



HFS

# Leverage engineering support services to drive digital engineering transformation initiatives

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Defining Future Business Operations

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In its 2018 strategic review, Nasscom mentioned that ER&D (Engineering research and development) and product development continued to be its fastest-growing segment at 12.8% (FY 2018 growth over FY 2017), [driven by demand](#) for autonomous services, electrification, connectivity, and shared mobility. According to Nasscom's senior vice president Sangeeta Gupta, the application of digital technologies in engineering services is one of the key areas fueling this growth.

Engineering support services have therefore become critical for most of the digital leaders and engineering services clients. As the application of software components (including usage of AI and analytics), and automation are increasing in engineering services, enterprises need a lot of guidance and support across the value chain in design, testing, compliance, documentation, and post-sales support. Thus, the role of engineering support services is a crucial strategic imperative to client organizations, along with the operational elements of core engineering services. In this PoV, we discuss how the client leaders can make the digital switch happen in their organizations by using engineering support services as key transformational and strategic levers, with practical examples and learnings drawn from HCL's experiences of aligning itself to the changing needs of their engineering services clients.

## The role of engineering support services is critical in the era of digital engineering

At present, the manufacturing industry is going through a major transformation to Industry 4.0, which is an amalgamation of several digital (artificial intelligence, internet of things, blockchain, etc.) and emerging (3D-printing, digital twin, etc.) technologies. Typically, manufacturing enterprises are very well versed with mechanical and embedded engineering and often lack software engineering capability, thus they need guidance from engineering service providers for massive strategic transformational programs such as process re-engineering and digitization, workflow automation, and software integration to pave the way for Industry 4.0 implementation.

All these digitalization efforts before and after core engineering implementation are crucial for the success of clients' transformation programs. The role of engineering support services is becoming strategically critical. The responsibility and nature of engineering support services have matured over the years as described in Exhibit 1.

**Exhibit 1: Engineering support services have evolved from operations and incremental to strategic and transformational**

<b>Attributes</b>	<b>In the early stages</b>	<b>Recent developments</b>
<b>Scope</b>	Confined to ECO (engineering change order) tracking, technical documentation, certifications, etc.	Expanded to product design, development, testing, and post-sales support in design aspects
<b>Pricing</b>	Fixed-price and time-and-materials	New pricing models (SLA (Service-level agreement), outcome-based) are introduced in addition to the old ones
<b>Technology</b>	Mechanical, embedded electronics, and enterprise software	Software engineering has increased for simulation, digital twins, etc.; the application of digital technologies such as robotic process automation (RPA), artificial intelligence (AI), analytics, etc., has been increasing
<b>Engagement types</b>	Primarily operational deals and small deal size	Both operational and strategic, longer-term, transformation deals; some of the deals are end-to-end

Source: HFS Research, 2020

Though several engineering service providers are focusing on this segment, HCL is leading this space with razor-sharp focus, execution capability, and innovation mindset. Among global service providers, HCL stood out as an increasingly relevant strategic partner for client transformation programs, with a 27% growth in engineering services in 2018. HCL has taken a number of initiatives to bolster its offerings and capability for both its core engineering and engineering support services teams.

## Clients’ digital transformation initiatives must get the most out of their service partners’ experience: Examples from HCL Digital Process Operations (DPO)

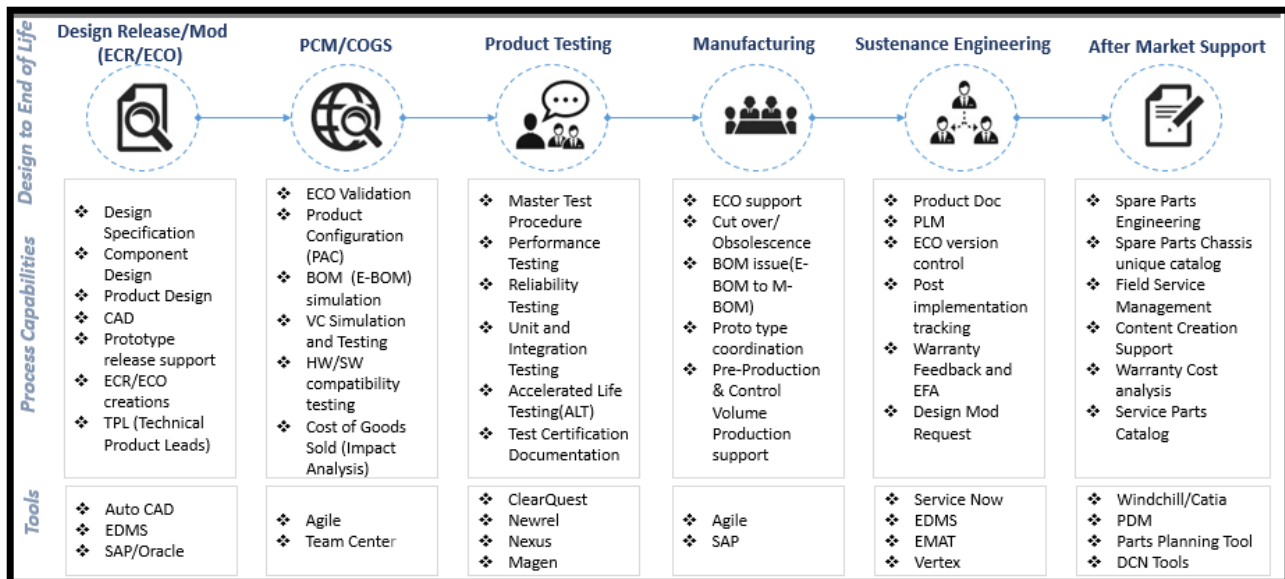
In engineering services, client leaders always look for ways to leverage the experience and extent of the knowledge base of their service partners. HCL Technologies have been in the engineering services space for several years, so, naturally, the client leaders expect a high degree of depth and breadth in the collective knowledge, experience, and wisdom, of the engineering support services team.

HCL Technologies is a leading global technology company that operates out of 45 countries. Its total revenue is the US \$9.7 billion (for 12 months ended December 31, 2019), and it has 149,000+ *ideapreneurs* (employees). HCL offers its services and products through three business units: IT and Business Services (ITBS), Engineering and R&D Services (ERS), and Products & Platforms (P&P). ITBS enables global enterprises to transform their businesses through offerings in areas of applications, infrastructure, digital process operations, and next-generation digital transformation solutions. ERS offers engineering services and solutions in all aspects of product development and platform engineering; under P&P, HCL provides modernized software products to global clients for their technology and industry-specific requirements.

As a leading global engineering service provider, HCL has strong expertise in mechanical, embedded and semiconductor software product engineering, and product lifecycle management (PLM). The [HFS engineering services top 50](#) report in 2018 ranked HCL fourth among the global engineering service providers and first among the Indian engineering service providers. HCL used both organic and inorganic means (e.g., acquiring Geometric and Butler Aerospace) to increase the depth and breadth of its talent pool and service capabilities for its engineering services business.

In early 2006, HCL DPO formed the Engineering Support Services group that focused on ECO (engineering change order) version control, ECO implementation tracking, variant configuration updates, and other areas. Later it started to focus on product cost management, product testing, product engineering support, and aftermarket support services. At present, the group has more than 4,000 resources and the capability to “Design to End-of-Life Support,” as described in Exhibit 2.

**Exhibit 2: HCL DPO engineering support services supports customers from design release to beyond production**



Source: HCL Technologies

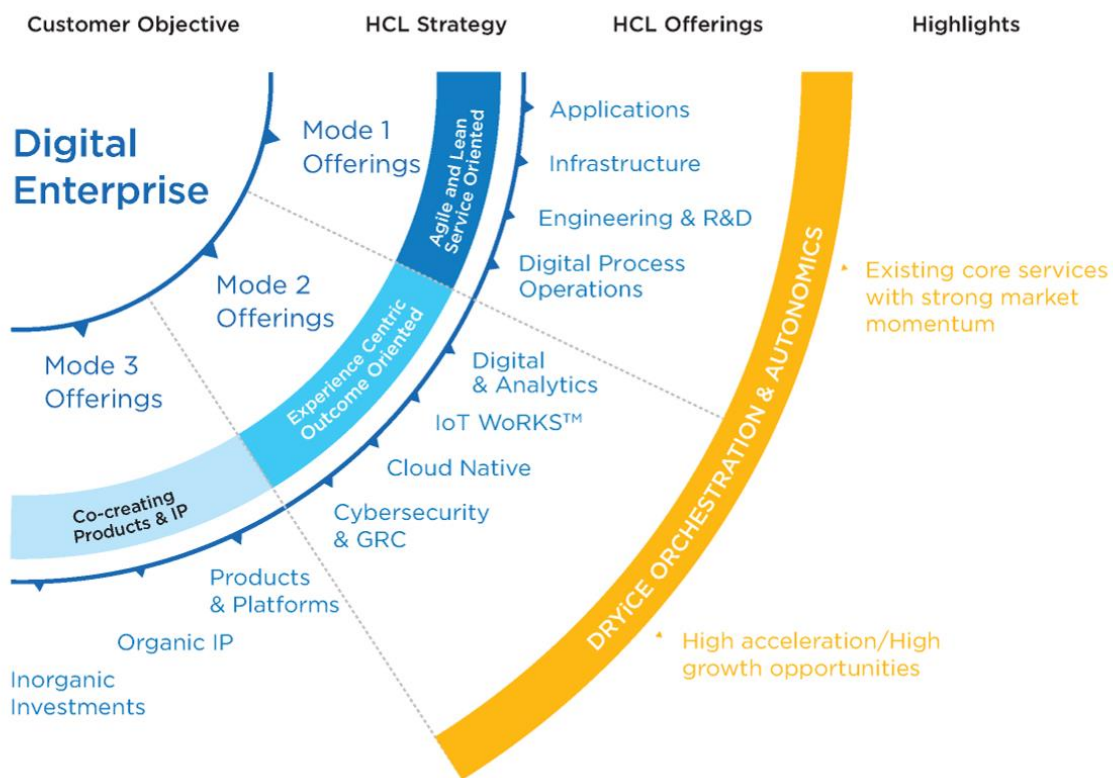
# The best way to showcase digital transformational agility is to prove your own transformation

Clients trust only those partners that have been successful in transforming themselves, their businesses, and their services lines first. “Physician, heal thyself,” is the common philosophy here. In sync with this client and market expectation, HCL’s engineering support services have undergone massive strategic transformations toward the digital mode, leveraging its 1-2-3 strategic roadmap and directions.

## Leverage HCL’s Mode 1-2-3 strategy in engineering services

HCL is transforming itself into a next-generation technology services firm through the Mode 1-2-3 strategy that will enable future proof of its customers' business. Mode 1-2-3 refers to core services, next-generation services, and products and platforms, as described in Exhibit 3.

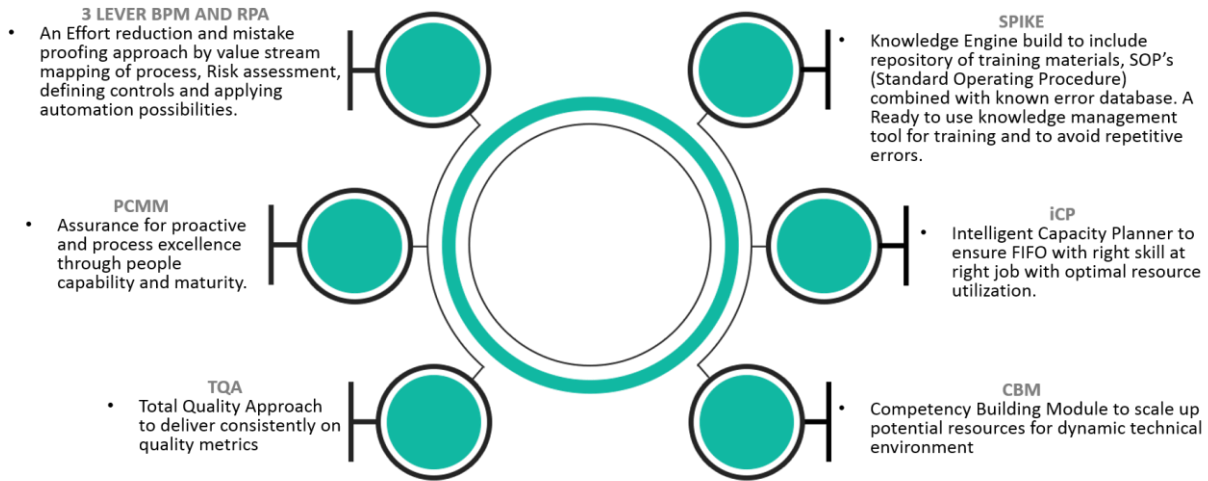
Exhibit 3: HCL Mode 1-2-3 strategy encompasses existing business, new growth areas, and the ecosystems



Source: HCL Technologies

Over the years in engineering services, the application of software components has grown from design to post-sales support phases. HCL DPO noticed this change earlier than many of its counterparts did, and it has been focusing on infusing digital technologies across all its key offerings, as mentioned in Exhibit 4.

**Exhibit 4: HCL DPO key transformation levers create value across the value chain of engineering support services**



Source: HCL Technologies

These digitally enabled tools in engineering services address the original HFS Trifecta of people, process, and technology aspects of the clients. HCL's Digital Process Operations (DPO) division houses its engineering support services and has enabled engineering support services professionals to develop a digital mindset. This has also helped HCL DPO to earn new avenues of business in upstream areas of its existing engineering support services customers. CBM and PCMM tools focus on the people aspect, as related to competency building, people maturity, and capability. SPIKE is HCL's engineering support services platform, and TQA manages the quality management aspects. Some of the technology-oriented tools are 3-Lever BPM, RPA, and iCP, which are related to effort reduction and intelligent capacity planning.

## How a global high-tech equipment manufacturer for people-movement solutions used HCL's experience to transform their own field engineering services into digital

We spoke with several engineering services leaders from various end-user companies, nudging them to share experiences, learnings, and key takeaways from their engagements with large engineering services providers. They clearly mentioned HCL DPO's key strengths as a partner, to have strategic transformation-related conversations beyond just operational services, and their talent strengths to support digital innovations.

Exhibit 5 shows this engagement as the client leaders described it to us. The example also shows HCL DPO engineering support services' automation capability. The client has categorically mentioned very high satisfaction levels with HCL's flexibility, fast execution capability, and quality of resources.



The HCL team has been very flexible and dynamic in responding to our changing requirements and challenges. We could never get the same level of dynamism and quality of a large talent pool if we were to do it any other way.

**—VP Engineering (Greater China area),  
leading global high-tech equipment manufacturer**

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**Exhibit 5: HCL DPO engineering support services team enabled a leading high-tech equipment manufacturer to realize cost-benefit and increase customer satisfaction**

Client: A leading global high-tech equipment manufacturer
<p style="text-align: center;"><b>Scope and engagement areas</b></p> <p>HCL DPO engineering support services are involved in providing innovative solutions for maintenance and modernizations for a <b>high-tech equipment manufacturer</b>. The scope involves engineering support, SAP configuration support, and layout drawing analysis among others across its various global regions.</p> <p><b>Key business drivers</b></p> <ul style="list-style-type: none"><li>• Low visibility in project details: Lack of ECO version controls and tracking with delayed implementation</li><li>• Customized design: Customizing electrical and mechanical layout design drawings against field engineers' requirements</li><li>• Lack of standardized template and transparency: Non-standard, fragmented, and low-visibility field engineering processes and systems</li><li>• Inconsistent reporting and analysis: Lack of systematic reporting and analysis across business units</li></ul>

### Solutions offered by HCL DPO engineering support services team

#### HCL DPO leveraged its engineering and automation expertise to deliver

##### transformation solutions:

- ECO impact analysis; part, assembly drawing, and data updates; simulation for compatibility with 100% compliance review for DFS (design for safety) and DFM (design for manufacturability)
- Implementation of a bot to list the parts needed for creating aftermarket parts catalog; the bot coordinates with the PDM (Product data management) system and PLM (Product lifecycle management) database based on the chassis configuration and automatically list the needed parts. This has helped for an effort savings of 20% in ECO change management in aftermarket catalogs, as shown in Exhibit 6.
- Successful integration of feedback management applications with SAP and other tool interfaces
- Reduction in clarification from field engineers' requests by 15% through feedback analytics powered by SPIKE, as shown in Exhibit 7
- Reduction of early failure rate on a year-over-year basis by more than 10% thru EFIA (early failure intelligence and analysis)

##### HCL also implemented automation in these areas:

- Layout drawing upload and analysis
- Validation of configuration for customer-specific orders
- Quality feedback handling process automation, powered by SPIKE, provides right guidance and resolutions for feedback related issues

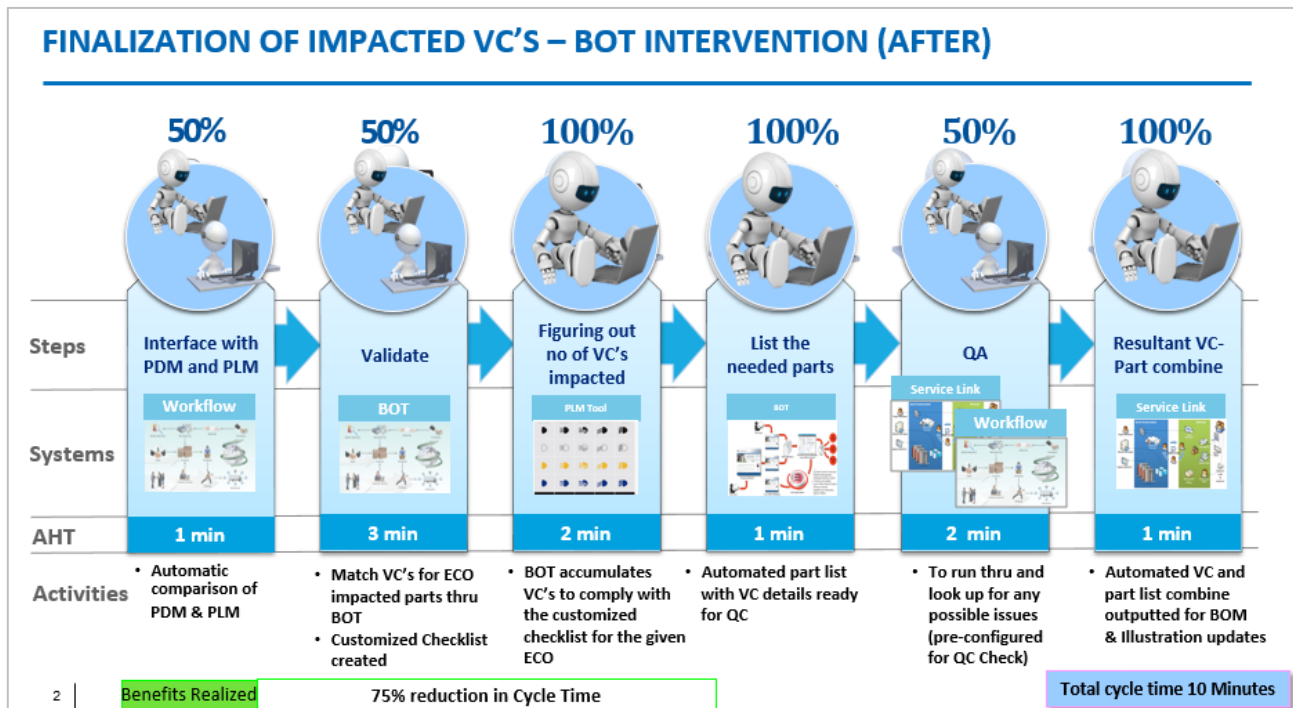
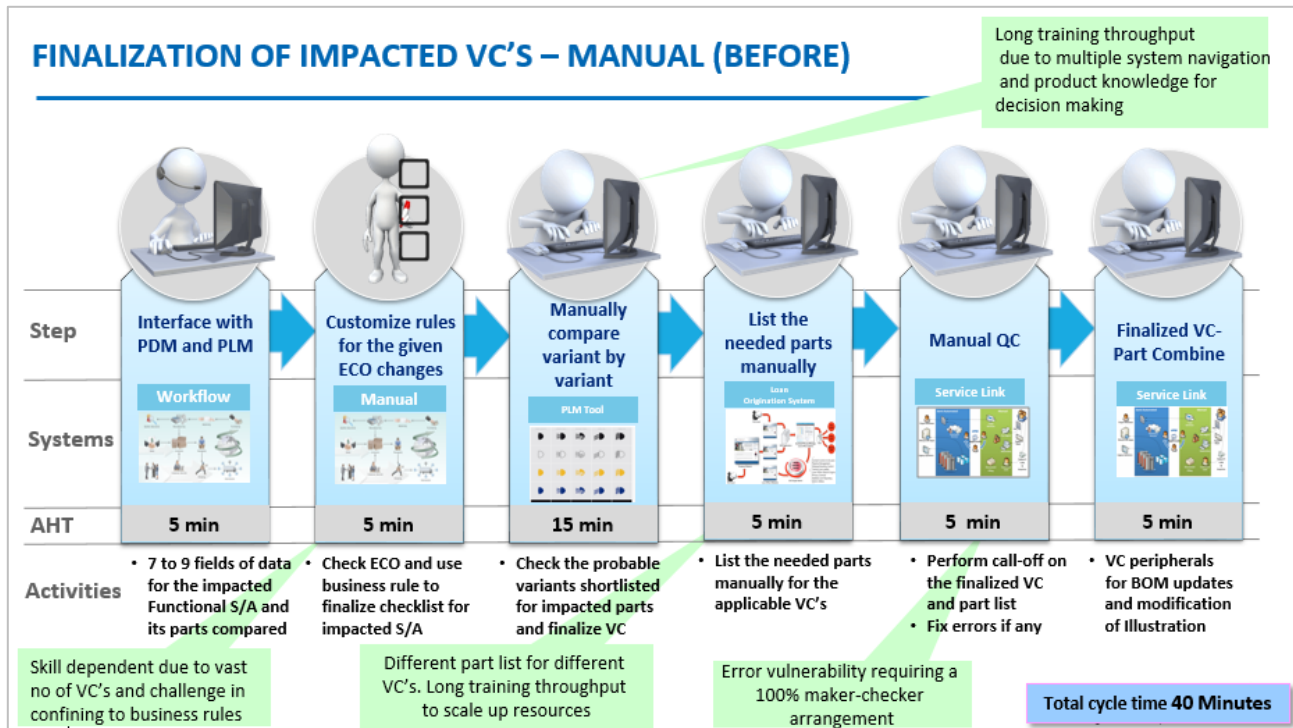
#### Outcomes achieved

- €500,000 cost benefits delivered per year
- 30% reduction in repeat feedbacks, increasing customer satisfaction
- More than 98% data quality score recorded for the last three consecutive years
- Catalog change accuracy improved to 99.8%

Source: HFS Research, HCL Technologies, 2020



Exhibit 6: Implementation of bot reduced the overall cycle time by 75%



VC-Variant Configuration, PDM – Product Data management, PLM – Product Lifecycle Management, S/A – Sub-Assy

Source: HCL Technologies

Before the bot was implemented, a lot of manual interventions were required for thorough product design knowledge and the ability to work with dynamic design rules (as the rules vary from one sub-assembly to another sub-assembly within a product variant). The bot deployment helped reduce the manual intervention needed while assuring quality through an accurate selection of VCs and the impacted parts list.

Exhibit 7: HCL DPO’s engineering support services platform (SPIKE)

Line of Services	Solutions	Initiatives	Reports	Support
ECO DR PCM VC BOM Testing	Automation Workflow Knowledge Engine Predictive Analysis Metrics Check Points	Knowledge Portal PCMM Dynamic QC Check List Complexity Segregation Resource Pyramid Skill Matrix	Volume Trend Balanced Score Card Complexity Mapping Dashboard Metrics Report	Knowledge Engine Process Flow Process SOP FAQ L1 and L2 Support

Source: HCL Technologies

SPIKE is a knowledge solution platform that provides coverage and addresses issues prior to delivering with less QC effort. The knowledge management is one of the SPIKE features customized for clients primarily for three benefits including to capture known error knowledge base scenarios as a ready reckoner, perform predictive analysis based on historical data, and manage process complexity mapping and exception scenarios.

## Three strong differentiators of HCL DPO engineering support services: vision, expertise, and collaborative effort

We had several conversations with HCL DPO executives and clients in the engineering services area over the years. Also, we have been closely following HCL DPO’s initiatives and investments in engineering services for a quite long time. Based on these interactions, client interviews, and market understanding, we have identified three key differentiators of the HCL DPO engineering support services unit.

**Vision:** HCL DPO engineering support services have come a long way from merely a support service unit providing niche services to a full-fledged engineering services unit that can be a strategic transformation partner for its clients in their digital journeys. The business unit matured from doing piecemeal technical work with excellent proof points on performance and quality to being involved in strategy discussions with senior client leadership across enterprises. As HCL is following Mode 1-2-3 strategy, HCL DPO has expanded its capability and massively upskilled its resources to support cutting-edge engineering and digital technologies across all three spectrums (operational, tactical, and strategic). Its enhanced capability has helped to win more upstream activities and end-to-end digital transformational programs from both existing and new customers.

**Expertise:** HCL DPO Engineering Support teams have the skills and capabilities to deliver and support end-to-end engineering digital process operations for existing and new clients. It has built capabilities across the major tools in engineering services ranging from enterprise technology and PLM to even more creative and challenging tasks such as engineering design. This end-to-end service capability has helped HCL to win some big deals. For example, in early 2019, HCL won a large deal that encompassed 360-degree coverage of a manufacturing organization's lifecycle (design, manufacturing support, source to pay, order to cash, and aftermarket service). Also, it has built capability in RPA and AI to implement integrated automation in line with [HFS' Triple-A Trifecta](#), which describes that automation, analytics, and artificial intelligence enable clients to optimize, renovate, or transform their business operations. This is also a key aspect highlighted in all client conversations in terms of how challenging it is on the ground for them access a broad spectrum of talents in engineering services and how the HCL teams excel in all aspects of this critical people capability lever. Clients cite this as a huge value differentiator given that people capabilities are most critical for digital success and cannot be sourced effectively by them, no matter how much technology, tools, software investments are taken up.

**Strong internal collaboration and cross-pollination to benefit clients:** HCL's DPO engineering services unit is collaborating with the HCL ERS team for strategy formulation, capability enhancement, and client engagements. Also, it is closely working with its technology partner ecosystem to explore the application of digital technologies and develop new offerings. HFS also believes that as organizational silos converge, ecosystems develop and a ["hyper-connected enterprise"](#) will emerge. HFS also predicted that hyper-connected enterprise will be driven by integrated automation, the same strategy followed by HCL DPO for its engineering services support unit. As most of the engineering enterprises have exposure to limited industries (non-conglomerate enterprises), they face challenges to leverage the best practices and recent developments of other industries that can become handy for them. As HCL DPO works with a broad spectrum of engineering enterprises across industries, it is exposed to several different types of business and technical challenges of its clients. HCL DPO can leverage its experience and can bring the best practices to solve client challenges. Engineering enterprises need to depend on their service partners for leveraging this cross-industry best practices. Thus, a service provider like HCL DPO that has experience and expertise in different industries can better serve clients in their engineering programs.

## Action items for client leaders for next Monday morning— to drive engineering services in the digital era

Actions	How to	Metrics
Think “strategic” when it comes to evaluating service partners for engineering support services.	Typically, engineering support services have been flavored as “operationally driven initiatives.” Client leaders must change that narrative and their own subsequent expectations from their service providers if they want to transform into truly digital businesses.	Client leaders must evaluate the following metrics of their potential partners: <ul style="list-style-type: none"> <li>• The percentage of their engineering support services engagements that are operational vs. strategic</li> <li>• The typical success stories and case studies from clients in their strategic engagements</li> </ul>
Give considerably higher weight to the people or talent capabilities aspect of partner evaluation.	All client leaders have unanimously agreed that access to top-quality talent is their critical success factor. Hence, client leaders must prioritize people capabilities over technology and tools, specifically when it comes to engineering services.	Client leaders must ask questions about people skills, such as <ul style="list-style-type: none"> <li>• What is the average experience span of different strata of their engineering services workforce?</li> <li>• How many of them have continuously certified and upskilled themselves to acquire more digital and software skills?</li> </ul>
Evaluate a broad range of capabilities across the creative–operational spectrum of engineering services.	Client leaders must move away from task-focused sourcing to end-to-end process transformation and digital skills.	Relevant metrics: <ul style="list-style-type: none"> <li>• Types of tasks covered and highlighted by the service partners</li> <li>• Percentage of end-to-end, long-term, strategic programs undertaken vs. piecemeal, task-based engagements</li> </ul>
Move from cost-focused to value and outcome-focused negotiations as your engagements move from operational to strategic.	Client leaders must prioritize innovative and flexible, outcomes-driven pricing mechanisms rather than just sticking to a cost-focused fixed-price and time-and-material-based model.	Relevant metrics: <ul style="list-style-type: none"> <li>• Percentage of outcome-based engagement vs. time-and-material or fixed-price projects</li> <li>• Percentage of revenue from non-linear pricing models vs. revenue from time-and-material or fixed-price projects</li> </ul>

<p>Create a “digital” mindset. Leverage digital technologies for engineering programs.</p>	<p>Client leaders must emphasize the application of digital technologies to improve the design, increase reliability in testing, and support post-production phases.</p>	<p>Client leaders must ask questions on the implementation of digital technologies, such as</p> <ul style="list-style-type: none"> <li>• What are the different digital technologies used for different value chain activities (for example, digital twin and simulation for design and testing, analytics for predictive maintenance, quality control, 3D-printing for customized design, etc.)?</li> <li>• What are the top-line and bottom-line improvements (operational efficiency, cost-saving, new revenue model, etc.) due to the application of digital technologies?</li> </ul>
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Source: HFS Research, 2020

**Bottom Line: Clients should closely collaborate with their engineering support services partners to leverage the collective experience and wisdom in their own transformation journeys.**

In the past, engineering support services units were involved with transactional and operational level initiatives, including service desk operations, technical documentation, regulatory compliance certifications, and testing requirements. With the advent of digital technologies and their rapid applications, these teams are getting involved with digital operations and process re-engineering initiatives, which are the essential parts of clients’ engineering strategic initiatives and enterprise transformation journey. The important question remaining for service providers is how to empower their engineering support services function so that it can get involved in major client transformation assignments. HCL DPO has shown the way by successfully transforming its engineering support services team, integrating with broader engineering services practice.

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HFS defines and visualizes the future of business operations across key industries with our Digital OneOffice™ Framework.

HFS influences the strategies of enterprise customers to help them develop OneOffice backbones to be competitive and to partner with capable services providers, technology suppliers, and third-party advisors.

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