation.</td>
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Note - Above analysis is based on the DRAUP’s proprietary services module, updated in December, 2019.

Source: DRAUP
## Infrastructure Management Services (IMS)

<table>
<thead>
<tr>
<th>Service Type</th>
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<tbody>
<tr>
<td>Server, Network, Desktop Management</td>
<td>IT Infrastructure Management Services (IMS) offers a suite of reliable, responsive, flexible and proven infrastructure services and solutions that deliver differentiated value across management of an enterprise hardware components such as Servers, Network, Desktops. Its aims to maintain and manage a client's IT applications and systems and ensure 24/7 availability.</td>
</tr>
<tr>
<td>Datacenter Management</td>
<td>Design and management of data centers across heterogeneous platforms. Services include Server / OS management, Database Management, Middleware management, Storage and Backup management, Production Operations, Mainframe Services, Hosting, etc.</td>
</tr>
<tr>
<td>Disaster Management</td>
<td>Use of services and solutions to ensure the presence of a holistic, proactive and technology-driven strategy for multi-disaster management. Services can be across enterprise data, backup, IT systems, Real time monitoring of IT solutions and hardware, etc.</td>
</tr>
<tr>
<td>Remote Infrastructure Management</td>
<td>Remotely managing information technology (IT) infrastructure such as workstations (desktops, laptops, notebooks, etc.), servers, network devices, storage devices, IT security devices, etc. of a company.</td>
</tr>
<tr>
<td>High End Technical Support</td>
<td>High level product and services support provided by qualified engineers. Services Tech support services, Remote Diagnostic Services, Set-up and Configuration, Patch Management, Service pack and Database Upgrades, Warranty Management/ RMA, Engineer Dispatch Management</td>
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</table>

### Note
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## Consulting & System Integration (CSI)

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<tbody>
<tr>
<td><strong>Advisory Services</strong></td>
<td>Consulting and advisory services that enables an organization to across business process transformation to improve performance, increase effectiveness, reduce costs and improve resilience. Services mainly involve business advisory, business and functional transformation, IT consulting and risk and compliance services.</td>
</tr>
<tr>
<td><strong>Package Software Consulting</strong></td>
<td>IT Consulting and Advisory services across enterprise level package software solutions. Services to evaluate which package solutions would solve an enterprise wide work area and also evaluating its integration capabilities across the current application stack used by an organization.</td>
</tr>
<tr>
<td><strong>System Integration Services</strong></td>
<td>Integration, implementation or deployment of a software solution/hardware for an enterprise and ensuring its proper functioning in line with its integration with various other solutions or hardware currently in use by the enterprise. Services include Cloud Integration, Data Integration, EAI (enterprise application integration), Integrated Communication, Network Integration, Integrated Security Software, Service-oriented architecture, etc.</td>
</tr>
<tr>
<td><strong>Application Portfolio Optimization</strong></td>
<td>Application Portfolio Optimization services help companies ensure that their portfolio of IT projects, applications and infrastructure are providing cost-effective benefits to the organization. Aim is to identify disparate applications and ensure ways to integrate them into a core enterprise solution. Services include mapping application to business functions and its importance, cost management analysis, dependency mapping of an application, etc.</td>
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</table>

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## Reporting & Analytics

<table>
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<tbody>
<tr>
<td><strong>Reporting &amp; Dashboard</strong></td>
<td>Applications enabling tracking and monitoring the health of an organization or department by reporting on certain KPIs, business metrics, and analytics. Reporting &amp; dashboards are majorly used to summarize information thereby providing a glance into enterprise's business performance.</td>
</tr>
<tr>
<td><strong>BI / Analytics</strong></td>
<td>BI / Analytics encompasses a wide variety of tools, applications and methodologies that enable organizations to collect data from internal systems and external sources, prepare it for analysis, develop and run queries against the data. It enables discovery, interpretation, and communication of meaningful patterns in data to help relevant stakeholders to make more informed business decisions.</td>
</tr>
<tr>
<td><strong>Data Quality</strong></td>
<td>Data Quality services enables delivery of clean, trusted data to ensure enterprises meet their projects and business objectives. Such applications and services enable effective data extraction, transformation and loading along with superior data management.</td>
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## Digital Services

<table>
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<tr>
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<tbody>
<tr>
<td><strong>Social</strong></td>
<td>End-to-end solutions and services to help companies capture insight from social media engagements to fuel innovation.</td>
</tr>
<tr>
<td><strong>Advanced Analytics</strong></td>
<td>High-end Advance Analytics solutions being leveraged which enable an organization to run analysis on their customer data and enables Predictive and Prescriptive analysis. Such solutions can be SAS Analytics, SAP, etc.</td>
</tr>
<tr>
<td><strong>Internet-of-Things (IoT)</strong></td>
<td>Solutions and platforms which enable an enterprise to transfer and run data over a network through web of inter-connected devices and technologies such as mobile, sensors, database, CRM etc.</td>
</tr>
<tr>
<td><strong>Machine Learning (ML) / Cognitive Computing (CC) / Artificial Intelligence (AI)</strong></td>
<td>Use of Artificial Intelligence solutions and services by an enterprise solving a particular business function. Example might be use of IBM Watson by an enterprise. Also includes Enterprises leveraging solutions which studies various patterns and computational learning and processes a particular task based on the identification of a particular pattern. Enables a particular task to be done without any human intervention.</td>
</tr>
<tr>
<td><strong>Robotics Process Automation (RPA)</strong></td>
<td>Robotic process automation (RPA) is the application of technology that allows employees in a company to configure computer software or a &quot;robot&quot; to capture and interpret existing applications for processing a transaction, manipulating data, triggering responses and communicating with other digital systems automatically.</td>
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